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Volume 6

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Ready Reference

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and thus be human life enriched."

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How to use the MICROPAEDIA

The 12 volumes of the MICROPAEDIA contain tens of thousands of shorter articles on specific persons, places, things, and ideas, arranged in alphabetical order. The MICROPAEDIA can be used as an information resource on its own; and it can function as support for the longer articles in the MACROPAEDIA (to which it refers whenever appropriate). The MICROPAEDIA in turn is supported by references in the INDEX and by the lists of suggested readings in the PROPAEDIA. Finally, the MICROPAEDIA is the portion of the *Encyclopædia Britannica* best suited for the reader who wishes to browse among the countless subjects in all fields of human learning and history in all times and places.

Alphabetization

Entry titles are alphabetized according to the English alphabet, A to Z. All diacritical marks (such as in ö, ł, or ñ) and foreign letters without parallels in English (such as ayin [ʿ] and hamza [ʾ]) are ignored in the alphabetization. Apostrophes likewise are ignored. Titles beginning with numbers, such as **1812, War of**, are alphabetized as if the numbers were written out (**Eighteen-twelve, War of**).

Alphabetization proceeds according to the "word-by-word" principle. Thus, **Mount Vernon** precedes **mountain**; any **John** entry precedes **John Henry**, which in turn precedes **Johne's disease**. Any character or string of characters preceding a space, hyphen, or dash is treated as a word and alphabetized accordingly. Thus, **De Broglie** precedes **debenture**, and **jack-o'-lantern** precedes **jackal**. Titles with identical spellings are arranged in the following order: (1) persons, (2) places, (3) things.

For many rulers and titled nobility, chronological order, as well as alphabetical order, governs placement. Rulers of the same given name (*e.g.,* William) may be grouped together, separate from other entries, and indicated by the symbol •. They may be subgrouped alphabetically by country and, within each country, arranged chronologically (**William I, William II**, etc.). Nobility or peers of the same titled name (*e.g.,* **Essex, EARLS OF**) are similarly grouped together, separate from other entries; they are indicated by the symbol • and arranged chronologically.

Places with identical names are arranged in the alphabetical order of the countries where they are located. Identical place-names in the same country are alphabetized according to the alphabetical order of the state, province, or other political subdivision where they are found.

Entry arrangement

The titles of entries are arranged according to the forms commonly found in indexes and dictionaries, with some special conventions.

Entry titles for certain physical features, institutions, structures, events, and concepts are ordinarily inverted to place the substantive word first. Thus, the Bay of Bengal is entered as **Bengal, Bay of**; the Bank of England as **England, Bank of**; the Tower of London as **London, Tower of**; the Siege of Vienna as **Vienna, Siege of**; and the balance of power as **power, balance of**. If the name of a physical feature, institution, structure, event, or concept has two or more descriptors, it is entered under the descriptor appearing first. Thus, the Episcopal Church in Scotland is entered as **Episcopal Church in Scotland** (not **Scotland, Episcopal Church in**); the Leaning Tower of Pisa as **Leaning Tower of Pisa**; and the kinetic theory of gases as **kinetic theory of gases**.

The entries for most Western persons are arranged so that one can read a name in correct order by beginning after the first comma, proceeding to the end of the boldface type, returning to the beginning word or words, and proceeding forward to the first comma. Thus, the entry **March, Patrick Dunbar, 2nd Earl of**, is read "Patrick Dunbar, 2nd Earl of March"; the entry **Orléans, Louis, duc d'**, is read "Louis, duc d'Orléans." Names of Far Eastern origin are given in Oriental order, with the surname preceding the personal name (*e.g.,* **Tōjō Hideki, Deng Xiaoping, Nguyen Cao Ky**).

Cross-references

Some cross-reference entries appear in the MICROPAEDIA for the purpose of leading a reader from names that are familiar to alternate names that may not be. Cross-references also appear frequently within or at the ends of standard entries, where they are identified by *see, see also, see under, q.v.* (*quod vide,* "which see"), or *qq.v.* (*quae vide,* "which see," plural).

Certain entries serve both as relatively brief essays on general subjects and as cross-references to the same subjects treated at greater length and in greater depth in the MACROPAEDIA. Such an entry (*e.g.,* **igneous rock**) begins with a definition of the subject and then provides the following cross-reference: "A brief treatment of igneous rocks follows. For full treatment, *see* MACROPAEDIA: Minerals and Rocks.

Entries on certain broad subjects (*e.g.,* **music**) direct the reader to several relevant articles in the MACROPAEDIA and also to the PROPAEDIA for listings of related articles in the MICROPAEDIA.

Abbreviations

Abbreviations used in the MICROPAEDIA are given in a list that appears at the end of every MICROPAEDIA volume.

Territorial boundaries

In articles and maps indicating disputed geopolitical boundaries and territories, the attribution of sovereignty or administrative subordination to any specific area does not imply recognition of the status claimed by an administering power.

Holderness, district (borough), county of Humberside, England, with an area of 208 sq mi (540 sq km). The plain of Holderness reaches the coast in unstable clay cliffs, where erosion is a serious problem north of Spurn Head. Several villages and their fields have been lost under the sea since Roman times. Inside the estuary silt deposits have been extensively reclaimed around one-time Sunk Island, and many small harbours that were tidal in medieval times (*e.g.,* Hedon) have silted up.

Apart from coastal resorts at Hornsea and Withernsea, protected from erosion by costly seawalls, the district is still profoundly rural. Since enclosure and piecemeal drainage of the hollows of its hummocky surface and the estuary silts were completed in the 19th century, Holderness has been one of the most productive agricultural tracts in England, raising large crops of cereals as well as sugar beets and fodder crops and supporting a high density of livestock, including intensive pig and poultry enterprises.

A gas terminal at Easington receives natural gas from offshore fields, and, near Hornsea, salt cavities beneath the clay surface are being excavated for large-scale storage. Pop. (1982 est.) 46,800.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Holdheim, Samuel (b. 1806, Kempen, Prussia—d. Aug. 22, 1860, Berlin), German rabbi who, although originally very traditional in his views, became a founder and leader of radical Reform Judaism. His theological positions, radical even within the Reform movement, offer an extreme example of the movement's attempt to keep Judaism viable in modern times.

From 1836 to 1840 Holdheim officiated as a rabbi at Frankfurt an der Oder. There he published *Gottesdienstliche Vorträge* (1839; "Sermons"), in which he emphasized that a rabbi should teach and morally edify his congregation, not merely act as a consultant on ritual. In 1840 he went as *Landesrabbiner* (rabbi of a whole province) to Mecklenburg-Schwerin.

Three years later he published his most controversial and important book, *Ueber die Autonomie der Rabbinen* ("The Autonomy of the Rabbis"). He concluded that Jewish marriage and divorce laws were obsolete because they represented the national aspect of Judaism (no longer valid) as against its enduring religious aspect. Such laws, he held, should be superseded by the laws of the state, for Judaism is a religion only, whose essential core is to be found in biblical ethics and doctrine. Later Holdheim took a controversial, although more moderate, position on the importance of circumcision. During the rabbinical conferences of 1844–46, which elaborated the ideology of Reform Judaism, he took a dominant role.

In 1847 he became rabbi of the Jüdische Reformgenossenschaft (Congregation of the Jewish Reform Alliance) in Berlin, where, for Reform Jews, he established Sunday as the day of worship and, except for Rosh Hashana (the Jewish New Year), abolished keeping the second day of holidays. Holdheim's writings form part of the classical literature of Reform Judaism, although few of his ideas are generally accepted within the movement today.

holding company, enterprise that owns a controlling portion of the stock of other companies, providing a means of concentrating control of several companies with a minimum amount of investment. It may exist solely as a holding company or it may engage in a business of its own as well. The holding company's liability is limited by its amount of stock ownership, and it is able to reap the benefits of a subsidiary's goodwill and reputation without participating in the management of its production operations. This makes it an effective form of organization on both national and international levels.

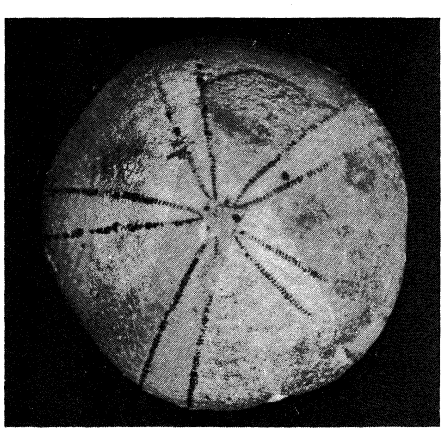
Holdrege, city, seat of Phelps County, south central Nebraska, U.S. Founded *c.* 1883 by Swedish immigrants, it was named for George W. Holdrege of the Chicago, Burlington and Quincy Railroad. It has developed as a commercial centre for an extensive agricultural area, with food processing as the chief industry. Manufactures include farm equipment and monuments. Inc. 1884. Pop. (1980) 5,624.

hole, in solid-state physics, a quasi-positive charge that moves freely through certain types of solids. Each hole is the absence of an electron (a negatively charged particle) from an accessible energy state in the solid, much as a bubble is the absence of liquid from an otherwise full container. While a hole cannot be examined outside the solid, its motion inside the solid can be observed. Certain metals, such as beryllium, and many types of semiconductors carry electrical currents by the motion of holes.

According to the band theory of solids, electrons within a solid have energies at only certain discrete levels. These discrete levels combine to form groups of energy levels, or bands. If all of the energy levels within a particular band are occupied by electrons, the band is said to be full. The motions of the electrons in a full band cancel each other, so that the electrons in full bands do not help the solid to carry an electrical current. If some electrons are removed from a full band, cancellation is no longer perfect, so that current can flow—*i.e.,* a net motion of electrons results. The band behaves as though each level from which an electron was removed contains a positive charge, or hole. Holes are not observed in empty space because this band structure applies only to solids.

Holes are often deliberately introduced into solids containing full energy bands, because the presence of holes increases the ability of a material to carry an electrical current. The process involves addition of certain impurity atoms to an otherwise pure, solid semiconductor. If the impurity atoms contain fewer outer electrons than the atoms that make up the solid, the impurity atoms may capture electrons from the neighbouring atoms of the solid. The absence of this electron from an atom is a hole.

Holectypus, genus of extinct echinoids, animals much like the modern sea urchins and sand dollars, found as fossils exclusively in marine rocks of Jurassic to Cretaceous age



Holectypus

By courtesy of the trustees of the British Museum (Natural History); photograph, Imitor

(between 65,000,000 and 190,000,000 years ago). *Holectypus* was bun shaped with a flat bottom and arched back.

Holguín, province, southeastern Cuba, bounded on the north by the Atlantic Ocean and by the provinces of Las Tunas on the west, Granma on the southwest, Santiago de Cuba on the south, and Guantánamo on the southeast. Part of former Oriente province until 1976, the province has an area of 3,440 sq mi (8,910 sq km). The territory consists of hilly country that fronts the Sierra de Nipe and the Sierra del Cristal in the southeast and is traversed by tributaries of the Río Salado in the southwest. In the northeast is the Bahía (bay) de Nipe basin. Large portions of the nation's corn (maize) and bean crops are grown near Holguín (*q.v.*) city, the provincial capital, in a region known as the granary of Cuba. Besides sugarcane and cattle, other important agricultural products include tobacco, sweet potatoes, cassava, peanuts (groundnuts), and fruits, principally bananas and oranges. The province is rich in iron ore, nickel, and chromium. Moa is the site of a nickel- and cobalt-separation plant and of a chromite-processing plant; chromite is also processed at Mayarí. Another nickel separation plant, built in 1943, is at Nicaro, together with an iron and steel foundry. Iron is mined in the Sierra de Nipe near Mayarí. Serpentine and gold (embedded in quartz) are also mined. Sugar refining, cigar making, meat processing, ceramic making, and shoe and furniture making are centred in Holguín city, which lies on the central highway and is connected to the main railroad. Pop. (1983 est.) 923,777.

Holguín, city, capital of Holguín province, eastern Cuba. Founded in the early 16th century, it became a centre of insurgency movements and suffered intensely the effects of the Ten Years' War (1868–78) and the 1895–98 struggle for independence.

Holguín, located on fertile, rolling plains, is now an important communications and trading centre in southeastern Cuba. Sugarcane and tobacco are the chief products of the region, although cattle are important. The city is on the central highway and is served by railroads and airlines. Its port, Gibara, lies 19 mi (31 km) to the north. Pop. (1981 prelim.) 190,155.

Holī, Hindu spring festival celebrated on the full-moon day of Phālguna (February–March).



"Celebration of spring by Krishna (Kṛṣṇa) and Rādhā," 18th-century miniature; in the Musée Guimet, Paris (MS 1832)

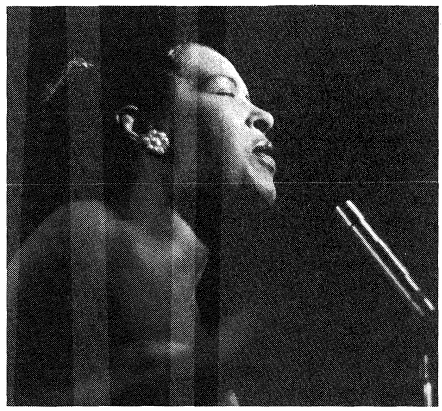
By courtesy of the Musee Guimet, Paris; photograph, Lavaud

The festival, probably of ancient origin, has many characteristics of a saturnalia. Participants throw coloured waters and powders on one another, and, on this one day only, the usual restrictions of caste, sex, status, and age are disregarded. In the streets the celebrations are often marked by ribald language and behaviour. The festival is particularly enjoyed by the worshippers of Krishna (Kṛṣṇa); general frivolity is considered to be in imitation of Krishna's play with the *gopīs* (wives and daughters of cowherds).

The Dolayātrā (swinging of the god) festival takes place during Holī; images of the gods are placed on specially decorated platforms and swung to the accompaniment of special songs.

holiday (from "holy day"), originally, a day of dedication to religious observance; in modern times, a day of either religious or secular commemoration. Many holidays of the major world religions tend to occur at the approximate dates of more ancient, pagan festivals. In the case of Christianity, this is sometimes owing to the policy of the early church of scheduling Christian observances at dates when they would eclipse pagan ones—a practice that proved more efficacious than merely prohibiting the earlier celebrations. In other cases, the similarity of the date is due to the tendency to celebrate turning points of the seasons, or to a combination of the two factors.

In many countries, secular holidays are based on commemoration of historic events and the birthdays of national heroes—*e.g.*, Independence Day and Washington's Birthday in the United States and Bastille Day in France. Forms of observance of national holidays range from display of the national flag to exemption of public employees from work, the latter practice generally being followed also by business organizations. Traditionally, many holidays are celebrated by family reunions and the sending of greeting cards and gifts.



Billie Holiday, 1958

Reprinted with permission of *down beat* Magazine



Memorial Day ceremony honouring United States servicemen who died in war

Jon Sinish—DPI

In Great Britain, the so-called bank holidays are marked by the closing of banks and other institutions. *See also* feast.

See Table for selected holidays.

Holiday, Billie, original name ELEANORA FAGAN (b. April 7, 1915, Baltimore—d. July 17, 1959, New York City), U.S. performer who was considered to be the outstanding jazz singer of her time; she was affectionately known as "Lady Day," a sobriquet first given her by her friend Lester Young.

Holiday was the daughter of an itinerant guitarist. She first became acquainted with jazz when the brothel keeper for whom she ran errands as a child allowed her to hear recordings by Louis Armstrong and Bessie Smith. After an interlude as a prostitute, she made her professional singing debut in obscure Harlem nightclubs in 1931 and recorded for the first time two years later.

She was not recognized until 1935, and her small group of recordings of that period are today acknowledged as jazz masterpieces. She toured briefly with Count Basie and Artie Shaw before becoming a nightclub solo attraction in 1940—never, however, severing her jazz affiliations. Her last years were a pathetic struggle against heroin addiction, which eventually killed her; but her later recordings show that, although her voice was ravaged, her technique remained supreme.

Holiday's style is considered to be one of the most vivid musical manifestations of personality ever achieved. With no technical training, she created beautiful and sophisticated musical effects, her diction being unique and her phrasing inimitable. Most memorable of all was an acute dramatic intensity that rendered the most banal lyric profound. Her vintage years were perhaps 1936–43, when her professional and private liaison with the saxophonist Lester Young was perpetuated by some of the best recorded examples of the interplay between a vocal line and an instrumental obbligato. Her autobiography, *Lady Sings the Blues,* written with W. Dufty, appeared in book form in 1956 and as a motion picture in 1972.

Holies, Holy of (Judaism): *see* Holy of Holies.

Holiness, Code of, collection of secular, ritualistic, moral, and festival regulations in the Old Testament Book of Leviticus, chapters 17–26. The code stresses that the people of Israel are separated from the rest of the world because Yahweh has chosen them; they are to demonstrate their unique election by disassociating themselves from profane worldliness and by retaining their ritualistic and moral purity.

The Code of Holiness includes regulations for animal sacrifices, eating, cleanliness, priestly conduct, speech, and sexual regulations. Also included are a list of days that are to be held sacred and laws concerning the sabbatical (jubilee) year, in which Israelite slaves were to be freed and interest was to be prohibited.

Consult the INDEX *first*

Holiness movement, fundamentalist religious movement that arose in the 19th century among Protestant churches in the United States, characterized by a doctrine of sanctification centring on a postconversion experience enabling the believer to live a sinless, perfect, holy Christian life. The numerous Holiness churches that arose during this period vary from quasi-Methodist sects to groups that are similar to Pentecostal churches.

Origins. The quest for perfection, or personal holiness, is to those who seek it as old as Christianity itself. The pursuers of perfection find sufficient warrant for it in the Gospels as well as in the apostolic writings, in passages such as "You, therefore must be perfect, as your heavenly Father is perfect" (Matt. 5:48), or "For God has not called us for uncleanness, but in holiness" (I Thess. 4:7). Yet opponents of perfectionism hasten to point out that throughout the history of Christianity those who have espoused such views have, for the most part, been pneumatics (spiritualists), heretics, or fanatics, forming groups such as the Gnostics, Pelagians, Montanists, Fraticelli, Anabaptists, or Shakers. Moreover, they argue that the principal orthodox theologians from St. Augustine to John Calvin have staunchly declared that one can never be entirely free from sin and its temptations and, therefore, can never achieve perfection in this life.

On the whole, this view prevailed until the 18th century when John Wesley, the founder of Methodism, issued his call to Christian perfection. For Wesley, the doctrine of perfection was a principle based upon a scriptural foundation. Perfection was to be the goal of all those who desired to be *altogether* Christian; it implied that the God who is good enough to forgive sin (justify) is obviously great enough to transform the sinner into a saint (sanctify), thus enabling him to be free from outward sin as well as from "evil thoughts and tempers," in short, to attain to a measure of holiness. And indeed, concepts such as Christian perfection, entire sanctification, and personal holiness were central both in Wesley's preaching as well as in the evangelical revival that swept across 18th-century England and eventually reached the American colonies.

From the outset, the motto of the colonial Methodism was "to spread Christian holiness over these lands." The 1787 edition of the *Discipline* admonished those who planned to be itinerant preachers "to save as many souls as you can; to bring as many sinners as you possibly can to Repentance, and with all your

Selected festivals and holidays

January
1 **New Year's Day.** The first day of the year in countries that use the Gregorian calendar and for some that also use a lunar calendar (*e.g.*, China, Japan, Korea); observed by a variety of rites, both religious and secular, and by parades, feasts, games, and gifts. In Christianity, generally, it is called the **Feast of the Circumcision and Name of Jesus,** and in Roman Catholicism the **Solemnity of Mary, the Mother of God**; a holy day of obligation for Roman Catholics, Eastern Orthodox, and Anglicans.
1 **Anniversary of the Revolution.** In Cuba (1959).
1 **Independence Day.** In Haiti (1804) and The Sudan (1956).
4 **Independence Day.** In Burma (1948).
6 **Epiphany.** In Christianity, the 12th day after Christmas, commemorating the visit of the Magi to Jesus and marking the end of the Christmas season; also called **Twelfth Night** (in England) or the **Feast of the Three Kings.**
15 **Adults Day.** Celebration held for Japanese men and women attaining the age of 20.
26 **Australia Day.** Commemorates the first settlement by the British in 1788 under Capt. Arthur Phillip.
26 **Republic Day.** Commemorates the day India became a republic (1950).
31 **Independence Day.** In Nauru (1968).

January–February
Yüan Tan. Chinese New Year's Day; based on the lunar calendar, it falls between January 21 and February 19; the traditional two-week celebration ends on **Yüan Hsiao (Lantern Festival)** when children parade with lighted lanterns.
Tu bi-Shebat. In Judaism, **New Year for Trees;** celebrated on the 15th of the lunar month Shebaṭ; observed by eating fruits and planting trees.

February
2 **Candlemas Day.** In Christianity, the 40th day after Christmas, commemorating the day the Virgin Mary went to the Temple of Jerusalem to be purified after bearing Jesus and to present him to God as her firstborn. The custom of blessing candles on this day—hence the name Candlemas—is observed in Roman Catholic, Eastern Orthodox, and Anglican churches because Christ was presented as "the Light to lighten the Gentiles"; also called **Purification of the Blessed Virgin Mary** and **Presentation of the Lord** in the West and **Hypapante (Meeting)** in the Greek Church.
4 **Independence Day.** In Sri Lanka (1948).
6 **Waitangi Day.** National holiday of New Zealand commemorating the Treaty of Waitangi (1840) between the Maoris and the British, under which Great Britain was granted sovereignty over the country.
7 **Independence Day.** In Grenada (1974).
11 **Japanese National Foundation Day.** Commemorates Japan's founding by the first emperor in 660 BC.
11 **Revolution Day.** Commemorates the overthrow (1979) of the last vestiges of the Shah's reign in what is now the Islāmic Republic of Iran.
14 **St. Valentine's Day.** A secular folk holiday observed informally in Great Britain, Canada, and the United States by sending messages of endearment or gifts expressing affection.
18 **Republic Day.** Independence Day in The Gambia (1965).
23 **Republic Day.** In Guyana (1970).
25 **National Holiday of Kuwait.**
27 **Independence Day.** In the Dominican Republic (1844).

February–March
Shrove Tuesday. In Christianity, the day before Ash Wednesday, also called **Fastnacht** (Eve of the Fast) in Germany, **Carnival** (Farewell to Meat) in Italy and other countries of southern European traditions, **Mardi Gras** in Brazil and the United States, and **Pancake Tuesday** in Great Britain; observed as the last day of merrymaking before Lent, with parades, masked dances, feasting, and other such activities.
Ash Wednesday. In Christianity, the first day of Lent; the medieval custom of marking a person's forehead with a cross of ashes as a sign of penance is still observed in the Roman Catholic liturgy; a movable feast day 40 days (exclusive of Sundays) before Easter.
Purim. In Judaism, **Feast of Lots;** a celebration on the 14th or 15th of the lunar month Adar, commemorating the escape of the Persian Jews from extermination in the 5th century BC; observed by reading the story from the Book of Esther, feasting, exchanging gifts and food, and merrymaking.
Holī. A Hindu festival of spring observed by lighting bonfires, dancing in the streets, and saturnalia and carnival-type activities.
Sivarātri. In Hinduism, the main festival honouring Śiva, the destroyer and restorer god.

February–April
Lent. In Christianity, a penitential season lasting for 40 days (excluding Sundays) before Easter; called **Carême** in France, **Quaresima** in Italy, and the **Great Fast** in Eastern Orthodoxy.

March
1 **Independence Movement Day.** In South Korea; a day honouring the national anti-colonial rallies of 1919 against Japanese rule.
3 **Hina Matsuri.** In Japan, **Doll Festival,** also called the **Peach Festival;** a folk holiday on which girls display a set of dolls, dressed in ceremonial costume, that have been handed down from mother to daughter for many generations.
3 **National Day.** In Morocco; celebration of independence (1956).
6 **Independence Day.** In Ghana (1957).
12 **Independence Day.** In Mauritius (1968).
17 **St. Patrick's Day.** Commemoration of the death of the patron saint of Ireland; observed by Irish throughout the world and the national holiday of the Republic of Ireland.
21 **Earth Day.** Day commemorated in western Europe and North America since the early 1970s espousing environmental awareness and conservation of the Earth's resources.
23 **Pakistan Day.** National holiday of Pakistan.
25 **Independence Day.** In Greece (1821).
25 **Feast of the Annunciation.** In Christianity, commemoration of the announcement by the angel Gabriel to Mary that she would become the mother of Jesus.
26 **Independence Day.** In Bangladesh (1971).
31 **Jum il-Helsien.** National day of Malta.
World Day of Prayer. Ecumenical Christian day of prayer observed on the first Friday of March.

March–April
Pesaḥ. In Judaism, **Passover,** also called the **Feast of Unleavened Bread;** a festival beginning on the evening of the 15th day of the lunar month Nisan and continuing through the 22nd (through the 21st in Israel), commemorating the deliverance of the Hebrews from Egyptian bondage in the 13th century BC. It is observed on the first and second nights by families or groups at a ceremony called the Seder, which includes a meal of certain foods (*e.g.*, unleavened bread and bitter herbs) symbolic of the Exodus, and a recitation of the Exodus story from the Passover Haggada ("Narrative").
Palm Sunday. In Christianity, the Sunday before Easter and the first day of Holy Week; it commemorates Christ's triumphal entry into Jerusalem and is observed by the blessing of palm leaves.
Maundy Thursday. In Christianity, the Thursday before Easter, commemorating the Last Supper of Jesus with the 12 disciples and his giving of a new commandment, or mandate, to love one another; observed by participating in Holy Communion services (the Eucharist).
Yom ha-shoa. Commemorates the systematic destruction of European Jewry between 1933 and 1945; it is also called **Holocaust Day.**
Vasanta Pancami. A Hindu festival in honour of Sarasvatī, the goddess of learning, wisdom, and fine arts.

March–May
Easter. In Christianity, the **Feast of the Resurrection,** the first Sunday after the first full moon after the vernal equinox (March 22–April 25) in Western churches; also called **Ostern** in Germany and Switzerland, **Pasqua** in Italy, **Pâques** in France, **Pasha** in Greece, and **Paske** in Norway; observed by lighting a Paschal candle, singing, sunrise worship services, wearing new clothes, hunting for and eating hard-boiled coloured eggs, and other festive activities. In Eastern Orthodox churches, which still use the Julian calendar, the date of Easter often is a week or more later than that of the Western churches.

April
4 **National Day of Senegal.**
4 **Anniversary of the Liberation.** In Hungary, national holiday celebrating the last withdrawal of Nazi troops in 1945.
5 **Ching Ming Festival.** Tomb-sweeping day in Taiwan, a day for cleaning tombs and performing rites for the dead.
8 **Kambutsue.** In Japan, celebration of the Buddha's birthday; also called **Hana Matsuri,** the **Flower Festival,** because fresh flowers are brought to temples; observed by washing the image of the Buddha with *amacha,* a sweet tea.
14–17 **Sanno Matsuri.** In Japan, a Shintō festival honouring the mountain god Sanno; celebrated at the Hie shrine in Takayama with parades, pageants, and floats. There is a festival honouring Sanno on June 15 in Tokyo.
16 **Birthday of Queen Margrethe II.** National holiday of Denmark.
17 **Evacuation Day.** In Syria (1946), day celebrating final evacuation of all French troops.
18 **Independence Day.** In Zimbabwe (1980).
19 **Republic Anniversary Day.** National holiday in Sierra Leone commemorating the formation of the republic in 1971.
27 **Union Day.** In Tanzania (1964), commemorates the unification of Zanzibar and Tanganyika.
27 **Independence Day.** In Togo (1960).
29 **Emperor's Birthday.** In Japan, a national holiday honouring the birth (1901) of Emperor Hirohito.
30 **Queens Day.** National holiday of The Netherlands commemorating Queen Beatrix's investiture in 1980 and former Queen Juliana's birthday.
30 **Birthday of the King.** National holiday of Sweden honouring King Carl XVI Gustaf's birthday.
30 **Walpurgis Night.** Evening celebrated in Germany; it is supposedly an occasion when witches celebrate the sabbat in the Harz Mountains.

April–May
Baisākhi. In Hinduism, the New Year festival; celebrated by gift giving, feasting, praying, and bathing in the Ganges River or other sacred waters.
Vesak. Commemoration of the birth, enlightenment, and death of the Buddha; celebrated in southeast Asia on the full moon of the lunar month Vaiśākha; observed by gift giving, decorating buildings with flowers and lanterns, and presenting flowers to images of the Buddha.
Independence Day. In Israel (1948), celebrated on the fifth day of the lunar month Iyyar.

May
1 **May Day.** In Europe and in countries with European traditions, a folk holiday based on the Roman festival of flowers, the Floralia, in honour of the coming of spring; observed by

Selected festivals and holidays (continued)

giving May baskets filled with flowers or candy, dancing around a Maypole, selection of a May queen and king, lighting bonfires on hilltops (in England), and other festivities.

1 **May Day.** A holiday honouring workers in Socialist and Communist countries; originated in 1890 in Europe in support of labour demands, in the United States for an eight-hour working day; in the Soviet Union an important national holiday observed with political demonstrations.

5 **Tango-no-sekku,** or **Boys' Festival.** In Japan, a national holiday, corresponding to the Doll Festival for girls.

9 **Liberation Day.** In Czechoslovakia, day commemorating the entrance (1945) of Soviet forces into Prague and the defeat of the Nazis.

14–15 **Independence Days.** In Paraguay (1811), national holidays commemorating the overthrow of the Spanish governor.

17 **Constitution Day.** In Norway, commemoration of the publication (1814) of a constitution, which was not fully implemented until 1905, when Norway became free of Swedish domination.

20 **National Day of Cameroon.**

24–25 **La Fête des Saintes-Maries.** Festival in Saintes-Maries-de-la-Mer, France, honouring the patron saints of Gypsies.

25 **National Holiday.** In Argentina (1810), commemorates the establishment of an autonomous government at Buenos Aires to administer the vice-royalty of La Plata in the name of Ferdinand VII, pending his restoration.

25 **Africa Day,** or **Liberation of Africa Day.** Celebrated in Chad, Equatorial Guinea, Mali, Mauritania, Zambia, and Zimbabwe.

25 **Independence Day.** In Jordan (1946).

31 **Republic Day.** In South Africa, the commemoration of the union of four South African colonies (1910) and the establishment of the republic (1961).

Mother's Day. In the United States, the second Sunday in May.

Memorial Day. In the United States, the last Monday in May, in commemoration of men and women of the military services who have died in war. Southern states recognize Confederate memorial days on other dates.

Pilgrimage to Częstochowa, Poland. Most important religious centre of central Europe containing the famous icon "Our Lady of Częstochowa," symbolizing Polish religious faith and freedom.

May–June **Tano Festival.** In Korea, a national holiday on the fifth day of the fifth month in honour of ancestors; observed by offering food at household shrines of ancestors and by wrestling contests among men and swing rides among women.

Tuan Wu Chieh. In China, the **Dragon Boat Festival;** also called **Tuan Yang Chieh;** celebrated on the fifth day of the fifth lunar month in honour of Ch'ü Yüan, a poet and statesman who drowned himself in despair *c.* 4th century BC; observed with dragon boat races and regattas and by eating pyramid-shaped rice cakes wrapped in leaves.

Shavuot. In Judaism, the **Feast of Weeks,** or **Pentecost;** celebrated on the 6th or 7th of the lunar month Sivan; originally a harvest festival, it commemorates the revelation of the Ten Commandments to Moses on Mt. Sinai.

Pentecost. In Christianity, 50 days after Easter, commemorating the coming of the Holy Spirit to the disciples of Jesus and the beginning of the church; also called **Whitsunday** by Anglicans from the custom of baptizing white-robed believers on this day.

Trinity Sunday. In Christianity, the Sunday after Pentecost; observed primarily in Western churches since the 10th century.

Corpus Christi. In Christianity, a festival in honour of the Real Presence of Christ in the Eucharist, primarily in Roman Catholic countries, on the Thursday after Trinity Sunday, or on the following Sunday in some places (*e.g.*, in the United States); observed with processions in which the Corpus Christi (Body of Christ, or consecrated bread) is carried.

Gaṅgā Dussehra. A Hindu festival honouring the goddess Gaṅgā during which devotees bathe in the supposedly sacred waters of the Ganges River.

June 1 **Independence Celebration Day.** In Western Samoa; the country became fully independent on Jan. 1, 1962.

1 **National Holiday of Tunisia.** Day commemorating the first major accomplishment realized in 1955 leading to eventual independence on March 20, 1956.

2 **Anniversary of the Republic.** In Italy, the celebration of the establishment (1946) of the Italian Republic.

4 **Emancipation Day.** Independence (1970) holiday of Tonga.

5 **Liberation Day.** In Seychelles, celebration of the initial resolution leading to independence on June 29, 1976.

5 **Constitution Day.** In Denmark, celebration of Denmark's becoming (1849) a constitutional monarchy.

10 **National Day.** In Portugal, celebration of the establishment (1910) of a republican form of government.

12 **Independence Day.** In the Philippines, commemoration of the declared independence (1898) from Spain; actual independence occurred on July 4, 1946.

15 **Sanno Matsuri.** In Japan, a Shintō festival honouring the mountain god Sanno; celebrated at the Hie shrine in Tokyo with processions of shrine palanquins (enclosed litters carried on the shoulders) through the streets. There is a festival honouring Sanno in Takayama in mid-April.

17 **Independence Day.** In Iceland, celebration of the proclamation (1944) of a republic.

17 **National Day,** or **Day of German Unity.** Observed in West Germany.

23 **National Holiday of Luxembourg.**

24 **Midsummer Day.** In Europe, celebration of the summer solstice dating from the pre-Christian times; also called St. John the Baptist's Day; observed by lighting bonfires, especially on mountaintops, dancing around and leaping over fires, and other ancient customs.

25 **Independence Day.** In Mozambique (1975).

26 **Independence Day.** In Madagascar (1960).

27 **Independence Feast Day.** In Djibouti (1977).

30 **Independence Day.** In Zaire (1960).

Father's Day. In the United States, the third Sunday in June.

Queen's Birthday. In the United Kingdom, a Saturday in the middle of June.

June–July 1 **Chalilo.** Hindu festival celebrated by the Sindhis of India to honour the river god known as Amarlāl, Daryālāl, or Uderolāl.

July 1 **Canada Day.** Also called **Dominion Day** or **Confederation Day;** commemoration of the unification (1867) of the provinces of Canada.

1 **Independence Day.** In Rwanda (1962) and Burundi (1962).

4 **Independence Day.** In the United States (1776).

5 **Independence Anniversary.** In Venezuela (1811).

6 **Republic Day.** Independence holiday of Malawi (1964).

7 **Independence Day.** In the Solomon Islands (1978).

10 **Independence Day.** In The Bahamas (1973).

11 **National Day.** In Mongolia (1921). Date traditionally associated with the establishment of the present republic.

12 **Anniversary of National Independence.** In São Tomé and Príncipe (1975).

12 **Orangeman's Day.** In Northern Ireland, day commemorating a Protestant victory over Roman Catholic forces.

13–15 **Bon.** In Japanese Buddhism, a festival in memory of the dead; observed with religious rites and the lighting of lanterns to guide the souls of the dead, who are believed to visit the Earth during this period.

14 **Bastille Day.** National holiday of France commemorating the destruction (1789) of the royal prison in Paris during the French Revolution.

16–24 **Gion Matsuri.** In Japan, a Shintō festival celebrated in Kyōto commemorating the end of a plague that ravaged the whole country; observed with processions of decorated palanquins, which originally were used to invoke the protection of the *kami,* or gods.

17 **17th of July Revolution Day.** National holiday in Iraq celebrating the return to power in 1968 of the Ba'th Party, advocating a single Arab Socialist nation.

20 **Independence Day.** In Colombia (1810).

21 **National Holiday of Belgium.** Commemorates the formal establishment of the kingdom in 1831 when Prince Leopold of Saxe-Coburg agreed to support the constitution drawn up by the National Congress.

22 **National Liberation Day.** In Poland, commemoration of the first major city (Lublin) to be captured (1944) from Nazi forces and of the manifesto proclaimed shortly thereafter.

23 **Revolution Anniversary.** National holiday of Egypt commemorating the establishment of the republic in 1952.

26 **Independence Day.** In Liberia (1847) and the Maldives (1965).

28–29 **Independence Days.** In Peru, celebration of the declaration of independence (1821) from Spain issued by José de San Martín.

30 **Independence Day.** In Vanuatu (1980).

Fiesta de San Fermín. More than week-long festival at Pamplona, Spain, having daily bullfights preceded each morning by the *encierro* ("enclosing") of the bulls, when they are driven through the streets behind crowds of skillfully dodging men and boys.

July–August **Nāga-pañcamī.** Indian festival celebrating the birth of serpents. Hindu worshippers empty pots of milk over snakes that have been collected in the temples of Śiva.

August 1 **Confederation Day.** In Switzerland, celebration of the formation (1291) of the Everlasting League by three cantons, which became the basis of the Swiss Confederation.

6 **Hiroshima Peace Festival.** In Japan, reflection on the dropping of the first atomic bomb on this date in 1945 includes prayers for world peace in Buddhist, Shintō, and Christian religious services.

6 **Independence Day.** In Bolivia (1825).

9 **National Holiday.** In Singapore, a celebration of the country's independence from Malaysia in 1965.

10 **Independence Day.** In Ecuador, commemoration of the first patriot uprising in 1809 against Spanish rule.

11 **Independence Day.** In Chad (1960).

15 **Independence Day.** In the Congo (1960).

15 **Liberation Day.** In South Korea, commemoration of liberation (1945) from Japanese rule.

17 **Independence Day.** In Indonesia, celebration of proclaimed independence on this date in 1945; the country attained actual independence on Dec. 28, 1949.

17 **Independence Anniversary.** In Gabon (1960).

23–24 **National Holidays.** In Romania, commemoration of the period in 1944 when Romania switched loyalties from the Axis to the Allied side.

25 **Independence Day.** In Uruguay, commemoration of the day in 1825 when independence was declared.

Selected festivals and holidays (continued)

31 **National Day.** In Malaysia, commemoration of the former Federation of Malaya which became independent on this date in 1957.

31 **Independence Day.** In Trinidad and Tobago (1962).

Esala Perahera. Celebration in Sri Lanka honouring a purported tooth of the Buddha preserved in the temple at the city of Kandy.

Independence Day in Jamaica. Observation on the first Monday in August since independence in 1972.

Nōrūz. In Zoroastrianism (Parsiism), new year or spring festival honouring Rapithwin, the personification of noonday and summer.

August–September — **Birthday of Krishna.** In Hinduism, the celebration of a major *avatar* (incarnation) of Vishnu, the Preserver; observed by washing, dressing, and entertaining the image of the deity.

September 1 **National Day.** In Libya, commemoration of the overthrow (1969) of the regime of King Idris I, leading to the establishment of a republic.

2 **Independence Day.** National holiday in Vietnam commemorating the proclamation of independence on this date in 1945 following the Japanese surrender.

3 **Independence Day.** In Qatar (1971).

6 **Somhlolo Day.** In Swaziland (1968), commemoration of the country's independence.

7 **Independence Day.** In Brazil (1822).

9 **Founding Day.** In North Korea, commemoration of the founding (1948) of the Democratic People's Republic of Korea.

9–10 **National Holidays.** In Bulgaria, commemoration of period in 1944 when Bulgaria switched allegiances from the Axis to Allied side.

12 **National Day.** Holiday observed in the former Portuguese colonies of Guinea-Bissau (independent since Sept. 10, 1974) and Cape Verde (independent since July 5, 1975).

12 **Popular Revolution Commemoration Day.** Celebration in Ethiopia of the overthrow (1974) of the Haile Selassie regime and the establishment of a Socialist state.

15 **Independence Day.** In Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua (1821); commemorates the declaration of independence of Central America.

16 **Independence Day.** In Mexico (commemoration of the call for independence proclaimed on this date in 1810) and Papua New Guinea (1975).

18 **Independence Day.** In Chile, commemoration of the earliest demands for independence proclaimed in 1810.

21 **Independence Day.** In Belize (1981).

22 **National Holiday.** Celebration of independence (1960) in Mali.

23 **National Day of Saudi Arabia.**

26 **National Day of Yemen (Ṣan'a').**

28 **Confucius' Birthday.** In the Republic of China (Taiwan), **Teachers' Day**, a school holiday observed by early morning ceremonies at the Confucian Temple.

30 **Botswana Day.** Celebration of the country's independence in 1966.

Labor Day. In the United States and Canada, the first Monday in September, observed in honour of workers.

September–October — **Chusok.** In Korea, a harvest festival observed on the day of the full moon of the eighth lunar month; a day of thanksgiving that begins with a visit to family graves, where prayers and food are offered.

Rosh Hashana. In Judaism, the **New Year**, celebrated on the first day of the lunar month Tishri; observed as the beginning of a 10-day period of penitence and prayer; the ritual ram's horn (*shofar*) is sounded in the synagogue service.

Yom Kippur. In Judaism, the **Day of Atonement**, the most solemn day of the Jewish religious year; celebrated on the 10th day of the lunar month Tishri; observed with fasting, confessions of sins, and prayer; ends with the blowing of the *shofar*.

Sukkot. In Judaism, the **Feast of Tabernacles**, also called the **Feast of Ingathering**, originally a harvest festival; celebrated from the 15th to the 21st of the lunar month Tishri as a time of joyous festivities. Booths (Sukkot) fashioned from branches are adorned with harvest fruits and vegetables and serve as temporary living or dining quarters.

Durgā-Pūjā. In Hinduism, a festival in honour of Durgā, an aspect of the consort of Śiva, the Destroyer; celebrated with religious rites and family reunions.

Chung Ch'iu Chieh. Harvest Festival, in Taiwan, the 15th day of the 8th lunar month, in honour of Ch'ang O, the moon goddess; observed by eating moon-shaped cakes and giving them to friends.

Thot Kathin. Annual ceremony of Thailand marking the end of Buddhist Lent that includes a procession of golden barges on the Chao Phraya. A high point of the ancient traditional festivities is the presentation of new yellow robes to Buddhist monks by the king of Thailand.

October 1 **National Day.** In the People's Republic of China, commemoration of its founding (1949).

1 **National Day.** Commemoration of Nigeria's independence on this date in 1960.

2 **Anniversary of Guinean Independence.** In Guinea (1958).

4 **Independence Day.** In Lesotho (1966).

7 **Foundation of German Democratic Republic.** National holiday honouring the proclamation of the state on this date in 1949.

9 **Independence Day.** In Uganda (1962).

10 **Fiji Day.** National holiday honouring the country's independence on this date in 1970.

10 **National Day.** In the Republic of China (Taiwan), commemoration of the overthrow (1911) of the Manchu dynasty.

12 **National Holiday of Spain.** Honours Columbus' discovery of the Western Hemisphere.

12 **National Day.** Commemorates the independence of Equatorial Guinea in 1968.

14 **National Day of Yemen (Aden).**

21–22 **Revolution Anniversary.** In Somalia; honours the bloodless revolution of 1969.

22 **Anniversary of the Beginning of the John Paul II Pontificate.** In the Vatican City (1978).

22 **Jidai Matsuri, or Festival of Eras.** Japanese festival at Kyōto including a costumed procession celebrating Japan's history between the 8th and 19th centuries.

24 **Independence Day.** In Zambia (1964).

26 **National Holiday of Austria.** On this date in 1955 a constitutional law of perpetual Austrian neutrality was promulgated.

27 **Independence Day.** In St. Vincent and the Grenadines (1979).

29 **Republic Day.** In Turkey, commemoration of the proclamation (1923) of a republican form of government.

31 **Reformation Day.** Anniversary of the day in 1517 that Martin Luther posted his Ninety-five Theses on the door of the church in Wittenberg, Germany. Considered the beginning of the Protestant Reformation, Lutherans commemorate this day on the Sunday preceding (or following).

31 **Halloween.** In northern European countries and the United States, a popular folk holiday (in Christianity called the **Eve of All Hallows**, or **All Saints' Eve**), originally the Celtic harvest festival of Samhain, the New Year of the Druids; observed by wearing costumes and masks, dancing, and lighting bonfires—customs that were believed to frighten away evil spirits, ghosts, witches, goblins, and the Devil. Since World War II in the United States it has been the occasion for collecting contributions for UNICEF (United Nations International Children's Emergency Fund, now known as United Nations Children's Fund).

Columbus Day. In the United States, the second Monday in October, commemorating the landing (1492) of Columbus at San Salvador Island in The Bahamas.

Thanksgiving Day. In Canada, a day of feasting in celebration of the country's bountiful harvest; observed on the second Monday in October.

Divālī. In India, an autumn festival honouring Lakṣmī, the goddess of wealth; observed by lighting oil lamps.

November 1 **Anniversary of the Revolution.** In Algeria, commemoration of the earliest well-coordinated attacks (1954) against French-operated military installations, public utilities, and communications facilities.

1 **Independence Day.** In Antigua and Barbuda (1981).

1 **All Saints Day.** In Christianity, commemoration of saints not specifically listed on the liturgical calendar.

3 **Independence Day.** In Dominica (1978).

3 **Independence from Colombia.** National holiday in Panama commemorating the proclamation of independence in 1903.

7–8 **Anniversary of the October (November) Socialist Revolution.** In the Soviet Union (1917).

10 **Gurū Nānak's Day.** Festival held in the Punjab state of India honouring the founder of Sikhism.

11 **Independence Day.** In Angola (1975).

11 **Veterans Day.** Holiday in the United States honouring all who served in wars; it is observed on the anniversary of the signing (1918) of the Armistice between the Allies and the Germans ending World War I. It is called **Remembrance Day** in Canada.

18 **National Day of Oman.**

22 **Independence Day.** In Lebanon (1943).

25 **Independence Day.** In Suriname (1975).

28 **Independence Day.** In Mauritania (1960).

29 **Liberation Day.** In Albania, commemoration of the coming to power (1944) of the Communist-led National Liberation Front.

29–30 **Days of the Republic.** In Yugoslavia, honours the Socialist republic proclaimed in 1945 following the defeat of the Nazis.

30 **Independence Day.** In Barbados (1966).

30 **National Day.** In Benin, honours the establishment of a Marxist-Leninist state in the mid-1970s; the official name of the country changed on this date in 1975 from Dahomey to Benin.

Thanksgiving Day. In the United States, commemoration of the first Thanksgiving (1621) celebrated by the members of the Plymouth colony; observed on the fourth Thursday of November with feasting and family gatherings.

November–December — **Advent.** In Christianity, a four-week period of preparation for Christmas.

December 1 **Anniversary of the Proclamation of the Republic.** National holiday of the Central African Republic; the country attained independence on Aug. 13, 1960.

2 **National Holiday of Laos.** Commemorates the establishment of the people's republic on this day in 1975.

5 **Birthday of King Bhumibol Adulyadej.** National holiday of Thailand.

Selected festivals and holidays (continued)

6 **Independence Day.** In Finland (1917).
7 **National Holiday of the Ivory Coast.**
12 **Fiesta de Nuestra Señora de Guadalupe.** In Mexico, commemoration of the vision of the Virgin Mary to a young boy in 1531, celebrated by processions and dancing.
12 **Independence Day.** In Kenya (1963).
13 **St. Lucia Day.** National holiday of St. Lucia; the country attained independence on Feb. 22, 1979.
16 **National Day of Bahrain.**
17 **National Day of Bhutan.**
18 **National Day of Niger.**
25 **Christmas.** In Christianity, the celebration of the Nativity of Christ; observed by gift giving, feasting, singing Christmas carols, decorating Christmas trees, and religious services.
25 **Constitution Day.** In the Republic of China (Taiwan), a national holiday.
26 **Boxing Day,** or **St. Stephen's Day.** Holiday celebrated in most of western Europe, Canada, Australia, and many former possessions of the British Empire. Part of the legal Christmas holidays, it may have begun in the custom of giving Christmas boxes to tradespeople, servants, and mail carriers. In some countries it is traditionally the time for a theatrical performance called a Christmas pantomime.
28 **Birthday of King Birendra.** National holiday of Nepal.

December–January **Ḥanukka.** In Judaism, the **Feast of Dedication,** also called the **Feast of Lights;** the eight-day commemoration of the victory of the Jewish Maccabees over the Syrians and the rededication of the Temple of Jerusalem on the 25th of the lunar month Kislev in 164 BC; observed by lighting candles, feasting, gift giving, and games.

Selected Islāmic festivals and holidays

Because the months of the Muslim calendar retrogress annually in relation to the Gregorian calendar, Islāmic festivals and fasts are listed separately.

Mawlid an-Nabī. Birthday of Muḥammad (12 Rabīʿ I, *c.* AD 570), the founder of Islām. Celebrated by Muslims with processions, ceremonial prayers, singing, and other forms of rejoicing; on the Gregorian calendar in the 1980s it occurs in January to October.

Fast of Ramaḍān. A month of fasting during the ninth month (Ramaḍān) of the Muslim calendar, as decreed by the Qurʾān, the Islāmic sacred scriptures; observed by abstention from food, drink, and sexual intercourse from dawn to dusk; on the Gregorian calendar during the 1980s the Fast of Ramaḍān occurs in August to April.

ʿId al-Fiṭr (al-ʿId Aṣ-Ṣaghīr, Küçük Bayram), Festival of Fast Breaking. Celebration ending the Fast of Ramaḍān; it occurs from the 29th or 30th of Ramaḍān to the 3rd of the following month of Shawwāl; observed with feasting and visiting decorated graves; on the Gregorian calendar during the 1980s it occurs in August to May.

ʿId al-Aḍḥā (al-ʿId al-Kabīr, ʿId al-Qurbān, Kurban Bayram). The Great Festival. Inaugurates the pilgrimage to Mecca and is observed by personal animal sacrifices, usually of sheep. It falls on the 10th to 13th of the month of Dhū al-Ḥijjah; on the Gregorian calendar in the 1980s it occurs in October to July.

power to build them up in that holiness without which they cannot see the Lord."

All this notwithstanding, the doctrine of holiness was largely ignored by U.S. Methodists during the early decades of the 19th century. The slackening of interest in perfectionism has been attributed to the rising national prosperity, which did little to encourage deepening piety, and to excesses that were associated with it in the popular mind because of the conduct of certain contemporaneous antinomian (antilegalistic) perfectionist societies, such as the Oneida Community.

The neglect of the doctrine of holiness was only temporary, however. In the 1830s perfectionism received new impetus with the publication of a monthly periodical entitled *Guide to Christian Perfection* and the inauguration of the "Tuesday Meeting for the Promotion of Holiness" in the Manhattan home of Phoebe Palmer, a laywoman active in the Allen Street Methodist Church. Moreover, many prominent leaders in Methodist circles, including Bishops Edmund S. Janes and Leonidas L. Hamline, heartily endorsed the revival of interest in holiness and "the higher Christian life."

By the time of the American Civil War, tensions were developing. In some quarters of Methodism, at least, the principles of Christian perfection and holiness had become merely part of official doctrinal statements. In practice these ideals were largely ignored, and some church papers reflected a growing hostility to the subject of entire sanctification and an increasing skepticism in regard to the role of the camp meetings; *i.e.,* revivalist retreats, often attended for several days, centring around services at a large tent.

On the other hand, however, there were many Methodists who were convinced that personal sanctification, or holiness, was, at the very least, one of the cardinal ideas of their founder, and they were determined to remain loyal to their Wesleyan heritage. They looked askance at the proposed abandonment of camp meeting revivalism; they bemoaned the expanding autocracy of the bishops and the increasing indulgence of worldly amusements, "broidered hair," gold, pearls, and costly array. When differences between these factions became irreconcilable, withdrawals and schisms resulted.

Schisms and associations. In 1843 about two dozen ministers and 6,000 members withdrew from the Methodist Episcopal Church to found the Wesleyan Methodist Church of America. Then, in 1860, after a decade of controversy over the issues of perfectionism and the power of the episcopacy, another body of Methodists left the Genessee (N.Y.) Conference to establish the Free Methodist Church of North America.

Despite these defections, however, it is a fact that most Protestants who favoured holiness or perfectionist views were reluctant to abandon their churches. They preferred to retain their memberships therein and then to seek fellowship with other like-minded Christians in independent organizations such as the National Campmeeting Association for the Promotion of Holiness, which was established in 1867. As a matter of fact, in the years that followed, this organization became an effective means of disseminating Holiness ideas. At diverse encampments, on both coasts—hundreds of conferees testified to receiving the second blessing, the consciousness of sanctifying grace.

This arrangement to retain one's denominational affiliation while simultaneously finding an outlet for one's perfectionistic proclivities in some local, regional, or national society for the promotion of holiness worked temporarily. As time passed, however, it became increasingly difficult for people who were thus inclined to keep up the practice.

For one thing, sizable numbers of Protestants from the rural areas of the Midwest and South were joining the Holiness movement. These people had a penchant for Puritan-like codes of dress and behaviour. Most of them had little sympathy for the "superficial, false, and fashionable" Christians whose preoccupation with wealth, social prestige, and religious formalism was repelling. Therefore, they began to advocate a policy of separatism. Besides, a growing cleavage began to develop between some of the denominational leaders and the pro-Holiness sector of their constituency.

It was especially difficult for some Methodist bishops, who were used to functioning in a denomination accustomed to tight discipline, to countenance the seeming plethora of "voluntary alliances, leagues, unions, and associations." They were also concerned with the increasing number of Holiness evangelists who were conducting campus revivals, camp meetings, and city-wide crusades without any sort of "official" sanction, as well as with the rapidly expanding Holiness press with its ever growing capacity for promoting second-blessing views. They urged that all such activities be placed under "some official supervision or limitation," but their advice went unheeded. Therefore, in the Bishops' Address for 1894, they denounced all those who proclaimed "holiness as a watchword" and who maintained "holiness meetings, holiness preachers, holiness evangelists, and holiness property." Doubtless such pronouncements only served to hasten the schismatic process that had begun in 1843, when 6,000 dissidents withdrew to found the Wesleyan Methodist Church.

Emergence of Holiness groups. Accordingly, between 1880 and World War I a number of new Holiness groups emerged. Some, such as the Church of God (Anderson, Ind.), were established to protest against bureaucratic denominationalism. Others, such as the Christian and Missionary Alliance and the Church of the Nazarene, were organized to serve the spiritual and social needs of the urban poor, who quite frequently were ignored by the stylish downtown congregations of churches, representing the so-called mainstream of Protestantism. Substantially all of these Holiness bodies arose in order to facilitate the proclamation of a second-blessing experience of sanctification with its concomitants—a life of separation and practical holiness, views that apparently could no longer be endorsed by or tolerated within the larger, more established denominations.

Although most of these newly emergent Holiness groups were destined to have only limited local or regional influence, several of them have demonstrated a remarkable capacity for sustained growth. Among these are the "older" denominations—the Wesleyan Church and the Free Methodist Church of North America—as well as the newer ones: the Church of God (Anderson, Ind.), the Christian and Missionary Alliance, the Salvation Army, and the Church of the Nazarene. The Church of the Nazarene, whose members constitute nearly a third of the total membership of the Holiness movement, is generally recognized as being its most influential representative.

While individual Holiness groups vary widely in belief and practice, several common threads may be discerned. Most Holiness churches, patterning their beliefs on the tenets of Methodism, ignore the stricter Calvinist doctrines of predestination and reprobation and accept the milder emphases of Arminianism as regards repentance, faith, and holiness. In addition, most Holiness churches still stand resolutely by John Wesley's views regarding Christian perfection, despite the fact that such principles have become less vitally important to the majority of 20th-century Methodists.

Having been affected by 19th-century pietism and revivalism, contemporary Holiness churches tend to stand closer, doctrinally speaking, to Fundamentalism than to their Methodist antecedents. In examining their tenets, one encounters such evidences of conservative evangelical belief as "plenary inspiration" (verbal inspiration of the whole Bible), "Christ's atonement for the entire human race," and "the personal Second Coming of Christ." In the doctrinal statements of a few churches—Church of the Nazarene and Christian and Missionary Alliance—brief allusions to divine healing and a Pentecostal experience do appear. However, these must not be construed as constituting sufficient grounds for their being identified with the Pentecostal movement, the so-called left wing of perfectionism, against which, in fact, many right-wing Holiness groups have inveighed.

Holiness churches have been experiencing phenomenal growth. (In the 30-year period 1933–63, the Nazarenes increased their membership by 80 percent.) And, unquestionably, Holiness churches have experienced dramatic change. In the eyes of most observers, however, they have remained constant in their devotion to a distinctive doctrine—the post-conversion experience of sanctification.

Moreover, they have not deviated appreciably from their position regarding a life of personal holiness, which includes renunciation of "worldly" preoccupations such as tobacco, liquor, movies, and high fashion. Camp meetings, revivals, and the mourners' bench, where sinful men can be restored to holiness of heart and life, remain as hallmarks of the contemporary Holiness movement.

Surviving the pervasive formalism and moral ineffectuality that seemed to characterize the American religious scene after the Civil War and during the early decades of the 20th century, these "Spirit-centred" churches have so flourished that they have been lauded as a "third force" (with traditional Protestantism and Roman Catholicism) in American Christianity.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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Holinshed, Raphael (d. *c.* 1580), English chronicler, remembered chiefly because his *Chronicles* enjoyed great popularity and became a quarry for many Elizabethan dramatists, especially Shakespeare, who found, in the second edition, material for *Macbeth, King Lear, Cymbeline*, and many of his historical plays.

Holinshed probably belonged to a Cheshire family. From about 1560 he was in London, where he was employed as a translator by Reginald Wolfe, who was preparing a universal history. After Wolfe's death (1573) the scope of the work was abridged, and it appeared, with many illustrations, as the *Chronicles of England, Scotlande, and Irelande*, 2 vol. (dated 1577).

The Chronicles was compiled largely uncritically from many sources of varying degrees of trustworthiness. The texts of the first and second (1587) editions were expurgated by order of the Privy Council, and the excisions from the second edition were published separately in 1723. An edition of the complete text of 1587 was published in six volumes (1807–08). A selection, *Holinshed's Chronicle as used in Shakespeare's Plays*, was edited by Allardyce and Josephine Nicoll (1927).

Holkar DYNASTY, Marāthā rulers of Indore in India. The family, of peasant origin and of shepherd caste, was said to have migrated from the Mathurā district to the Deccan village of Hol, or Hal, the name of which coupled with *kar* ("inhabitant of") became the family surname.

The dynasty's founder, Malhār Rāo Holkar, rose from peasant origins by his own ability. In 1724 Bājī Rāo I, the peshwa (prime minister) of the Marāthā state, gave him command of 500 horses, and he soon became the Peshwa's chief general in Mālwa, with headquarters at Maheshwar and Indore. At his death (1766) he was the virtual ruler of Mālwa. From 1767 to 1795 his son's widow, Ahalyābāi, ruled the state with great skill and understanding. Indore was an island of peace and prosperity in a sea of violence, and her rule became proverbial for justice and wisdom. Tukōjī Holkar, a distant relative whom she had appointed as commander of her forces, succeeded her two years later; on his death, in 1797, his illegitimate son Jaswant Rāo seized power.

At the outbreak of the Second Marāṭhā War in 1803, Jaswant Rāo remained neutral; but in 1804, after the defeat of Sindhia (one of the other states of the Marāṭhā confederacy), he attacked the British and besieged Delhi. His forces were defeated, however, at Dīg and Farrukhābād in November 1804, and he made peace a year later. Soon thereafter he became insane; he died in 1811. The Holkar family rule continued, marked by disputes and abdications, until the state's end as a separate entity after Indian independence in 1947.

Holland, historic region of the Netherlands, divided since 1840 into the provinces of Noord-Holland and Zuid-Holland (*qq.v.*).

A brief treatment of Holland follows. For full treatment, *see* MACROPAEDIA: Low Countries.

Holland originated in the early 12th century as a fief of the Holy Roman Empire and was ruled by a dynasty of counts that traced its origin to the 9th century. These nobles had reemerged in the 10th century after Viking devastation of the coastal area had ended, and they proceeded to expand their territory of present Noord-Holland northward, at the expense of the Frisians, and eastward and southward, which involved them in a series of wars with the bishops of Utrecht. The name Holland was derived from the region around Dordrecht, which was known as Holtland ("Wooden Land").

Dirk III, the third in the line of the early counts of Holland, conquered much of what is now Zuid-Holland from the bishops of Utrecht; he defeated their forces and an imperial army in 1018 at Vlaardingen, a fortification he had erected to levy river tolls on traffic in the Mense delta. Under Dirk's descendants Holland reached its final frontiers by the 13th century, although it gained possession of Zeeland in 1323.

In 1170 Holland's physical shape was altered by flooding, a devastation that helped to form the Zuider Zee (IJsselmeer). William II, count of Holland from 1234 to 1256, promoted land reclamation, pressed for the maintenance of waterways and dikes, and encouraged municipal development by granting trading privileges to the growing towns of the county. He was also elected German king in 1247 by the opponents of Conrad IV in Germany. The family line of the ancestor of the House of Holland, Dirk I, who had received the original feudal land from Charles the Simple in 922, continued down to 1299—a line of 14 descendants. At that time John I of Avesnes, count of Hainaut and a relative of John I, the last of the old house of the counts of Holland, took the title of John II of Holland, uniting Holland with Hainaut.

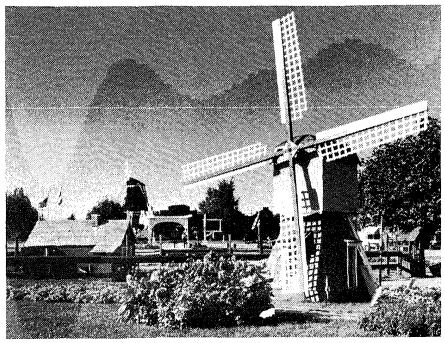
During the succeeding rule of the House of Avesnes, economic prosperity was promoted by extensive land reclamation, and the towns profited by growing trade and fishery enterprises. A disputed succession upon the death of William IV (1345) resulted in a prolonged civil war between rival factions known as the Hooks (Hoeken) and the Cods (Kabeljauwen), who eventually came to represent rival aristocratic and middle-class parties, respectively. The succession was finally settled with the intervention of the House of Wittelsbach, whose members served as counts of Holland, Zeeland, and Hainaut until they were forced to give up the titles to Philip III the Good, duke of Burgundy, in 1433.

Under the Burgundian line of counts, Holland's material prosperity increased continually owing to the thriving herring fishery and the development of the carrying trade. Under Philip's son, Charles the Bold, Holland suffered from heavy taxation, however, and after Charles's death in 1477 and the collapse of the central government, Holland, along with other Burgundian possessions, passed to the Habsburgs (1482). Philip the Handsome, grandson of Charles the Bold, came of age in 1494, and the territory prospered under his rule for 12 years. Upon his death, his son Charles II (later Holy Roman emperor Charles V) succeeded him. In 1555 Charles abdicated the Netherlands to his son, the future Philip II of Spain.

In 1559 William of Orange (William the Silent) was appointed stadholder of Holland, Zeeland, and Utrecht by Philip II. Under William's leadership Holland and Zeeland in 1572 became the centre of the revolt of the Netherlands against Spain. Holland, along with the six other northern Netherlands provinces, declared its independence from Spain in 1581. The last vestiges of the old order disappeared at the end of 1587, when Holland became one of the sovereign republics of the seven United Provinces. The province of Holland during the 17th and 18th centuries was governed by the estates. After 1608 this assembly consisted of 19 delegations, one representing the nobility and 18 the towns, each having just one vote. Important questions such as peace and war, the voting of subsidies, and the imposition of taxation required unanimous approval in the estates. During periods when the estates was not in session, the continuous supervision of the province was confided to a group of deputed councillors, who were charged with its general administration as well as with the carrying out of the resolutions of the estates.

In the 17th century, Holland was the dominant power in the Dutch Republic, and, during the next 100 years, its capital, Amsterdam, became Europe's foremost commercial centre. Because of this predominance, both the Republic and the present Kingdom of The Netherlands are often called "Holland"; but this name as applied to the whole country is proper only for the Napoleonic Kingdom of Holland, which occupied the territory of the old republic between 1806 and 1810.

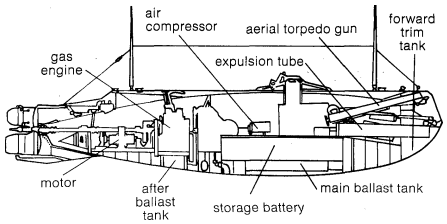
Holland, city, Ottawa County, southwestern Michigan, U.S., on Lake Macatawa, an inlet of Lake Michigan, 29 mi (47 km) southwest of Grand Rapids. In 1847 the Rev. A.C. van Raalte led a group of Dutch settlers to the site, which became a focus for further Dutch immigration. Early lumber industries gave way to agriculture, poultry raising, manufacturing, and resort activities. Holland State Park and Dutch Village (a recreation and exhibition complex) are nearby, and the annual Tulip



Dutch Village, Holland, Mich.
Eric Carle—Shostal/EB Inc.

Time Festival in May is a popular event. The Netherlands Museum has exhibits of Dutch folklore. Hope College (1866) and Western Theological Seminary (1869) are maintained by the Reformed Church in America. Inc. city, 1867. Pop. (1980) 26,281.

Holland, submersible vessel considered the principal forerunner of the modern submarine, designed by John Holland for the United States Navy and accepted by the Navy in 1900. It was 53 feet (16 metres) long, displaced 74 tons, and was armed with a gun that could fire a 100-pound (45-kilogram) projectile half a mile (about 0.8 kilometre). Its hull was cigar-shaped, and the tanks were flooded for submersion, two features similar to those of modern submarines. The "Holland" had an apparatus that took it to a predetermined depth and another device that kept it level. For surface cruising it was powered by a gasoline engine; this also served to turn a generator to charge the batteries that provided



Longitudinal section of the "Holland"

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the current for the electric motors used for underwater propulsion. The "Holland" had a surface speed of seven knots (nautical miles per hour).

holland, plainwoven unbleached or dull-finish linen used as furniture covering or a cotton fabric that is made more or less opaque by a glazed or unglazed finish (called the Holland finish), consisting of oil and a filling material. Originally the name was applied to any fine, plainwoven linens imported from the continent of Europe, and especially to the product obtained from The Netherlands.

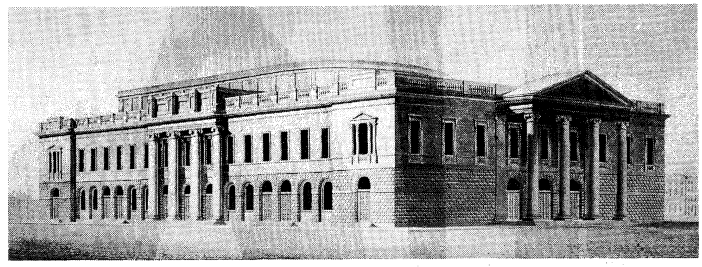
Holland is used for window shades, insulation, labels and tags, sign cloth, and the like. In Greece a number of coloured cotton fabrics are also known as hollands.

Holland, Sir (Thomas) Erskine (b. July 17, 1835, Brighton, Sussex, Eng.—d. May 24, 1926, Oxford), English legal writer and teacher of international law whose outstanding work, *Elements of Jurisprudence,* underwent 13 editions from 1880 to 1924.

Educated at Brighton College and at Balliol and Magdalen colleges, Oxford, Holland was called to the bar in 1863, and from 1874 to 1910 he was professor of international law and diplomacy at Oxford. In 1885 he helped to found the *Law Quarterly Review.* He was British plenipotentiary at the Geneva Conference of 1906. He was knighted in 1917.

Holland's edition (1877) of Alberico Gentili's *De jure belli* ("On the Law of War") demonstrated that Hugo Grotius, the noted 17th-century Dutch authority on international law, owed many of his ideas to Gentili, an Italian teacher of civil law at Oxford late in the 16th century. Holland drafted the *Admiralty Manual of Naval Prize Law* (1888) and the Prize Courts Act (1894). The war office employed him in preparing orders for troops in the field. This work inspired his *Laws and Customs of War on Land* (1904) and *Laws of War on Land* (1908).

Holland, Henry (b. July 20, 1745—d. June 17, 1806, London), English architect perhaps best known for building the original Marine Pavilion (1786–87) at Brighton, Sussex, for the prince regent, afterward King George IV. His elegant, simple Neoclassicism contrasted with the more lavish Neoclassic style of his great contemporary Robert Adam.



The Theatre Royal (Drury Lane Theatre), London, designed by Henry Holland, engraving by Matthew C. Wyatt, 1810

© *Country Life*

Beginning as an assistant, Holland later became the partner and son-in-law of the landscape architect Lancelot ("Capability") Brown. Among his works in London were Brooks's Club (1776–78) and two major remodellings, neither presently extant: Carlton House (from 1787; demolished 1826), town residence of the Prince of Wales, and the Theatre Royal, also known as the Drury Lane Theatre (1791–94; burned 1809), commissioned by the dramatist and impresario Richard Brinsley Sheridan.

At Brighton, Holland built a duplicate of an existing farmhouse owned by the Prince and then connected the two structures with a rotunda having a low dome and two wings of two stories each. His pavilion was rendered unrecognizable by William Porden's addition (1804–08) and John Nash's remodelling (1815–22), both in what was called a Hindu style (actually derived from Islāmic architecture in India).

Holland, Henry Edmund (b. June 10, 1868, Ginninderra, New South Wales—d. Oct. 8, 1933, Waihi, N.Z.), Australian-born labour leader who helped found the New Zealand Labour Party (1916), which he led in Parliament from 1919 to 1933.

After an apprenticeship in the printing trade, Holland worked from 1892 to 1912 in Sydney as a union organizer and an editor of left-wing journals. He was imprisoned in 1896 for libel, led a successful strike of women tailors in 1901, and was imprisoned again in 1909 for sedition.

Ill health led him to emigrate to New Zealand in 1912, and he became prominent in the New Zealand labour movement at a unity conference in 1913, called after repression of the miners' strike at Waihi in 1912. From 1913 to 1918 he edited the Federation of Labour's *Maoriland Worker,* the organ of the trade union movement's left wing. He was imprisoned for sedition in 1913–14 and was a fervent opponent of conscription for World War I. In 1918 he was elected to Parliament as a member of the newly founded Labour Party and became party leader the following year.

Holland's objectives were to establish an obvious contrast between the interests of the labour movement and the existing political parties by forcing the Reform and Liberal (later United) parties together in opposition to Labour, which occurred in 1931, and to gain for Labour the support of the entire trade union movement. The dissident Alliance of Labour stymied the latter goal. Holland's firm leadership of the Labour contingent in Parliament prepared the party to assume power two years after his death.

Holland (of Foxley), Henry Fox, 1st Baron (b. Sept. 28, 1705—d. July 1, 1774, Kensington, near London), English politician, notable chiefly for the success with which he exploited public office for private gain.

The second son of Sir Stephen Fox, he inherited a large share of the riches that his father had accumulated but squandered it. He contracted a wealthy marriage which enabled him to enter Parliament in 1735, where he became the favourite pupil and devoted supporter of Sir Robert Walpole. He was surveyor general of works from 1737 to 1742, lord of the Treasury in 1743, secretary at war and member of the privy council in 1746, and leader of the House of Commons and secretary of state under the Duke of Newcastle in 1755.

During the Seven Years' War, Fox devoted himself mainly to accumulating a vast fortune. He again became leader of the House of Commons, with a seat in the Cabinet, under the Earl of Bute in 1762 and exercised his skill in cajolery and corruption to induce the House of Commons to countenance the Treaty of Paris of 1763; as a recompense, he was raised to the House of Lords with the title of Baron Holland of Foxley, Wiltshire.

In 1769 a petition of the livery of the City of London against the ministers referred to him as "the public defaulter of unaccounted millions." The proceedings brought against him in the Court of Exchequer were stayed by a royal warrant, and he justified the delays by appealing to custom. One of his four sons was the Whig leader Charles James Fox.

Holland (of Foxley and of Holland), Henry Richard Vassall Fox, 3rd Baron (b. Nov. 21, 1773, Winterslow, Wiltshire, Eng.—d. Oct. 22, 1840, London), British Whig politician, associate of the party leader and reorganizer Charles Grey, 2nd Earl Grey, and nephew and disciple of the statesman Charles James Fox, whose libertarian political ideas he expounded in the House of Lords.

He was the son of Stephen Fox, who had inherited both the barony of Holland of Foxley from his father and the barony of Holland of Holland from his mother. He was soon orphaned, his father dying in 1774 and his mother in 1778.

In October 1806, shortly after his uncle's death, Holland became lord privy seal in Lord Grenville's coalition "Ministry of All the Talents," helping to secure the abolition of the slave trade in the British colonies and leaving

office with the rest of the Cabinet in March 1807.

In 1812 Holland declined Grey's offer of the Whig opposition leadership. The Whigs who joined the Canning and Goderich ministries in 1827 wanted him to be foreign secretary, but King George IV refused to admit another Whig to the Cabinet. In November 1830 he was appointed chancellor of the duchy of Lancaster in Grey's reform ministry, and, except for the brief period of Sir Robert Peel's first ministry (November 1834–April 1835), he held that office until his death.

Holland, John Philip (b. Feb. 29, 1840, Liscannor, County Clare, Ire.—d. Aug. 12, 1914, Newark, N.J., U.S.), father of the modern submarine, who designed and built the first underwater vessel accepted by the U.S. Navy.

Educated at Limerick, Holland taught school until 1872 in Ireland and in 1873 emigrated to the United States. Settling in Paterson, N.J., he taught there until 1879, when, with financial support from the Irish Fenian Society (who hoped to use submarines against England), he built the *Fenian Ram,* a small sub that proved a limited success in a test run. In 1895 his J.P. Holland Torpedo Boat Company received a contract from the U.S. Navy to build a submarine, and in 1898 a successful *Holland,* the first truly practical submarine, was launched. The U.S. government ordered six more; similar orders came from England, Japan, and Russia. Holland's final years were marked by litigation with his financial backers. One of his last inventions was an apparatus designed to enable sailors to escape from damaged submarines.

Holland, Parts of, also called HOLLAND, formerly one of the three separately administered divisions of the ancient county of Lincolnshire, England. Since the 1974 reorganization of local government it has formed two county districts; Boston, the northern portion, includes the ancient port borough and its rural surroundings, while South Holland is centred on the market town of Spalding.

Much of the area is reclaimed fen, the fertile alluvial soils of which are mainly used for arable cultivation and yield heavy crops of corn (maize), potatoes, and vegetables. The area around Spalding is especially noted for its extensive bulb fields.

Holland, Sir Sidney (George) (b. Oct. 18, 1893, Greendale, N.Z.—d. Aug. 5, 1961, Wellington), leader of New Zealand's National Party (1940–57) who, as prime minister (1949–57), suppressed union unrest and relaxed government controls over the economy.

After military service in Europe during World War I and subsequent convalescence, Holland became important in business and politics in



Sidney Holland, 1951
BBC Hulton Picture Library

Christchurch, N.Z. In 1935 he replaced his father, Henry H. Holland, in Parliament and became leader of the National Party opposition in 1940. Holland served briefly (1942) in the war Cabinet but thereafter attacked the Labour-led government for its economic controls and mismanagement. Under him, the National Party won office in 1949. Holding the finance portfolio in the first five years of his ministry, Holland reduced controls on imports, prices, and property transactions, and increased food subsidies. Balance of payments crises (1952, 1954) and continued inflation, however, led him to reinstitute many of the economic controls that had been imposed by Labour in 1940–49.

In 1950 Holland converted New Zealand's government to a one-chamber system by gaining abolition of the Legislative Council, the country's upper house. The following year, he capitalized on his success in repressing a dockmen's strike by immediately calling an emergency election in which he increased his parliamentary majority, but his subsequent bill (1951) to increase police powers in industrial conflicts (at a loss, many felt, of important individual rights) was enacted only in an amended form after a public outcry. Discontent with economic conditions caused the party's defeat in 1957. Holland retired before the 1957 elections because of poor health. In that year he was knighted.

Holland, Thomas: *see* Surrey, Thomas Holland, duke of.

Holland Tunnel, twin-tube tunnel under the Hudson River connecting New York City with Jersey City, N.J. The tunnel was completed in 1927 and named for Clifford M. Holland, the engineer who designed it. The north tube is 8,558 feet (2,608 m) long and the south tube 8,371 feet (2,551 m) long.

Considered a notable engineering achievement because it solved the problem of ventilating a long vehicular tunnel, it has 84 powerful fans capable of replacing air in the tunnel every 90 seconds. The polluted air is drawn off through a duct in the roof of the tube with the aid of suction fans. The system was severely tested on May 13, 1949, when a truck loaded with poisonous and flammable carbon disulfide caught fire in the tunnel and exploded. Despite the destruction of 23 trucks and the ruin of 500 feet of tunnel ceiling, no fatalities resulted.

Hollandia (Indonesia): *see* Jayapura.

Hollar, Wenzel, Bohemian WENCESLAUS HOLLAR (b. July 13, 1607, Prague—d. March 28, 1677, London), Bohemian etcher whose works are a rich source of information about the 17th century.

Hollar went to Frankfurt in 1627 where he studied under the engraver and publisher Matthäus Merian, later moving to Strasbourg, and then to Cologne in 1633. There he attracted the attention of the collector Thomas, earl of Arundel, with whom he was associated for most of his life. Hollar settled in England in 1637, but moved to Antwerp in about 1644, and returned to London in 1652.

He was a master etcher, and his work is still much appreciated by connoisseurs. He illustrated a number of books and produced the celebrated "Views of London," after the Great Fire of 1666. Some 3,000 plates are credited to him. He died in extreme poverty.

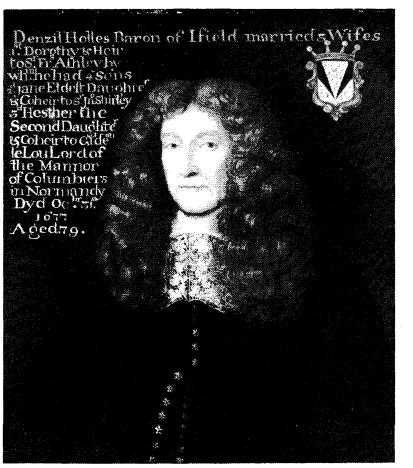
Hollerith, Herman (b. Feb. 29, 1860, Buffalo, N.Y., U.S.—d. Nov. 17, 1929, Washington, D.C.), American inventor of a tabulating machine that was an important precursor of the electronic computer.

Immediately after graduation from the Columbia University School of Mines in 1879, Hollerith became an assistant to his teacher William P. Trowbridge, in the U.S. census of 1880. During the next decade he taught briefly at the Massachusetts Institute of Technology, Cambridge; experimented on air brakes; and worked for the Patent Office in Washington, D.C. During all of this time he was occupied with the problem of automating the tabulation work of the census. By the time of the census of 1890, he had invented machines to record statistics by electrically reading and sorting punched cards that had been numerically encoded by perforation position. The invention was a success in the United States but drew much more attention in Europe, where it was widely adopted for a number of statistical purposes. In 1896 Hollerith organized the Tabulating Machine Company, incorporated in New York, to manufacture the machines; through subsequent mergers it grew into the International Business Machines Corporation.

Holles, Thomas Pelham-: *see* Newcastle (under Lyme), Thomas Pelham-Holles, 1st duke of.

Holles (of Ifield), Denzil Holles, 1st Baron (b. Oct. 18, 1598, Houghton, Nottinghamshire, Eng.—d. Feb. 17, 1680), English Presbyterian who was a leading but moderate Parliamentary opponent of King Charles I. Later in his career he served in the government of Charles's son King Charles II.

Elected to the House of Commons in 1624, Holles joined the critics of the crown. In the Parliament of 1628–29 he was one of the three members who—after the King had ordered adjournment—held the Speaker of the House in his chair while three resolutions critical of



1st Baron Holles of Ifield, painting by an unknown artist; in the National Portrait Gallery, London, on loan from the Duke of Portland
By courtesy of the National Portrait Gallery, London

Charles's religious and economic policies were passed. In retaliation the King arrested Holles and imprisoned him until he paid (1630) a security pledging good behaviour.

During the 1630s Holles took no part in public life. He gained a seat in the Short and Long Parliaments that convened in 1640, and he provoked the King's anger by his vigorous support for a bill to abolish bishops. On Jan. 4, 1642, Charles attempted to arrest Holles and four other prominent Parliamentarians, but they evaded capture and returned in triumph to Parliament on January 11. Upon the outbreak (August 1642) of the Civil War between Parliament and the King, Holles raised his own infantry regiment. He fought with distinction at the Battle of Edgehill (Oct. 23, 1642) but was badly defeated at the Battle of Brentford (November 11). In 1643 he became a leader of the peace party that sought a negotiated peace based on a limited monarchy and a Presbyterian form of church government. After the split developed between the Presbyterian-controlled Parliament and the army, dominated by Independents, Holles fled to France in December 1648 to escape arrest by the army. Nevertheless, he was allowed to live in England during the Protectorate (1654–59).

When the Royalists again gained the upper hand in 1659, Holles became a member of the

Council of State, and he played a leading role in the restoration of Charles II in 1660. He was admitted to Charles's Privy Council in June 1660 and was created Baron Holles of Ifield in April 1661. Although Holles served Charles in ambassadorial missions in the 1660s, he supported the opposition party—soon to be known as the Whig Party—in Parliament during the 1670s. He was removed from the Privy Council in 1676 and subsequently supported the Earl of Shaftesbury. See P.M. Crawford, *Denzil Holles* (1978).

Holley, Marietta (b. July 16, 1836, Jefferson County, N.Y., U.S.—d. March 1, 1926, Jefferson County), U.S. humorist who popularized women's rights and temperance doctrines under the pen names Josiah Allen's Wife and Samantha Allen.

Holley began her literary career writing for newspapers and women's magazines. In 1873 she published her first book, *My Opinions and Betsy Bobbet's.* Holley subsequently published some 20 books based on her successful *Betsy Bobbet* formulas: dialect and rural humour used to express feminist and temperance views (often incorporating material sent to Holley by the reformers Susan B. Anthony and Frances Willard). She often also criticized the sexual double standard, the exploitation of labour, and race antagonism. Her books were widely read and were translated into a number of languages. They include *Samantha at the Centennial* (1877), *Samantha at the World's Fair* (1893), and *Josiah Allen on the Woman Question* (1914).

Holley, Robert William (b. Jan. 28, 1922, Urbana, Ill., U.S.), U.S. biochemist who shared the Nobel Prize in Physiology or Medicine in 1968 with Marshall Warren Nirenberg and H. Gobind Khorana. Their research helped explain how genetic components of the cell nucleus control the synthesis of proteins.

Holley obtained his Ph.D. in organic chemistry from Cornell University in 1947 and investigated a variety of biochemical questions at the state and federal agricultural experiment stations at Cornell (1948–64). He began RNA research after spending a year studying with James F. Bonner at the California Institute of Technology (1955–56). By 1960 Holley and others had shown that small molecules of ribonucleic acids, called transfer RNA's, were involved in the assembly of amino acids into proteins. Holley and his collaborators developed techniques to separate the different transfer RNA's from the mixture in the cell. By 1965 he had determined the composition of the transfer RNA that incorporates the amino acid alanine into protein molecules. This feat—the first demonstration of the sequence of nucleotides in a nucleic acid—required digesting the molecule with enzymes, identifying the pieces, then figuring out how they fit together. It has since been shown that all transfer RNA's have similar structures.

In 1968 Holley became a resident fellow at the Salk Institute for Biological Studies in La Jolla, Calif. He also became an adjunct professor at the University of California, San Diego, in the following year.

Holliday, Doc, byname of JOHN HENRY HOLLIDAY (baptized March 21, 1852, Griffin, Ga., U.S.—d. Nov. 8, 1887, Glenwood Springs, Colo.), U.S. gambler, gunman, and sometime dentist of the American West.

He was reared in Georgia in the genteel tradition of the Old South, graduated from the Pennsylvania College of Dental Surgery in 1872, and, already consumptive, moved west for drier climes. He practiced dentistry briefly in Dallas but soon discovered his prowess as a gambler, a poker and faro player, and began drifting throughout the West—Jacksboro, Texas; Pueblo and Denver, Colo.; Cheyenne, Wyo.; Deadwood, S.D.; Dodge City, Kan.; Trinidad and Leadville, Colo.; and Las Vegas, N.M.; ending up in Tombstone, Ariz., in 1880. During the period he gained a reputation as a drinker, fighter, and killer; he also probably married one Kate Elder (*q.v.*).

Holliday had befriended Wyatt Earp in Dodge City and, when in Tombstone, joined the Earp brothers in the celebrated gunfight at the O.K. Corral against the Clanton gang. From then (1882) on, he was again a drifter (having abandoned Kate Elder) and died five years later in Glenwood Springs, Colo., where he had gone for treatment of his tuberculosis.

hollow-faced bat: *see* slit-faced bat.

hollow ware, hollow metal utensils and artifacts. The simplest metalwork technique for making hollow ware is to join pieces of sheet metal together, using rivets, solder, or other means. A rivetted bucket is a simple example. Raising, a technique dating from at least the 3rd millennium BC, is commonly used for hollow ware in silver, copper, and other malleable metals: a disk of sheet metal is gradually shaped into a hollow form over a stake or anvil by a series of hammer blows spiralling from the centre of the convex side; the hammer marks are later removed with a smooth, planishing hammer.

Casting in metal, sand, or other molds is used for metals unsuitable for hammer work. Bronze vessels and most pre-19th-century pewter objects have either been cast whole or made up from several separate castings. Spinning, a technique that originated in the early 19th century, can be used for most metals. A metal disk is set on a lathe behind an appropriately shaped metal or wooden chuck, and during rotation the metal is pressed onto the chuck with a tool. Britannia metal was often spun; a typical, modern spun object is the aluminum saucepan. As in most metalworking techniques, the metal is periodically softened by annealing, or heating, when it has become hardened through being worked. Combinations of techniques are often used. The term hollow ware also refers to certain types of pottery and treen (wooden objects).

Hollweg, Theobald (Theodor Friedrich Alfred) von Bethmann: *see* Bethmann Hollweg, Theobald (Theodor Friedrich Alfred) von.

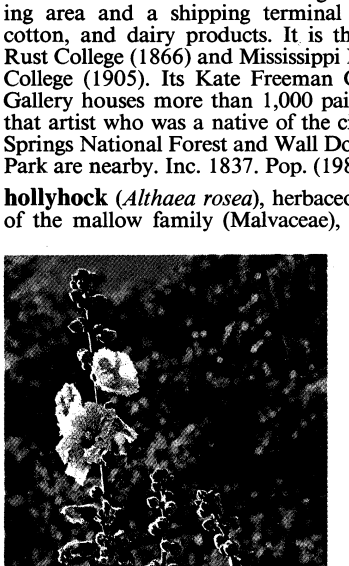
holly, any of the shrubs and trees of the genus *Ilex,* in the family Aquifoliaceae, comprising about 400 species of red- or black-berried plants, including the popular Christmas hollies. They have alternate, simple leaves and single or clustered, small, usually greenish flowers (male and female being usually on separate plants). English holly (*I. aquifolium*), a tree growing to 15 metres (nearly 50 feet) tall, bears shining, spiny, dark, evergreen leaves and usually red fruits. Somewhat taller, American holly (*I. opaca*) has oblong, prickly leaves and usually red fruits. There are spineless and yellow-fruited forms of both species. Chinese holly (*I. cornuta*), from East Asia, a shrub reaching 3 metres, produces scarlet berries among shining, evergreen leaves. Japanese holly (*I. crenata*), an East Asian shrub growing to 6 metres, has small, evergreen leaves and black berries. Yaupon (*I. vomitoria*), a shrubby tree reaching 8 metres, bears oval leaves and red berries. It is native to eastern North America, as is the winterberry, or black alder (*I. verticillata*). Possum haw (*I. decidua*), also deciduous, bears red fruits on a shrub growing to 10 metres. Yerba maté (*I. paraguariensis*), a South American evergreen shrub, reaches 6 metres; its leaves are used to make a popular caffeine-rich tea.



American holly (*Ilex opaca*)
W.H. Hodge

Holly Springs, city, seat (1836) of Marshall County, northern Mississippi, U.S., 42 mi (68 km) southeast of Memphis, Tenn. It was founded in 1835 by William S. Randolph of Virginia at the site of a spring encircled by holly trees. Its fine antebellum homes reflect the prosperity of the cotton era. During the Civil War more than 60 skirmishes were fought there, including a raid by Confederate Gen. E. Van Dorn, who destroyed a Federal supply depot and delayed the Federal drive to Vicksburg. A yellow-fever epidemic in 1878 killed more than 300 residents. Holly Springs is the trade centre for a farming and dairying area and a shipping terminal for clay, cotton, and dairy products. It is the seat of Rust College (1866) and Mississippi Industrial College (1905). Its Kate Freeman Clark Art Gallery houses more than 1,000 paintings by that artist who was a native of the city. Holly Springs National Forest and Wall Doxey State Park are nearby. Inc. 1837. Pop. (1980) 7,285.

hollyhock (*Althaea rosea*), herbaceous plant, of the mallow family (Malvaceae), native to China but widely cultivated for its handsome flowers. The several varieties include annual, biennial, and perennial forms. The stalk grows about 1.5–2.7 metres (5–9 feet) tall. The leaves have five to seven lobes. Commonly white, pink, red, or yellow, the flowers are 7.5 centimetres (3 inches) or more across and are borne along the upper portion of the stalk.



Hollyhock (*Althaea rosea*)
F.K. Anderson—EB Inc.

Hollywood, district within the city of Los Angeles, California, U.S., whose name is synonymous with the U.S. motion-picture industry. Lying northwest of downtown Los

Angeles, it is bounded by Hyperion Avenue and Riverside Drive (east), Beverly Boulevard (south), the foothills of Santa Monica Mountains (north), and Beverly Hills (west). Since the early 1900s, when movie-making pioneers found in southern California an ideal of blend mild climate, much sunshine, varied terrain, and a large labour market, the image of Hollywood as the fabricator of tinselled cinematic dreams has become worldwide. An adobe was the first house built (1853) on the site near Los Angeles, then a small city in the new state of California. Hollywood was laid out as a real-estate subdivision in 1887 by Horace Wilcox, a Prohibitionist from Kansas who envisioned a community based on his sober religious principles. His wife, Daeida, named the area after the home of a friend in Chicago. In 1910, because of an inadequate water supply, Hollywood residents voted to consolidate with Los Angeles; cameras were then already grinding across its landscape of orange groves and dusty streets.

In 1908 one of the first storytelling movies, *The Count of Monte Cristo*, was completed in Hollywood after its filming had begun in Chicago. The following year a tavern on Sunset Boulevard—in the 1920s the site of posh shops and speakeasies—was turned into Hollywood's first studio, and soon about 20 companies were producing films in the area. In 1913 Cecil B. de Mille, Jesse Lasky, and Samuel Goldwyn produced *The Squaw Man* in a barn one block from present-day Hollywood Boulevard and Vine Street, an intersection that was to become famous as the crossroads of movie and television celebrities. For more than three decades, from the silent screen through the advent of the talking picture, such men as D.W. Griffith, Goldwyn, Adolph Zukor, William Fox, Louis B. Mayer, Darryl F. Zanuck, and Harry Cohn served as overlords of the great film studios—20th Century–Fox, Metro-Goldwyn-Mayer, Paramount Pictures, Columbia, Warner Brothers, and others. The Hollywood film idols plied their crafts against a background of opulence and glamour, of plush homes with large swimming pools; their behaviour often scandalized more conventional American mores. Among writers who were fascinated with Hollywood in its "golden age" were novelists F. Scott Fitzgerald, Aldous Huxley, Evelyn Waugh, and Nathanael West and a host of newspaper gossip columnists.

After World War II, film studios began to move outside Hollywood; and location filming around the world emptied many of the famous lots and sound stages or turned them over to television show producers. With the advent of television. Hollywood began to alter its functions. By the early 1960s it had become the source of the majority of U.S. network television entertainment.

Among the features of Hollywood, aside from its working studios, are the Hollywood Bowl (1919; a natural amphitheatre where the summertime "Symphonies Under the Stars" has taken place since 1922), the Pilgrimage Play Amphitheater and Greek Theatre in Griffith Park, Mann's (formerly Grauman's) Chinese Theater (with footprints and handprints of many stars in its concrete forecourt), and the California Art Club. Many stars, past and present, live in neighbouring Beverly Hills, and the Hollywood Cemetery contains the crypts of such performers of the gilded past as Rudolph Valentino, Douglas Fairbanks, and John Gilbert. Thriving cosmetics and fashion industries are further reminders of the glamour and chic that were and are Hollywood. Pop. (1980) 228,550.

Hollywood, city, Broward County, southeastern Florida, U.S., on the Atlantic coast, 20 mi (32 km) north of Miami. It was a palmetto jungle with a few pineapple and tomato farms until 1921, when Joseph W. Young, a developer from California (hence the name Hollywood), laid out the town, which was incorporated in 1925. In 1926 it was heavily damaged by a hurricane and grew but little until the 1940s, when the population began to boom. Primarily a resort–residential city with some diversified industry, it shares the ownership and benefits of Port Everglades (a channel providing docking and warehousing facilities) with nearby Dania and Fort Lauderdale. A Seminole Indian Reservation (Okalee Village) is 8 mi northwest. Pop. (1980) city, 117,188; metropolitan area (SMSA), 1,014,043.

Holm, Hanya, original name JOHANNA KUNTZE, *née* ECKERT (b. *c.* 1898, Worms am Rhein, Ger.), German-born U.S. choreographer, teacher, and modern dancer. She was most widely known for her choreography for Broadway musicals.

After early study at the Dalcroze institutes in Frankfurt am Main and Hellerau, she joined Mary Wigman's Central Institute in Dresden



Hanya Holm, 1929

By courtesy of the Dance Collection, the New York Public Library at Lincoln Center, Hanya Holm Collection

and for several years was chief instructor; she also served as co-director for Wigman's massive *Das Totenmal* (1930). In 1931 she opened the Mary Wigman School in New York City, which in 1936 became the Hanya Holm Studio, reflecting her development of an individual style of movement and teaching. She took U.S. citizenship in 1939.

Holm was interested in absorbing American cultural and artistic influences into her choreography and so for several years choreographed only small demonstration pieces. *Trend*, her first major creation in the United States, was produced in 1937 at a Bennington College dance festival. It was a large, dramatic work, revolutionary in its stage settings and its prerecorded music for nonorchestral instruments. *Metropolitan Daily* (1938), the first televised modern dance, and *Tragic Exodus* (1939) are among her other well-known concert works. With her company (1936–44) she toured the United States and Europe. In 1941 she established the Center of Dance in the West in Colorado Springs, Colo., where she gave annual summer courses for more than 25 years; Alwin Nikolais, Valerie Bettis, and Glen Tetley were among her many pupils.

Holm choreographed many successful musical plays, including *Kiss Me, Kate* (1948), *Out of This World* (1950), *My Fair Lady* (1956), and *Camelot* (1960); her dances for them were particularly notable for their natural development from dramatic context. She also staged several operas in Central City, Colo., including the world premiere (1956) of Douglas Moore's *The Ballad of Baby Doe*. Holm was instrumental in increasing the use of dance notation, and all her Broadway choreographies were recorded in Labanotation, microfilmed, and copyrighted.

Holm, Sven (b. April 4, 1940, Copenhagen), Danish novelist and short-story writer, a participant in the political movement in Danish literature of the 1960s.

In the title story of his first collection, *Den store fjende* (1961; "The Great Enemy"), Holm describes how a church on a precipice is gradually crumbling and falling into the sea in spite of the dutiful and confident prayers of its priest. The latter fails to ascend to heaven, and his villagers remain in a state of false material security. The village is a metaphor for a society that has become warped by politics and in which the urge to prosper has become man's central fulfillment. In *Det private Liv* (1974; "The Private Life") the realization dawns upon the main character during a marriage crisis that material things have usurped the central meaning in his life. The breakdown of his personal life becomes necessary if he is to change. In most of Holm's novels he deals with different forms of social exploitation—poverty in *Syg og munter* (1972; "Sick and Happy"), corruption of language in *Jomfrutur* (1966; "Maiden Voyage"), and ignorance in *Termush, Atlanterkysten* (1967; Eng. trans. 1969). In his intense prose poem on the theme of human suffering, *Syv passioner* (1971; "Seven Passions"), Holm offers a utopian alternative to the psychological breakdown and envisioned collapse of the Western way of life.

Holmes, Arthur (b. Jan. 14, 1890, Hebburn, Durham, Eng.—d. Sept. 20, 1965, London), English geologist and geophysicist who investigated the age of rocks by means of radioactive measurements. In 1913 Holmes proposed the first quantitative geological time scale, and in 1915 he made an estimate of the age of the Earth using thermal calculations of the internal temperature distribution.

He served as professor of geology at the University of Durham (1924–43) and regius professor of geology and mineralogy at the University of Edinburgh (1943–65). He wrote the text *Principles of Physical Geology* (1944).

Holmes, Oliver Wendell (b. Aug. 29, 1809, Cambridge, Mass., U.S.—d. Oct. 7, 1894, Cambridge), U.S. physician, poet, and humorist notable for his medical research and teaching, and as the author of the "Breakfast-Table" series of essays.

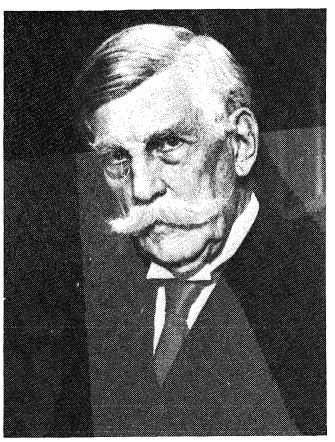
Holmes read law at Harvard University before deciding on a medical career; and, following studies at Harvard and in Paris, he received his degree from Harvard in 1836. He practiced medicine for 10 years, taught anatomy for two years at Dartmouth College (Hanover, N.H.), and in 1847 became professor of anatomy and physiology at Harvard. He was later made dean of the Harvard Medical School, a post he held until 1882. His greatest medical contribution was that of calling attention to the contagiousness of puerperal fever (1843).

Holmes achieved his greatest fame, however, as a humorist and poet. He wrote much poetry and comic verse during his early school years; he won national acclaim with the publication of "Old Ironsides" (1830), which aroused public sentiment against destruction of the USS "Constitution," an American fighting ship from the War of 1812. Beginning in 1857, he contributed his "Breakfast-Table" papers to *The Atlantic Monthly* and subsequently published *The Autocrat of the Breakfast-Table* (1858), *The Professor of the Breakfast-Table* (1860), *The Poet of the Breakfast-Table* (1872), and *Over the Teacups* (1891),

written in conversational style and displaying Holmes's learning and wit.

Among his other works are the poems "The Chambered Nautilus" (1858) and "The Deacon's Masterpiece, or 'The Wonderful One-Hoss Shay' " (1858), often seen as an attack on Calvinism, and the psychological novel *Elsie Venner* (1861), also an attack on Calvinism that aroused controversy.

Holmes, Oliver Wendell, Jr., byname THE GREAT DISSENTER (b. March 8, 1841, Boston—d. March 6, 1935, Washington, D.C.), justice of the United States Supreme Court, U.S. legal historian and philosopher who advocated judicial restraint. He stated the concept of "clear and present danger" as the only basis for limiting free speech.



Justice Holmes
EB Inc.

Early life and Civil War experience. Oliver Wendell Holmes, Jr., was the first child of the celebrated writer and physician Oliver Wendell Holmes. The family background on both sides represented the New England "aristocracy" of character and accomplishment. His father was descended from the Puritan poet Anne Bradstreet; he married Amelia Lee Jackson, whose father, Charles, was a justice of the Supreme Judicial Court of the State of Massachusetts, a bench on which Oliver Wendell Holmes, Jr., was to sit for 20 years. He was proud of this heritage and spoke of it often. It helped shape his mind and character.

Young Holmes went to a private school and then to Harvard College. He was graduated in the class of 1861 and like his father before him was class poet. At the outbreak of the U.S. Civil War he enlisted as a private in the 4th Battalion of Infantry and began training at Boston's Fort Independence, not expecting to finish the academic year or take his degree. The battalion was not called up, and after graduation the young man applied for and received, in July, a commission as first lieutenant in the 20th Massachusetts Regiment of Volunteers. He was 20 years old at that time.

His letters and diary give vivid pictures of his war experiences. He was seriously wounded three times, at the battles of Ball's Bluff, Antietam, and Chancellorsville. He left the army after three years, having been commissioned lieutenant colonel although mustered out with the rank of captain. Holmes described war as "an organized bore." He said, "I trust I did my duty as a soldier respectably, but I was not born for it and did nothing remarkable in that way." In a Memorial Day address to fellow veterans, in 1884, he attributed a certain value to the war experience: "Through our great good fortune, in our youth our hearts were touched with fire. It was given to us to learn at the outset that life is a profound and passionate thing." This is an aspect of his conviction that ". . . it is required of a man that he should share the passion and action of his time at peril of being judged never to have lived."

Legal studies. In the autumn of 1864 he entered Harvard Law School, ironically without any clear sense of vocation. He had even contemplated medicine, to which his father objected. On different occasions, he said that his "Governor" "put on the screws to have me go to the Law School" or "kicked" him into it. There is a story that, when young Holmes announced to his father the decision to enter the law school, the doctor said, "What's the use of that, Wendell? A lawyer can't be a great man." There was not a deep affinity between father and son. The little doctor's puns and quips, his easy display of emotion, and a somewhat patronizing attitude chafed the tall, less talkative, inherently shy law student. The philosopher William James, perhaps the closest friend of Wendell in the immediate postwar years, once remarked that "no love is lost" between father and son.

Holmes experienced a certain restlessness in law school, finding the tradition of the law as presented in an uninspired curriculum to be stagnant and narrowly precedent-centred. The science, philosophy, or history of law were slighted, and these, rather than what he later called "the small change of legal thought," were what captured Holmes's mind and drew him into the depths of a profession toward which at first he had not felt a powerful incentive.

After finishing law school in 1866 he made the conventional "pilgrimage" abroad, visiting England, France, and Switzerland and meeting a variety of distinguished men. He was admitted to the bar in 1867 and for 15 years practiced law as a member of several firms. From 1870 to 1873 he was an editor of the *American Law Review.* He edited the 12th edition of the classic survey of early American law, Chancellor James Kent's (1763–1847) *Commentaries on American Law* (1873). He also lectured at Harvard on law.

During this busy time he was engaged in courtship. Always something of a ladies' man, he had maintained a long friendship with Fanny Bowditch Dixwell, daughter of his one-time schoolmaster. She had waited patiently through wartime, his law studies, travel, and apprenticeship. Holmes and Dixwell were married at last on June 17, 1872. The marriage, happy and long lasting, was childless.

The Common Law. In 1880–81 Holmes was invited to lecture on the common law at the Lowell Institute in Boston, and from these addresses developed his book *The Common Law* (1881). Here the genius of Holmes was first clearly revealed and the consistent direction of his thought made evident. A fresh voice was speaking in his words:

> The life of the law has not been logic: it has been experience. The felt necessities of the time, the prevalent moral and political theories, intuitions of public policy, avowed or unconscious, even the prejudices which judges share with their fellow-men, have had a good deal more to do than the syllogism in determining the rules by which men should be governed. The law embodies the story of a nation's development through many centuries, and it cannot be dealt with as if it contained only the axioms and corollaries of a book of mathematics. In order to know what it is, we must know what it has been, and what it tends to become. We must alternately consult history and existing theories of legislation. But the most difficult labor will be to understand the combination of the two into new products at every stage. The substance of the law at any given time pretty nearly corresponds, so far as it goes, with what is then understood to be convenient; but its form and machinery, and the degree to which it is able to work out desired results, depend very much upon its past.

In January 1882 Holmes was made Weld Professor of Law, a chair established for him at Harvard Law School. In December of the same year he accepted appointment to the Supreme Judicial Court of the State of Massachusetts, knowing the judgeship was his destiny and the function through which he could most influence the development of law. He was to sit on that bench for 20 years, becoming its chief justice in 1899. In 1902 Pres. Theodore Roosevelt appointed him associate justice of the United States Supreme Court. He sat on that court to a more advanced age than did any other man, retiring on Jan. 12, 1932, soon before his 91st birthday.

Fanny Holmes, devoted, witty, wise, tactful, and perceptive, died on April 30, 1929. Holmes wrote to his intimate friend, the English jurist Sir Frederick Pollock, "For sixty years she made life poetry for me and at 88 one must be ready for the end. I shall keep at work and interested while it lasts—though not caring very much for how long." He died two days before his 94th birthday.

Justice of the Supreme Court. In that long span of years on the Supreme Court he became acknowledged as one of the most notable jurists of the age—in the opinion of many the foremost. Often he has been called The Great Dissenter because of the brilliance of his dissenting opinions, but the phrase gives a falsely negative emphasis, and his penetration and originality are seen as fully in the opinions in which he expressed or concurred in the majority view of the court as in those in which he was in dissent.

Holmes believed that the making of laws is the business of legislative bodies, not of courts, and that within constitutional bounds the people have a right to whatever laws they choose to make, good or bad, through their elected representatives. He stated the concept of "clear and present danger" as the only basis for curtailing the right of freedom of speech, illustrating it with the homely example: "The most stringent protection of free speech would not protect a man in falsely shouting fire in a theatre and causing a panic."

He wrote that "the best test of truth is the power of the thought to get itself accepted in the competition of the market. . . . That at any rate is the theory of our Constitution." Again: "If there is any principle of the Constitution that more imperatively calls for attachment than any other it is the principle of free thought—not free thought for those who agree with us but freedom for the thought that we hate."

A man austerely dedicated to his work, he also enjoyed the earthy and the droll. He loved Rabelais. Sometimes in Washington he attended burlesque shows and was said to have remarked, "I thank God I am a man of low tastes." The newly inaugurated President Franklin D. Roosevelt called upon the retired justice and found him reading Plato. "Why do you read Plato, Mr. Justice?" "To improve my mind, Mr. President," replied the 92-year-old man.

Holmes won the love and admiration of generations of lawyers and judges in his long career. When he resigned from the Supreme Court, his "brethren," as he always addressed his fellow justices, wrote him a letter signed by all, saying in part:

> Your profound learning and philosophic outlook have found expression in opinions which have become classic, enriching the literature of the law as well as its substance. . . . While we are losing the privilege of daily companionship, the most precious memories of your unfailing kindliness and generous nature abide with us, and these memories will ever be one of the choicest traditions of the Court.

(E.Fu.)

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Holmes, Sherlock, fictional character who was created in 1887 by the English writer Sir Arthur Conan Doyle and who became the prototype for the modern mastermind detective. The character generated the most enduring tradition in detective fiction. Although Holmes had been anticipated by the fictional detective C. Auguste Dupin, the creation of Edgar Allan Poe, Dupin remained an eccentric genius, whereas Holmes made a signal impact on the popular imagination.

Doyle modeled his great detective on the methods and mannerisms of his former teacher in medical school, Dr. Joseph Bell of Edinburgh. Doyle's skill in surrounding the character of Holmes with a mythic environment—a world of London fogs and Victorian hansom cabs; a mastermind opponent, Professor Moriarty, as dedicated to evil as Holmes is to good; and a loyal friend, Dr. Watson, whose obtuseness is a foil to Holmes's brilliance—did much to enlarge his hero's image.

Holmes's character is many-sided. He is the complete pragmatist; he admits to Watson (in *A Study in Scarlet*) his ignorance of the Copernican theory, but his knowledge of such things as chemistry, sensational literature, and varieties of cigar ash is profound. He is arrogant; unfailingly chivalrous, but mistrustful of women; artistically sensitive; and eccentric (he keeps his cigars in the coal scuttle, and, when bored, every so often shoots bullet holes in his wall in the shape of a patriotic "V.R."). Holmes's partner, John H. Watson, who is the narrator of the Holmesian stories and who shares with the reader his delight and amazement at Holmes's ratiocinative powers, is almost as popular as Holmes himself in his role as "the reader's friend."

Consult the INDEX *first*

Holmes, William Henry (b. Dec. 1, 1846, near Cadiz, Ohio, U.S.—d. April 20, 1933, Royal Oak, Mich.), American archaeologist, artist, and museum director who helped to establish professional archaeology in the United States.

Holmes became interested in geology while serving as artist on a survey of the Rocky Mountains in 1872. That interest led to archaeology when in 1875 he was working on a geologic exploration of ancient cliff dwellings in southeastern Utah.

In 1883 Holmes published *Art in Shell of the Ancient Americans.* As curator of anthropology at the Field Museum of Natural History, Chicago (1894–97), he went to Yucatán and produced his superbly illustrated *Archaeological Studies Among the Ancient Cities of Mexico* (1895–97). Curator of anthropology at the Smithsonian Institution, Washington, D.C. (1897–1902 and 1910–20), he was also chief of the institution's Bureau of American Ethnology (1902–09) and director of the National Gallery of Art (1920–32). Holmes opposed a popular belief that there was a period in New World prehistory comparable to Upper Paleolithic (Old Stone Age) Europe. His other published works include *Handbook of Aboriginal American Antiquities* (1919).

holmium (Ho), chemical element, rare-earth metal of transition Group IIIb of the periodic table, one of the most paramagnetic substances known. Among the least abundant of the rare-earth elements, holmium and its compounds have limited application except for research. Holmium has been used as a component of some electronic devices; the trivalent ion has been used as a catalyst for ortho-para hydrogen conversion; and the oxide has been used as a special refractory.

Holmium was discovered (1878) spectroscopically by Jacques-Louis Soret and Marc Delafontaine and independently (1879) by Per Teodor Cleve, who separated it chemically from erbium and thulium. Cleve named the element for his native city of Stockholm, Swed., its Latinized name being Holmia. Holmium occurs associated with other rare earths in the minerals xenotime, euxenite, and many others; it also occurs in the products of nuclear fission. The classical methods of separation and purification were fractional crystallization and precipitation. Ion-exchange technology has made available kilogram quantities of highly pure holmium oxide. The silvery metal is produced by thermoreduction of the anhydrous fluoride HoF_3 with calcium. It is reactive and slowly attacked by oxygen and water. The one naturally occurring isotope, holmium-165, is stable; about two dozen radioactive artificial species are known.

Holmium behaves as a typical rare earth; it forms a series of yellow-brown salts, many of which are obtained in solution by dissolving the oxide Ho_2O_3 in the appropriate acid.

atomic number	67
atomic weight	164.930
melting point	1,470° C
boiling point	2,720° C
specific gravity	8.781 (25° C)
valence	3
electronic config.	2-8-18-29-8-2 or $(Xe)4f^{11}5d^{0}6s^{2}$

Holocaust, Hebrew SHO'AH, or ḤURBAN, the 12 years (1933–45) of Nazi persecution of Jews and other minorities, which was marked by increasing barbarization of methods and by expansion of territories terrorized by German rule and which climaxed in the "final solution" (*die Endlösung*), the attempted extermination of European Jewry.

Adolf Hitler's persecution of the Jews in Germany began a month after he became chancellor on Jan. 30, 1933. Jewish businesses were boycotted and soon vandalized, and Jewish personnel were dismissed from local governments, law courts, and universities. In a series of laws, confiscations, and pogroms between 1933 and 1938, Hitler succeeded in undermining the political and economic foundations of German Jewry, which, according to Nazi doctrine, included thousands of German Christians of Jewish origin. By the Nürnberg laws of 1935, Jews lost their citizenship completely and were forbidden to intermarry with other Germans. As a result of the *Kristallnacht* pogrom, the Night of Broken Glass, of Nov. 9–10, 1938, practically every synagogue in Germany was destroyed, along with other Jewish institutions. Thereafter, thousands of Jews were imprisoned in concentration camps, and the major part of German Jewish wealth was confiscated by huge punitive fines and other exactions. By the time that World War II had broken out in 1939, Jews were no longer citizens, could attend no public schools, engage in practically no business or profession, own no land, associate with no non-Jew, and frequent no park, library, or museum; and they were ordered to live in ghettos. By 1941 boys over 12 were conscripted into munition factories, all use of the telephone and public transportation systems was forbidden, and all Jews over 6 years of age were required to wear the yellow Star-of-David badge.

The Nazis became convinced, after a few propaganda successes, that anti-Semitism could also serve as an entering wedge into many countries of Europe. By 1938 Fascist Italy had issued an anti-Jewish law modeled on German anti-Semitic racial legislation; and the conquest and incorporation of Austria in 1938 and of Czechoslovakia in 1939 brought about the subjection of their Jewries. Hungary, with a background of anti-Semitism, enacted its first anti-Semitic statute on the Hitlerian model in 1938. Romania reached a climax of anti-Semitism in December 1937, when Octavian Goga became premier and sponsored a series of Nazi anti-Semitic laws. He was speedily deposed by King Carol II; but, nevertheless, by November 1939, more than one-third of Romanian Jewry was disenfranchised. This meant that, as aliens, they were not permitted to work.

Those social and political forces that might have been expected to rise to the support of the Jews and other oppressed minorities in Europe failed to do so. The student bodies of central and eastern Europe, following old traditions, refused to line up with the liberals. The liberal political parties themselves had been crushed or suppressed. The protests of the churches, when they were made, were feeble and ineffective; certain individual churchmen and prelates were apparent anti-Semites.

The methods of self-help employed by the Jews themselves served in a small degree to ameliorate their position. The majority hoped for emigration; from 1931 to 1941, for example, 161,262 immigrant Jews were admitted to the United States. This relatively small migratory tide, however, did little to alleviate the conditions of millions of Jews.

The victories of the German armies in the early years of World War II brought the overwhelming majority of European Jewry under the Nazis and their satellites. From the Atlantic to the Volga, from Norway to Sicily, Jews were deprived of human rights. Their property confiscated, most of them were herded into ghettos and concentration camps.

As the German armies moved eastward, first into Poland and then into the Soviet Union and the Baltic states, the resolution of the "Jewish question" (*die Judenfrage*) was terrifyingly inaugurated by SS death squads known as special task forces (Einsatzgruppen). Whole populations of Jews (as well as Gypsies and many non-Jewish Slavs) of conquered villages, towns, and cities were rounded up, shot, and buried locally in mass graves. Another method of extermination consisted of herding victims into enclosed trucks or vans into which exhaust fumes were directed, killing the occupants on the ride to mass graves. However, a combination of inefficiency and the uneasiness in some sectors of public opinion, especially among regular army troops and officers, meant that the time had come for some new methods of mass murder. The evolving plans for murder and cremation in remote extermination camps would ensure that most killings would be done behind a wall of secrecy, by methods that far fewer people would have to see, and in circumstances that would reduce to a minimum the chance of discovery. At the notorious Wannsee Conference, on Jan. 20, 1942, in the Berlin suburb of Grossen-Wannsee, 15 leading Nazi bureaucrats headed by *SS Obergruppenführer* Reinhard Heydrich (and including Adolf Eichmann) met to discuss the "final solution of the Jewish question." The decision taken was to systematically evacuate Jews from all over occupied Europe to camps in the East, where they would be "treated accordingly." Some would be exterminated outright (though the word extermination or execution was not used officially), and others would be organized into huge labour battalions; exhausting work and meagre food would ultimately spell the death of survivors or their eventual selection for extermination. (Some of Germany's allies, such as Italy and

Hungary, opposed and resisted the extermination policy but submitted when overpowered by Germany in 1943–44. Only Bulgaria resisted to the end.)

The most effective method for mass extermination became gassing in specially constructed gas chambers (disguised as showers), from which the bodies were removed to adjacent crematoriums. By this and other means, perhaps as many as 4,000,000 Jews were put to death in the extermination camps of Auschwitz, Majdanek, Treblinka, Chelmno, Sobibor, and Belzec and in the other concentration camps. The total number of Jews exterminated by the Nazis during the war is variously estimated but may have been as many as 6,000,000. (This is about 13 percent of the estimated total of probably more than 46,000,000 military personnel and civilians killed worldwide in World War II.)

This plan of genocide was carried out with efficiency, and the victims, whose will to resist had been sapped by prolonged starvation and disease, were often unaware until the last moment that they were going to be gassed. Nevertheless, there was some Jewish resistance, both passive and active. Where the population was friendly to the Jews, as in Denmark, France, Italy, and Bulgaria, it proved possible to save considerable numbers of Jews by hiding them, furnishing them with false documents, and even evacuating them to neutral countries. Thus a large part of Danish Jewry was secretly transferred en masse to Sweden, while some French Jews found refuge in Spain, Portugal, and Switzerland. In eastern Europe, however, the Germans exploited the traditional anti-Semitism of the peasant, so that hardly any aid reached the Jews from the mass of the people, while not a few non-Germans were among the most brutal agents in carrying out the extermination campaign. Notwithstanding these unfavourable conditions, thousands of young Jews joined the various underground resistance movements and the partisans in Poland, the U.S.S.R., Yugoslavia, France, and Italy. Jewish partisans often formed their own units, and in France there was a special Jewish section of the Maquis (bush guerrillas) that distinguished itself in attacks against the Germans.

But it was above all in the major ghettos of Poland—Warsaw, Bialystok, and Vilnius—that Jewish risings took place against overwhelming odds. In Warsaw, where at one time nearly 400,000 Jews had been concentrated, the last 60,000, almost unarmed, resisted the German deportation order and held out for nearly a month against regular German troops armed with flame throwers, armoured cars, and tanks (April-May 1943). Unfortunately, the Allied governments were too preoccupied with their own effort to render effective aid in saving Jews, and throughout the war the gates of most countries remained closed to all but a handful of refugees.

The war in Europe ended on May 8, 1945. The subsequent years tended to heal a few individual wounds, but the damage suffered by organized Jewry on the continent of Europe could not be fully repaired. Jewry's hopes became concentrated on the establishment and preservation of Israel and on the bringing of Nazi war criminals to trial.

Holocaust Day, a day of commemoration, is observed in Israel on Nisan 27 and elsewhere on April 19 or 20. The date is considered the anniversary of the beginning of the Warsaw Ghetto Uprising (*q.v.*) of 1943.

Holocene Epoch, formerly RECENT EPOCH, younger of the two epochs that comprise the Quaternary Period, and the latest interval of the Earth's geologic history. The Holocene Epoch follows the Pleistocene Epoch, and it constitutes the last 10,000 years to the present. It follows the last glacial stage of the Pleistocene and is characterized by relatively warm climatic conditions. The Holocene is important in terms of human history; within a few thousand years after the Old Stone Age, man developed the skills that have led to the present-day level of civilization.

A brief treatment of the Holocene Epoch follows. For full treatment, *see* MACROPAEDIA: Geochronology.

The progress of deglaciation at the end of the last glacial stage was complex. A major climatic warming occurred about 13,000 years ago, and it can be detected in deep-ocean sediments and in the changes of fossils of flora and insect faunas in western Europe. This warming was discontinuous, and the final remnants of the vast North American ice sheet lingered in Labrador until less than 7,500 years ago. The date of the onset of the Holocene proved difficult to define on climatic grounds, but radiocarbon dating (a method of age determination based on the measurement of radioactive carbon decay) has now placed it at 10,000 radiocarbon years BP (before the present, the reference year being AD 1950). This date coincides closely with the end of the Younger Dryas interval of cooling in northwestern Europe and the final fragmentation of the dwindling Scandinavian ice sheet there.

A direct result of the melting of the great ice sheets was a major rise of world sea levels during the early part of the Holocene. At 10,000 BP, ocean levels were still about 35 m (110 feet) below that of the present; they subsequently rose rapidly until about 6000 BP. Since that time the sea level has fluctuated within a few metres of its present level. Transgression of the sea over exposed continental shelves has had major paleogeographic effects. The land bridge from Asia to North America across the Bering Strait that had enabled early humans to migrate to the Americas was covered by water. So too were the connections between the British Isles and Europe, Japan and Siberia, Sri Lanka and India, and Tasmania and the Australian mainland.

In areas that had actually been covered by thick ice sheets, the direct effects of ice melting on relative land and sea levels were even more complicated. Here the weight of the ice masses had depressed the underlying crust of the Earth, a process known as isostatic depression. Subsequent melting of the ice resulted in a release of pressure, followed by uplift of the crust, a process known as isostatic recovery. Heavily glaciated areas such as Scandinavia have undergone several hundred metres of isostatic uplift since the end of the last glaciation.

The climatic development of the Holocene has been investigated chiefly through the technique of palynology (pollen analysis). Past vegetational conditions can be deduced from assemblages of fossil pollen and spores preserved in lake and bog sediments. Comparisons of these assemblages from different levels within deposits indicate vegetational changes that can in turn be interpreted in terms of ecological and climatic change. Furthermore, sediment from levels in which major changes occurred can be subjected to radiocarbon dating. Results from many parts of the world show that the beginning of the Holocene was characterized by rapid climatic warming and widespread vegetational change. In previously glaciated areas of western Europe, for example, tundra vegetation was replaced by boreal forest (birch and pine), which in turn gave way to broad-leaved deciduous trees, such as oak, elm, and hazel. This warming culminated in a period lasting from approximately 8000 to 5000 BP, known as the climatic optimum, or hypsithermal interval, when mean annual temperatures were generally 2° to 3° C (3.6° to 5.4° F) higher than at the present day. At this time broad-leaved trees reached farther north than today in both North America and northern Europe, and the prairie grasslands of what is now the midwestern United States expanded far to the east of their historic limits.

In tropical regions it is particularly notable that between 10,000 and 5000 BP there were lakes with high water levels across areas of Africa, Arabia, and India that are now quite arid. This indicates a much wetter climate than that of today and a very different distribution of monsoonal rainfall in the first half of the Holocene.

After 5000 BP the vegetational evidence is harder to interpret because of soil deterioration and the ever-increasing and widespread effects of human activities. Climates, however, certainly became cooler and have been characterized by small-scale oscillations between warmer and cooler intervals lasting a few hundred years. Such intervals are evident from historical records as well as from the meteorological records that have been kept since the 17th century. The favourable climate of the Little Climatic Optimum (AD 1000–1250) and the severe Little Ice Age (1250–1850) had extremely significant effects on human civilizations and their economies.

Although the Earth is presently supposed to be in a long-term cooling of the glacial-interglacial cycles, reliable records of temperature readings from around the world (maintained since the mid-1800s) indicate that a global warming of nearly 0.5° C (0.9° F) has occurred over the past century. A number of scientists believe that the buildup of carbon dioxide and other so-called greenhouse gases (*e.g.,* methane and nitrous oxide) in the atmosphere largely as a result of human activities may be primarily responsible for this warming trend.

holography, means of creating a unique photographic image without the use of a lens. The photographic recording of the image is called a hologram, which appears to be an unrecognizable pattern of stripes and whorls but which—when illuminated by coherent light, as by a laser beam—organizes the light into a three-dimensional representation of the original object.

An ordinary photographic image records the variations in intensity of light reflected from an object, producing dark areas where less light is reflected and light areas where more light is reflected. Holography, however, records not only the intensity of the light but also its phase, or the degree to which the wave fronts making up the reflected light are in step with each other, or coherent. Ordinary light is incoherent; that is, the phase relationships between the multitude of waves in a beam are completely random; wave fronts of ordinary light waves are not in step.

Dennis Gabor, a Hungarian-born scientist, invented holography in 1948, for which he received the Nobel Prize in physics more than 20 years later (1971). Gabor considered the possibility of improving the resolving power of the electron microscope, first by utilizing the electron beam to make a hologram of the object and then by examining this hologram with a beam of coherent light. A degree of coherence can be obtained by focusing light through a very small pinhole, but this technique reduces the light intensity too much for it to serve in holography; therefore, Gabor's proposal was for several years of only theoretical interest. The development of lasers in the early 1960s suddenly changed the situation (*see* laser). A laser beam has not only a high degree of coherence but high intensity as well.

Of the many kinds of laser beam, two have especial interest in holography, the continuous-wave (CW) laser and the pulsed laser. The CW laser emits a bright, continuous beam of a single, nearly pure colour. The pulsed laser emits an extremely intense, short flash of light that lasts only about 1/100,000,000

of a second. Two scientists in the United States, Emmett N. Leith and Juris Upatnieks of the University of Michigan, applied the CW laser to holography and achieved great success, opening the way to many research applications.

Basic principles of holography. In essence, the problem Gabor conceived in his attempt to improve the electron microscope was the same as the one photographers have confronted in their search for three-dimensional realism in photography. To achieve it, the light streaming from the source must itself be photographed. If the waves of this light, with their multitude of rapidly moving crests and troughs, can be frozen for an instant and photographed, the wave pattern can then be reconstructed and will exhibit the same three-dimensional character as the object from which the light is reflected. Holography accomplishes such a reconstruction by recording the phase content as well as the amplitude content of the reflected light waves of a laser beam. How this works is shown in Figure 1 at the top.

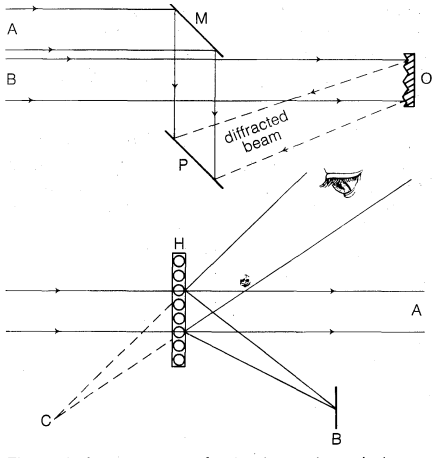


Figure 1: Arrangements for (top) creating a hologram and (bottom) reconstructing an image from a hologram

Continuous-wave laser holography. In a darkened room, a beam of coherent laser light is directed onto object O from source B. The beam is reflected, scattered, and diffracted by the physical features of the object and arrives on a photographic plate at P. Simultaneously, part of the laser beam is split off as an incident, or reference, beam A and is reflected by mirror M also onto plate P. The two beams interfere with each other; that is, their respective amplitudes of waves combine, creating on the photographic plate a complex pattern of stripes and whorls called interference fringes. These fringes consist of alternate light and dark areas. The light areas result when the two beams striking the plate are in step—when crest meets crest and trough meets trough in the waves from the two beams; the beams are then in phase, and so reinforce each other. When the two waves are of equal amplitude but opposite phase—trough meeting crest and crest meeting trough—they cancel each other and a dark area results.

The plate, when developed, is called a hologram. The image on the plate bears no resemblance to the object photographed but contains a record of all the phase and amplitude information present in the beam reflected from the object. The two parts of the laser beam—the direct and the reflected beams—meet on the plate at a wide angle and are recorded as very fine and close-packed interference fringes on the hologram. This pattern of fringes contains all the optical information of the object being photographed.

By reversing the procedure, as shown at the bottom in Figure 1, an image of the original object can be reconstructed. The coherent light of a laser beam illuminates the hologram negative H. Most of the light from the laser passes through the film as a central beam A and is not used. The close-packed, fine-detailed fringes on the hologram negative act as a diffraction grating, bending or diffracting the remaining light to exactly reverse the original condition of the coherent light waves that created the hologram. The diffracted light is transmitted at a wide angle from that of the laser's reference beam.

On the light source side of the hologram, at C, a virtual image visible to the eye is formed. On the other side, at B, a real image that can be photographed is formed. Both these reconstituted images have a three-dimensional character because in addition to amplitude information, which is all that an ordinary photographic process stores, phase information also has been stored. This phase information is what provides the three-dimensional characteristics of the image, as it contains within it exact information on the depths and heights of the various contours of the object. It is possible to photograph the reconstituted image, at B, by ordinary photographic means, at a selected depth, in exact focus.

The difference in appearance between a hologram and the reconstituted image is remarkable, as illustrated in Figure 2. The object in this instance was a model of a royal crown, decorated with fur trim. The hologram, an enlarged part of which is shown at the top, is a complex pattern of fringes. On the bottom is the astonishingly crisp, reconstructed image obtained from this hologram.

The real image from a hologram—that is, the one that can be photographed—appears pseudoscopic, or with a reversed curvature. This reversal can be eliminated by making a double hologram, first by preparing the single hologram and then by using it as an object in the creation of a second hologram. With a double reversal the image becomes normal again, as when a mirror image of writing is made legible by viewing it in a second mirror. The real image of a hologram has valuable properties. A viewing camera or microscope can be positioned and focussed on various selected positions in depth. The original object also can be brought into the position in space.

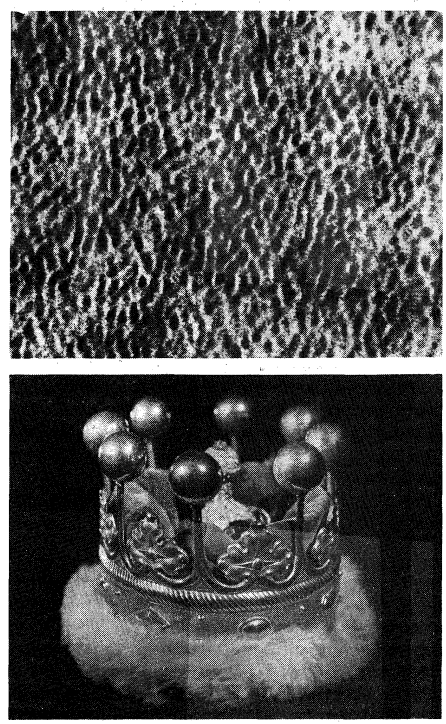


Figure 2: (Top) complex pattern of fringes in a hologram and (bottom) reconstructed image from the hologram

By courtesy of the National Physical Laboratory, Teddington, Middlesex, Crown copyright reserved

The hologram not only offers images at different depths (different cross-sections of the object) but also images seen along different directions if the viewer moves off the axis on which the principal image is viewed. Direct images can be seen under these conditions. In holography it is also possible to record on the same plate a succession of numerous multiple images that can be reconstructed as one image, leading to the possibility of holography in colour. Three holograms could be superimposed on the same plate, using three lasers of different colours. Reconstruction with the three different lasers would produce an image in its natural colour, even though the hologram plate itself is black-and-white.

Pulsed-laser holography. A moving object can be made to appear to be at rest when a hologram is produced with the extremely rapid and high-intensity flash of a pulsed ruby laser. The duration of such a pulse can be less than 1/10,000,000 part of a second; and, as long as the object does not move more than 1/10 of a wavelength of light during this short time interval, a usable hologram can be obtained. A continuous-wave laser produces a much less intense beam, requiring long exposures; thus it is not suitable when even the slightest motion is present.

With the rapidly flashing light source provided by the pulsed laser, exceedingly fast-moving objects can be examined. Chemical reactions often change optical properties of solutions; by means of holography, such reactions can be studied. Holograms created with pulsed lasers have the same three-dimensional characteristics as those made with CW sources.

Pulsed-laser holography has been used in wind-tunnel experiments. Usually high-speed air flow around aerodynamic objects is studied with an optical interferometer (a device for detecting small changes in interference fringes, in this instance caused by variations in air density). Such an instrument is difficult to adjust and hard to keep stable. Furthermore, all of its optical components (mirrors, plates, and the like) in the optical path must be of high quality and sturdy enough to minimize distortion under high gas-flow velocities. The holographic system, however, avoids the stringent requirements of optical interferometry. It records interferometrically refractive-index changes in the air flow created by pressure changes as the gas deflects around the aerodynamic object.

Nonphotographic holography. Holograph images are also recorded on materials other than photographic plates. Most of these nonphotographic materials, however, are still in the experimental stage, and the photographic production of holograms remains the only widely used process.

Major applications of holography. Because the real image from the hologram can be viewed by a camera or microscope, it is possible to examine difficult and even inaccessible regions of the original object. This feature renders holography useful for many purposes. A deep, narrow depression on a plane, for example, cannot often be reached by a microscope objective because of working distance limitations. If the detail can be reached by coherent light, however, a hologram can be taken and its image reconstructed. Since this image is aerial, the microscope can be positioned in such a way that it can focus on the required region. In the same way, a camera also can be focussed at the required depth and can photograph objects inside a deep transparent chamber.

Many holographic applications exploit the

fact that composite repeat holograms of a surface tilted slightly after each exposure can be treated as composite, repeat wave patterns. If two such patterns are matched, a condition arises that is effectively the same as that which exists in ordinary classical two-beam interferometry, in which a single light source is split into two beams and the beams recombined to form interference patterns. Such an arrangement can be set up in several ways; in one, a holographic exposure is made of a surface, then, before the hologram is removed or developed, the surface is slightly tilted and a repeat hologram is made, superimposed on the first hologram. When this double hologram is reconstructed, the object as well as the surface covered by the interference fringes caused by surface irregularities can be seen. These fringes reveal microtopographic information about the object.

Holographic interferometry can be applied successfully to any situation in which the wave front is modified slightly, no matter how complex the surface may be. Elastic deformation effects can be studied by superimposing the two wave fronts on the hologram, reflected before and after the elastic distortion effect has been introduced. When reconstructed, the hologram provides a clear picture of the object, crossed by interference fringes. Even highly complex shapes respond to this approach in a manner that would be impossible in classical interferometry. There is also great flexibility in the choice of methods used to apply distortions, and even these conditions alone often completely exclude optical interferometry. Not only static distortion but also slow dynamic variations can be studied in this manner. And with pulsed ruby lasers, very fast, short-time variations can be studied.

Time variations in the shape of an object are not usually studied with a single, double-exposure hologram but by an alternative method. First, a hologram is made of the object in its free, unstressed condition. Then the object is stressed and a new hologram made. The stressed hologram is viewed through the original unstressed hologram, and the superposition provides the interference fringe pattern that would have been produced by a double exposure. By such means, time variations can be studied. Valuable studies have been made of mechanically vibrating systems, such as diaphragms, musical instruments (*e.g.*, the belly of a violin), vibrating steam-turbine blades, and the like. The examination of large engineering components, measuring as much as one metre (about three feet) in length, imposes special problems. The distance between the hologram plate and the object must be great enough to ensure that all of the object can be seen at once. In turn, laser power must be increased, high demands on the coherence of light are imposed, and mechanical stability of the whole setup must be exceptionally good.

When hologram interferometry is applied to the examination of vibrations set up in a rapidly rotating turbine blade, stroboscopic techniques aid the analysis. The laser light is stroboscopically interrupted at the same frequency as the rotation of the turbine blade, and, with the blade thus apparently at rest, a hologram is produced. Consequently, a holographic interferometric pattern is created for the blade whose motion is stopped by stroboscopic action. By slightly altering the frequency of the stroboscope arrangement, a slow scan can be made over the complete vibrational stress pattern to which the blade is subjected. Much information about stresses in turbine blades and other rotating or vibrating objects can be obtained from such holograms.

Holomastigotoides, genus of large, pear-shaped zooflagellate protozoans of the order Hypermastigida; they are intestinal inhabitants of termites. The species *H. tusitala,* whose chromosomal behaviour during nuclear division has been studied, ranges from 130 to 200 micrometres (0.005 to 0.008 inch) in length and has five spiralling bands of flagella running posteriorly along the body. The chromosomes of *H. tusitala,* which may reach a length of 50 micrometres (0.002 inch), are larger than many small protozoans. Nuclear structural changes and chromosomal behaviour during division in *H. tusitala* provide a pattern for comparison with nuclear division in other Protozoa; these differences are useful in determining taxonomic relationships.

Ḥolon, city, west central Israel, on the Plain of Sharon near the Mediterranean Sea, just south of Tel Aviv–Yafo. A part of the Tel Aviv–Yafo metropolitan area, Ḥolon resulted from the union and incorporation of several district residential settlements, the earliest dating from 1925. During the Arab–Israeli War of 1948–49, Ḥolon was attacked by Arab snipers from the hill of Tall ar-Rīsh, between the residential quarters and Jaffa (now Yafo) to the northwest. The Arab position did not fall until the surrender of Jaffa on May 13, 1948.

Ḥolon is a centre of the Israeli textile industry; other manufactures include metals, rubber, and plastics. It is also the home of one of two remaining Samaritan communities in Palestine.

The Survey Department of Israel's College of Surveying is in the city; in 1971 a College of Fashion Technology was opened. Pop. (1982 est.) 132,300.

holostean, any member of the subclass Holostei, a group of archaic, bony fishes represented by the bowfin and the gar of North America.

A brief treatment of holosteans follows. For full treatment, *see* MACROPAEDIA: Fishes.

Major characteristics of this subclass include a dermal bone that is free of the upper jaw (maxilla) and attached to the skull only in the vicinity of the nasal chambers, a palate unconnected to the cheek elements, and a heterocercal tail. The scales became rounded (cycloidal) in some groups, but in the primitive condition they were diamond shaped and had a reduced dentine layer. The bowfin reaches a length of about 75 centimetres (30 inches) and a weight of 3.5 kilograms (8 pounds); the males are usually smaller than the females. The alligator gar (*Lepisosteus spatula*) is the largest living member of the group as well as one of the largest freshwater fish. It can attain a length of 3 metres (10 feet) and may weigh up to 136 kg.

Living gars are characterized by a long snout that is well endowed with teeth. The body is fusiform, and the dorsal and anal fins, which each have less than 12 rays, are located toward the posterior end of the body. The long snout ends in a beak that may be broad and short, as in the alligator gar, or a long forcepslike arrangement, as found in the long-nose gar (*L. osseus*). The extinct semionotiforms (Semionotidae), which include the oldest known member of the subclass (*Acentrophorus*), were fish with short snouts and strong teeth. In some the body was disk-shaped rather than fusiform.

The living bowfin has bony plates covering the head, thin cycloidal scales, and a fusiform body. The tail (caudal fin) is lobed, although in extinct forms it was sometimes forked. There are 58 rays in the long, dorsal fin that extends over most of the back. Male bowfins have a dark spot near the tail that is encircled with yellow or orange. In females the entire spot, or at least the coloured border, is lacking.

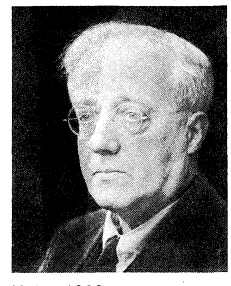
The three extinct orders are the Pachycormiformes, the Pycnodontiformes, and the Pholidophoriformes. Pachycormiforms were fusiform fish with forked tails, large mouths, and well-developed teeth; they generally resembled modern teleosts such as swordfish and mackerel. The pycnodontiforms were unique in having a flat, crushing dentition, although some anterior teeth were incisiform to help in grasping prey. Their bodies were disk-shaped, and they were generally strong, fast swimmers. The pholidophoriforms include those forms closest in structure to modern teleost fish. They differ most strongly from teleosts in the heterocercal (forked) nature of the caudal skeleton.

Most living holosteans are limited to fresh water, although some gars may temporarily venture into brackish or marine waters where, however, they do not feed. Gars are able to breathe air, which they obtain while floating at the surface. This ability allows them to inhabit poorly oxygenated waters. Modern bowfins inhabit only sluggishly moving fresh water, although the majority of the extinct forms were marine. The well-developed swim bladder of the bowfin can also be used as a lung, allowing the fish to survive out of water for up to 24 hours. Holostean fish are highly predaceous, feeding on other fish and various invertebrates. Bowfins occasionally decimate local game-fish populations.

Bowfins breed in weedy areas along the shore. The male builds a nest and guards the eggs; after they hatch he will guard the fry. The young bowfins are equipped with an adhesive organ at the end of the snout that enables them to hold on to weeds and so remain in one area. Bowfin young grow rapidly and may reach 23 cm in their first year. The gars lay their large, yolk-filled eggs in the spring; these eggs are placed in shallow waters. Long rows of sharp teeth enable the gar fry to capture the fast-swimming minnows that make up their diet.

holotrich, any ciliate protozoan of the subclass Holotrichia (or Holotricha). In most species the cilia are simple and uniformly distributed over the body surface. Holotrichs do not have prominent membranelles (structures consisting of rows of cilia fused into a flat plate), and the mouth region varies considerably. In the order Astomatida the mouth opening is absent. Holotrichia are divided into eight orders. For additional information about the members of these orders, *see* gymnostome; trichostome; entodiniomorph; chonotrich; apostome; astome; hymenostome; thigmotrich.

Holst, Gustav (Theodore), original name GUSTAVUS THEODORE VON HOLST (b. Sept. 21, 1874, Cheltenham, Gloucestershire, Eng.—d. May 25, 1934, London), English composer



Holst, 1933
M. Stern

and music teacher, noted for the excellence of his orchestration, whose music combines an international flavour based on the styles of Ravel, Stravinsky, and others with a continuation of English Romanticism.

The son of a Swedish father and English mother, Holst studied at the Royal College of Music in London. His solo instrument was the trombone, and for some years after leaving the college he made his living as a trombone player in the Carl Rosa Opera Company and

in various orchestras. He became music master at St. Paul's Girls' School in 1905 and director of music at Morley College in 1907. These were the most important of his teaching posts, and he retained both of them until the end of his life.

Holst's pioneering methods, which entailed a rediscovery of the English vocal and choral tradition (folk song, madrigals, and church music), were influential in musical education in many English schools. Many of Holst's smaller choral works, folk-song arrangements, and instrumental pieces (*e.g.*, the *St. Paul's Suite* for strings [1913]) reflect the musical interests he sought to promote as a teacher. In this activity he shared much common ground with Ralph Vaughan Williams, his friend and contemporary. Holst's stubbornly independent, exploring mind had need, however, of a musical language less limited and more flexible than that offered by the English folk-song school. He found fresh creative stimuli in the new European music (*e.g.*, the innovations of Stravinsky), whose impact Holst registered in his orchestral suite *The Planets* (1918); and also in Hindu literature, which gave rise to his "Sanskrit" period (1908–12), during which he composed the opera *Savitri* and four sets of choral hymns from the Rigveda. The cosmopolitanism of Holst's style, rare in English music of his period, lends him a special historical significance. In such works as *Egdon Heath* for orchestra (1927), the *Choral Fantasia* (1930), and the *Fugal Concerto* for flute, oboe, and string orchestra (1923), he anticipated many trends associated with later English composers who were to turn away from the self-consciously national style bred by the folk-song revival.

Holst's works include the opera *Sita*, composed during 1899–1906; *The Hymn of Jesus*, for chorus and orchestra (1917); *Ode to Death*, for chorus and orchestra (1919); *The Perfect Fool*, an opera (1923); *Choral Symphony* (1923–24); the opera *At the Boar's Head* (1925); *Double Concerto for Two Violins and Orchestra* (1929); and *Hammersmith*, for orchestra (1930).

Holste, Luc, Latin LUCAS HOLSTENIUS (b. Sept. 27, 1596, Hamburg—d. Feb. 2, 1661, Rome), classical scholar and Vatican librarian best known for his annotated editions of geographical works and whose *Epistolae ad diversos* (1817; "Letters to Various Persons") is a valuable source of information on the literary history of his time.

Holste travelled in Italy and Sicily (1617–18) with Philipp Clüver, a geographer, collecting materials for Clüver's *Italia antiqua* (1624; "Ancient Italy"). Holste's notes on this work appeared in 1666. He went to Rome as librarian to Cardinal Francesco Barberini (1627) and in 1629 received a Vatican post. His edition (1630) of some lesser works of Porphyry, the 3rd-century-AD Greek Neoplatonist, contained a dissertation on the philosopher's life and writings.

A scholar of unwearied industry and immense learning that reflected the Humanist, theological, and scientific currents of his time, Holste became Vatican librarian in 1641. Though his vast literary schemes were never realized, he assembled voluminous notes, some of which were printed posthumously. His chief geographical works include revisions of maps of Italy in the Vatican gallery. He prepared corrections (1663) of the *Italia antiqua,* and his edition of the *Ethnica* by the Greek geographer Stephanus Byzantinus appeared in 1684.

Holstebro, city, Ringkøbing *amtskommune* (county), western Jutland, Denmark, on the Storå (Big River), southwest of Viborg. It stands on the site of a prehistoric settlement that commanded a crossing of the Storå. First mentioned in 1274, most of old Holstebro was destroyed by fires in the 17th and 18th centuries. Now a garrison town, it is also the centre of the western Jutland livestock trade and is noted for its horse and cattle fairs. Industries include meat processing, a tobacco factory, and a brewery. The Holstebro Museum primarily displays regional antiquities. Pop. (1981) city, 28,270; (1982 est.) mun., 37,030.

Holstein, historic and cultural region occupying the southern Jutland Peninsula between the Eider and Elbe rivers, now comprising the southern half of Schleswig-Holstein *Land* (state) in northern Germany. Holstein was created as a county of the Holy Roman Empire in 1111. It came under a personal union with the Danish king in 1459, an arrangement which caused much unrest among the German majority. In 1474 Holstein was raised to the rank of a duchy in the Holy Roman Empire and after 1815 in the German Confederation. Attempts by Denmark to annex Holstein and Schleswig led to war with Austria and Prussia in 1864. Denmark was defeated and, as a result, Holstein was annexed by Prussia and incorporated with Schleswig as a single Prussian province by the Peace of Prague (1866).

The people of Holstein are mostly descendants of the Saxons and speak a Low German dialect. More than 85 percent are Protestants. The predominant rural settlement pattern in the marshlands along the North Sea coast and Elbe River is one of linear villages (Marschhufendörfer) situated along interior dikes and canals, with their fields extending at right angles in long narrow strips. In the eastern farming zone along the Baltic coast compact villages, small hamlets, and large estates dominate. Farms of the less fertile central *Geest* region are dispersed. The traditional single-story Saxon farmhouse is characteristic of Holstein. One vast, steeply sloping roof houses the *Diele,* a large threshing floor running through the building, and the living quarters and stables on either side. The *Diele* is entered through a large gateway at the gable end of the building.

Holstein, Friedrich (August) von, byname THE GRAY EMINENCE, German DIE GRAUE EMINENZ (b. April 24, 1837, Schwedt an der Oder, Pomerania—d. May 8, 1909, Berlin), the most influential maker of German foreign policy from 1890 to 1909, during the emperor William II's reign, after the departure of Otto von Bismarck. A member of the Foreign Office in Berlin uninterruptedly from 1876, he never became foreign minister but exercised his large power behind the scenes, as a "gray eminence."

Early career. Holstein was raised on his family's estate in Pomerania and their town house in Berlin. Throughout his youth, his family spent a great deal of time travelling abroad, and Holstein became fluent in several foreign languages. A sickly boy, he was educated mostly by private tutors, and, after studying at the University of Berlin, he joined the legal section of the Prussian government.

Always a proud and self-witted man, Holstein rarely deferred to his superiors and took a cavalier attitude toward his official duties. He could afford to do so, for his family was wealthy, and he himself enjoyed the patronage of a neighbour of his father, Otto von Bismarck, who was already in the 1850s a power in Prussian politics.

With the support of Bismarck, Holstein entered the Prussian diplomatic service in 1860, serving his apprenticeship under Bismarck at the Prussian legation in St. Petersburg. After being posted to Rio de Janeiro, he returned to Germany at the time of Prussia's war with Denmark in 1864, acting as one of Bismarck's diplomatic representatives at army headquarters and taking part in the international conference in London in 1864–65 to settle the Danish question.

From 1865 to 1867 he was stationed in the United States and there had the opportunity to observe the operation of a democratic government at first hand and to travel in what was then still the "wild" West. In America he became interested in a project for the development of a mechanical device for towing barges and invested in this venture the greater part of his fortune, most of which he appears to have lost. Holstein was recalled by Bismarck but not, as has been alleged, as a result of a love affair with the wife of Sen. Charles Sumner.

Just before the outbreak of war with France in the summer of 1870, Bismarck, alarmed by the possibility that the Italian monarchy might side with France, instructed Holstein to enter into secret negotiations with Italian republicans. After the war broke out, Holstein grew bored in Berlin and appeared at Bismarck's headquarters in France. He was attached to Bismarck's staff, though officially he did little more than serve as a translator during the armistice negotiations with France. But Bismarck, who liked to be as fully informed as possible, allowed him a more independent role in maintaining unofficial contact with leaders of the Paris Commune, the city's left-wing government that refused the Prussian peace terms and opposed France's regular government.

After the conclusion of peace with France, Holstein served under the German ambassador to Paris, Count Harry von Arnim. An opponent of Bismarck's support of republican France, Arnim was also believed by the Chancellor to be planning to supplant him. When papers were found to be missing from the embassy, Arnim was disgraced. The story spread by Bismarck's enemies that Holstein had served as Bismarck's spy in bringing about Arnim's eventual ruin was proved false in the course of Arnim's trial for the removal of official documents.

Influence on government policy. In April 1876 Holstein was recalled to the German Foreign Office, where his thorough study of every problem and his network of connections soon enabled him to exert a predominant influence not only on foreign policy but also on domestic policy. To remain at the centre of affairs in Berlin, he declined several offers of advancement to diplomatic posts. In 1900 he even refused Chancellor Bernhard, Fürst von Bülow's offer to make him head (state secretary) of the Foreign Office, reportedly because he did not wish to operate in the limelight, a refusal he himself later acknowledged to have been the greatest mistake of his career.

One of the greatest puzzles in Holstein's life was his metamorphosis from an ardent partisan of Bismarck, whom he served during the 1870s as close collaborator and political confidant, into a bitter critic and opponent of the older statesman. This change in attitude, which took place gradually over many years, was in fact largely prompted by Bismarck's alignment with Russia. Holstein advocated instead a firm alliance with Austria and Britain, and, after Bismarck's dismissal in 1890, he joined with other counsellors of the new chancellor, Leo von Caprivi, in advising against the renewal of the Russian treaty.

Under Caprivi, Holstein assumed a more important role in the formulation of German foreign policy, for the new chancellor had no experience in this field. Although Holstein had played an important part in formulating the new anti-Russian and pro-British direction of German policy, he also warmly supported Caprivi's reciprocal trade treaties, including the one with Russia, which reduced tariffs on agricultural imports, thus lowering German food costs and stimulating Germany's export trade.

Holstein's influence increased further under Caprivi's successor, Chlodwig Karl Viktor, Fürst zu Hohenlohe-Schillingsfürst, who be-

came chancellor in 1894, and he retained his influential role as the confidential adviser of Hohenlohe's successor, Bernhard von Bülow, who became head of the German Foreign Office in 1897 and chancellor in 1900. Yet Holstein found himself stymied in the most extended and crucial fight of his career. He was powerless to oppose the policies of his unpredictable sovereign, Emperor William II, nor could he persuade his superiors to do so.

For the most important German policies in the years after Bismarck's dismissal—the feverish quest for colonies, the construction of a German battle fleet and the ensuing Anglo-German naval rivalry, the tortuous negotiations for an Anglo-German alliance that not only failed but actually heightened the tension between the two countries—were in large part inspired by the Kaiser, often without consulting the members of his government.

Holstein saw the folly of many of these policies. Had he restricted himself to warning against them, he might have gone down in history as the Cassandra of the Wilhelminian era. But the policies he himself formulated and tried to carry out were hardly more beneficial to his country than those of his emperor. After helping to sever the German alliance with Russia, he failed to secure the alliance he desired with Britain; and when he once again sought an understanding with Russia, that country had formed an alliance with France. Meanwhile, Germany was left with only one reliable ally, the moribund Habsburg Empire, which presented ever greater demands in return for its friendship. Holstein's most notable diplomatic campaign, his attempt to break up the newly formed Anglo-French entente of 1904 by fomenting a crisis over Morocco, only served to expose Germany's global isolation. At the height of the crisis, in April 1906, the Emperor dismissed him. Holstein died three years later.

Holstein was a conservative Prussian aristocrat, an individualist, proud, anxious to make his mark in the world, but with very independent ideas as to how to attain his goal. He was not a German nationalist but rather a proponent of the status quo for Germany, for although he had loved and sought adventure in his youth, he feared and disliked adventures in foreign policy. He himself believed he would go down in history, if he were remembered at all, as an intriguer, although in his opinion he had only tried to be of service to his country. Holstein's greatest weakness was his excessive confidence in his own judgment and his grasp of political facts, for the wisdom of his decisions was often debatable. He also overemphasized the personal element in any political situation. He liked to think himself the equal of any man, no matter how exalted, and would concede others superiority only in having greater means at their disposal. He did not know the meaning of political fear, and the greater the power of a potential opponent, the more heedlessly he plunged into the fray, whether it was against Bismarck's son-in-law, while Bismarck was still at the height of his power, or against a favourite of the Kaiser. He was equally unconcerned about his economic status. Although he enjoyed spending money while he still had it, in his old age he lived in almost penurious modesty in his bachelor quarters. The last half of his life was completely taken up with politics, which to the day of his death remained his overriding obsession. (He.R.)

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Holstein-Friesian, breed of large dairy cattle originating in northern Holland and Friesland. Its chief characteristics are its large size and black and white spotted markings, sharply defined rather than blended. These cattle are believed to have been selected for dairy qualities for about 2,000 years. They have long been widely distributed over the more fertile lowlands of continental Europe, where they are valued highly for their milk-producing ability. In the United States the Holstein-Friesians outnumber all other dairy breeds and produce nine-tenths of the milk supply. The milk, however, has a relatively low butterfat content.

When the Dutch colonized New York, they brought their cattle with them, but after the colony was ceded to the British crown and English settlers brought their own cattle, the Dutch cattle disappeared. The first exportation from Holland to the United States was in 1795, but the largest importations were made between the years 1879 and 1887.

The breed is widely distributed but usually is concentrated in areas having good fluid milk markets. With the emphasis on the production of lean beef, the Friesian either as a purebred or crossed with a beef bull is playing an increasingly important part in beef production in Great Britain and the United States.

Holstein-Gottorp, Karl Peter Ulrich, Herzog von (duke of): *see* Peter III *under* Peter (Russia).

Holstein Interglacial Stage, major division of Pleistocene deposits and time in Europe (the Pleistocene Epoch began about 2,500,000 years ago and ended about 10,000 years ago). The Holstein Interglacial followed the Elsterian Glacial Stage and preceded the Saale Glacial Stage. The Holstein Interglacial is correlated with the Hoxne Interglacial Stage of Britain and the Mindel-Riss Interglacial Stage of classical Alpine usage in Europe. It is also considered to be approximately contemporaneous with the Yarmouth Interglacial of North America.

In much of northern Europe, the Holstein is represented by marine and lake sediments; the stage itself was named for the region of Germany in which these deposits are well represented. During the Holstein Interglacial, the waters that resulted from the melting of the vast continental ice sheets of the previous glacial period increased sea levels and much of the lowlands were inundated. Studies of fossil mollusks and pollen indicate that climate conditions prevailing then were similar to those of today.

Holstein Sea, marine transgression during the Holstein Interglacial Stage of the Pleistocene Epoch (the Pleistocene began about 2,500,000 years ago and ended about 10,000 years ago). The Holstein Sea occupied the North Sea and Baltic Sea basins and deposited marine sediments over a wide area. The fauna of the Holstein Sea deposits shows a change from cold to temperate conditions. The Holstein Sea flooded many land areas; correlations are possible between marine and terrestrial sediments.

Holsteinsborg, Greenlandic SISIMIUT, town on the west central coast of Greenland, near the mouth of Amerloq Fjord. The Danish settled the site in 1764 and a church (still standing) was built in 1773. The Gammelhuset (Old House), constructed in 1756, served as the residence of the first Danish governor of Greenland. Originally catering to the whaling industry, Holsteinsborg is now a modern fishing port with shipyards and fish processing plants. The town has a heliport and coastal steamer connections. The Greenlandic (Eskimo) name means "place of foxes' earths." Pop. (1982) 4,270.

Holstenius, Lucas: *see* Holste, Luc.

Holston River, river formed by the junction of the North and South forks just west of Kingsport, eastern Tennessee, U.S. It flows southwest through the Great Appalachian Valley, joining the French Broad River near Knoxville to form the Tennessee River. Named for Stephen Holston, who built a cabin on its banks in 1746, it is 115 mi (185 km) long and has two important Tennessee Valley Authority (TVA) installations along its course—Cherokee Dam on the Holston and South Holston Dam on the South Fork.

Holt, Edwin B(issell) (b. 1873, Winchester, Mass., U.S.—d. Jan. 25, 1946, Rockland, Maine), U.S. psychologist and philosopher noted for his emphasis on the purposive character of knowing.

A student and follower of the psychologist William James, he received his Ph.D. from Harvard University (1901) and remained there to teach until 1918. By 1908, when he completed *The Concept of Consciousness* (1914), he believed that objects are as perceived: thus, consciousness resembles a photographic lens that provides a correct picture of objects.

According to Holt, behaviourism may be regarded as cognitive psychology, or a psychology of meanings, with the specific response relation essentially being what is meant by having a meaning or knowing. In *The Freudian Wish and Its Place in Ethics* (1915), he suggests that the wish, viewed as purpose or planned course of action, is the response relation that explains mind.

Holt retired from Harvard to devote time to writing but in 1926 began 10 years of teaching at Princeton University, where he completed the first volume of *Animal Drive and the Learning Process* (1931). This work contributed to the development of dynamic psychology, or the psychology of human nature, and sought to explain the significance of radical empiricism for psychology.

Holt, Harold (Edward) (b. Aug. 5, 1908, Sydney—d. Dec. 17, 1967, near Portsea, Victoria, Australia), prime minister of Australia (1966–67) who supported U.S. policies in Vietnam and sponsored the visit to Australia of Lyndon B. Johnson, the first American president-in-office to travel there.

As a Melbourne lawyer during the early 1930s, Holt became interested in the United Australia Party, the forerunner of the Liberal Party, and was elected to the federal Parliament in 1935. In 1941 he organized the Department of Labour and National Service for wartime mobilization under Robert Menzies.



Harold Holt, 1966

By courtesy of the Australian Information Service

When Menzies returned to power in 1949, Holt became minister of labour (1949–58) and of immigration (1949–56). He served as leader of the House of Representatives and deputy leader of the Liberal Party from 1956 to 1966 and as federal treasurer (1958–66). His strict anti-inflationary measures in 1960 helped to

create a recession that nearly cost his party the 1961 election.

Succeeding Menzies as prime minister in 1966, Holt generated controversy by increasing Australian troop support of the South Vietnamese military effort, but he was re-elected with an increased majority in late 1966. He reduced the residency requirement for Australian citizenship and the training requirements for entrance, though some barriers against immigration of Asians remained. A devoted water sportsman, he apparently drowned while swimming off Cheviot Beach in Bass Strait.

Holtei, Karl von (b. Jan. 24, 1798, Breslau, Silesia—d. Feb. 12, 1880, Breslau), author who achieved success by his "vaudevilles," or ballad operas, and by his recitations.

Holtei led a varied and unsettled life, travelling between Hamburg, Paris, and Graz as a playwright, actor, and theatre manager, a life vividly described in his autobiography, *Vierzig Jahre* (1843–50; "Forty Years"). Two of his best plays, *Der Alte Freiherr* (1825; "The Old Baron") and *Lenore* (1829), a dramatization of Gottfried August Bürger's poem, achieved great popularity. Also successful were his *Schlesische Gedichte* (1830; "Silesian Poems"), written in his native dialect. He also wrote novels, including *Die Vagabunden* (1851; "The Vagabonds") and *Der letzte Komödiant* (1863; "The Last Comedian"), that are interesting when they draw on his own experience but suffer from loose construction and superficial characterization. As a reciter he was unequalled, especially in his interpretation of speeches from Shakespeare. After 1850 he grew tired of his wandering and settled in Graz until 1864, when he moved to Breslau; he entered a monastery in 1876.

Hölty, Ludwig Heinrich Christoph (b. Dec. 21, 1748, Mariensee, Hanover—d. Sept. 1, 1776, Mariensee), German poet who is considered the most gifted lyric poet of the Göttinger Hain, a group of young poets who saw themselves as heirs of the great lyric poet Friedrich Gottlieb Klopstock and whose work was characterized by love of nature and the expression of national feeling.

In 1769 Hölty went to Göttingen to study theology. There he became close friends with the poets Johann Martin Miller, Johann Heinrich Voss, Heinrich Boie, and Christian and Friedrich Leopold Stolberg. Together they organized the Göttinger Hain, or Dichterbund. Hölty managed to support himself by working as a tutor and translator and by writing "occasional poetry." His poems in the society's mouthpiece, *Musenalmanach* ("Muses' Almanac"), encompassed a wide variety of forms. Influenced by Thomas Gray's "Elegy Written in a Country Churchyard," he introduced an element of social criticism into that form by his comparison of city and village life in *Elegie auf einen Dorfkirchhof* and *Elegie auf einen Stadtkirchhof* (both 1771; "Elegy on a Village Churchyard" and "Elegy on a City Churchyard"). He loved the *Volkslied* ("folk song"); his sense of closeness to the peasants, delight in nature, and longing for the simple and natural life find skillful expression in his poetry. His lyrics are characterized by strains of melancholy and by sincere religious faith. He was able to make original use of all the styles that influenced him, showing the seriousness of Klopstock without his complicated solemnity, the tenderness and sentimentality of the age without its affectation, and the lightness of the Anacreontics' praises of love and friendship without their superficiality.

Holub, Emil (b. Oct. 7, 1847, Holice, Bohemia—d. Feb. 21, 1902, Vienna), naturalist who travelled extensively in south central Africa gathering varied and valuable natural history collections that he distributed to museums and schools throughout Europe. In 1872 he went to South Africa, where he practiced as a surgeon at the Kimberley diamond fields. Undertaking expeditions to the northern Transvaal, Mashonaland (eastern Rhodesia), and through Bechuanaland to Victoria Falls, he collected the specimens that he took back to Europe in 1879. Returning to South Africa with his wife in 1883, he planned to cross the continent from Cape Town to Egypt. In June 1886 his party passed north of the Zambezi River and explored the region, then almost unknown, of present-day Zambia between the river and its Kafue tributary. North of the Kafue his camp came under attack, and Holub was forced to retrace his steps. He returned to Austria in 1887 with a collection of some 13,000 items of great scientific interest. His writings include *Sieben Jahre in Süd-Afrika . . . , 1872–79* (1881; *Seven Years in South Africa,* 1881) and *Reisen, 1883–87* (1890; "Travels, 1883–87").

Holy Alliance, a loose organization of most of the European sovereigns, formed in Paris on Sept. 26, 1815, by Alexander I of Russia, Francis I of Austria, and Frederick William III of Prussia when they were negotiating the Second Peace of Paris after the final defeat of Napoleon. The avowed purpose was to promote the influence of Christian principles in the affairs of nations. The alliance was inspired by Alexander, perhaps under the influence of the visionary Barbara Juliane von Krüdener. It was eventually signed by all European rulers except the Prince Regent of Britain, the Ottoman sultan, and the Pope. Its importance was not great, but liberals and later historians believed it was a major force and symbol of conservatism and repression in central and eastern Europe. Both the Austrian prince Klemens von Metternich and Viscount Castlereagh of England, the leading figures in the diplomacy of the post-Napoleonic era, however, saw the Holy Alliance as an insignificant and ephemeral association.

Holy Brotherhood (Spanish militia): *see* Santa Hermandad.

Holy Club, group of Oxford students led by John and Charles Wesley, whose methodical habits of study and devotion led to their being derisively called methodists. Organized by Charles Wesley, who soon turned the leadership over to John in November 1729, the group met regularly to study the Scriptures and the classics. Communion was celebrated frequently and members fasted on Wednesdays and Fridays. They were also concerned with social work and worked in prisons and among the poor. The Holy Club disintegrated in 1735 when the Wesleys left Oxford.

Holy Communion: *see* Eucharist.

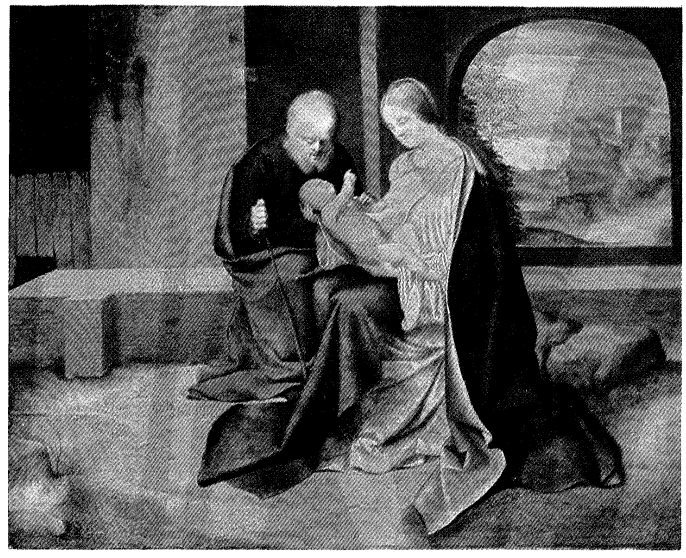
Holy Cross, Exaltation of the, also called HOLY CROSS DAY, liturgical feast celebrated on September 14 to honour the cross on which Jesus Christ was crucified. In the Eastern churches the feast dates back to the dedication of the Church of the Holy Sepulchre (the site of Christ's tomb) in Jerusalem *c.* 335. It was adopted by the Roman Church in the 7th century.

Holy Cross Mountains (Poland): *see* Świętokrzyskie, Góry.

holy days of obligation, in the Roman Catholic Church, religious feast days on which Catholics must attend mass and refrain from unnecessary work. Although all Sundays are sanctified in this way, the term holy days usually refers to other feasts that must be observed in the same manner as Sunday. The number of such days has varied greatly, since bishops had the right to institute new feasts for their dioceses until the 17th century. Pope Urban VIII then limited the number of holy days throughout the church to 36. In 1918, considering the difficulty of observing religious feasts that are not civil holidays, canon law designated 10 holy days: Christmas, Circumcision (New Year's Day), Epiphany, Ascension, Corpus Christi, Assumption, SS. Peter and Paul, All Saints, the Immaculate Conception, and St. Joseph. With papal permission the number has been reduced or other changes made in some countries. Thus Epiphany, Corpus Christi, SS. Peter and Paul, and St. Joseph are not kept in the United States. Scotland and Ireland keep all 10 holy days, except that Ireland celebrates St. Patrick's Day instead of St. Joseph's.

The various Eastern Catholic churches have their own feasts of obligation, which are generally more numerous than those of the Western Church. See holiday (table).

Holy Family, as a theme in Christian art, representation of the infant Jesus with his immediate family. There are two major versions, one showing the Virgin and Child with St. Joseph and the other showing the Virgin and Child with the Virgin's mother, St. Anne. Like a number of other themes dealing with the lives of Christ and the Virgin, the Holy Family gained importance at the end of



"The Holy Family," oil painting by Giorgione, *c.* 1508; in the National Gallery of Art, Washington, D.C.

By courtesy of the National Gallery of Art, Washington, D.C., Samuel H. Kress Collection

the Middle Ages as an inspiration to popular piety through contemplation of the emotional aspects of the Gospel story. It was most frequently depicted in painting and, especially in the Renaissance, was a favourite subject for altarpieces. The Holy Family with St. Anne was the version most popular in Germany, where it first appeared in the 14th century and was widely represented in the 15th; in the 15th and 16th centuries it was also frequently depicted in Italy and Spain. It has two forms: St. Anne holding both Virgin and Child on her lap and the Child seated on the ground between the two women. In addition to its sentimental significance, the Holy Family with St. Anne also dramatized the recently formulated doctrine of the Immaculate Conception, which held that Mary was, from the first instant of her conception by her mother, free from original sin.

The Holy Family with St. Joseph, which grew out of the intimate Western version of the theme of the Nativity (*q.v.*), was current in all areas of western Europe from the 14th through the 17th century. In the 16th and 17th centuries it was often augmented by the figures of the infant St. John the Baptist and his mother, Elizabeth, the Virgin's cousin. The simpler version of the Holy Family with St. Joseph, however, was particularly important in the art of Roman Catholic countries from the late 16th century on, since it illustrated the Counter-Reformation concept of the "terrestrial trinity," which held that Joseph, Jesus, and Mary were an earthly reflection of Father, Son, and Holy Spirit. In France, Spain, and Flanders in the 17th century the theme of the "two trinities"—combining both groups, earthly and celestial, in one work—was frequently represented.

Holy Family, Feast of the, Roman Catholic religious festival falling on the first Sunday after Christmas. Although major feast days dedicated to each member of the Holy Family—Jesus, Mary, and Joseph—also exist, the Feast of the Holy Family commemorates their life together and the celebration focuses on religious family life. Because of the flight of the Holy Family into Egypt, a feast for the Holy Family has been observed by the Copts from early times. In Western Christianity, however, a cult of veneration for the Holy Family as a group, rather than as individuals, did not arise until the 17th century and was not officially recognized until the feast day was instituted in 1921. Originally celebrated on the Sunday after Epiphany (January 6), the Feast of the Holy Family was moved to the Sunday after Christmas in 1969, bringing it within the Christmas season.

Holy Ghost: *see* Holy Spirit.

Holy Ghost Father, member of CONGREGATION OF THE HOLY GHOST AND OF THE IMMACULATE HEART OF MARY, byname SPIRITANS (C.S.S.), a Roman Catholic society of men founded in 1703 at Paris by Claude-François Poullart des Places. Originally intended only for the training of seminarians, the congregation gradually took an active part in missionary work. Suppressed by the French Revolution, it was restored under Napoleon, but persecution kept it weak until 1848, when the Congregation of the Immaculate Heart of Mary merged with it, and Francis Libermann, a convert from Judaism, became its superior general. The congregation pioneered in the resumption of African missions in the 1800s. Besides its missionary efforts, it carries on educational and social works.

Holy Grail: *see* Grail.

Holy Innocents, Feast of the, also called CHILDERMAS, or INNOCENTS' DAY, festival celebrated in the Christian churches in the West on December 28 and in the Eastern churches on December 29 and commemorating the massacre of the children by King Herod in his attempt to kill the infant Jesus (Matthew 2:16–18). These children were regarded by the early church as the first martyrs, but it is uncertain when the day was first kept as a saint's day. At first it may have been celebrated with Epiphany, but by the 5th century it was kept as a separate festival. In Rome it was a day of fasting and mourning.

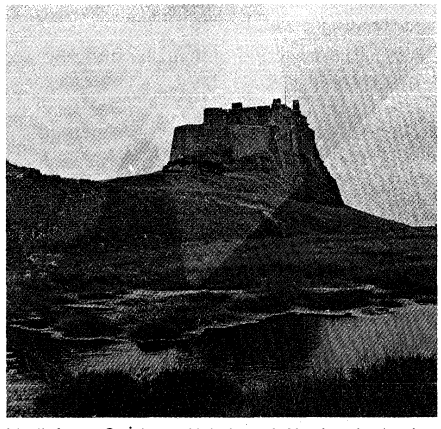
It was one of a series of days known as the Feast of Fools, and the last day of authority for boy bishops. Parents temporarily abdicated authority. In convents and monasteries the youngest nun and monk were allowed to act as abbess and abbot for the day. These customs, which mocked religion, were condemned by the Council of Basel (1431).

In medieval England the children were reminded of the mournfulness of the day by being whipped in bed in the morning; this custom survived into the 17th century.

The day is still observed as a feast day and, in Roman Catholic countries, as a day of merrymaking for children.

Holy Island, also called LINDISFARNE, historic small island (2 sq mi [5 sq km]) in the west North Sea, 2 mi (3 km) from the English Northumberland coast (in which county it is included), linked to the mainland by a causeway at low tide. It is administratively part of Berwick-upon-Tweed district.

Holy Island's importance as a religious centre dates from AD 635, when the ecclesiastic St. Aidan established a church and monastery there with the aim of converting the Northumbrians. The Lindisfarne Gospels (produced on the island and now housed in the British Museum) are fine examples of 7th-century illuminated manuscripts. The threat of Danish raids



Lindisfarne Castle on Holy Island, Northumberland
R. Lomas—Bruce Coleman Inc.

caused the monastery to be abandoned in 875, and the monks fled inland with the body of St. Cuthbert (the sixth bishop), eventually settling at what became the inland cathedral city of Durham. The prior and convent of Durham refounded the monastery in 1082, and it was garrisoned at the end of the 16th century.

The village of Lindisfarne, in the fertile southwest corner of the island, grew up around the monastery and is now a tourist centre. It has coast guard and lifeboat stations. Pop. (latest census) 190.

Holy Lance, a relic discovered in June 1098 during the First Crusade by Christian crusaders at Antioch, in Syria. It was said to be the lance that pierced the side of Christ at the crucifixion. The recovery of the relic inspired the crusaders to take the offensive against the Muslims, routing them in battle and securing Christian possession of Antioch. Disputes about the authenticity of the lance, however, caused internal dissension among the crusaders, and its discoverer, Peter Bartholomew, was eventually discredited.

Peter was a peasant who claimed that St. Andrew had appeared to him in a series of visions and revealed the location of the lance. He informed the leaders of the First Crusade of his visions, and though Bishop Adhémar of Le Puy was skeptical of their authenticity, Count Raymond of Toulouse was impressed and commanded that a solemn search be conducted for the lance. Peter led them to the Cathedral of St. Peter in Antioch and indicated where the lance would be located. After a day of fruitless digging, he leaped into the hole and produced a piece of iron that was assumed to be the relic. Most of the crusaders accepted its authenticity and carried the lance with them into battle against the Muslims.

After the recovery of the lance, Peter claimed that St. Andrew reappeared to him at various times, giving him instructions for the prosecution of the crusade. With the proliferation of Peter's visions and his attacks on the memory of Bishop Adhémar (died 1098)—who had never believed Peter's claims—people began to doubt the visions and challenged the authenticity of the Holy Lance.

When Peter submitted himself to an ordeal by fire to test the validity of his claims, he was fatally burned, and the Holy Lance was discredited. Raymond of Toulouse's prestige suffered as a consequence of his acceptance of Peter's visions.

Holy League, either of two European leagues sponsored by the papacy in the late 15th and early 16th centuries, formed for the purpose of protecting Italy from threatened French domination.

The first was the League of 1495 between Pope Alexander VI, the Holy Roman emperor Maximilian I, Aragon's Ferdinand II, Venice, and Milan, in opposition to Charles VIII of France, who had invaded Italy in 1494. The allies forced the French out of Italy in 1496.

The Holy League of 1511, organized by Pope Julius II, was directed against Charles VIII's successor, Louis XII. Spain, Venice, the Holy Roman Empire, England, and the Swiss had all joined the anti-French coalition by spring of 1512 and drove the French out of Milan in May. When the French attempted to return, they were defeated by the Swiss at the Battle of Novara on June 6, 1513. After this the allies could not agree on strategy, and beginning with the Swiss in September 1513, all the allies made separate peace agreements with France.

Holy League, French LA SAINTE LIGUE, association of Roman Catholics during the French Wars of Religion of the late 16th century; it was first organized in 1576 under the leadership of Henri I de Lorraine, 3e duc de Guise, to oppose concessions granted to the Protestants (Huguenots) by King Henry III. Although the basic reason behind the League's formation was the defense of the Catholic religion, political reasons, notably the desire to limit the king's power, were not absent. Henry III, having failed at an attempt to place himself at the head of the Catholic party, ordered its dissolution (September 1577). The League revived in importance in 1584, when the Protestant leader Henry of Navarre (later Henry IV) became heir of the crown. The League set up an alternative candidate to the throne, and in this effort to exclude Henry of Navarre it received the assistance of Spain, the leading Catholic power. The League's popular support throughout France forced Henry III to placate it by proscribing the Protestant religion (July 1585). To put a decisive end to the League, which was in control of much of France and which continued to challenge his authority, Henry III had the Duc de Guise assassinated (December 1588). The King's act failed to destroy the League, and he, in turn, was as-

sassinated in August 1589. The Holy League, actively supported by the Spanish, opposed the accession of Henry IV. Only after Henry removed the main reason for opposition to him by becoming a Catholic in July 1593 did the power of the League gradually wane.

Holy Mountain (Greece): *see* Athos, Mount.

Holy of Holies, Hebrew QODESH HA-QADASHIM, also called DEVIR, the innermost and most sacred area of the ancient Temple of Jerusalem, accessible only to the Israelite high priest. Once a year, on Yom Kippur, the Day of Atonement, he was permitted to enter the square, windowless enclosure to burn incense and sprinkle sacrificial animal blood. By this act, the most solemn of the religious year, the high priest atoned for his own sins and those of the priesthood.

The Holy of Holies was located at the west end of the Temple, and in Solomon's Temple it enshrined the Ark of the Covenant, a symbol of Israel's special relationship with God. At the entrance to the Holy of Holies stood a small cedar altar overlaid with gold. After his conquest of Jerusalem in 63 BC, Pompey desecrated the Temple by daring to enter the Holy of Holies. *See also* Jerusalem, Temple of.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

holy order, one of the grades in the ordained ministry of some of the Christian churches, comprising at various times the major orders of bishop, priest, deacon, and subdeacon and the minor orders of porter (doorkeeper), lector, exorcist, and acolyte.

The term order (Latin *ordo,* plural *ordines*) was adopted by the early Christian Church from Roman civil life and was first used ecclesiastically by Tertullian to mean both clergy and laity. Gradually, it came to mean some office in the church to which a person had been specifically admitted by a bishop.

In the early church a person was evidently not required to pass by regular steps from a lower to a higher order, and a layman could pass directly to any office in the church. After the 9th century it became the rule that a man must progress from a lower to a higher order.

In the Roman Catholic Church holy orders is one of the seven sacraments; the rite is so complex, however, that theologians do not unanimously agree that it is a single sacrament. There is theological consensus that the orders of bishop, priest, and probably deacon are sacramental in character, but there is debate as to whether or not these three constitute one sacrament or two or three. All eight orders were formerly found in the Catholic Church, but by a *motu proprio* of Pope Paul VI (effective Jan. 1, 1973) there are now only the orders of bishop, priest, and deacon and the ministries of acolyte and lector. A candidate for holy orders must be a baptized male who has reached the required age, has attained the appropriate academic standard, is of suitable character, and has a specific clerical position awaiting him. Since the second Vatican Council (1962–65), married men may be ordained to the permanent diaconate; otherwise, celibacy is a requirement for holy orders, except in certain specified cases. It is possible for priests to withdraw from the ministry through a process called laicization, which has become more common since the late 1960s.

In the Eastern Orthodox Church a candidate must fulfill the same requirements as in the Roman Catholic Church, except that celibacy is not required for the diaconate or for the priesthood. A priest may be married if he was married before his ordination but must not remarry if his wife dies after he is ordained. An unmarried priest must remain celibate. Only unmarried or widowed priests may be consecrated bishop. There are only two minor orders, lectors and subdeacons, but in practice these grades of the ministry have tended to lapse. A priest can divest himself of his orders and become a layman.

In the Church of England the four minor orders, the subdiaconate, and the requirement of celibacy were abolished during the Reformation. The requirements for becoming a priest or deacon are otherwise similar to those in the Roman Catholic Church, except that the deacon must be 23 years old. Bishops must take an oath of temporal allegiance to the English sovereign. Since 1870 it has been possible for a member of the clergy to relinquish holy orders. Other churches within the Anglican Communion have essentially the same requirements for holy orders as the Church of England, except that in some constituencies, as in the United States and Canada, women can now be ordained.

Holy Roman Empire, German HEILIGES RÖMISCHES REICH, Latin SACRUM ROMANUM IMPERIUM, traditional European institution dating from the 8th century until 1806.

The following article summarizes the history of the Holy Roman Empire; for fuller discussion, *see* MACROPAEDIA: Holy Roman Empire.

The Roman imperial title, which had lapsed in western Europe in the 5th century, was revived in 800 by Pope Leo III and conferred on Charlemagne, king of the Franks. After another lapse when the Carolingian line died out, the title of emperor, or Holy Roman emperor, was borne by successive dynasties of German kings almost continuously from the mid-10th century until abolition of the empire.

The Latin phrase *sacrum Romanum imperium* actually dates only from 1254, though the term holy empire was used in 1157, while the words Roman empire in 1034 denoted the lands under the emperor Conrad II. Otto II (died 983) was called Roman emperor, but his predecessors were simply called *imperator augustus* ("august emperor"). The form Holy Roman emperor is a convention adopted by modern historians; it was never officially used. The prospective heir to the throne was called king of the Romans.

The territory of the empire originally included what is now Germany, Austria, western Czechoslovakia, Switzerland, eastern France, the Low Countries, and parts of northern and central Italy. But its sovereign was usually the German king, and the German lands were always its chief component; after the mid-15th century, it was known as the Holy Roman Empire of the German Nation.

Originally allied with the papacy, the empire became involved in a long struggle with the popes for the leadership of Christian Europe between the mid-11th and the mid-13th century. Weakened by the effects of this struggle, the empire was further shaken by the 16th-century Reformation, during which a split developed between the Catholic emperor and those German princes who adopted Protestantism. A series of conflicts followed, climaxed by the Thirty Years' War, which devastated Germany in the period 1618–48. After 1648, the empire was simply a loose collection of semi-independent states under the nominal authority of the emperor. In this

Holy Roman emperors

Carolingian dynasty	
Charlemagne (Charles I)	800–814
Louis I	814–840
Civil War	840–843
Lothair I	843–855
Louis II	855–875
Charles II	875–877
Interregnum	877–881
Charles III	881–887
Interregnum	887–891
House of Spoleto	
Guy	891–894
Lambert	894–898
Carolingian dynasty	
Arnulf	896–899
Louis III	901–905
House of Franconia	
Conrad I	911–918
Carolingian dynasty	
Berengar	915–924
House of Saxony (Liudolfings)	
Henry I	919–936
Otto I	936–973
Otto II	973–983
Otto III	983–1002
Henry II	1002–24
Salian dynasty	
Conrad II	1024–39
Henry III	1039–56
Henry IV	1056–1106
Rival claimants	
Rudolf	1077–80
Hermann	1081–93
Conrad	1093–1101
Henry V	1105/06–25
House of Supplinburg	
Lothair II	1125–37
House of Hohenstaufen	
Conrad III	1138–52
Frederick I (Barbarossa)	1152–90
Henry VI	1190–97
Philip	1198–1208
Welf dynasty	
Otto IV	1198–1214
House of Hohenstaufen	
Frederick II	1215–50
Rival claimants	
Henry (VII)	1220–35
Henry Raspe	1246–47
William of Holland	1247–56
Conrad IV	1250–54
Great Interregnum	
Richard	1257–72
Alfonso (Alfonso X of Castile)	1257–75
House of Habsburg	
Rudolf I	1273–91
House of Nassau	
Adolf	1292–98
House of Habsburg	
Albert I	1298–1308
House of Luxembourg	
Henry VII	1308–13
House of Habsburg	
Frederick (III)	1314–26
House of Wittelsbach	
Louis IV	1314–46
House of Luxembourg	
Charles IV	1346–78
Wenceslas	1378–1400
House of Wittelsbach	
Rupert	1400–10
House of Luxembourg	
Jobst	1410–11
Sigismund	1410–37
House of Habsburg	
Albert II	1438–39
Frederick III	1440–93
Maximilian I	1493–1519
Charles V	1519–56
Ferdinand I	1556–64
Maximilian II	1564–76
Rudolf II	1576–1612
Matthias	1612–19
Ferdinand II	1619–37
Ferdinand III	1637–57
Leopold I	1658–1705
Joseph I	1705–11
Charles VI	1711–40
House of Wittelsbach	
Charles VII	1742–45
House of Habsburg	
Francis I	1745–65
Joseph II	1765–90
Leopold II	1790–92
Francis II	1792–1806

period the French writer Voltaire described it as "neither holy, nor Roman, nor an empire."

In spite of their bitter quarrels, the empire and the papacy remained closely associated throughout the Middle Ages, and until the beginning of the 16th century the German king, having been elected emperor by the leading German princes, was then crowned by the pope. Maximilian I (reigned 1493–1519) was the first emperor not to be so crowned; his successor, Charles V, did have a papal coronation in 1530, but the custom was abandoned in the war-torn period that followed, and it was never revived.

Beginning in the early 15th century, the imperial title and the German kingship became virtually hereditary in the Austrian House of Habsburg (Habsburg-Lorraine after 1740), although formal elections were still held. On Aug. 10, 1804, after Napoleon Bonaparte had declared himself emperor of the French in a bid to usurp the Holy Roman emperor's traditional primacy among European monarchs, Francis II, last of the imperial line, adopted the title "emperor of Austria." Two years later, on Aug. 6, 1806, he resigned the old title of Holy Roman emperor altogether.

The German Empire of 1871–1918 was often called the Second Reich (empire) to indicate its descent from the medieval empire; by the same reasoning, Adolf Hitler referred to Nazi Germany as the Third Reich.

Holy Saturday, also called EASTER VIGIL, Christian religious observance that ends the Lenten season, falling on the day before Easter Sunday. The early church celebrated the end of Lent with large baptismal ceremonies; but, for many centuries, no services were held on Holy Saturday in the Western churches, recalling the suspended state of Christ's followers in the period between the Crucifixion and the Resurrection. Beginning in 1955, the Roman Catholic and some other churches restored the Easter Vigil; Eastern Orthodox churches never abandoned the ceremony. The vigil celebration may include lighting fires to symbolize Christ's passing from death to life and tolling bells to signify the joyous end of Lent.

Holy Sepulchre, the tomb in which Jesus was buried and the name of the church built on the traditional site of his Crucifixion and burial. According to the Bible, the tomb was close to the place of Crucifixion (John 19:41–42), and so the church was planned to enclose the site of both cross and tomb.



Entrance to the Holy Sepulchre, Jerusalem
AP/Wide World Photos

The Church of the Holy Sepulchre lies in the northwest quarter of the Old City of Jerusalem. Constantine the Great first built a church on the site. It was dedicated about AD 336, burned by the Persians in 614, restored by Modestus (the abbot of the monastery of Theodosius, 616–626), destroyed by the caliph al-Ḥākim Bī-Amr Allāh about 1009, and restored by the Byzantine emperor Constantine Monomachus. In the 12th century the crusaders carried out a general rebuilding of the church. Since that time, frequent repair, restoration, and remodelling have been necessary. The present church dates mainly from 1810.

This site has been continuously recognized since the 4th century as the place where Jesus died, was buried, and rose from the dead. Whether it is the actual place, however, has been hotly debated. It cannot be determined that Christians during the first three centuries could or did preserve an authentic tradition as to where these events occurred. Members of the Christian Church in Jerusalem fled to Pella about AD 66, and Jerusalem was destroyed in AD 70. Wars, destruction, and confusion during the following centuries possibly prevented preservation of exact information. Another question involves the course of the second north wall of ancient Jerusalem. Some archaeological remains on the east and south sides of the Church of the Holy Sepulchre are widely interpreted to mark the course of the second wall. If so, the site of the church lay just outside the city wall in the time of Jesus, and this could be the actual place of his Crucifixion and burial. No rival site is supported by any real evidence.

Various Christian groups, including the Greek, Roman, Armenian, and Coptic churches, control parts of the present church and conduct services regularly.

Holy Shroud: *see* Turin, Shroud of.

Holy Spirit, also called PARACLETE, or HOLY GHOST (from Old English *gast*, "spirit"), in Christian belief, the third person of the Trinity. Numerous outpourings of the Spirit are mentioned in the Acts of the Apostles, in which healing, prophecy, the expelling of demons (exorcism), and speaking in tongues (glossolalia) are particularly associated with the activity of the Spirit.

Christian writers have seen in various references to the Spirit of Yahweh in the Old Testament an anticipation of the doctrine of the Holy Spirit. The Hebrew word *ruaḥ* (usually translated "spirit") is often found in texts referring to the free and unhindered activity of God, either in creating or in revitalizing creation, especially in connection with the prophetic word or messianic expectation. There was, however, no explicit belief in a separate divine person in biblical Judaism; in fact, the New Testament itself is not entirely clear in this regard. One suggestion of such belief is the promise of another helper, or intercessor (paraclete), that is found in the Gospel According to John.

The definition that the Holy Spirit was a distinct divine Person equal in substance to the Father and the Son and not subordinate to them came at the Council of Constantinople in AD 381, following challenges to its divinity. The Eastern and Western churches have since viewed the Holy Spirit as the bond, the fellowship, or the mutual charity between Father and Son; they are absolutely united in the Spirit. The relationship of the Holy Spirit to the other Persons of the Trinity has been described in the West as proceeding from both the Father and the Son, whereas in the East it has been held that the procession is from the Father through the Son.

Most Catholic and Orthodox Christians have experienced the Holy Spirit more in the sacramental life of the church than in the context of such speculation. From apostolic times, the formula for Baptism has been Trinitarian. Confirmation (in the Eastern Orthodox Church, chrismation) although not accepted by most Protestants as a sacrament, has been closely allied with the role of the Holy Spirit in the church. The Eastern Orthodox Church has stressed the role of the descent of the Spirit upon the worshipping congregation and upon the eucharistic bread and wine in the prayer known as the epiclesis.

From the earliest centuries of the church, various groups, discontented with the lack of freedom, active charity, or vitality in the institutional church, have called for a greater sensitivity to the ongoing outpourings of the Holy Spirit; one of many such movements was the Pentecostal movement of the 20th century. *See also* Trinity.

Holy Spirit Association for the Unification of World Christianity: *see* Unification Church.

Holy Thursday: *see* Maundy Thursday.

Holy Trinity, Feast of the, also called TRINITY SUNDAY, feast in honour of the Trinity. It is celebrated in the Christian churches on the Sunday following Pentecost (the 50th day after Easter). It is known that the feast was celebrated on this day from as early as the 10th century. Celebration of the feast gradually spread in the churches of northern Europe, and in 1334 Pope John XXII approved it for the entire church. In the liturgical Church Year, Anglican and Lutheran churches date the Sundays that follow Trinity "after Trinity"; the Roman liturgy dates these Sundays "after Pentecost."

holy war, any war fought by divine command or for a religious purpose. The concept of holy war is found in the Bible (*e.g.*, the Book of Joshua) and has played a role in many religions. *See* crusade; jihad.

holy water, in the Eastern Christian churches and the Roman Catholic Church, special water that has been blessed and is used to bless churches, homes, and articles of devotion. A natural symbol of purification, water has been used by religious peoples, both primitive and advanced, as a means of removing uncleanness, either ritual or moral.

In the early Christian community the "living" water of rivers and streams was preferred for Baptism and apparently received no special blessing. By the time of the 4th century the still waters of the baptismal font or pool were exorcised and blessed with the sign of the cross. Other water was blessed for the use of the faithful as a means of warding off the unclean spirit and as a safeguard against sickness and disease. In the course of time, this blessed, or holy, water was used as a reminder of Baptism by the faithful on entering the church and by the celebrant in sprinkling the congregation before the Sunday mass.

Holy Week, in the Christian Church, the week between Palm Sunday and Easter, observed with special solemnity as a time of devotion to the passion of Jesus Christ. In the Greek and Roman liturgical books it is called the Great Week because great deeds were done by God during this week. The name Holy Week was used in the 4th century by Athanasius, bishop of Alexandria, and Epiphanius, bishop of Constantia. Originally only Friday and Saturday were observed as holy days; later Wednesday was added as the day on which Judas plotted to betray Jesus, and by the beginning of the 3rd century the other days of the week had been added. The pre-Nicene Church concentrated its attention on the celebration of one great feast, the Christian Passover, on the night between Saturday and Easter Sunday morning. By the later 4th century the practice had begun of separating the various events and commemorating them on the days of the week on which they occurred: Judas' betrayal and the institution of the Eucharist on Maundy Thursday; the passion and death of Christ on Good Friday; his burial on Saturday; and his Resurrection on Easter Sunday.

The Holy Week observances in the Roman missal were revised according to the decree *Maxima Redemptoris* (Nov. 16, 1955) to restore the services to the time of day corresponding to that of the events discussed in Scripture.

Holy Year: *see* Jubilee, Year of.

Holyhead, Welsh CAERGYBI, port and resort, on Holy Island (Welsh *Ynys Gybi*), Ynys Môn (Isle of Anglesey) district, Gwynedd county, Wales, off the northwest coast of the Isle of Anglesey. The town and island bear many traces of prehistoric, Celtic, and Roman occupation. In 1801 Holyhead was selected as a



Prehistoric (Bronze Age) "fertility" stones, near Holyhead, Holy Island, Anglesey
Roger Worsley—Tourist Photo Library

port for trade with Ireland; but the chief stimuli to its growth came with a new main road from the English town of Shrewsbury (1815–19) and, later, the railway from Chester. Holyhead's harbour was improved in 1873, with a breakwater and was enlarged by 1880; it has regular services to Dun Laoghaire, Ire., near Dublin. Holy Mountain and the South Stack lighthouse are noted features of the island. Pop. (1981 prelim.) 10,467.

Holyoake, Sir Keith Jacka (b. Feb. 11, 1904, Scarborough, N.Z.—d. Dec. 8, 1983, Wellington, N.Z.), farmer and politician who served twice as prime minister (1957, 1960–72) and was the first politician to be appointed governor general of New Zealand (1977–80).

A member of Parliament (1932–38, 1943–77), he was also vice-president of the Dominion Council of the Farmers Federation, represented New Zealand at the First World Conference of Farmers (1946), and was president of the United Nations Food and Agricultural Conference (1955). He became prime minister for a brief period following the retirement of Prime Minister Sir Sidney Holland (1957), and as leader of the National Party he became prime minister again in 1960. Sir Keith was knighted in 1970 and served as minister of state (1975–77) until his appointment as governor general.

Holyoke, city, Hampden County, west central Massachusetts, U.S., on the Connecticut River. Settled in 1725 as part of Springfield, it was included in West Springfield in 1774 and was incorporated as a separate township in 1850. Named either for an early settler, Elizur Holyoke, or for the Rev. Edward Holyoke, president of Harvard University (1737–69), it began to develop industrially after 1828, when the first of several dams was completed across the river. A system of canals was built during the latter half of the 19th century, attracting paper and textile mills.

The city's economy has become well diversified and includes printing and publishing and the manufacture of electrical equipment, fabricated metal, machinery, paper, clothing, leather, textiles, chemicals, and rubber products. The city was the birthplace of volleyball, invented in 1895 by William G. Morgan, physical education director of the local Young Men's Christian Association (YMCA). Holyoke Community College was established in 1946. Mt. Holyoke College, founded in 1837 by Mary Lyon as one of the first institutions of higher learning for American women, is in South Hadley, 4 mi (6 km) south. The Mt. Tom Ski Area and Westover Air Force Base are nearby. Inc. city, 1873. Pop. (1980) city, 44,678; metropolitan area (SMSA), 530,668.

Holyoke, Edward (b. June 25, 1689, Boston—d. Jan. 1, 1769, Cambridge, Mass.), 10th president of Harvard College, who liberalized and strengthened its academic program.

Born into a distinguished Massachusetts family, Holyoke attended the most prestigious schools in Boston before entering Harvard, from which he was graduated with high honours in 1705. He stayed at the college for seven years, first in the dual capacity of tutor and librarian and then as a fellow of the Harvard Corporation. Holyoke then embarked upon theological studies and was ordained as pastor of the Marblehead (Mass.) Congregational Church (1716–37). In 1737 Holyoke was appointed president of Harvard.

Holyoke proved to be a popular president. He liberalized the curriculum and granted aid to deserving students. Harvard College prospered during his long administration (1737–69), despite the loss of its library in a disastrous fire. Though not considered a commanding intellect by his contemporaries, Holyoke strengthened Harvard's academic program in mathematics and science, and during his tenure Harvard established the first laboratory for experimental physics in North America.

Holywell, Welsh TREFFYNNON, town, Delyn district, Clwyd county, Wales, near the Dee Estuary. The holy well is on the spot where, in the 7th century, the Celtic St. Winifred's head is said to have fallen when she was decapitated. In the past, copper, lead, and coal have been mined near Holywell, which is now important mainly for its woollen, rayon, and chemical industries. Nearby are the ruins of the 12th-century Cistercian monastery of Basingwerk. Pop. (1981 prelim.) 8,905.

homage and fealty, in European society, solemn acts of ritual by which a person became a vassal of a lord in feudal society. Homage was essentially the acknowledgment of the bond of tenure that existed between the two. It consisted of the vassal surrendering himself to the lord, symbolized by his kneeling and giving his joined hands to the lord, who clasped them in his own, thus accepting the surrender.

Fealty was an oath of fidelity made by the vassal. In it he promised not to harm his lord or to do damage to his property. Although homage had to be rendered directly to the lord, fealty could be given to a bailiff or steward. The lord then performed a symbolic investiture of the new vassal, handing over to him some object representing his fief. The whole procedure was a recognition of both the assistance owed by the tenant to his lord and the protection owed by the lord to the tenant.

Homburg, city, Saarland, southwestern Germany, on the Erbach River, northeast of Saarbrücken. Chartered in 1330 and 1558, it belonged to the counts of Homburg, most of whose territory was divided in 1499 between the houses of Nassau-Saarbrücken and Pfalz-Zweibrücken. It became part of the Bavarian Palatinate in 1815 and was included in the Saar in 1920. The market square is surrounded by fine 17th-century houses, and nearby are remains of the 12th-century Hohenburg fortress and the Karlsberg Castle (1778–85; destroyed 1793). Homburg is the seat of the medical faculty of the University of Saarland. It is an important industrial centre specializing in iron goods. Other industries include woodworking, brewing, construction, and the manufacture of textiles. Pop. (1989 est.) 41,888.

Home, Alexander Frederick Douglas-Home, 14th earl of, also called BARON HOME OF THE HIRSEL OF COLDSTREAM: *see* Douglas-Home, Sir Alec.

Home, Alexander Home, 1st earl of, also called (1575–1605) 6TH LORD HOME, Home also spelled HUME (b. *c.* 1566—d. April 5, 1619), Scottish noble who took part in many of the turbulent incidents that marked the reign of James VI of Scotland (afterward James I of Great Britain).

In August 1575 he became 6th Lord Home on the death of his father, the 5th lord. He was warden of the east marches, and was often at variance with the Hepburns, a rival border family headed by the earls of Bothwell; the feud between the Homes and the Hepburns was an old one, and it was probably the main reason why Home's father, the 5th lord, sided with the enemies of Mary, Queen of Scots, during the period of her intimacy with the 4th Earl of Bothwell. When the 5th Earl of Bothwell became an exile (*c.* 1595), Home shared in the distribution of the estates and other spoils. Home accompanied James to England in 1603 and was created earl of Home and Lord Douglass in 1605.

Home, Henry (Scottish philosopher): *see* Kames, Henry Home, Lord.

Home, John (b. Sept. 21, 1722, Leith, Scot.—d. Sept. 5, 1808, Merchiston Bank, near Edinburgh), Scottish dramatist whose play *Douglas,* according to the poet Thomas Gray, "retrieved the true language of the stage."

Home entered the church, then fought against the Jacobites in the 1745 uprising led by Charles Edward Stuart (Bonnie Prince Charlie). When his play *Douglas* was produced (1756) in Edinburgh, the church, disapproving of the theatre, sent him a summons, which he ignored. In 1757 *Douglas* had a great success at London's Covent Garden theatre, where the actor-manager David Garrick later produced other plays by Home. After returning to Edinburgh, Home resigned the ministry. He became private secretary to John Stuart, 3rd earl of Bute (then secretary of state), and was later tutor to the Prince of Wales. He took up soldiering in later life, joining a regiment formed by the Duke of Buccleuch, but retired after a horseback-riding accident, afterward devoting himself to *The History of the Rebellion of 1745* (1802). Among his friends were David Hume, Adam Smith, and Sir Walter Scott.

Home, Sir Patrick: *see* Hume, Sir Patrick.

home rule, limited autonomy or self-government granted by a central or regional government to its dependent political units. It has been a common feature of multinational empires or states—most notably, the ancient Roman Empire, the British Empire, and the Soviet Union—which have afforded measured recognition of local ways and measured grants of self-government provided that the local populations should remain politically loyal to the central government. It has also been a feature of state and municipal government in the United States, where state constitutions since 1875 have frequently been amended or revamped to confer general or specifically enumerated self-governing powers on cities and towns and sometimes counties and townships.

Home Rule, in British and Irish history, movement to secure internal autonomy for Ireland within the British Empire.

The Home Government Association, calling for an Irish parliament, was formed in 1870 by Isaac Butt, a Protestant lawyer who popularized "Home Rule" as the movement's slo-

gan. In 1873 the Home Rule League replaced the association, and Butt's moderate leadership soon gave way to that of the more aggressive Charles Stewart Parnell. Demands for land reform and denominational education were added to the Irish program, and Parnell's obstructionist tactics in the British Parliament publicized his country's grievances. Prime Minister W.E. Gladstone was converted to Home Rule by 1885, but it was rejected by Parliament in 1886. Gladstone introduced a second Home Rule Bill in 1893; it was defeated in the House of Lords. The third bill had to wait for another Liberal ministry (the Conservatives had attempted to "kill Home Rule by kindness," to undermine its program by effecting moderate reforms); its introduction in 1912 inflamed the militant opposition of both Ulster Unionists (led by Edward Carson) and republicans in Ireland. The bill became law Sept. 18, 1914, but was inoperative for the duration of World War I. After years of conflict, a system akin to Home Rule was established in the six counties of Ulster (Northern Ireland) by the Government of Ireland Act (1920). By the Anglo-Irish Treaty (1921) the remaining 26 counties in the south achieved dominion status; the nominal link with the British Commonwealth was further eroded in 1937 and was completely severed in 1949.

homeopathy, also spelled HOMOEOPATHY, a system of therapeutics, notably popular in the 19th century, which was founded on the stated principle that "like cures like" and which prescribed for patients drugs or other treatments that would produce in healthy persons symptoms of the diseases being treated. For example, in homeopathic therapy, hot compresses are often prescribed for treating burns.

This system of therapeutics based upon the "law of similars," *similia similibus curantur,* was introduced in 1796 by the German physician Samuel Hahnemann (*q.v.*). Its essential tenets were (1) that the cure of disease is effected by drugs or other therapies that are capable of producing in a healthy individual symptoms similar to those of the disease to be treated and (2) that, in order to ascertain the curative virtues of any drug, it must be "proved" upon healthy persons—that is, taken by individuals of both sexes in a state of health, in gradually increasing doses. Another peculiar feature of homeopathy was its theory of dose. Most homeopathists believed in the action of minute doses of medicine.

In the medical profession in the 20th century, homeopathy has been viewed with little favour and has been especially criticized for focusing on symptoms of disease and neglecting the search for the underlying causes of disease. Homeopathy, however, has its many adherents, and there are a number of national and international societies, including the International Homoeopathic Medical League, headquartered in Bloemendaal, Neth.

homeostasis, self-regulating process by which biological systems tend to maintain stability while adjusting to conditions that are optimal for survival. If homeostasis is successful, life continues; if unsuccessful, disaster or death ensues. The stability attained is actually a dynamic equilibrium, in which continuous change occurs yet relatively uniform conditions prevail. Such systems are called open, as contrasted with the closed systems of, for example, solutions in test tubes. Biological systems are all of the open-system type, and the dynamic equilibrium, or steady state, achieved through homeostatic control implies a controlled environment.

Any system in dynamic equilibrium tends to reach a steady state, a balance that resists outside forces of change. When such a system is disturbed, built-in regulatory devices respond to the departures (or feedback) to establish a new balance. All processes of integration and coordination of function, whether mediated by mechanical circuits or by nervous and hormonal systems, are examples of homeostatic regulation.

The stability in the self-regulating devices commonly used in engineering and industry is achieved primarily through the use of such regulators as gyroscopes, mechanical governors, and inducers. Biological systems, of greater complexity, have regulators only very roughly comparable to such mechanical devices. The two types of systems are alike, however, in their goals—to sustain activity within prescribed ranges, whether to control the thickness of rolled steel or the pressure within the circulatory system. The basic difference between the two systems is, theoretically at least, that mechanical regulating devices are characterized by rigidity of operation, whereas biological ones are more flexible and adaptable.

Through homeostasis, biological systems perform efficiently enough to survive. A tremendous variety of responses is possible to any set of stimuli; however, some sort of filtering or guiding mechanism is necessary if effort is not to be wasted. Homeostasis permits the storing of "blueprints"—instead of "spare parts"—which are used only if needed. The pattern of response is economical because it is called into play only when predetermined organismic limits are exceeded and then only until the normal range of action has been obtained.

There are two basic types of homeostatic regulators: off-on switches, in which an action does or does not occur, and feedback controls, in which the system is under continuous adjustment. Off-on switches normally react within well-defined limits and range, whereas feedback controls react proportionally to the governing effect of some product of the system. Neither type of adjustment produces a constant response but fluctuates, or oscillates, about some mean value that is preset for off-on controls and self-determining for feedback controls.

A familiar example of off-on regulation is the action of a room-temperature regulator, or thermostat. The heart of the thermostat is a bimetallic strip that responds to temperature changes by completing or disrupting an electric circuit. When the room cools, the circuit is completed, the furnace operates, and the temperature rises. At a preset level the circuit breaks, the furnace stops, and the temperature drops.

In a typical feedback, or closed-loop system, input (information) is connected to output (effector) by way of a control modulator. Feedback from the output is routed into the system, where it has some effect on the level of activity of the control modulator, negative when it reduces activity, and positive when it accelerates activity. In technological systems the control modulator is a computer, flywheel, or some other driving mechanism. In biological systems, this modulator—and frequently the input as well—is inaccessible within the system and consists of such things as concentrations of substances in the blood. Response of the system to the input information may be either linear, directly proportional to the input, or nonlinear, variable to the input. Biological systems almost always show a nonlinear response.

The pattern that identifies a homeostatic system represents equally well the level of white blood cells in the bloodstream, the number of mice in a wheat field, or the concentration of phosphorus in bone. The range between high and low levels constitutes the homeostatic plateau—the "normal" range that sustains life. As either of the two extremes is approached, corrective action (through negative feedback) returns the system to the normal range. Oscillations inherent in the system represent the compensatory adjustments to any deviations from the normal. The adjustments are not perfect, and a lag in response is always present. If the lag becomes too great, the compensating reaction may occur out of phase, resulting in overshoots of increasing magnitude. If such overshoots continue, a condition termed "runaway" may occur, resulting in collapse of the system. Under certain circumstances, the homeostatic plateau may be adjusted upward or downward; oscillations then must be maintained within newly established limits if the system is to survive.

homeothermy: *see* warm-bloodedness.

Homer (fl. 9th or 8th century BC?, Ionia?), presumed author of the *Iliad* and *Odyssey*, the two greatest epic poems of ancient Greece.

A brief treatment of Homer follows. For full treatment, *see* MACROPAEDIA: Homeric Epics.

Virtually nothing is known about the life of Homer. Scholars generally agree, however, that he was probably an Ionian who lived in the 9th or 8th century BC. In the judgment of most modern scholars, he composed (but probably did not literally write) the *Iliad*, most likely relying on oral traditions, and he at least inspired the composition of the *Odyssey*. Ancient Greeks esteemed these epics as symbols of Hellenistic unity and heroism and as sources of moral and practical instructions. Since that time the *Iliad* and *Odyssey* have had a profound influence on Western literature and have been translated into modern languages countless times. Their value lies chiefly in the poetry itself, which often moves from sublime passages dealing with gods and heroic exploits to passages expressing deep human emotion.

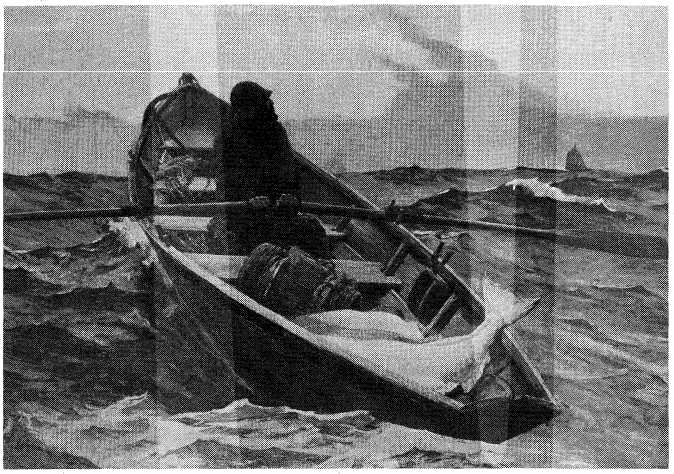
Homer, city, southern Alaska, U.S., on Kenai Peninsula and the northern shore of Kachemak Bay. The city, founded in 1895, was named for Homer Pennock, a prospector in the Cook Inlet area. On a highway connecting Seward and towns in the Cook Inlet area, it is a trading centre for a vast farming region (dairy products, meat, poultry, eggs, and vegetables). Fishing and coal mining are also important economically. The Winter Carnival (February) and an agricultural fair (August) are annual events. Inc. city, 1964. Pop. (1982 est.) 2,845.

Homer, Louise, *née* LOUISE DILWORTH BEATTY (b. April 30, 1871, Pittsburgh—d. May 6, 1947, Winter Park, Fla., U.S.), American opera singer, one of the leading operatic contraltos of the first quarter of the 20th century.

In 1895 she married the composer Sidney Homer. After study in Philadelphia, Boston, and Paris, she made her debut in 1898 in Vichy, Fr., as Leonora in Donizetti's *La favorita*. She appeared at Covent Garden, London, and at the Royal Opera in Brussels; from 1900 to 1919 and in 1927 she sang at the Metropolitan Opera in New York City. She joined the Civic Opera Company in Chicago (1920–25) and subsequently sang in San Francisco and Los Angeles.

She developed an unusually rich contralto voice and was noted for her roles as Amneris in Verdi's *Aida*, Orfeo in Gluck's *Orfeo ed Euridice*, and Dalila in Saint-Saëns' *Samson et Dalila*.

Homer, Winslow (b. Feb. 24, 1836, Boston—d. Sept. 29, 1910, Prouts Neck, Maine, U.S.), American painter whose works, particularly those on marine subjects, are among the most powerful and expressive of late 19th-century American art. His mastery of sketching and watercolour lends to his oil paintings the invigorating spontaneity of direct observation from nature (*e.g.*, in "The Gulf Stream," 1899). His subjects, often deceptively simple on the surface, dealt in their most seri-



"Fog Warning," oil painting by Winslow Homer, 1885; in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston

ous moments with the theme of man's efforts to establish his humanness in the face of an indifferent universe.

Homer was born into an old New England family. When he was six, the family moved to Cambridge, then a rural village, where he enjoyed a happy country childhood. His artistic inclinations were encouraged by his mother, an amateur painter. When he was 19, he was apprenticed to the lithographic firm of John Bufford in Boston. At first, most of his work involved copying the designs of other artists, but within a few years he was submitting his own drawings for publication in such periodicals as *Ballou's Pictorial* and *Harper's Weekly.* In 1859 Homer moved from Boston to New York City to begin a career as a free-lance illustrator. The following year he exhibited his first paintings at the National Academy of Design.

With the outbreak of the Civil War, Homer made drawings at the front for *Harper's,* but unlike most artist-correspondents he dealt more often with views of everyday camp life than with scenes of battle. As the war dragged on, he concentrated increasingly on painting. In 1865 he was elected to the National Academy of Design. Admirably capturing the dominant national mood of reconciliation, his "Prisoners from the Front" was warmly received when exhibited at the academy shortly after the war ended.

Although Homer's studio was in New York City, the city was rarely his theme. During the warm months he travelled to Pennsylvania, the Hudson River Valley, and New England, camping, hunting, fishing, and sketching. In 1866 he went to France for about a year. Although influenced by French Naturalism, Japanese prints, and contemporary fashion illustration, his work after his return to America did not change markedly, except that the pictures were generally somewhat brighter. Such early pictures as "Snap the Whip" and "Long Branch, New Jersey" depict happy scenes, the former of children frolicking in a meadow after school and the latter of fashionable ladies promenading along the seashore. In a few early pictures a disquieting note of human isolation is struck, premonitory of Homer's later, more powerful work.

In 1873 Homer began to work in watercolour, which allowed him to make rapid, fresh observations of nature. In this demanding medium he explored and resolved new artistic problems, and paintings of the next few years, such as "Breezing Up," reflect the invigorating effect of the watercolours.

Winslow Homer matured slowly as an artist, but his development was constant. With the passage of years his oil paintings became larger, his figures more solitary, his concern for naturalistic detail greater. He painted many women, increasingly as single figures, intimate, withdrawn, feminine. From the late 1870s Homer began to devote his summers exclusively to direct painting from nature in watercolour. Greater concern for atmospheric effects and reflected light added complexity to the images but at the same time enabled him to achieve greater pictorial unity.

Although Homer received some recognition during his early years, he had not had any real success by midcareer. By 1880 he began to show signs of increasing antisociality, deliberately shunning the company of other people. In 1881 he unexpectedly went to England, where he spent about two years sketching and painting in Tynemouth, a remote fishing port on the North Sea. Here, at the age of 45, his period of greatest artistic growth began. He was intrigued by the life of the hardy fisherfolk of Tynemouth, who struggled against the sea to earn their livelihood, but he did not paint that struggle directly. He depicted instead the robust and courageous women of Tynemouth, who mended the nets, kept house, and waited for their men to return from the sea. The English coastal atmosphere posed a new and difficult artistic challenge, but Homer mastered the diffused light, limited in colour but infinitely varied in tone, in a series of subtle watercolours.

After Homer's return to America in 1883, the sea became the dominant theme in his work. He moved to Prouts Neck, a fishing village on the bleak, desolate coast of Maine. He travelled extensively but always returned to his Prouts Neck studio, with its large balcony facing the sea like the bridge of a ship, to convert his sketches into major paintings. Solitude became for Homer not simply a preference but an absolute necessity, as he turned his mind and his art to subjects dealing with man's fate in confronting the elemental forces of nature.

In the summer of 1883 Homer saw a demonstration in Atlantic City of the use of a breeches buoy for rescue from the sea. The following year he painted his large, impressive, and immediately popular painting "The Life Line," one of several he did at this time on the rescue theme, depicting the dramatic transfer of an unconscious female from a wrecked ship to shore.

During the next few years, Homer's interest shifted from the edge of the sea to the sea itself. Perhaps inspired by a putative trip to the Grand Banks of Newfoundland with a fishing fleet, he painted heroic men in the act of pitting their strength, intelligence, and experience against the mighty sea. In the most impressive of these works, "Fog Warning," night is falling, fog is rolling in, and a lone fisherman in a dory calculates the distance and the time remaining for him to get back to his home ship in safety. Although the monumental narrative paintings Homer produced in his studio in the mid-1880s lack the freshness of his earlier works, Homer simultaneously painted innumerable brilliantly coloured watercolours during his travels north to Canada and south to the Caribbean.

While Homer's fishermen and their women are heroic in their confrontations with the physical world, the artist occasionally took a more jaundiced view of his fellowman. In "Huntsman and Dogs" of 1891, set in a cheerless autumnal landscape, a sullen-faced young hunter, pausing on a hillside levelled by timbering and blackened by fire, epitomizes man as a despoiler of nature, killing for trophies rather than food.

Homer abandoned the human subject entirely in "The Fox Hunt" of 1893. A fox ventures forth to forage for berries on the snow-covered land, and a sinister line of starved black crows converges to attack him. The ensuing life-and-death struggle will be over quickly, but the pulse of nature that drives the winter ocean against the cliffs in the distance will go on forever. "Northeaster" (1895) distills this theme, and only the viewer witnesses the endless struggle between the irresistible sea and the immovable rocky shore. In "Northeaster," Homer successfully wedded the freshness of his watercolours to the power of his oils to achieve an impressive pictorial effect that, as in many of his later works, transcends the subject matter.

"The Gulf Stream" (1899) stands at the apex of Homer's career. A black man lies inert on the deck of a small sailboat. A hurricane has shredded the sails, snapped off the mast, and snatched away the rudder. Unlike the boys in "Breezing Up" or the fisherman in "Fog Warning," this man is powerless to control his vessel. He is at the mercy of the elements. Sharks circle the boat, a waterspout hovers in the distance, and a boat on the distant horizon passes by unseeing and unseen. As in Stephen Crane's comparable short story, *The Open Boat,* nature is seen as not caring whether a man lives or dies.

Homer, ever more crusty and isolated in his old age, continued to paint vigorously and adventurously through the first decade of the 20th century. Similar in subject matter to his earlier work, although with more emphasis on pure seascape, his late paintings, in their unconventional composition and brilliant colour, reflect increasing concern with the abstract and expressive possibilities of art. Homer died in his Prouts Neck studio in 1910. Although by the 1890s he had become generally recognized as one of the leading American painters, and his work brought top prices, his passing was but briefly noted, and appreciation of his artistic achievement came only in the years following his death. (J.D.Pro.)

MAJOR WORKS. *Paintings in oil.* "Pitching Quoits" (1865; Fogg Art Museum, Cambridge, Mass.); "Prisoners from the Front" (1866; Metropolitan Museum of Art, New York City); "Croquet Scene" (1866; Art Institute of Chicago); "The Bridle Path, White Mountains" (1868; Sterling and Francine Clark Art Institute, Williamstown, Mass.); "Long Branch, New Jersey" (1869; Museum of Fine Arts, Boston); "High Tide" (1870; Metropolitan Museum of Art); "The Country School" (1871; City Art Museum, St. Louis, Mo.); "Snap the Whip" (1872; Butler Institute of American Art, Youngstown, Ohio); "Breezing Up," or "A Fair Wind" (1876; National Gallery of Art, Washington, D.C.); "The Gale" (1883, repainted 1893; Worcester Art Museum, Massachusetts); "The Life Line" (1884; Philadelphia Museum of Art); "Fog Warning" (1885; Museum of Fine Arts, Boston); "The Herring Net" (1885;

Art Institute of Chicago); "Eight Bells" (1886; Addison Gallery of American Art, Andover, Mass.); "Huntsman and Dogs" (1891; Philadelphia Museum of Art); "Northeaster" (1895; Metropolitan Museum of Art); "The Lookout—'All's Well'" (1896; Museum of Fine Arts, Boston); "The Gulf Stream" (1899; Metropolitan Museum of Art); "West Point Prouts Neck" (1900; Clark Art Institute); "Searchlight Harbor Entrance, Santiago de Cuba" (1901; Metropolitan Museum of Art); "Early Morning After a Storm at Sea" (1902; Cleveland Museum of Art).

Paintings in watercolour. "Fresh Air" (1878; Brooklyn Museum, New York); "Gloucester Harbor and Dory" (1880?; Fogg Art Museum); "The Green Dory" (1880?; Museum of Fine Arts, Boston); "Inside the Bar, Tynemouth" (1883; Metropolitan Museum of Art); "Tynemouth" (1883; Fogg Art Museum); "Conch Divers" (1885; Minneapolis Institute of Arts, Minnesota); "Shark Fishing" (1885; private collection, New York); "Street Scene, Santiago, Cuba" (1885; Philadelphia Museum of Art); "After the Hunt" (1892; Los Angeles County Museum of Art); "Adirondacks" (1892; Fogg Art Museum); "The Adirondack Guide" (Museum of Fine Arts, Boston); "The Turtle Pound" (1898; Brooklyn Museum); "After the Hurricane, Bahamas" (1899; Art Institute of Chicago).

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Homeric Hymns, collection of 34 ancient Greek poems in heroic hexameters, all addressed to gods. Ascribed in antiquity to Homer, the poems actually differ widely in date and are of unknown authorship. Most end with an indication that the singer intends to begin another song, therefore suggesting preludes used by rhapsodists beginning recitals of heroic poetry. The collection is incomplete; it contains major hymns to Demeter, Apollo, Hermes, and Aphrodite but only short pieces to Zeus, Hera, Poseidon, Athena, Artemis, Hephaestus, and Ares; the opening hymn to Dionysus is severely mutilated at the beginning.

Homerids, Latin HOMERIDAE, a historical clan whose members claimed to be descendants of the ancient Greek poet Homer; they claimed to have brought the *Iliad* and *Odyssey* attributed to him from Ionia to the Greek mainland, as early as the 6th century BC. They may have preserved texts of poems ascribed to Homer. Originally, they were rhapsodists, singer-reciters of Homeric epics; but by the 4th century BC they had apparently ceased to perform and had become judges of rhapsodists competing at the Panathenaea. Authorship of a few Homeric Hymns, preludes, and mythical tales of the gods have been attributed to them.

Homestead, city, Dade County, southern Florida, U.S., in the fertile Redlands district. Established in 1904 after the arrival of the railroad from Miami (28 mi [45 km] northeast), it developed as a shipping centre for fruit and produce grown on the surrounding farmland. The city remains an important agricultural trading centre and is also the service centre for Homestead Air Force Base, the headquarters for the Everglades National Park (a few miles southwest), and the gateway to the Florida Keys. An experimental catfish hatchery is nearby. Homestead Bayfront Park overlooks Biscayne (Bay) National Monument, which is replete with colourful marine life. Inc. 1913. Pop. (1980) 20,668.

Homestead, borough, Allegheny County, southwestern Pennsylvania, U.S., across the Monongahela River from the southeastern edge of Pittsburgh and adjacent to West Homestead and Munhall. Laid out as Amity Homestead in 1871, the borough developed with the growth of Andrew Carnegie's steel empire. The steelworks, now in Munhall borough, were the site of the noted Homestead Strike of July 1892, when company guards (hired through Pinkerton's National Detective Agency) fought a pitched battle with the strikers who controlled the town. State militiamen were sent to quell the trouble. The strike directly influenced the reelection of Pres. Grover Cleveland over Benjamin Harrison in 1892, and it retarded the unionization of steelworkers for more than 40 years. With the steel mills now chiefly located in adjacent communities, the economic mainstay is the manufacture of heavy mill machinery, tools, cement blocks, and bricks. Inc. 1880. Pop. (1980) 5,092.

Homestead Movement, in U.S. history, movement that promoted the free ownership of land by people willing to settle on and cultivate it, culminating in the Homestead Act of 1862.

From the beginning of the republic, the dominant view of the federal government was that public land should be sold to raise revenue. Seeking to change this view came petitions from western farmers asking that land in the public domain be given without charge to settlers willing to work the land.

Up to around 1830, there was little resembling a concerted drive for homestead legislation. But starting in that decade, eastern labourers and reformers of all stripes began to join the farmers in pressing for a homestead act. In 1848 the Free-Soil Party included a plank in the party platform urging distribution of public land to settlers free of charge.

Yet there was always significant opposition to the Homestead Movement. Eastern employers did not want workers to have the option of leaving low-paying jobs for a farm in the West. And eastern landowners feared the threat to land values posed by a huge public domain given away to anyone willing to settle on it. Southern slaveholders saw homesteaders as antislavery advocates, and so they too blocked homestead legislation.

In 1846 Andrew Johnson of Tennessee emerged as one of the leading spokesmen of the Homestead Movement. But bills introduced in Congress in 1846 and 1852 failed. Only when Southern participation in the federal government ceased in 1861 did homestead legislation become a genuine possibility.

The Republican Party, in control of the government, had come out in support of a homestead measure during the 1860 campaign. On May 20, 1862, Pres. Abraham Lincoln signed the Homestead Act, providing 160 acres of public land free of charge (except for a small filing fee) to anyone either 21 years of age or head of a family, a citizen or person who had filed for citizenship, who had lived on and cultivated the land for at least five years. By the turn of the century, more than 80,000,000 acres had been claimed by homesteaders.

Homestead National Monument of America, area in southeastern Nebraska, U.S., just west of Beatrice, established in 1936 as a memorial emblematic of the hardships of pioneer life. It is the site of the first claim under the Homestead Act of 1862, entered by a Dan Freeman. The visitor centre has exhibits tracing the development of the movement, under which more than 1,000,000 citizens became landowners. The monument, which occupies 163 ac (66 ha), also includes a homestead log cabin that was built in a neighbouring township in 1867 and later was moved to the site. The graves of Freeman and his wife are situated on a hill overlooking the monument.

homicide, the killing of one human being by another. Homicide is a general term; it may refer to a killing that is not criminal.

Some homicides are considered justifiable. Thus, in most cases a man may kill to prevent the commission of a serious felony or to aid a representative of the law. Other homicides are said to be excusable, as when a man kills in self-defense (*q.v.*).

A criminal homicide is one that is not regarded by the applicable criminal code as justifiable or excusable. All legal systems make important distinctions between different types of homicides. Punishments vary greatly according to the intent of the killer, the dangerousness of his conduct, or the circumstances in which he acted.

Anglo-American codes classify homicides in two or more separate crimes, each crime carrying its own penalty, which can be varied within limits by the sentencing authority. Thus, murder is a homicide committed intentionally or as a result of the commission of another serious offense. The crime of manslaughter includes killings that are the result of recklessness or a violent emotional outburst, as when the killer is provoked by the victim. The penalty for murder may be death or confinement for life, whereas the penalty for manslaughter is usually a maximum number of years in confinement.

European codes and their derivatives group all unjustified killings under the single crime of homicide but specify different penalties depending on the circumstances of the act. Some countries provide for unique situations in accordance with special social needs. Thus, Japan reserves its harshest penalties for the murder of one's own lineal descendents, and Italy allows for mitigation of punishment if the killer acted from a sudden intense passion to avenge his honour. European codes, like the Anglo-American, distinguish between intentional and felony murders, on the one hand, and reckless, negligent, and provoked murders, on the other. In all systems the most important dividing line in terms of sentencing falls between conduct that is socially dangerous and that which is merely reckless, between acts of intent and acts of passion.

Anglo-American systems require an element of intent, or malice aforethought, in the act of murder. This includes "transferred intent," as when one who intends to kill another kills a third person by mistake, as well as acts of such extreme recklessness and dangerousness that criminality or disregard may be inferred. The Indian penal code requires that an offender know of the danger he might cause, thus ruling out reckless acts that are the result of ignorance. But other jurisdictions are less clear on this point. Many states of the United States distinguish between murder of the first and of the second degree, with capital punishment limited to crimes of clear intent.

European codes place a greater emphasis than do English systems on the dangerousness of the actor's conduct and the circumstances surrounding his act. Thus, bodily injury resulting in death and death that is a result of negligence rather than recklessness are more heavily penalized in European than in Anglo-American systems. Whereas in England murder that is the result of felony is limited to only a few serious crimes, European codes often punish any killer as a murderer if he has employed a deadly weapon. The European codes, on the other hand, acquit a man for a "mercy killing," whereas the Anglo-American codes do not.

homing, ability of certain animals to return to a given place when displaced from it, often over great distances. The major navigational clues used by homing animals seem to be the same as those used in migration (sun angle, star patterns, etc.), but homing may occur in any compass direction and at any season. The best-known examples of strong homing ability are among birds, particularly racing, or homing, pigeons; many other birds, especially seabirds and also swallows, are known to have equal or better homing abilities. A Manx shearwater (*Puffinus puffinus*), transported in a closed container to a point about 5,500 km (3,400 miles) from its nest, returned to the nest in 12½ days.

hominid, any creature of the family Hominidae (order Primates), of which only one species exists today—*Homo sapiens,* or human beings. Extinct species of the family are indicated in fossil remains, some of which are now quite well known: *Homo erectus, Homo habilis,* and, going further back in evolutionary history, various species of *Australopithecus.*

A brief treatment of hominids follows. For full treatment, *see* MACROPAEDIA: Evolution, Human.

The family most closely related to the Hominidae today is the Pongidae, the anthropoid apes including the gorilla, the chimpanzee, and the orangutan. These are believed to have diverged from a common ancestral line during the Late Miocene epoch (11.2 million to 5.3 million years ago). The physical characteristics that distinguish hominids from the pongids are erect posture, bipedal locomotion, rounded skulls with larger brains, small teeth (including unspecialized canines), and such behavioral characteristics as communication through language.

In the slow process of evolution, countless generations are needed to acquire these characteristics, so it is extremely difficult to draw a line between pongid types and hominids in the fossil record available. Teeth and skull fragments constitute most of the evidence, and these are often not well enough preserved to show adaptations that might serve to distinguish one species from another.

The oldest definitely known hominid genus is *Australopithecus,* of which several species have been identified in Africa. This type was bipedal and had manipulative hands and an opposable thumb, and there is some evidence of primitive toolmaking. The origin of *Australopithecus* dates to some 8 million to 5.6 million years ago, although the fossil record beyond 4 million years ago is inconclusive. There is evidence of a direct relationship between this type and a later species, *Homo habilis,* the earliest-known finds of which are dated to about 2 million years ago; *H. habilis* was discovered and named by anthropologist L.S.B. Leakey, who believed it to be the earliest true toolmaker.

Homo erectus, now believed to date to about 1.6 million years, was apparently the first hominid to forsake the dry, hot climate of tropical African savanna lands and move into more temperate zones. Fossils showing distinct hominid characteristics have been found in Java, China, eastern Africa, northern Africa, and Europe. It was *H. erectus* who mastered fire and also produced a range of well-made tools.

The physiological differences between the hominids and the pongids indicates how these two adapted differently for different environments. The most significant anatomical differences in the hominids are changes in the pelvis, femur, and foot, all clearly related to an erect posture and walking on two legs; these were a distinct advantage in an open savannah environment. The pongids, by contrast, had characteristics that were best adapted for brachiation (swinging by the arms) in a heavily forested environment. They had a smaller thumb than the hominids but a strong and opposable big toe. Young pongids of existing species are active and acrobatic in the trees, but as they grow older they spend more time on the ground, walking on all fours and taking the weight of the upper half of the body on the knuckles of the hand. The pongid pelvis clearly shows evidence of this quadrupedal locomotion. Another adaptation indicating brachiation and walking on all fours is the reduction in size of the hind legs.

The early hominids had larger braincases than pongids and protuberances on the base of the skull that articulated with the spinal column; the position of these occipital condyles farther back on the skull shows that the head was held erect. This also enabled the neck to bear the increased weight of the braincase. In the fossil pongid skull, on the other hand, the position of the occipital condyles, farther forward on the skull, shows that the spine and head were carried horizontally.

The pongid face was prognathous, *i.e.,* it had projecting and massive lower jaws. The teeth show adaptation to a vegetarian diet; the molars are large and worn by grinding. The pongids were adapted for cutting and tearing large stalks, crushing with their large molars and chiseling with their sharp canines. In hominids the arc of the teeth is rounded and higher, and their disposition shows adaptations for cutting and eating seeds, fruit, grasses, and meats—in other words, the hominids were also hunters (or at least scavengers) as well as gatherers of food.

See also Homo erectus; Homo habilis; Homo sapiens.

hominy, kernels of corn, either whole or ground, from which the hull and germ have been removed by a process usually involving a caustic agent. Hominy was traditionally prepared by boiling the corn in a dilute lye solution made from wood-ash leachings until the hulls could be easily removed by hand and flushed away with running water. In the modern commercial technique, the corn is boiled in dilute sodium hydroxide, and the hulls are removed by the combined action of rotating cylinders and running water.

Wood-ash lye is still often employed in this process to impart calcium to the kernels. Hominy can be made in the home by soaking dried, shelled corn in a baking-soda solution and then removing the hulls.

Hominy is perhaps most familiar in the form of coarsely ground grits, boiled and served with butter, gravy, or syrup for breakfast or shaped into cakes and fried. Grits from white corn are processed into cornflake cereals. Hominy is also sometimes used in brewing and in the manufacture of wallpaper paste.

Homma Masaharu (b. Nov. 27, 1887, Sado, Japan—d. April 3, 1946, Los Baños, Luzon, Phil.), Japanese army general and commander of the Japanese invasion force of the Philippine Islands in World War II.

Homma was a graduate (1907) of the Army Academy and of the Army War College (1915). During World War I he was an observer with the British forces in France, and in 1925 he served as Japanese resident officer in India. In 1930 Homma was appointed military attaché in London. In 1939 he commanded Japanese forces at Tientsin, China, when the Japanese army blockaded the foreign concession there.

In December 1941, a few days after the Japanese air attack on Pearl Harbor, Homma, then a lieutenant general, led the Japanese invasion of the Philippine Islands. Although it was commonly supposed that Homma had been superseded by General Tomoyuki Yamashita after the campaign bogged down at Bataan and Corregidor, subsequent evidence suggested that Homma held the supreme command throughout the campaign. He also directed the mopping-up actions against stray U.S. and Filipino forces in the Visayas and Mindanao areas.

Homma, who arrived in Tokyo to surrender to U.S. forces on Sept. 14, 1945, was brought to trial in December. He was formally charged with having been responsible for the Bataan Death March, which occurred shortly after the Japanese conquest. It was estimated that some 10,000 Filipino and U.S. troops died during the forced march. Convicted of ordering the death march and for condoning other atrocities, Homma was executed by a firing squad.

Homme, Musée de l' (French: "Museum of Man"), in Paris, museum and library of ethnography and anthropology. It was founded in 1878 and is supported by the state.

The institution is attached to the National Museum of Natural History and has a professional staff that engages in postgraduate instruction and supervision of research. It covers physical, social, and cultural anthropology from all over the world except France, and it contains exceptional collections made by the French kings until the mid-19th century and during the early colonial times.

Homo, genus of the family Hominidae (order Primates) characterized by a relatively large cranial capacity, limb structure adapted to a habitual erect posture and a bipedal gait, well-developed and fully opposable thumb, hand capable of power and precision grips, and the ability to make standardized precision tools, using one tool to make another. Together with modern man, *Homo sapiens,* the genus includes the extinct species *Homo habilis* and *Homo erectus* and the extinct forms of *Homo sapiens* called Neanderthal and Cro-Magnon.

Homo erectus, extinct species of early hominid that, while there is still considerable disagreement on the point, is thought to be the direct ancestor of modern *Homo sapiens.*

A brief treatment of *Homo erectus* follows. For full treatment, *see* MACROPAEDIA: Evolution, Human.

H. erectus, a relatively recent creature in hominid evolution, flourished from the beginning of the Pleistocene epoch to sometime in the Middle Pleistocene, about 1,600,000 to 250,000 years ago. Fossil remains of *H. erectus* were first found in the 1890s, but, lacking a wide overview of how humans evolved, the discoverers of the first *H. erectus* fossils gave them a confusing variety of individual names that obscured the similarities and tended to exaggerate the differences between the various fossil finds. Now, by general agreement, these remains are classified as *Homo erectus.*

Chronologically, *H. erectus* is preceded by *Australopithecus,* a more apelike hominid, and is succeeded by *H. sapiens. H. habilis,* whose remains have been recovered from sites between 2 million and 1.5 million years old, may be a transitional stage between *Australopithecus* and *H. erectus.*

H. erectus appears to have ranged widely over the Earth. These fossils were first found at Trinil on the island of Java; other finds were near Peking, at Ternifine in Algeria, and at Olduvai Gorge and Koobi Fora in eastern Africa. Specimens from Europe were discovered at Bilzingsleben and Mauer (both in Germany), and Petralona (Greece), and in northwestern Africa at Salé, Sidī 'Abd ar-Raḥmān, and Rabat, all in Morocco. There are fossils that seem to represent subspecies of *H. sapiens* dating from the late Middle or early Late Pleistocene and found in Africa at Kabwe (Broken Hill), Elandsfontein, the Cave of Hearths, Lake Ndutu, Omo, and Bodo, and in Europe at Swanscombe, Steinheim, Biache, Ehringsdorf, La Chaise, and Vértesszőllős. It is among these that the line of distinction between *H. erectus* and *H. sapiens* becomes

dim, for it seems that one species was grading imperceptibly into its successor.

Most of the anatomical differences between *H. erectus* and *H. sapiens* concern the skulls and teeth. The limb bones of *H. erectus* that have been found so far have been similar to *H. sapiens,* leading to the inference that *H. erectus* was a creature of medium stature who walked upright.

Skull fragments show that *H. erectus* had a smaller brain than modern humans—less than 1,000 cubic cm (60 cubic inches) on the average, over a range from 750 to 1,225 cubic cm. The average cranial capacity for modern *H. sapiens* is 1,450 cubic cm, but the range is much greater—1,000 to 2,000 cubic cm.

H. erectus, however, had a larger brain than *Australopithecus.* The gap in brain size between the australopithecines and *H. erectus,* however, is filled by *H. habilis,* who, based on this evidence, is thought to be the immediate predecessor of *H. erectus.*

The skulls of the *H. erectus* fossils show other characteristics of their physical appearance. The braincase is low, and the skull bones are thick. They have jutting brow ridges and a markedly thickened area of bone at the hind end of the skull called the occipital torus. The forehead recedes, and the nose, jaws, and palate are wide. The front teeth are larger even than *Australopithecus*—an archaic trait that occurs in apes but in no other hominids. It is generally agreed, however, that the dentition is hominid and not apelike.

These mixed traits are puzzling. Some paleoanthropologists see them as specialized features characteristic of neither *H. sapiens* nor the apes and question whether *H. erectus* evolved toward *H. sapiens.* According to these paleoanthropologists, *H. erectus* wandered off the main evolutionary line and could not have been an ancestor to modern humans. This appears to leave two possibilities. Either *H. erectus,* with his thick cranium and outsize dentition, was not on the direct evolutionary line from *Australopithecus* to *H. sapiens,* or *H. erectus* evolved specialized features from *Australopithecus* and then lost them again in the transition to *H. sapiens.* Other authorities judge these two choices to be an oversimplification of the problem. In any case, all anthropological evidence indicates that *H. erectus* was the first hominid to master fire and inhabit caves.

Homo habilis, extinct species of early hominid that inhabited parts of sub-Saharan Africa about 2 million to 1.5 million years ago. Considerable disagreement exists concerning the evolutionary place of this species, but *H. habilis* is generally accepted as the earliest member of the genus *Homo,* following *Australopithecus* and preceding *H. erectus.*

A brief treatment of *Homo habilis* follows. For full treatment, see MACROPAEDIA: Evolution, Human.

The remains of *H. habilis* were first discovered in 1959 and 1960 at Olduvai Gorge in northern Tanzania. After more specimens were discovered, it was recognized that these fossils represented a species anatomically different from *Australopithecus.* In 1964, L.S.B. Leakey, Philip Tobias, and John Napier named this species *Homo habilis,* meaning "able (or handy) man." The increased cranial capacity and reduced molar and premolar tooth size seemed to foreshadow trends seen in *H. erectus* and later humans. Since 1960 additional discoveries have been made, including fossils found in the Kooba Fora region of northern Kenya and, perhaps, at Swartkrans and at Sterkfontein in South Arica.

The remains of *H. habilis* have provided a fair amount of knowledge about the anatomy of this hominid. Based on various skull fragments, researchers have estimated that the cranial capacity of *H. habilis* ranged from slightly more than 500 to nearly 800 cubic cm (about 30 to 50 cubic inches). Facial proportions vary substantially among individuals, with some specimens more closely resembling *Australopithecus* and some *H. erectus.* Limb bones suggest that *H. habilis* walked efficiently bipedally, and the fossil of a hand suggests that *H. habilis* was capable of precise manipulation of objects. Crude tools found along with the remains of *H. habilis* provide further evidence that this species could shape stone. Some anthropologists have argued that *H. habilis* could also communicate verbally, but the limited archaeological record makes this claim difficult to support.

The wide range of variance in specific anatomical features, particularly cranial size, has led some researchers to conclude that these remains represent two species. One theory incorporating two taxa classifies individuals with smaller crania as a species of gracile australopithecines and only individuals with larger crania as *Homo.* Other researchers suggest that these remains represent two species of *Homo,* only one of which could have been the immediate predecessor to *H. erectus. See also* Homo erectus; Australopithecus.

Homo heidelbergensis, original designation given to the fossil known as the Heidelberg jaw, now considered to be a European example of *Homo erectus. See* Heidelberg jaw.

Homo neanderthalensis: *see* Neanderthal.

Homo sapiens, genus and species to which all modern human beings (*Homo sapiens sapiens*) belong and to which are attributable fossil remains of humans perhaps as much as 400,000 years old. *Homo sapiens* is distinguished from other animals and from earlier hominid species by characteristics and habits such as bipedal stance and gait, brain capacity averaging about 1,350 cubic cm (82 cubic inches), high forehead, small teeth and jaw, defined chin, construction and use of tools, and ability to make use of symbols such as language and writing. Some of these features were possessed by the immediate ancestor, *Homo erectus;* but in the aggregate they are characteristic only of *Homo sapiens.*

A brief treatment of *Homo sapiens* follows. For full treatment, *see* MACROPAEDIA: Evolution, Human.

Homo sapiens, "man the wise," is the only currently existing species of the genus *Homo.* It is difficult, if not impossible, to follow the evolutionary steps that led to this distinction in the fossil record. Charles Darwin himself defined the problem. "In a series of forms graduating insensibly from some ape-like creatures to man as he now exists," he wrote in *The Descent of Man,* "it would be impossible to fix on any definite point when the term man ought to be used."

One of the things that makes discovery of a point of distinction so difficult is that *H. sapiens* is the product of an evolutionary process called mosaic evolution, which postulates that humans did not evolve smoothly as a species but that various populations evolved at different rates according to environmental and genetic circumstances. And, because fossils are the remains of individuals, who differ even within populations, one fossil alone or even a few do not adequately describe how a population may have evolved.

The time when the early forms of *H. sapiens* were evolving has now been fixed as the late Middle Pleistocene epoch, about 100,000 to 250,000 years ago, perhaps even as long as 400,000 years ago.

Before the principle of mosaic evolution was accepted, there were several types within the genus *Homo* that were thought to be distinct enough to warrant being classified as separate species. The best known of these is Neanderthal, long classified as *H. neanderthalis,* who possessed a combination of cranial, dental, and postcranial features that appeared to separate him from *H. sapiens.* Subsequent research has led many workers to classify Neanderthals as a human subspecies (*Homo sapiens neanderthalensis*), although controversy remains about their classification.

Another example of a related species, or possibly an intermediate form, is indicated by fossil remains of the teeth of a child and a broken adult occipital bone (the bone at the back of the skull) in a site known as Vértesszőllős in Hungary. With an estimated cranial volume of 1,400 cubic cm and various other characteristics, this fossil is in some respects quite modern, and it was agreed that it originated from *H. erectus* but might well be the beginning of a progressive evolutionary line. It has therefore been classified as *Homo* (*erectus seu sapiens*) *palaeohungaricus* to indicate that it is probably an intermediate form. Other probable intermediate forms have been discovered at Swanscombe in North Kent, England; at Steinheim site, near Stuttgart, Germany; at Petralona in northeastern Greece; and at Arago cave near Tautavel in southern France.

In Africa, along the Omo River in southern Ethiopia, two skulls and a large number of limb bones that are regarded as early modern *H. sapiens* have been recovered. Other early modern humans have been found in Africa at the Laetoli site in Tanzania and at the Border Cave site between Swaziland and the black state of KwaZulu in South Africa. These discoveries represent some of the earliest-known fossils (more than 100,000 years old) of modern *H. sapiens* and lend support to the theory that all modern humans have a common origin in Africa.

Homo sapiens neanderthalensis: *see* Neanderthal.

Homo transvaalensis, classification of hominid fossil remains proposed (E. Mayr, 1950) to replace the designation *Australopithecus* and used by students of human evolution who do not believe that the morphological (structural) and cultural differences between *Australopithecus* and *Homo sapiens* are large enough to warrant taxonomic distinction at the genus level. Rather, those who support Mayr view all fossils for which strong evidence exists for direct ascendancy to modern man as *Homo* and preserve genus distinction for forms (such as *Ramapithecus*) not believed, or not clearly shown, to have evolved in the direction of modern man. Disagreement exists among users of the name as to whether it should apply only to the gracile (light-bodied) form of *Australopithecus* (*A. africanus* and its subspecies) or to both the gracile and the robust (*Paranthropus*) forms.

homoclinal ridge (landform): *see* cuesta.

homocystinuria, hereditary metabolic disorder involving methionine, a sulfur-containing essential amino acid. The metabolic sequence of methionine normally begins with its stepwise conversion to homocysteine, cystathionine, and cysteine, successively, each step being carried out by a specific organic catalyst, or enzyme. In homocystinuria, the defective enzyme is cystathionine synthetase, which normally converts homocysteine to cystathionine. As a result, abnormally high concentrations of homocysteine and its precursor, methionine, are found in the blood plasma. Symptoms of homocystinuria include mental retardation; displacement of the lenses of the eyes; shuffling gait; fine, sparse hair; skeletal deformations; and sometimes fatal episodic obstruction of blood vessels with clots. The joints tend to have restricted mobility rather than hyperextensibility. Dietary therapy, with methionine restriction and cystine supplementation (cystine is the oxidized form of cysteine) is apparently beneficial. Homocystinuria is believed to

be transmitted recessively: unaffected carriers of the trait who mate can expect, on the basis of chance, to have one affected offspring out of four births. *See also* cystathioninuria.

homocytotropic antibody: *see* reagin.

Homoean, in the Trinitarian controversies of the 4th-century Christian Church, a follower of Acacius, bishop of Caesarea. The Homoeans taught a form of Arianism that asserted that the Son was distinct from, but like (Greek *homoios*), the Father, as opposed to the Nicene Creed, which stated that the Son is "of one substance" (Greek *homoousios*) with the Father.

The doctrine of the Homoeans was favoured by Emperor Constantius II, who called councils for the Western Church at Rimini (October 359) and for the Eastern Church at Seleucia (winter 359). Accepted for a time by the bishops of the entire Christian Church, the doctrine of the Homoeans was abandoned after Constantius' death in 361. It was revived in the East during the reign of Emperor Valens (364–378) but was finally condemned, with all Arian views, at the first Council of Constantinople in 381.

homogeneous reaction, any of a class of chemical reactions that occur in a single phase (gaseous, liquid, or solid), one of two broad classes of reactions—homogeneous and heterogeneous—based on the physical state of the substances present. The most important of homogeneous reactions are the reactions between gases (*e.g.*, the combination of common household gas and oxygen to produce a flame) and the reactions between liquids or substances dissolved in liquids (*e.g.*, the reactions between aqueous solutions of acids and bases). From the theoretical standpoint, homogeneous reactions are the simpler of the two classes of reactions because the chemical changes that take place are solely dependent on the nature of the interactions of the reacting substances. *Compare* heterogeneous reaction.

homogenization, process of reducing a substance, such as the fat globules in milk, to extremely small particles and distributing it uniformly throughout a fluid, such as milk. When milk is properly homogenized, the cream will not rise to the top. The process involves forcing the milk through small openings under high pressure, thus breaking up the fat globules. Cream and other food products, such as peanut butter, may also be homogenized to produce a stable emulsion, *i.e.*, one in which fats or oils will not separate from other elements. A similar process is used in the manufacture of some cosmetics and pharmaceutical products.

homoiothermy: *see* warm-bloodedness.

Homolka, Oscar (b. Aug. 12, 1898, Vienna—d. Jan. 27, 1978, Sussex, Eng.), Austrian-born U.S. character actor of stage and screen, known for his memorable portrayals of spies and villains.

After two years of military service in World War I, Homolka made his stage debut in Vienna, playing a small part in *The Little Man* (1918). In 1924 he established himself as a major actor in the German production of *The Emperor Jones* and for 10 years thereafter worked in Vienna and Berlin with the Austrian producer-director Max Reinhardt as a leading man. His German-language films began in 1926 with *Die Abenteuer eines Zehnmarkscheines* (*Uneasy Money*); perhaps his most famous film was *Dreyfus* (1930). In 1932 he produced, directed, and played Professor Higgins in the Berlin production of *Pygmalion.* Not long after, when Hitler came to power, Homolka left Germany. He went first to Paris and then to England, where he made his London debut in *Close Quarters* with Dame Flora Robson (1935).

It was during the mid-1930s that Homolka began what was to be a long and fruitful career in English-language films, appearing first with Walter Huston in *Rhodes of Africa* (1936). He then went to the United States and made his first Hollywood film, *Ebb Tide* (1937). Among the many others that followed were: *Seven Sinners* (1940; with Marlene Dietrich), *Mission to Moscow* (1943), *Anna Lucasta* (1949), *The Seven Year Itch* (1955), *War and Peace* (1956), *A Farewell to Arms* (1957), *Mr. Sardonicus* (1961), *The Long Ships* (1964), *Funeral in Berlin* (1966), *Billion Dollar Brain* (1967), *The Madwoman of Chaillot* (1969), *Song of Norway* (1970), and *The Tamarind Seed* (1974).

Homolka made his Broadway debut in *Grey Farm* (1940). His most acclaimed stage performance was undoubtedly as the blustering Uncle Chris in *I Remember Mama* (1944), a role he repeated in George Stevens' film version (1948). He continued his theatrical career in notable productions of *The Broken Jug* (1950), *Le Diable et le bon Dieu* (1951), *The Master Builder* (1955), and *Rashomon* (1959). Homolka also appeared on numerous television shows.

homologous series, any of numerous groups of chemical compounds in each of which the difference between successive members is a simple structural unit. Such series are most common among organic compounds, the structural difference being a methylene group, as in the paraffin hydrocarbons, or alkanes; the normal primary alcohols, or 1-alkanols; and the normal carboxylic acids, or alkanoic acids. In each of these homologous series the number of methylene groups—designated by the subscript *n*—may have the successive values 0, 1, 2, 3, etc.

Homologous series of inorganic compounds include the phosphoric acids, the silicic acids, and the phosphonitrilic chlorides.

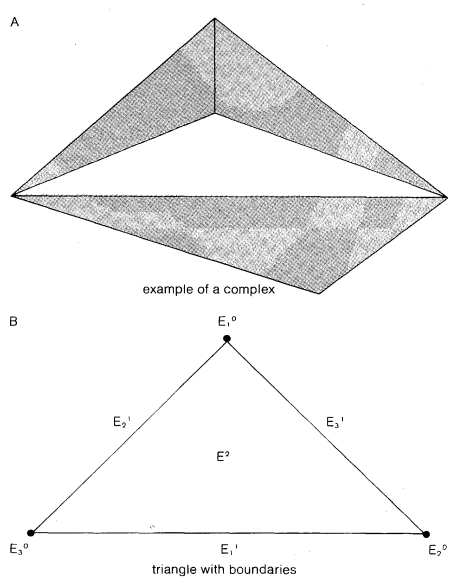
Within a given homologous series the chemical properties of the compounds are essentially all alike, and the physical properties vary in a continuous and predictable manner.

homology, in biology, similarity of the structure, physiology, or development of different species of organisms based upon their descent from a common evolutionary ancestor. Homology is contrasted with analogy, which is a functional similarity of structure based not upon common evolutionary origins but upon mere similarity of use. Thus the forelimbs of such widely differing mammals as humans, bats, and deer are homologous; the form of construction and the number of bones in these varying limbs are practically identical, and represent adaptive modifications of the forelimb structure of their common early mammalian ancestors. Analogous structures, on the other hand, can be represented by the wings of birds and of insects; the structures are used for flight in both types of organisms, but they have no common ancestral origin at the beginning of their evolutionary development. A 19th-century British biologist, Sir Richard Owen, was the first to define both homology and analogy in precise terms.

When two or more organs or structures are basically similar to each other in construction but are modified to perform different functions, they are said to be serially homologous. An example of this is a bat's wing and a whale's flipper. Both originated in the forelimbs of early mammalian ancestors, but they have undergone different evolutionary modification to perform the radically different tasks of flying and swimming, respectively. Sometimes it is unclear whether similarities in structure in different organisms are analogous or homologous. An example of this is the wings of bats and birds. These structures are homologous in that they are in both cases modifications of the forelimb bone structure of early reptiles. But birds' wings differ from those of bats in the number of digits and in having feathers for flight while bats have none. And most importantly, the power of flight arose independently in these two different classes of vertebrates; in birds while they were evolving from early reptiles, and in bats after their mammalian ancestors had already completely differentiated from reptiles. Thus, the wings of bats and birds can be viewed as analogous rather than homologous upon a more rigorous scrutiny of their morphological differences and evolutionary origins.

homology, in mathematics, correspondence between elements that play similar roles in distinct geometrical figures or mathematical functions. The concept is based on the algebraic structures associated with the topology of geometric regions. A given region can be associated with a qualitatively equivalent region, or complex, composed of triangles put together in such a way so that they meet only at vertices or along their entire edges (*see* Figure).

Points, lines, and triangles are zero-, one-, and two-dimensional objects, and are called 0-cells, 1-cells, and 2-cells, denoted as E^0, E^1, and E^2, respectively, with subscripts added to distinguish between individual cells. The boundary operator, ∂, is simply a way of specifying the end points of a given line, the



equation 1, boundary of triangle in B: $\partial E^2 = E_1^1 + E_2^1 + E_3^1$
equation 2, end-points of a line in B: $\partial E_1^1 = E_2^0 + E_3^0$
equation 3, boundary of a 1-chain in B: $\partial(E_1^1 + E_2^1) = E_2^0 + E_3^0 + E_3^0 + E_1^0 = E_2^0 + E_1^0$

Homology of geometric regions

sides bounding a given triangle, or the triangles bounding a given tetrahedron (*see* Equations 1 and 2). Any polynomial the terms of which are *n*-cells ($n = 0, 1, 2, \ldots$) is called an *n*-chain. The boundary operator can be used on polynomials as well as on single terms, and the resulting boundary cells of each term are added modulo two (*i.e.*, the sum of any two identical cells is zero; *see* Equation 3). If the resulting boundary chain adds to zero, as when the end-points of all three sides of a triangle are taken, the original chain is called a cycle, with a numerical prefix to indicate its dimension. All cycles, however, are not boundaries; for example, the cycle described in terms of the three sides of the triangular hole (A) is not the boundary of any region (*i.e.*, there is no 2-chain the boundary of which is this cycle). Two 1-cycles Z_1 and Z_2 are called homologous if their sum $Z_1 + Z_2$ is the boundary of some

2-chain. The class of all cycles homologous to each other is called a homology class. The set of all classes of dimension n is called the nth homology group for the geometric region under study.

It is the nature of these groups and the way they differentiate between geometric regions that is studied in algebraic topology. The theory of homology groups was extended from Euclidean figures to arbitrary topological spaces by the Austrian Leopold Vietoris (1927) and the Czech Eduard Čech (1932).

homoousian, an adherent of the doctrine formulated at the Council of Nicaea (325) to affirm that God the Son and God the Father are of the same substance. The council, presided over by Emperor Constantine, intended the condemnation of Arianism, which taught that Christ was more than human but not truly divine. The use of *homoousios* (Greek: "of one substance," or "of one essence") in the Nicene Creed was meant to put an end to the controversy, but Arianism revived within the church, and it was not until 381 at the second ecumenical council (first Council of Constantinople) that a creed (also containing the word *homoousios*) was accepted as a definitive statement of orthodox belief.

homophony, musical texture based primarily on chords, in contrast to polyphony, which results from combinations of relatively independent melodies. In homophony, one part, usually the highest, tends to predominate and there is little rhythmic differentiation between the parts, whereas in polyphony, rhythmic distinctiveness reinforces melodic autonomy.

Homophony does not necessarily suppress counterpoint, however. The "Allegretto" in Beethoven's *Seventh Symphony* offers an excellent example of essentially homorhythmic counterpoint, since it combines two distinct, yet rhythmically identical, melodies. An early genre featuring homophony of this sort is the 13th-century conductus.

In the 15th century Italian secular compositions of popular derivation (*e.g.*, the frottola) were often homophonically conceived, as were numerous 16th-century pieces by Andrea and Giovanni Gabrieli and Carlo Gesualdo. Not until the 17th century, however, with such composers as the Italians Arcangelo Corelli, Claudio Monteverdi, and Giacomo Carissimi and the German Johann Hermann Schein, did homophony become dominant in Western music. *See also* polyphony.

homopteran, a member of the insect order Homoptera, which includes some 32,000 species of sucking insects. Homopterans are divided into two main suborders: the Auchenorrhyncha include the cicadas, spittlebugs, treehoppers, leafhoppers, and planthoppers; the Sternorrhyncha include the aphids, scale insects, white flies, and mealybugs. A third suborder, Coleorrhyncha, consists of a single family of primitive forms. Homopterans all feed on plant juices, frequently causing considerable damage. They are worldwide in distribution. The evolutionary history of Homoptera is a matter of debate, as is their correct taxonomic classification. Fossils dating to the Upper Permian (about 230,000,000 years ago) have been found.

A brief treatment of homopterans follows. For full treatment, *see* MACROPAEDIA: Insects.

Most homopterans are between 4 and 12 millimetres (0.16 and 0.5 inch) in length, although certain cicadas (family Cicadidae) and the lanternfly (*Lanternaria phosphorea*) can reach 8 centimetres (3.1 inches). At the other extreme, male scale insects may only reach 0.5 mm. In all homopterans the beak, or proboscis, is adapted for piercing plants and sucking their juices; consisting of the mandibles and maxillae with extensible stylets, it is firmly attached to the ventral margin of the head. The first pair of wings may be pigmented or transparent, and they occasionally have waxy surfaces. The hindwings are always membranous. When closed, the forewings sit over the back like a peaked roof. One pair of compound eyes is typical, but some male scale insects have three pairs. Visual sensitivity varies in the order, being greatest in leafhoppers and treehoppers, less important in cicadas and aphids, and almost nonexistent in the mealybugs and scale insects.

Most homopterans live on plant sap, which contains much water. In order to obtain sufficient nutrients they must process large amounts of sap. There is a filter chamber in the gut which traps excess water and excretes it, along with some sugars and waste, as a substance known as honeydew. This is attractive to other insects, such as ants, that subsist on sweetened nutrients. Some ants "farm" certain species of aphids, carrying them to their food plants and feeding on the exuded honeydew.

Most species of homopterans have specific types of plants on which they feed. These preferences determine the habitats in which various species are found; some may occur only on white oaks in deciduous forests, others on rabbitbrush in deserts or on blueberry bushes in bogs. The moisture in the microhabitat is also important, and the nymphs of many species feed on the undersides of leaves where the stomata, through which transpiration occurs in plants, maintain a slightly higher relative humidity. Many aphids lead a subterranean existence, feeding on the roots of plants. Young cicadas and some immature leafhoppers are other underground root feeders.

Homopterans are the object of many predaceous and parasitic insects. Ladybird beetles feed on aphids and scale insects; an adult ladybird can consume several thousand aphids in a period of a few months. Aphidlion larvae and flower flies also feed on aphids. Dryinid wasps parasitize various leafhoppers and treehoppers, the larvae developing within the host insect. The cicada-killer wasp (*Sphecius speciosus*) paralyzes a cicada by stinging it, places it at the bottom of a burrow, and lays her eggs on it; then she covers the burrow. The larvae hatch and grow on the cicada until they emerge as adults the following year.

Most homopterans reproduce sexually, and the females lay eggs. Metamorphosis is typically gradual; immature stages lack wings but otherwise resemble the adults. Most homopterans have a short life cycle and produce at least one generation per year. Eggs are generally laid on (among Sternorrhyncha) or in (Auchenorrhyncha) the preferred food plant, so that the newly hatched young have food immediately available.

Some leafhoppers (*e.g., Gyponana mali*) overwinter as eggs inside the twigs of various trees. Others, such as *Empoasca recurvata,* hibernate in the adult form. Most leafhoppers have only one generation a year. White flies (Aleyrodidae), common pests of citrus trees and in greenhouses, produce several generations per year in warm climates. Metamorphosis differs from the usual homopteran mode in occurring entirely during the last molt.

The aphids are soft-bodied insects that generally form dense populations. They usually overwinter as eggs that hatch into females. These females reproduce parthenogenetically and give birth to living female young. Late in the season they produce males also. Mating occurs, and new eggs are laid that overwinter and repeat the cycle. Scale insects also depart from the usual reproductive pattern. Most overwinter as eggs under the scale covering of the female. The newly hatched are active crawlers and wander off in search of food. Within a few days they molt their legs and antennae and secrete a hard scale. Thereafter females increase in size but do not change their form: In the males, however, the last preadult stage develops wings, and after the final molt the male can fly in search of females.

The best-known homopterans are the periodical cicadas, especially the 13- and 17-year forms. Early in the spring the orange-winged adults mate, following which the female, using her powerful ovipositor, lays her eggs within the wood of deciduous trees. After several weeks the young hatch, drop to the ground, and dig into the soil. They spend the next 13 or 17 years underground, feeding on sap from the roots of trees. After the proper number of years the mature nymph emerges from the soil, climbs a tree, and attaches itself firmly to the bark. A split appears in the skin of the back and the adult slowly crawls out.

Many homopterans cause economically significant damage to crops and ornamental plants. Plants may be harmed directly by feeding methods. Some leafhoppers (Cicadellidae) secrete a salivary substance that causes the destruction of chlorophyll and death of the leaf. Spittlebugs, or froghoppers (Cercopidae), may stunt a crop severely by intensive feeding. Cicadas damage fruit-bearing trees when they make slits in the twigs for egg deposition. Many homopterans are carriers of bacterial and viral plant diseases. On the positive side, some of the wax-secreting insects are commercially important. The female Indian lac insect, *Laccifer lacca,* secretes great amounts of lac that coat the twig she rests on; this coating may be over one inch in thickness. The lac is melted off the twigs, refined, and used to prepare shellac and varnish.

homosexual rights movement, also called GAY RIGHTS MOVEMENT, or GAY LIBERATION MOVEMENT, homosexual civil-rights movement that seeks to eliminate sodomy laws barring homosexual acts between consenting adults and that calls for an end to discrimination against homosexuals in employment, credit, housing, public accommodations, and other areas of life. Its ultimate aim is to encourage society's tolerance or acceptance of homosexuality.

Before the end of the 19th century there were scarcely any "movements" for homosexual rights. In 1897 a homosexual Scientific-Humanitarian Committee (Wissenschaftlich-humanitäres Komitee) was founded in Berlin; it published emancipation literature, sponsored rallies, and campaigned for law reform throughout Germany and in The Netherlands and Austria, developing some 25 local chapters by 1922. Its founder, Magnus Hirschfeld, helped sponsor the World League of Sexual Reform, which held a series of international congresses from 1921 to 1935. Hitler's rise in 1933 killed the German movement.

The British also were early activists; in 1914 the British Society for the Study of Sex Psychology was founded by Edward Carpenter and Havelock Ellis for both propagandistic and educational purposes. The chief existing "homophile" organization in Europe is COC, or Cultur-en Ontspannings-Centrum (Culture and Recreation Center), founded in 1966 in Amsterdam, which has become one of the world's centres for homosexual activism. In the United States, the first major male organization was the Mattachine Society, founded in 1950–51 in Los Angeles by Henry Hay and four friends and later represented by chapters in several other cities. (The name derived from a medieval French society of masked players, Société Mattachine, and suggested the fact that social constraints forced homosexuals to publicly "mask" their proclivity.) The Daughters of Bilitis (named after the Sapphic love poems of Pierre Louys, *Chansons de Bilitis*) was the first major American organization for female homosexuals; it was founded in San Francisco in 1955.

The beginning of militant homosexual ac-

tivism can virtually be dated. At about 3:00 AM on June 28, 1969, the Stonewall Inn, a homosexual bar at 53 Christopher St. in Greenwich Village, was raided by New York City police. Instead of passively accepting the situation (as in the past), the some 200 homosexuals present began taunting the police and throwing debris; the riot lasted 45 minutes and resumed on succeeding nights. Protest rallies ensued; homosexual rights organizations proliferated in the 1970s and 1980s. "Stonewall" or "Christopher Street" came to be commemorated annually in late June in Gay Pride Week (alternatively, Gay and Lesbian Pride Week), not only in American cities but in cities in several other countries. What Oscar Wilde had called the "love that dared not speak its name" had, by the late 20th century, become highly outspoken.

The effectiveness of homosexual movements varies from country to country. Harassment or circumscription of homosexual activity tends to be greater in countries in which governments are strongly influenced politically by Roman Catholicism (*e.g.,* Austria, Ireland), in which machismo is pervasive (*e.g.,* Mexico), and in which a somewhat puritanical Communism is entrenched (*e.g.,* the Soviet Union). A more tolerant atmosphere exists in The Netherlands, Scandinavia, France, and northern Germany. The United States and Great Britain are developing in a more tolerant direction; in 1961 Illinois became the first of several states to repeal laws against homosexual acts between consenting adults; Britain repealed such a law in 1967. Efforts to secure laws banning discrimination in hiring have been less successful, especially with regard to such "sensitive" areas as teaching (in which homosexuals as role models, it is asserted, might somehow adversely influence students) or foreign service (in which homosexuals allegedly might be subject to blackmail).

The international homosexual symbol is the Greek letter lambda (λ).

homosexuality, sexual interest in and attraction to members of one's own sex. This attraction usually but not always leads to physical contact culminating in orgasm. Female homosexuality is often referred to as lesbianism, from the Aegean island of Lesbos, where the poet Sappho was leader of a group of women. The use of the word gay to describe a homosexual has become a popular modern term.

A brief treatment of homosexuality follows. For full treatment, *see* MACROPAEDIA: Sex and Sexuality.

At different times and in different cultures, homosexual behaviour has variously been approved of, tolerated, and banned; concepts of homosexuality in modern Western society are in flux. Until the early 1970s the U.S. psychiatric establishment classified homosexuality as a mental illness, but that designation was dropped amid increased political activity and efforts by homosexuals to be seen as individuals exercising a different sexual preference rather than as aberrant personalities. The two conflicting viewpoints about homosexuality, as a normal variant or as deviant behaviour, remain in many professional treatments of the subject and in the minds of mental health professionals and laymen alike.

The ancient Greeks accepted homosexuality and in some respects considered it a higher form of love than heterosexuality. Judeo-Christian culture has generally perceived it as sinful, and thus homosexuality was traditionally viewed as socially unacceptable through most of Western culture. Nevertheless, sex researchers of the 20th century have found homosexual activity to be a frequent pattern in adolescence among both males and females. The Kinsey report of 1948 found that 30 percent of adult U.S. males had engaged in some homosexual activity, and 10 percent were committed to primarily homosexual behaviour patterns. About half as many women were predominantly homosexual.

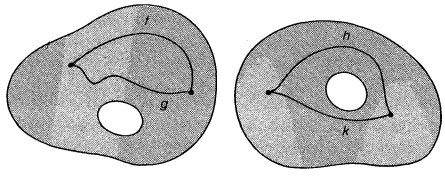
Instead of identifying people as exclusively homosexual or heterosexual, Kinsey observed a spectrum of sexual activity, of which exclusive orientations of either type make up the extremes. Homosexual activity increases in environments where there are no heterosexual outlets for sexual desires; many persons who, in such environments, are exclusively homosexual in practice identify themselves as exclusively heterosexual in orientation. A large population of bisexuals, people who respond sexually to persons of either sex, has also been recognized. As the societal tolerance of homosexual behaviour has broadened, the number of people identifying themselves as bisexual has also increased.

Psychologists in the 19th and 20th centuries, most of whom classified homosexuality as a form of mental illness, developed a variety of theories on its origin. The 19th-century psychologist Richard von Krafft-Ebing saw it as originating in heredity, whereas Sigmund Freud defined homosexuality as a result of conflicts of psychosexual development including identification with the parent of the opposite sex. Others have looked at social influences and physiologic events in fetal development as possible sources of later homosexuality. In identifying homosexuality as a distorted behaviour pattern, some have divided homosexuals into subgroups, usually at least two: "true" homosexuals, reasonably content with their sexual identity and able to develop stable, mature relationships with other homosexuals; and "heterophobes," whose sexuality finds expression in homosexual channels because they are unable to relate intimately to members of the opposite sex. Such analyses, however, are no longer universally accepted.

As a result of the increased evidence of homosexual activity and growing acceptance of it as a common variant of human sexuality, traditional beliefs about homosexuals have begun to lose credence. Most people now recognize that there is no single homosexual type. The concepts that all male homosexuals are effeminate or that all lesbians are masculine and aggressive, widespread in the West as recently as the 1950s and early 1960s, have largely been discarded. Similarly, the notion that homosexuals are "sick" individuals who need only to meet the right person of the opposite sex to be "cured" has largely given way, particularly in areas with large homosexual populations, to some degree of tolerance or acceptance.

Homosexuality became a political issue in some countries during the late 20th century, as a late offshoot of various civil rights movements of the 1960s. Homosexuals identified themselves as such to friends and relatives and, in many cases, even publicly. The homosexual, or gay, community became openly known to the heterosexual (straight) population for the first time. Homosexuals demanded their rights to equal treatment in employment practices, housing, and public policy. In many jurisdictions laws to ban discrimination against homosexuals became the subject of acrimonious debate.

homotopy, in mathematics, a way of classifying geometric regions by studying the different types of paths that can be drawn in the region. Two paths with common end points are called homotopic if one can be continuously deformed into the other without leaving its end points or passing outside the region (*see* Figure). Of particular interest are the closed paths starting and ending at a single point, called the base point.



Example of (left) homotopic path and (right) non-homotopic path

The class of all such paths homotopic to each other in a given geometric region is called a homotopy class. The set of all such classes forms an algebraic entity called a group, the structure of which varies according to the type of region. In a region with no holes, all closed paths are homotopic. In a region with a single hole, all paths are homotopic that wind around the hole the same number of times, and the homotopy classes can be corresponded with the group of integers, each integer corresponding to the number of times a path winds around the hole.

The idea of deforming one path into another can be given a more formal definition as follows: first, a path can be associated with a function that corresponds to points in the interval from zero to one with points on the path in a continuous manner; that is, so that neighbouring points on the interval correspond to neighbouring points on the path. A homotopy function $h(x,t)$ is a function that associates with two suitable paths, $f(x)$ and $g(x)$, a function of two variables x and t that is equal to $f(x)$ when $t = 0$ and equal to $g(x)$ when $t = 1$, and corresponds to the intuitive idea of a gradual deformation without leaving the region as t changes from 0 to 1. For example, $h(x,t) = tf(x) + (1 - t)g(x)$ is a homotopic function for the two paths in the Figure.

Homotopy groups can also be defined for higher-dimensional figures, but it is often difficult to determine their structure. Groups called homology groups are used instead, which are based on the boundary relationships of regions composed of triangles in such a way as to preserve the essential features of the original region under study.

homozygote, an organism with identical pairs of genes (or alleles), for a specific trait. If both of the two gametes (sex cells) that fuse during fertilization carry the same form of the gene for a specific trait, the organism is said to be homozygous for that trait. In a heterozygous organism, or heterozygote, the genes for a specific trait are different.

Because genes may be either dominant or recessive, the genetic composition (genotype) of an organism cannot always be determined by the physical appearance (phenotype).

Homs (Libya): *see* Khums, al-.

Homs (Syria): *see* Ḥimṣ.

Hon Gai, port city and provincial seat of Quang Ninh *tinh* (province), northeastern Vietnam, on the Vung (bay) Ha Long of the Gulf of Tonkin, about 25 mi (40 km) northeast of Haiphong. It is an export centre for coal mined at nearby Quang Yen, site of anthracite deposits that are the largest in Southeast Asia. Most of the inhabitants are Vietnamese. Other economic activities in the area are rice farming and fishing. Vung Ha Long is noted for its many strangely shaped limestone inlets and caves and grottoes. Pop. (1979) 115,312.

Hon'ami Kōetsu, Kōetsu also spelled KŌYETSU (b. 1558, Kyōto—d. Feb. 27, 1637, Kyōto), celebrated Japanese painter of the Edo period who was also an innovator in lacquerwork (with raised inlays of metal and shell and bold designs), a calligrapher, a potter, a connoisseur of swords, a landscape gardener, and a devotee of the tea ceremony.

He was born in the imperial city of Kyōto and followed his father's profession as purveyor of swords to the Imperial court. In 1615

the shogun Tokugawa Ieyasu granted him a territory in Takamine, northwest of Kyōto, where he established a hermitage called the Taikyo-an. Together with his equally remarkable relative Sōtatsu, he founded a school of painting that was continued by Ogata Kōrin, the style of which was colourful and strongly decorative, recapturing the *Yamato-e* tradition of classical Japan.

Honan, Wade–Giles romanization HO-NAN, Pinyin HENAN, small *sheng* (province) in the north central part of the People's Republic of China, bounded by the provinces of Shansi and Hopeh on the north, Shantung and Anhwei on the east, Shensi on the west, and Hupeh on the south.

A brief treatment of Honan follows. For full treatment, *see* MACROPAEDIA: China.

Some of the most important evidences of the Neolithic beginnings of Chinese civilization are found in the northern part of Honan, marking the presence of a well-established primitive farming culture. These earliest farmers, who occupied the lands at the confluence of the Huang Ho (Yellow River), Wei River, and Fen River, were the sowers of Chinese civilization. They gave rise to the early civilization of the Shang (Yin) dynasty (18th–12th century BC), the first of several dynasties that ruled the province until *c.* AD 936. With the fall of the T'ang dynasty, K'ai-feng assumed the role of the nation's capital and remained so until the Northern Sung dynasty was overthrown by the Mongols in 1127. K'ai-feng was superseded by Cheng-chou, the present capital.

Honan can be divided topographically into two parts, the western highlands and the eastern plain. The Huang Ho also divides the province into two unequal parts—one-sixth north of the river and five-sixths south.

South of the river there is a broad stretch of upland composed of a number of moderately high mountain basins, the main ranges being the Hsiung-erh Mountains and Fu-niu Mountains. Honan has three river systems: the Huang Ho in the north and northeast, the Huai River in the east and southeast, and the T'ang and T'ao rivers in the southwest. Climatically, the province lies in a transitional zone between the North China Plain and the Yangtze Valley. Honan has very cold winters and hot and humid summers. The province is more subject to years of alternating heavy rain and drought than the provinces of the Yangtze Valley. In the past Honan has suffered severe famine. It also experiences spring cloudbursts and occasional hailstorms, both of which can be very destructive. In times of drought, summer dust storms are worse even than those of winter.

Honan is China's second most populous province. The ethnic composition of its population is remarkably homogenous and essentially Han Jen (northern Chinese). The greatest concentration of rural population is in the eastern plain. Houses are made mainly of mud-plastered walls and thatched roofs.

Honan lies in the region of the wheat eaters, as distinct from the rice-eating people of the south. Wheat is by far Honan's most important crop; it leads all of China in acreage and production. The main food crops are winter wheat, millet, *kaoliang* (sorghum), soybeans, barley, corn (maize), sweet potatoes, rice, and lentils. The main industrial crops are cotton, tobacco, and vegetable oils. The province is also one of the oldest centres of sericulture (silkworm raising) in China and is an exporter of silk.

Honan also has large deposits of coal, petroleum, and natural gas. Coal mines supply the growing industries of Lo-yang, Cheng-chou, K'ai-feng, and Hsin-hsiang. Tractor production is one of the most important industries, and appliances and textiles are also produced.

Cheng-chou is the junction of China's two greatest trunk railways, the Peking–Han-k'ou–Canton line and the Lunghai line, which runs from the east coast to the Uighur Autonomous Region of Sinkiang in the far west. The Peking–Canton line is double-tracked in its entirety and carries a heavy load of both freight and passengers. One major highway transverses the province. Area 64,500 square miles (167,000 square km). Pop. (1985 est.) 76,460,000.

Honan, formerly HONAN-FU (city, China): *see* Lo-yang.

Honaunau, village and historical site, at the southern end of Kealakekua Bay, on the western coast of Hawaii Island, Hawaii, U.S. Once the traditional seat of the Kingdom of Kona and now a small fishing community, it is the site of numerous archaeological remains, principally the City of Refuge.

Located on a 20-acre (8-hectare) lava shelf that dips into the Pacific Ocean, the refuge (*puuhonua*), one of several sacred spots that provided sanctuary, especially in times of war, was established by at least the 15th century. Warriors, fugitives, and taboo breakers escaped death if they reached the site ahead of their pursuers; after remaining a few days and performing religious services, they were free to depart, protected by the gods. It is the most important refuge in the islands, square in shape and lying between the ocean and an L-shaped lava wall, 1,000 feet (300 m) long, built *c.* 1550 and averaging 10 feet in height and 17 feet in width. Three temple (*heiau*) platforms are within the wall; Alealea Heiau is the largest, and Hale-o-Keawe (dating from 1650) was a depository for the bones of deified kings and chiefs. In the reign of King Kamehameha II, the old religious practices were forbidden (1819) and the temples razed. The City of Refuge, together with adjacent palace grounds and royal fishponds and covering 180 acres, was declared a national historic park in 1961.

Nearby St. Benedict's Church, called the Painted Church for its colourful murals depicting biblical scenes, was the first Roman Catholic church in Hawaii. The site where Capt. James Cook was killed is 3 miles north of Honaunau and includes the remains of a temple where the explorer was worshiped as the god Lono. Pop. (1970) 200.

Honda Motor Company, Ltd., Japanese HONDA GIKEN KŌGYŌ KK, leading Japanese manufacturer of motorcycles and a major producer of automobiles for the world market. Headquarters are in Tokyo.

The company was founded as the Honda Institute of Technology near Hamamatsu in 1946 to develop small, efficient, internal combustion engines. It was incorporated as Honda Motor Company in 1948 and began producing motorcycles in 1949. The Honda C-100, a small-engine motorcycle, was introduced in 1953 and by 1959 was the largest selling motorcycle in the world. In 1959 the company also established a U.S. subsidiary, the American Honda Motor Company, which began producing motorcycles in the United States in 1979 and automobiles in 1982.

While Honda is a world leader in producing motorcycles, the bulk of the company's annual sales comes from automobiles, which the company began manufacturing in 1963. Other major product areas include farm machinery and small engines. Honda is a major Japanese exporter to the United States and to other parts of the world. It also has assembly plants in a number of other countries and is engaged in joint ventures and technology licensing agreements with several foreign companies.

Honda Toshiaki (b. 1744, Echigo Province, Japan—d. Jan. 14, 1822, Edo [now Tokyo]), one of the first Japanese scholars to undertake a thorough investigation of Western thought and customs and to advocate the adoption by Japan of many Western techniques and ideas.

A well-known mathematician, with his own school at the age of 24, Honda began his study of the Dutch language to acquaint himself with Western mathematics. (The Dutch at that time were the only Westerners with whom the Japanese had contact.) His interest in Dutch books soon began to extend beyond mathematics to astronomy and navigation, subjects he investigated even further by piloting his own ship to the northernmost Japanese island of Hokkaido in 1801. He also became interested in economics, and his statistical studies of the Japanese economy led him to the same conclusion about the fixed relation of population growth and food supply as that of his English contemporary, the demographer Thomas Malthus.

Honda's knowledge of Western subjects led him to advocate the end of Japanese isolation, the development of foreign trade, the improvement of coastal defenses, and the imperial expansion of Japan, particularly to the north. He also hoped that foreign gunpowder could be used to blast new shipping channels and thus improve internal transportation and communications in Japan. He even proposed moving the Japanese capital to the same latitude as London to help make Japan the "England of the East," and he suggested abolishing the use of Chinese characters and adopting the simpler Western alphabet for writing Japanese.

Articles are alphabetized word by word, not letter by letter

Hondecoeter, Melchior de, Hondecoeter also spelled EONDEKOETER (b. 1636, Utrecht, Neth.—d. April 3, 1695, Amsterdam), Baroque painter of the Dutch school who specialized in bird studies.

Hondecoeter was the grandson of Gilles and the son of Gijsbrecht de Hondecoeter, as well as the nephew by marriage of J.B. Weenix, all of whom were painters of animals and still lifes. Hondecoeter was greatly favoured by the magnates of the Netherlands and in 1659 was made a member of the painters' academy at The Hague, where he lived until he moved to Amsterdam in 1663.



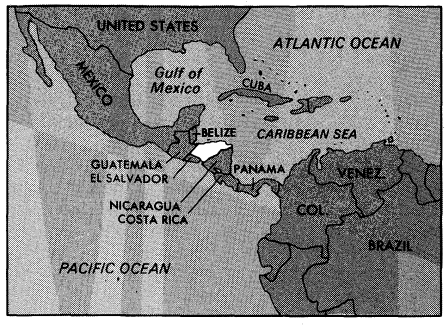
"The Fight Between a Cock and a Turkey," oil on canvas by Melchior de Hondecoeter; in the Alte Pinakothek, Bayerische Staatsgemäldesammlungen, Munich

By courtesy of the Bayerische Staatsgemaldesammlungen, Munich; photograph, Joachim Blauel

Hondecoeter is especially renowned for his pictures of birds fighting and in flight. Few of his pictures are dated, though some are signed. Among those with dates are "Jackdaw Deprived of His Borrowed Plumage" (1671), "Game and Poultry" (1672), and "A Park with Poultry" (1686). Hondecoeter's earliest works are more conscientious, lighter, and more transparent than his later ones. At all times he is bold of touch and sure of eye, giv-

ing the motion of birds with great spirit and accuracy.

Honduras, officially REPUBLIC OF HONDURAS, Spanish REPÚBLICA DE HONDURAS, the second largest country of Central America, covering an area of 43,277 sq mi (112,088 sq km). The capital is Tegucigalpa. The country is bounded on the north by the Caribbean Sea; on the south and east by Nicaragua; on the south, along the 45-mi (72-km) coast, by the Gulf of Fonseca of the Pacific Ocean; and on the west by Guatemala and El Salvador. The population in 1984 was estimated to be 4,135,000.



Honduras

The article that follows is a summary of significant detail about Honduras. Fuller treatment is provided in the MACROPAEDIA articles named below. For geography and history in its regional setting, *see* Central America; for information about the country in its continental setting, *see* North America; for information about regional aspects of Honduras' history, *see* Latin America, The History of; and for information about Honduras' peoples and their traditional cultures, *see* American Indians. For information about its literary history in a regional setting, *see* Latin American Literature.

For current history and for statistics on society and economy, *see* the article "World Affairs" and BRITANNICA WORLD DATA, respectively, in the *Britannica Book of the Year.*

The land. More than three-fourths of Honduras is mountainous. The lowlands are confined to the coastal plains and river valleys. The southern lowland area is formed by the valley of the Choluteca River, which drains southward, across a small coastal plain, into the Gulf of Fonseca. The larger northern lowland area is composed of the Caribbean coastal plain, extending about 400 mi from west to east, and three river valleys (the Ulúa, the Aguán, and the Patuca) stretching finger-like into the northern ranges. The Honduran mountains, trending generally from west to east, lie mostly outside the more active Pacific ranges and seldom experience the extreme volcanic eruptions and earthquakes suffered by the country's neighbours.

The northern lowland area is hot and rainy. Average temperatures range between 79° and 82° F (26° and 28° C), and annual precipitation averages from 70 to 110 in. (1,780 to 2,790 mm) or more. The climate supports such tropical crops as rice, bananas, and cassava (manioc) in the west and dense rain forests eastward toward the Nicaraguan border. Many small intermontane valleys (between 2,000 and 4,000 ft) have average temperatures ranging from 66° to 73° F (19° to 23° C). Few regions receive less than 40 in. of rainfall each year. The rainy slopes of highland Honduras support excellent oak and pine forests. Mangroves occupy the country's low coastal swamps.

Honduras has small polymetallic ore reserves containing lead, zinc, silver, and gold. Copper, cadmium, and antimony are also mined.

The people. The population of Honduras is predominantly mestizo. The mestizos of Honduras are generally darker and more Indian in appearance than those of other Latin-American countries. More than half of the population is rural, living in small villages or isolated settlements. Nearly half of the population is less than 15 years of age. The density is 96 persons per sq mi (37 persons per sq km).

The birth rate in the early 1980s was 49.3 per 1,000; the number of infant deaths was 103 per 1,000 live births. The annual rate of growth is 3.5 percent.

The economy. Honduras has a predominantly market economy heavily dependent on the production and export of bananas, coffee, sugar, and timber. As much as one-fourth of the work force is unemployed. The gross national product (GNP) totalled $2,070,000,000 in 1980; the GNP per capita, one of the lowest in Central America, was $560.

Agriculture accounts for about one-third of the GNP and employs three-fifths of the work force. Corn (maize), beans, and rice are the chief staples. Bananas are ordinarily the chief cash crop and are exported by U.S. companies. Coffee and sugar are produced primarily for export. Live cattle are also an important export. Sawmills and facilities to produce wood pulp and paper are being developed in Olancho.

Mineral industries centre on the underground mine of El Mochito, which produces silver, gold, lead, and zinc. Offshore exploration for petroleum has been funded by the World Bank. Manufacturing industries account for one-fifth of the GNP and employ more than one-tenth of the work force. Local manufactures include furniture, textiles, footwear, chemicals, cement, and rubber. Production of electricity totalled 800,000,000 kW-hr in 1980, generated primarily from hydroelectric sources, with less than one-third from imported fuels. A hydroelectric complex is under development southeast of San Pedro Sula, at El Cajón.

Honduras' trade deficit has widened as a result of rising prices for imported petroleum, and funds have been secured from the International Monetary Fund to offset the deficit. Tariffs on imported capital and consumer goods have been raised, and the government has acted to stem the outflow of domestic savings. Principal trading partners include the United States (which supplied nearly 42 percent of Honduras' imports in 1980), Venezuela, and Japan.

Administrative and social conditions. Honduras is a civilian republic, strongly influenced by the military. The constitution promulgated in 1982 vests executive power in a president, who is elected to four-year terms by popular vote. Legislative power rests in the National Congress, whose 82 members are also elected to four-year terms. Ultimate power, however, rests with the Superior Council of the Armed Forces, a body with authority over national security policy and veto power over all cabinet appointments. There are two major political parties in Honduras: the Liberal Party, a moderately conservative organization advocating social reform; and the National Party, a right-wing group with close ties to the military.

The country's social welfare system provides benefits to urban workers for unemployment, work injury, sickness, maternity, old age, disability, and widowhood.

Health and sanitary conditions in Honduras are generally poor; many people suffer from such diseases as enteritis, malaria, whooping cough, and typhoid fever. Malnutrition is a major problem, and there is a severe shortage of doctors—only 3 for every 10,000 people. Life expectancy is less than 60 years.

Education is free and compulsory for children between the ages of 7 and 12 years. Largely because of a shortage of trained teachers, however, only about 70 percent of all rural children of school age can enroll in classes. To combat illiteracy, the government requires every adult who has completed primary education to teach at least two illiterate adults to read and write.

The news media in Honduras are generally free to express a variety of viewpoints. The military, however, has occasionally tried to control the media by withholding advertising, bribing reporters, jailing editors, and closing radio staions.

Cultural life. The western part of Honduras was occupied by part of the Mayan Indian civilization. Relics of this civilization are exhibited in the Museo Regional de Arqueologia Maya in the city of Copán, and examples of its architecture survive in ruins nearby.

Painting and literature have been strongly influenced by the country's Spanish cultural heritage. The most important Honduran artists of the 20th century have been the landscape painter Carlos Garay and Antonio Valásquez, founder of the National School of Arts and Crafts. The major contemporary writers of this century have been the poet and historian Rafael Helliodoro Valle and the poet Clementina Suarez.

History. In pre-Columbian times Honduras was part of the Mayan civilization that flourished in the 1st millennium AD. The ceremonial centre at Copán was in use from about 465 to 800, when the Maya population suddenly diminished.

Columbus reached Honduras in 1502, and permanent settlement by Europeans began in 1522. A struggle followed among rival Spanish *conquistadores,* but some stability was achieved when the first territorial governor was appointed in 1526. A major war between the Spaniards and the Indians broke out in 1537. Commanding an Indian force of as many as 30,000 warriors, a chieftain named Lempira held off the Spanish until his death in 1539. Decimation of the Indian population continued through disease and enslavement.

Honduras was never an independent colony. After 1570 it was part of the Captaincy General of Guatemala. The discovery of silver in the 1570s brought prospectors to Honduras and significantly increased its population. During the 17th century British privateering was a constant danger.

Independence came for all of Central America in 1821, in the wake of the Mexican independence movement. In 1823 the Central American states formed the United Provinces of Central America. Despite the strong presence of the Honduran leader Francisco Morazán in the federation, Honduras withdrew and declared its own independence in 1838.

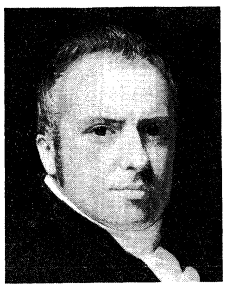
A conservative group held political power until 1876, when a liberal assumed the presidency and a new constitution was promulgated. By the beginning of the 20th century the government had become unstable, and it fell under the influence of neighbouring Nicaragua. The United States, under Pres. William Howard Taft, dispatched Marines to Honduras to protect U.S. investments in banana production. Unrest continued until 1932, when Gen. Tiburcio Carías Andino was elected president. He ruled as a virtual dictator until 1949, but uprisings were common.

Governments after Carías' presidency were short-lived. The constitution adopted in 1957 instituted a program of moderate social reform. Land reform, which was extended in 1975, has benefitted relatively few peasants, and there have been several protests by unions of peasants. Military leaders continued to rule, with one exception, until 1982, when a civilian government was elected to office. The military has remained in the background, however, as the activity of leftist guerrillas has increased.

Honduras, Gulf of, also called BAY OF HONDURAS, wide inlet of the Caribbean Sea, in-

denting the coasts of Honduras, Guatemala, and Belize. It extends from Dangriga (formerly Stann Creek), Belize, southeastward to La Ceiba, Honduras, a straight-line distance between the two localities of about 115 miles (185 km). The gulf receives many rivers, including the Ulúa and the Motagua, and it contains the reefs known as the Pelican Cays of Belize to the north and the Bay Islands (Islas de la Bahía) of Honduras to the east. Its coastal recess, Amatique Bay, holds the city of Puerto Barrios, the chief port of Guatemala. The port of Belize City north of Dangriga is sometimes considered the northern limit of the Gulf of Honduras.

Hone, William (b. June 3, 1780, Bath, Somerset, Eng.—d. Nov. 6, 1842, Tottenham, London), English Radical journalist, bookseller, publisher, and satirist, notable for his attacks on political and social abuses. He is remembered primarily for his concern for liberty and



Hone, detail of an oil painting by George Patten in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

justice and his struggle for the freedom of the English press.

Hone taught himself to read from the Bible and became a solicitor's clerk. A Radical from 1796, he produced two weekly newspapers, *The Traveller* (1814–15) and *The Reformist's Register* (1816–17), in which he exposed injustice and supported extension of the franchise. His report on lunatic asylums, 1814–15, foreshadowed modern journalism in its use of shock tactics supported by fact. In 1817 he published several witty political satires on the Tories in the form of parodies of the Anglican church's prayer book. These pamphlets, notable among which were *The Political Litany* and *The Sinecurist's Creed,* led to his prosecution on charges of blasphemy and sedition. He won his acquittal, which is regarded as a landmark in the history of the press, by a brilliant defense of a journalist's right to free expression. His *The Political House That Jack Built* (1819), the first and most famous of a series of satires that he produced with the caricaturist George Cruikshank, ran into 54 editions but failed to keep Hone solvent. A bankruptcy (1828) followed his imprisonment for debts incurred in publishing *The Every-Day Book* (1826–27), the most popular of his miscellanies, and he ended his career as subeditor on a Nonconformist weekly.

Honecker, Erich (b. Aug. 25, 1912, Neunkirchen, Ger.), Communist official who, as first secretary of East Germany's Socialist Unity Party of Germany (Sozialistische Einheitspartei Deutschlands, or SED), was East Germany's leader from 1971 until he fell from power in 1989 in the wake of the democratic reforms sweeping eastern Europe.

The son of a miner who was an official of the Communist Party, Honecker joined the Communist Youth Movement at the age of 14 and in 1929 became a full party member. By trade he was a slater. After the Nazis came to power in 1933, he organized illegal activities by young Communists in various parts of Germany. He was arrested by the Gestapo in 1935 and sentenced to 10 years' hard labour for "preparing treason." He refused to repudiate his Communist convictions.

In 1945 he was freed by the Soviet Red Army as it swept across eastern Germany, and he quickly caught up with those German Communists who had been trained in the Soviet Union to set up a Communist government in the Soviet-occupied zone. He was one of the founders of the Free German Youth movement (Freie Deutsche Jugend, or FDJ), and was its chairman from 1946 to 1955.

He was elected a member of the Central Committee of the Communist Party in 1946 and was one of the prime movers behind the fusion of the Communist and Social Democratic parties in East Germany into the newly formed SED. His influence in the SED grew rapidly, and in 1967 he was designated as the successor to the East German leader, Walter Ulbricht. He became both leader of the SED and chairman of the Council of State in 1971, thus heading both party and government. Under Honecker's rule, East Germany was one of the more repressive but also one of the most prosperous of the Soviet-bloc countries of eastern Europe. He allowed the growth of some trade and travel ties with West Germany in return for West German financial aid. His wife, Margot, was minister of education in the East German government.

Having lost the support of the reform-minded Soviet leader Mikhail Gorbachev, the aged and inflexible Honecker was forced to resign in October 1989 when confronted with massive pro-democracy demonstrations in East German cities. In the face of growing public agitation, he was then arrested and charged with corruption, abuses of power, and other crimes.

Honegger, Arthur (b. March 10, 1892, Le Havre, Fr.—d. Nov. 27, 1955, Paris), composer associated with the modern movement in French music in the first half of the 20th century.

Born of Swiss parents, Honegger spent most of his life in France. He studied at the Zürich conservatory and after 1912 at the Paris Conservatory. After World War I he was associated with "Les Six" (*see* Six, Les), a group of young composers that also included Georges Auric, Germaine Tailleferre, Francis Poulenc, Darius Milhaud, and Louis Durey. Honegger soon asserted his own strong personality in the "dramatic psalm" *Le Roi David* (1921). Two successful orchestral works followed: *Pacific 231* (1924), an impression of a locomotive in action, and *Rugby* (1928), which reflected the composer's love of speed and virile sports. Also from this period was the *Pastorale d'été* for chamber orchestra (1921). Much—but not all—of his music from the 1920s is rhythmic, dissonant, and austere and shows great freedom in the treatment of tonality. Polytonality sometimes occurs. With his dramatic oratorios *Jeanne d'Arc au bûcher* ("Joan of Arc at the Stake") and *La Danse des morts* ("The Dance of the Dead"), both on texts by Paul Claudel, he turned toward the mysticism and religious meaning that underlie many of his later works.

Honegger was a prolific composer and made notable contributions to opera (*Judith,* 1926; *Antigone,* 1927; *Amphion,* 1931), ballet (*Skating Rink,* 1922; *Sémiramis,* 1934), choral music (oratorios, including *Cantique des cantiques,* 1938), and orchestral music (five symphonies, symphonic poems, symphonic movements). His chamber music includes three string quartets and sonatas for violin, viola, and cello. He also composed the music for several films, including *La Roue* (1922), *Pygmalion* (1938), and *Cavalcade d'amour* (1939). Honegger's music is written in a bold and uninhibited musical idiom that combines the harmonic innovations of the French avant-garde with the large forms and massed sonorities of the German tradition. He published an autobiography, *Je suis compositeur* (*I Am a Composer*), in 1951.

Hōnen, original name SEISHIMARU, later GENKŪ, also called HŌNEN SHŌNIN, ENKŌ DAISHI, or GANSO (b. May 13, 1133, Inaoka, Mimasaka province, Japan—d. Feb. 29, 1212, Kyōto), Buddhist priest, founder of the Jōdo (Pure Land) Buddhist sect of Japan. He was seminal in establishing Pure Land pietism as one of the central forms of Buddhism in Japan. Introduced as a student monk to Pure Land doctrines brought from China by Tendai priests, he stressed *nembutsu* (recitation of the name of Amida Buddha) as the one practice necessary for salvation.

Life and teachings. Hōnen was the only son of Uruma Tokikuni, a regional military chief, who on his deathbed instructed his young son to enter the priesthood. After a period of local instruction, Hōnen at age 15 was sent to Mount Hiei, the monastic centre of the Tendai sect of Buddhism. The centre prospered externally, in wealth and prestige, but suffered from the internal power struggles of ambitious abbots and the moral and spiritual corruption of the priests.

Hōnen, along with other serious-minded young priests, however, came under the influence of the Pure Land doctrine, which taught salvation by the mercy of Amida (or Amitābha) Buddha. Hōnen was greatly inspired by the *Ōjōyōshū* ("Essentials of Salvation") written by a 10th–11th-century Japanese Amida Buddhist, Genshin, and the *Kuan-ching-su* ("Commentary on the Meditation *sūtra*") by a 7th-century Chinese Pure Land master, Shan-tao (Japanese Zendō). In 1175 Hōnen, then 43 years old, proclaimed his message that the one and only thing needed for salvation is *nembutsu.*

In his main work, the *Senchaku hongan nembutsu-shū* ("Collection on the Choice of the *nembutsu* of the Original Vow"), or *Senchaku-shū,* written in 1198, Hōnen classified all the teachings of Buddhism under two headings: Shōdō (Sacred Way) and Jōdo (Pure Land). According to him, Buddha, confident of man's inner character, had shown men the Sacred Way to enlightenment by means of precepts, meditation, and knowledge, thus enabling them to be emancipated from this world of lust and delusion and to attain the other world of ultimate peace. Hōnen, convinced of his own "sinful and avaricious" nature, however, came to the conclusion that, while it was theoretically possible, it was practically impossible for him and others like him to follow the Sacred Way. The only alternative open for them was the way of Jōdo, which is based on implicit trust in the Original Vow (*hongan*) of Amida Buddha, the lord of the Sukhāvatī (Sanskrit: Pure Land), who in his mercy assures salvation to the believer who clings to Amida's merciful hand and calls upon Amida's holy name—*namu Amida Butsu* ("Homage to Amida Buddha")—with all his heart. This is the *nembutsu* ("calling the name") of the *Senchaku-shū.*

Hōnen established his headquarters in the midst of the secular city of Kyōto, away from ecclesiastical establishments, and gathered together devoted disciples, including Shinran, who was to become the founder of the Jōdo Shinshū (True Pure Land sect). Hōnen and his followers accepted the legendary periodization of Buddhist history, according to which the first 1,000 years following the demise of the Buddha was the period of the "perfect law" (*shōbō*), in which the true teaching prospers; the second 1,000 years was the period of the "copied law" (*zōbō*), in which piety continues but true teaching declines; and the last 1,000 years is the period of the "end of law" (*mappō*), in which Buddhism declines and the

world is destined to be overwhelmed by vice and strife. It is to be noted that, according to the accepted calculation of the Japanese Buddhist, the last period began in AD 1051. And, as though to substantiate this view of history, Japanese society during the 12th century suffered from political instability and social disintegration that resulted in the establishment of feudal government under the leadership of the warrior class. Understandably, Hōnen's simple teaching found eager followers among the various levels of Japanese society of that time.

The popularity of the faith in the Pure Land of Amida Buddha aroused jealousy from the established schools of Buddhism, and it so happened that two court ladies were converted to Hōnen's teaching and gave up the court form of Buddhism. Hōnen was thereupon charged with their seduction and was banished, together with his immediate disciples, from the capital in 1207 (some of his disciples were beheaded). Compelled to use a nonclerical name, he called himself Fujii Motohiko and proved to be an effective evangelist even during his exile to the island of Shikoku. He was permitted to leave Shikoku at the end of the year but not to return to Kyōto until 1211, when he received a warm popular welcome.

Although he insisted on faith in Amida and the recitation of the name as the best way to salvation, Hōnen, an intrepid but nonaggressive person, was markedly tolerant and nonpolemical, urging his followers to respect the other Buddhas and other Buddhist ways of faith and practice. Observance of other forms of discipline, indeed, according to him, might be occasions leading toward Amida and his Paradise. Hōnen was also especially careful to warn against the temptation of accompanying the *nembutsu* with an immoral life or of believing that its recitation removes the stain of violations of the Buddhist life discipline or other immoral acts. He combined the cultured heritage of the established Buddhism of the past with the pioneering spirit of the new Buddhism of the 13th century. The Jōdo-shū founded by him continues to be one of the most influential schools of Japanese Buddhism; and the far more numerous Jōdo Shinshū founded by his disciple Shinran adds still more to the Pure Land influence initiated by him. (Ma.Fu.)

Honesdale, borough, seat of Wayne County, northeastern Pennsylvania, U.S., at the confluence of the Lackawaxen and Dyberry rivers, 24 mi (39 km) northeast of Scranton. Settled in the early 1800s, it was named for Philip Hone, who pioneered construction of the Delaware and Hudson Canal from Honesdale to Roundout (now Kingston, N.Y.). From 1828 to 1898 as the western terminus of the canal, it was the major shipping point for coal carried from the Susquehanna Valley mines on a gravity railroad and loaded on barges for eastern markets. In 1829 the "Stourbridge Lion," the first locomotive in the United States to run on rails, was initially tested there but proved too dangerous to operate; a replica stands on Park Street (the original is in the Smithsonian Institution, Washington, D.C.). Located in a rich agricultural area Honesdale has light manufactures. Numerous recreational sites, including the Hickory Ridge Ski Area, are nearby. Inc. 1829. Pop. (1980) 5,128.

honesty, either of the two species of the genus *Lunaria*, of the mustard family (Brassicaceae). They are European annuals or biennials that are widely grown for their disklike, papery, seedpod partitions, used in dried flower arrangements. The best known species, also called moonflower, money plant, moonwort, or satinflower, as well as honesty (*Lunaria annua*), have four-petalled, reddish purple or white flower clusters that are borne in summer. It has become naturalized in some wooded



Honesty (*Lunaria*)
G.R. Roberts

parts of eastern North America. Perennial honesty (*L. rediviva*) has pointed oval seedpod partitions and pale purple flowers.

honey, sweet, viscous liquid food, dark golden in colour, produced in the honey sacs of various bees from the nectar of flowers. Flavour and colour are determined by the flowers from which the nectar is gathered. Some of the most commercially desirable honeys are produced from clover by the domestic honeybee. The nectar is ripened into honey by inversion of the major portion of its sucrose sugar into the sugars levulose (fructose) and dextrose (glucose) and by the removal of excess moisture. Honey is stored in the beehive or nest in a honeycomb, a double layer of uniform hexagonal cells constructed of beeswax (secreted by the worker bees) and propolis (a plant resin collected by the workers). Honeycomb is used in winter as food for the larvae and other members of the colony. It is commonly sold by beekeepers as a delicacy, or the wax may be extracted for various purposes.

Honey contains about 18 percent water, is water soluble, and may granulate between 50° and 65° F (10° and 18° C). Somewhat acid, it has mild antiseptic properties and has been used in the treatment of burns and lacerations. One of the most easily assimilated foods, it is widely used in baked goods, candies, prepared fruits, cereals, and medicines.

Honey was almost the only source of sugar available to the ancients and was valued for its medicinal benefits. It was used to make mead, a fermented beverage, and was mixed with wine and other alcoholic drinks. In Egypt it was employed as an embalming material. In India and other Asian countries it was used to preserve fruit and make cakes, sweetmeats, and other foods. Honey is mentioned in the Bible and in the Qur'ān.

honey ant, any member of several different species of ant (family Formicidae; order Hymenoptera) that have developed a unique way of storing the honeydew, a by-product of digestion that is gathered mainly from the secretions of aphids and scale insects. A worker ant, fed by the others, is called a replete. The honeydew is stored in the replete's abdomen, which can become distended to many times its normal size. The replete hangs from the ceiling of an underground chamber, sometimes for months, until the ant colony needs the stored food. After stimulation, the replete regurgitates the sweet honeydew.

The different honey ants apparently evolved this method of storage independent of each other. They include *Melophorus, Leptomyrmex, Plagiolepis, Camponotus, Myrmecocystus,* and *Prenolepis.* In some countries honey ants are considered a great delicacy; either the entire replete or only the golden-coloured abdomen may be eaten.

honey badger (mammal): *see* ratel.

honey bear, either of two bear species, the sloth bear and the sun bear (*qq.v.*).

honey bell (*Hermannia verticillata*), rambling shrub, of the cacao, or chocolate, family (Sterculiaceae), native to Africa. Widely cultivated indoors, chiefly as a basket plant, it grows up to 15 centimetres (6 inches) tall and bears, in pairs, yellow, fragrant flowers about 1.5



Honey bell (*Hermannia verticillata*)
J.W. Wilburn

cm long and with five flat petals. The plant blooms in winter and early spring.

honey bush (*Melianthus major*), evergreen shrub, of the family Melianthaceae, native to southern Africa. Because of its sweet-scented flowers and handsome foliage, it is cultivated elsewhere, notably southern California.



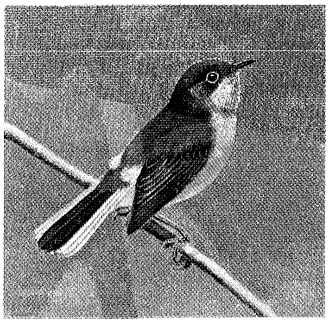
Honey bush (*Melianthus major*)
J.L. Watcham

The plant, which grows to about 3 metres (10 feet) tall, has fragrant, reddish-brown flowers borne in showy clusters. The fruit, a papery inflated capsule, contains black seeds.

honey guide, any of about a dozen species of birds constituting the family Indicitoridae (order Piciformes). The honey guide gets its name from two African species, the greater, or black-throated, honey guide (*Indicator indicator*) and the scaly-throated honey guide (*I. variegatus*), that exhibit a unique pattern of behaviour: the bird leads a ratel (honey badger) or a man to a bees' nest by its chattering and flying ahead; after the larger animal takes honey, the bird eats the wax (the only vertebrate known to do so) and bee larvae.

Eight other nonguiding species in Africa, one in the Himalayas, and one in Malaysia are also members of the family. All are small, tough-skinned birds that feed chiefly on bees

and wasps. Some are brood parasitic (*i.e.,* they lay their eggs in the nests of other birds),

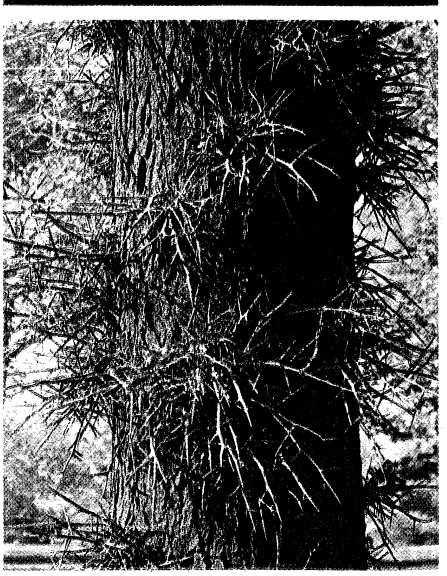


Cassin's honey guide (*Prodotiscus insignis*)
Painting by H. Douglas Pratt

usually choosing a hole nester (barbet, woodpecker) as foster parent. The hatchling has a pair of temporary bill hooks, which it uses to kill or injure the host's young.

honey locust, any of the thorny trees of the genus *Gleditsia,* in the pea family (Fabaceae),





(Top) Leaves and pods and (bottom) thorny trunk of honey locust (*Gleditsia triacanthos*)
John H. Gerard—EB Inc.

with about 12 species native to North and South America, tropical Africa, and central and eastern Asia. Some species are cultivated as ornamentals, such as *G. triacanthos* of North America. This tree grows to about 40 metres (about 130 feet) high but is generally lower under cultivation. It bears long compound leaves divided into as many as 30 oval leaflets, each of which is about 25 millimetres (about 1 inch) long. Some leaves may be doubly divided, in which case the leaflets are more numerous and smaller. The small, greenish white flowers are borne in clusters in the leaf axils. The fruit is a reddish brown, flattened pod, up to 45 centimetres (about 18 inches) long, sometimes sickle shaped and twisted. Brown, beanlike seeds lie within, separated by a sticky, sweet-tasting substance. The trunk and branches have clusters of stout, simple or branched thorns, 8 to 10 cm long.

A thornless variety, *Gleditsia triacanthos inermis,* is a popular city tree, valued for its slender growth habit, lacy effect, and light, filtered shade. It has given rise to several horticultural variants including the Sunburst locust, with bright-yellow new growth at twig ends, and the Ruby Lace locust, with reddish new growth. Thornless strains called Moraine, Shademaster, and Imperial are horticultural improvements of the green type.

honey tree: *see* raisin tree.

honeyballs (shrub): *see* buttonbush.

honeybee, in a broad sense, any insect of the tribe Apini (family Apidae, order Hymenoptera), which includes all bees that make honey; in a stricter sense, honeybee applies to any one of four members of the genus *Apis.* Usually the term is applied to one species, *Apis mellifera,* the domestic honeybee, sometimes known as the European domestic bee, or the western honeybee. The other *Apis* species are confined to Asia. *A. florea,* the little honeybee, occurs in central Asia, where it builds its nests in trees. *A. dorsata,* the giant honeybee, occurs in India, Indonesia, and central China; it sometimes builds combs nearly three metres (more than nine feet) in diameter. *A. indica,* the Eastern honeybee, is domesticated in parts of Asia. There are also a number of races, or subspecies, and strains of *Apis* species.

A. mellifera is about 1.2 centimetres (about ½ inch) long, although size varies among the several strains of this species. The head and thorax, or midsection, are somewhat bristly and vary in colour according to the strain. Two large compound eyes and three simple eyes, or ocelli, are located on top of the head. Keen eyesight is complemented by two sensitive, odour-detecting antennae.

All honeybees are social insects and live together in nests or hives. There are three castes, or classes: the workers, which are undeveloped females; queens, which are larger than the workers; and males, or drones, which are larger than the workers and are present only in early summer. The workers and queens have stings; the drones are stingless. Both queens and workers lay eggs, but only the queens' are fertilized with the drones' sperm and develop into females. Eggs of the workers develop into males. Queens are not hatched as queens; they become so when fed royal jelly, a substance produced by the salivary glands of the workers.

Eggs hatch in three days into larvae that are known as grubs. All the grubs are fed royal jelly at first, but only the future queens are continued on the diet. When fully grown, the grubs transform into pupae. Queens emerge in 16 days, workers in three weeks, and drones several days after the workers. After emerging, the queens fight among themselves until only one remains in the hive. She then attacks the old queen, who leaves the nest with a swarm to form a new colony.

The hive is a series of combs composed of two



Honeybee (*Apis mellifera*)
Ingmar Holmasen

layers of six-sided cells made of wax produced within the worker's body. Food in the form of honey (*q.v.*), plant nectar, and so-called bee bread, made from pollen, is stored in the cells.

honeycomb work (architecture): *see* stalactite work.

honeycreeper, any of the tropical American birds of the subfamily Coerebinae, family Emberizidae. Birds of the Hawaiian honeycreeper (*q.v.*) group constitute the family Drepanididae and are commonly referred to as drepanidids.

Certain of the 35 species of coerebine honeycreepers are called sugarbirds. Many feed on nectar, in tropical forests and gardens. All are small, most are brilliantly coloured, and many have thin, downcurved bills; the tongue is brushy and may be double-tubed. The red-legged, or blue, honeycreeper (*Cyanerpes cyaneus*) of Cuba and Mexico to Ecuador and southern Brazil is 13 centimetres (5 inches) long; the breeding male is shiny blue, with black upperparts and mask. The nest, typically a cup made in a forked twig, usually contains two eggs.

Some authors consider the subfamily Coerebinae to be a family; others place the group, or some members of it, with tanagers (Thraupinae) or wood warblers (Parulidae); and still others assign the bananaquit (*q.v.*), long grouped with the honeycreepers, to Parulidae, putting the remainder of the Coerebinae into a separate subfamily renamed the Dacninae.

Consult the INDEX *first*

honeyeater, any of the 170 species of the songbird family Meliphagidae (order Passeriformes), including some of the commonest birds of Australia, New Guinea, and the western Pacific islands.

The birds range in size from 10 to 35 centimetres (4 to 14 inches) and are drab, with subtly distinctive head markings. The bill is slender and somewhat downcurved, the tongue tubular and brush-tipped. Honeyeaters go about in pairs or in small flocks, feeding on nectar, insects, and fruit. Representative of the 40 species of the genus *Meliphaga,* most of which have ear tufts, is the 18-cm (7-in.) white-eared honeyeater (*M. leucotis*), of southern Australia. A colourful genus is *Myzomela,* with 25 species, found chiefly on islands of Oceania; males typically are red and black. The 11.5-cm (4.5-in.) scarlet honeyeater, or bloodbird (*M. sanguinolenta*), of eastern Australia sings a tinkling song in the midday heat.

Other members of the honeyeater family are called bellbirds, friarbirds, miners, and wattlebirds. The three wattlebirds (*Anthochaera*) are large for honeyeaters, about 35 cm (14 in.)

long, and are found in forests of eastern and southern Australia.

The Cape sugarbird (*Promerops cafer*) of southern Africa is often considered a member of this family.

honeysuckle, any of about 200 species of ornamental shrubs and climbers of the genus *Lonicera* (family Caprifoliaceae). Honeysuckle, native to temperate zones of both hemispheres, also grows in the Himalayas, southern Asia, and North Africa. Most have two-lipped, fragrant flowers and red, orange, or black berries. Perfoliate, or sweet, honeysuckle (*L. caprifolium*) is native to Eurasia but has become established in North America. Its clustered, night-blooming, purple-white flowers are pollinated mostly by night-feeding



Honeysuckle (*Lonicera*)
Sven Samelius

hawk moths because the flower tubes are too long for most other insects to reach the nectar. The fruit is a red-orange berry.

Another climbing species is the giant Burmese honeysuckle (*L. hildebrandiana*), with 15-centimetre (6-inch) deep-green leaves, 17-centimetre-long yellow flowers, and 2.5-centimetre green berries. The Japanese honeysuckle (*L. japonica*) of eastern Asia has become a weed in many areas by growing over other plants and shutting out light. It has fragrant, yellowish white flowers and black berries. Trumpet honeysuckle (*L. sempervirens*) has oval, sometimes joined leaves and climbs high in forest trees. Its orange-scarlet spikes of 5-centimetre-long, tubular, five-lobed flowers and red berries are common throughout eastern North America. Woodbine (*L. periclymenum*), native to Eurasia, twines to 6 m (20 feet). Its whorled, many-flowered clusters of yellowish, purple-tinged blooms are followed by red berries. Some of the more widespread shrub honeysuckles are Tartarian honeysuckle (*L. tartarica*), from southeastern Europe and Siberia, and four Chinese species: winter honeysuckle (*L. fragrantissima*), privet honeysuckle (*L. pileata*), box honeysuckle (*L. nitida*), and lilac honeysuckle (*L. syringantha*).

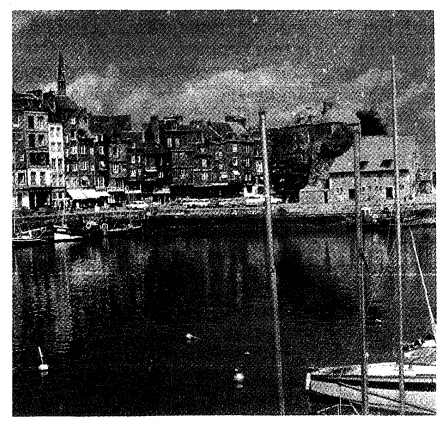
Honeywell Inc., major American multinational corporation, producer of electronic control systems and automation equipment. It is a major supplier of engineering services and production for the U.S. Department of Defense. Headquarters are in Minneapolis, Minn.

The company was founded in 1885 as the Consolidated Temperature Controlling Company, which pioneered the use of thermostats attached to motors. It was incorporated in 1927 as Minneapolis-Honeywell Regulator Company and acquired Minneapolis Heat Regulator Company and the Honeywell Heating Specialties Company. It then became a major producer of automatic dampers for the coal furnaces of the 1930s. As a defense contractor before the beginning of World War II, Honeywell created the first autopilot. It assumed its present name in 1964. Following its 1970 acquisition of General Electric's computer division, the company also grew to be one of the world's leading computer manufacturers; but in 1986 it formed a consortium with two foreign computer companies, Compagnie des Machines Bull of France and NEC Corporation of Japan, retaining only about 40 percent control of the new computer business.

Honeywell has operations in all of the 50 states and in major centres overseas. More than one-fourth of its revenues are generated by overseas sales. It provides automated equipment for environmental systems and controls, industrial systems and controls, aerospace and defense guidance systems and controls, and information systems. Its control systems are found in uses ranging from home heating systems to complex steel and chemical processing plants. The company manufactures computerized temperature control systems, as well as freeway traffic control systems. Military control equipment ranges from missile guidance systems to infrared reconnaissance equipment.

Honfleur, seaport, northern France, Calvados *département,* Basse-Normandie *région,* on the southern bank of the Seine Estuary, opposite Le Havre and west of Rouen. A yachting, tourist, and small fishing centre, it has a picturesque 17th-century harbour ringed with 15th- and 16th-century buildings.

The town, dating from the 11th century, changed hands many times in the Hundred Years' War (1337–1453) between England and France. The last period of English occupation was from 1418 to 1450. From the 16th to the 19th century the town prospered from its trade with the North American continent and with the East Indies. The French explorer Samuel de Champlain sailed to Canada from Honfleur in 1608 to found Quebec. In the 19th century Honfleur was supplanted as a port by Le Havre, becoming instead a resort favoured by artists and writers, a number of whom were born there. The Musée du Vieux-



The harbour, Honfleur, Fr.
Art Resource—EB Inc.

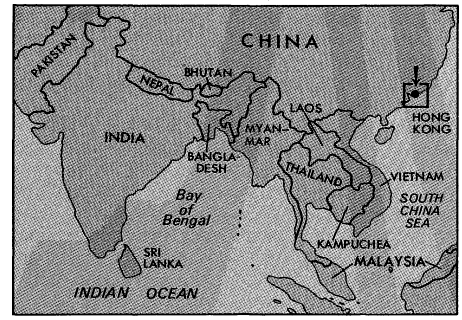
Honfleur, housed in the 14th–15th-century Church of Saint-Étienne, contains local maritime and folklore exhibits. The timber church of Sainte-Catherine, which looks like a ship upside down, was constructed in the 15th century by shipbuilders. It is separated from its wooden belfry, which is in the Place du Marché. Furniture making is the only major local industry. Pop. (1982) 8,125.

hong (Chinese guild): *see* cohong.

Hong, Song (river, China–Vietnam): *see* Red River.

Hong Chengchou (Chinese official): *see* Hung Ch'eng-ch'ou.

Hong Kong, Chinese (Pinyin) XIANGGANG, or (Wade-Giles) HSIANG-KANG, British crown colony located off the southern coast of Kwangtung *sheng* (province), China. It comprises the island of Hong Kong and adjacent islets, Stonecutters Island and the Kowloon Peninsula on the mainland, as well as the



Hong Kong

New Territories (a portion of the mainland, Lantau Island, and more than 230 other islands that were leased from China in 1898 for 99 years). The colony has an area of 412 square miles (1,067 square km). Hong Kong is about 27 miles (43 km) from north to south and 35 miles (56 km) from east to west; its only landward neighbour is China, which lies to the north. The remaining borders are on the South China Sea. The capital, Victoria, is located on the island of Hong Kong. Total population in 1990 was estimated at 5,841,000.

A brief treatment of Hong Kong follows. For full treatment, *see* MACROPAEDIA: Hong Kong.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. The peninsula and islands that form Hong Kong are part of a partially submerged section of a mountain range extending southwestward from southeastern China. The many mountain peaks are composed primarily of volcanic rock. The highest peak, located on the mainland, is Mount Tai Mo, reaching an elevation of 3,140 feet (957 m) above sea level. The colony is roughly divided into a northwestern lowland (the principal agricultural area) and a more densely populated southeastern area, with natural harbours and easy access to the sea. The two regions are separated by the Kowloon Ridge, which runs generally from the southwest (Lantau Island) to the northeast (near the border with China).

Situated just south of the Tropic of Cancer, Hong Kong has a tropical climate. Summers are humid, receiving more than half of the annual 85 inches (2,160 mm) of rainfall; July afternoon temperatures average about 91° F (33° C). Winters are cool and dry, receiving only about 10 percent of the annual precipitation; January afternoon temperatures average about 73° F (23° C). The typhoon season occurs mostly between July and October (occasionally November).

Hong Kong's agricultural cropland has been steadily decreasing. Only about 27 square miles (70 square km) remained in the late 1980s. An extensive reforestation program has restored part of the country's original forested area. Stands of pine, eucalyptus, banyan, and palm trees are common. Most of the land is under tropical herbaceous growth, including extensive mangrove swamps. The country has some 36 species of wild mammals, among them large numbers of bats and rodents.

The people. About 97 percent of the people of Hong Kong are Chinese, most of them coming from the neighbouring Chinese province of Kwangtung and lesser numbers from Fukien and other provinces. The most numerous of the regional groups are the Cantonese, who inhabit both rural and urban areas. Among

the major non-Chinese elements in the population are those from the Commonwealth countries, the Philippines, the United States, Portugal, and Japan.

Buddhists and Taoists far outnumber other religious groups in the colony, comprising about nine-tenths of the population. Christians comprise most of the remaining population, and there are smaller numbers of Muslims and Hindus.

Hong Kong has one of the highest population densities in the world, averaging more than 14,000 persons per square mile (5,400 persons per square km). The birth rate is one of the lowest in Asia and is only slightly above the colony's also low death rate. Birth-control and family-planning programs have been largely responsible for lowering the birth rate. High levels of immigration, however, have led to rapid growth in the size of the population since the 1950s. Because of the high proportion of adult immigrants, less than one-fourth of Hong Kong's population was under 15 years of age in the late 20th century. Virtually 100 percent of Hong Kong's people live in urban areas.

The economy. Hong Kong has a market economy based on light industry and thriving international trade. The gross national product (GNP) has experienced steady growth, and the GNP per capita is one of the highest in Asia. Economic benefits were tempered during the 1980s, however, by persistent inflation and steady erosion in some of the colony's traditional export markets.

Agriculture accounts for less than 1 percent of the GNP and employs about 1 percent of the labour force. Although agricultural yields have increased rapidly with new technologies, Hong Kong is not agriculturally self-sufficient. China is the main source of food imports. Rice, long the leading staple, is being replaced by more profitable vegetable crops.

The fishing industry is well developed. The ocean fishing fleet supplies marine fish for domestic consumption and for export, and fish farmers produce a significant percentage of the freshwater fish consumed domestically.

The mining industry is owned and operated by the British government. Mining accounts for only a very small percentage of the GNP. Feldspar and kaolin are mined by opencut methods.

Manufacturing accounts for roughly one-fifth of the GNP and employs more than one-third of the work force. Light manufacturing industries, producing mainly consumer goods, predominate. The construction industry has prospered as a result of a government commitment to furnish adequate public housing. Services account for the bulk of the GNP and employ about 45 percent of the work force.

Electricity is generated largely from imported petroleum. Production is adequate for domestic needs, and some electricity is exported to China. Hong Kong's per capita consumption of electrical energy is one of the highest rates in Asia.

Hong Kong has no central bank, and its currency is issued by two commercial banks. The United States, Japan, the United Kingdom, The Netherlands, and Switzerland account for most of the foreign industrial investment in Hong Kong.

Foreign trade is one of the most important sectors in the economy. Textile and clothing products dominate export business. Other exports include electronics, plastic products, toys, watches, clocks, and accessories. Reexported (or transit) goods account for more than one-third of total exports. The largest categories of imports are raw materials used in manufacturing, machinery, consumer items, and foodstuffs. The principal suppliers are China and Japan (about one-half of the total), Taiwan, and the United States. Principal markets are the United States (which receives about one-third of Hong Kong's exports), China, Germany, and the United Kingdom.

The colonial government of Hong Kong adheres to a free-port economic policy and levies import taxes only on tobacco, alcohol, and some hydrocarbon oils. In contrast, exports are under various restrictions. Hong Kong has the second largest containerized shipping terminal in the world. The Kai Tak airport is served by more than 30 international airlines.

Government and social conditions. Hong Kong is a British crown colony; executive power is vested in a governor appointed by the British monarch. The governor is advised by a Cabinet known as the Executive Council, which is composed of 4 ex officio members and 10 members selected by the governor under instructions from the British secretary of state. The Legislative Council, an appointed body with a maximum of 57 members, including the governor, and 3 ex officio members from the Executive Council, enacts legislation and approves budgets. The highest judicial authority is the 10-member Court of Appeal; judicial decisions are made largely according to English common law. Units of the British armed forces constitute Hong Kong's defense force.

The government's social welfare system provides benefits for unemployment, disability, and old age. It also offers low-cost medical care through public hospitals. Large-scale public health programs, sponsored by the government and voluntary health and welfare agencies, have improved health conditions. The colony's infant mortality rate, for instance, has dropped to one of the lowest levels in all Asia. The spread of contagious diseases such as tuberculosis remains a problem, however, greatly aggravated by Hong Kong's overcrowded conditions.

Primary education in the colony is free and compulsory; most schools provide instruction in Chinese, with English as a second language. The University of Hong Kong (1911), the Chinese University of Hong Kong (1963), and the Hong Kong Polytechnic (1972) are modeled on British systems.

Hong Kong has the most unrestricted press in Asia outside of Japan. Unlike the press, broadcasting is carefully regulated, and the government requires television stations to offer more than eight hours of educational programming each weekday.

Hong Kong's culture is Chinese, with Western influences. The Hong Kong Chinese Orchestra, formed in 1977, combines Western orchestral works with Chinese music and traditional Chinese musical instruments. The Hong Kong Museum of Art features a pictorial record of Sino-British contacts in the 18th and 19th centuries, as well as a variety of both Occidental and Oriental art. Hong Kong's so-called New Wave film directors, many of whom are Western-trained, have focused on international themes.

History. Evidence of human habitation in Hong Kong dates from Neolithic times. The excavated artifacts suggest an influence from northern Chinese Stone Age cultures, most notably the Lung-shan. Before the British occupation, Hong Kong Island was inhabited only by a small fishing population and was a haunt of pirates.

Britain's illegal opium trade in the early 19th century led to its acquisition of Hong Kong. In 1839 an antiopium campaign was launched in Canton by the Chinese government, resulting in a siege of the British factory there and confiscation of more than 20,000 chests of opium. The British retreated to Macau and demanded either a commercial treaty or a small island from which British operations could be conducted safely. Fighting in the waters off Hong Kong Island expanded into the first Opium War (1839–42). The Treaty of Nanking, which ended hostilities, ceded the island of Hong Kong to the British.

As Chinese power waned in the 19th century, Britain acquired more territory surrounding Hong Kong, including Stonecutters Island and the Kowloon Peninsula (1860), and a 99-year lease on the New Territories (an area comprising 235 islands off the mainland and mainland territory bordering the Kowloon Peninsula up to the Sham Chum River).

From these inauspicious beginnings, Hong Kong developed into a flourishing trading centre that attracted large numbers of Chinese immigrants, especially after the 1911 Revolution, then during the Japanese occupation of China, and most recently after the Chinese Civil War (1945–49).

The Japanese attacked Hong Kong at the same time they attacked Pearl Harbor, and, on Christmas Day, 1941, the island surrendered. When the British returned in 1945, economic recovery was tied to increased industrialization, based on the manufacture of cotton textiles. In 1982 Britain and China began talks concerning the 1997 expiration of the lease on the New Territories, and on Dec. 19, 1984, the British prime minister and Chinese premier signed an agreement that outlined the terms under which Hong Kong would become a special administrative region of China upon expiration of the lease.

Hong Rengan (Chinese rebel leader): *see* Hung Jen-kan.

Hong Shen (Chinese dramatist): *see* Hung Shen.

Hong Xiuquan (Chinese prophet): *see* Hung Hsiu-ch'üan.

Hongqi Qu (China): *see* Hung-ch'i Canal.

Hongren: *see* Hung-jen.

Hongshui He (China): *see* Hung-shui River.

Hongwei Bing (China): *see* Red Guards.

Hongwu (Chinese emperor): *see* Hung-wu.

Hongze Hu (China): *see* Hung-tse Lake.

Honiara, town, capital of the Solomon Islands, southwestern Pacific Ocean. The town is situated at the mouth of the Mataniko River on the north coast of Guadalcanal. A port and communications centre, it trades chiefly in coconuts, timber, fish, and a little gold (from Gold Ridge in the centre of the island). Henderson Airfield, the Solomons' international airport, is 10 miles (16 km) east. Prior to World War II the town did not exist; it developed around the site of the U.S. military headquarters. In 1952 it officially replaced Tulagi as the capital of the Solomons. Government buildings are on a narrow coastal strip behind Point Cruz. Pop. (1986 prelim.) 30,499.



Village on the outskirts of Honiara, Guadalcanal, Solomon Islands

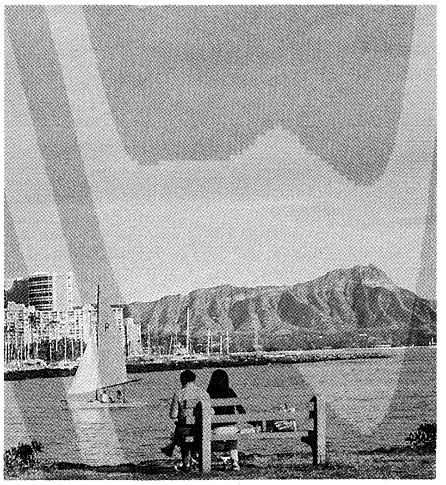
Milt and Joan Mann—Cameramann

Honiton lace, bobbin lace made in England at Honiton, Devonshire, from the 17th century. By *Honiton* most people, however, mean the lace made there in the 19th century in which strong floral motifs are

joined to a net (often spotted) background. The finest pieces have a fresh, easy naturalism that can be very attractive, but generally the designs are somewhat incoherent and have a less professional look than the similar Belgian laces.

Honnecourt, Villard de: *see* Villard de Honnecourt.

Honolulu, capital and principal port of Hawaii, U.S., seat of Honolulu county. A modern city, it extends about 10 miles (16 km) along the southeastern shore of Oahu Island and 4 miles (6 km) inland across a plain into the Koolau Mountain foothills. It is the crossroads of trans-Pacific shipping and air routes, the focus of interisland services, and



Ala Wai Yacht Basin and Diamond Head, Honolulu, Hawaii

Herb & Dorothy McLaughlin—Arizona Photographic Associates, Inc.

the commercial and industrial centre of the state. The city-county (area 597 square miles [1,545 square km]) comprises all of Oahu and some outlying islets, which have an area aggregate of only 3 square miles (8 square km) but extend for more than 1,300 miles (2,100 km) and constitute the Hawaiian and Pacific Islands National Wildlife Refuge. It is administered as a single entity and has about 80 percent of the state's population.

Hawaiian legend indicates a settlement at Honolulu (meaning "protected bay") in AD 1100. Overlooked by Captain James Cook and other early explorers, the harbour with its outlet through the reef of Nuuanu Stream and sheltered by Sand Island was entered by Captain William Brown in 1794. After 1820 Honolulu assumed first importance in the islands and flourished as a base for sandalwood traders and whalers. A Russian group arrived there in 1816, and the port was later occupied by the British (1843) and the French (1849) but was returned to King Kamehameha III, who on Aug. 31, 1850, officially declared Honolulu a city and the capital of his kingdom (Honolulu had been the de facto capital since 1845). In December 1941 the city and the adjacent Pearl Harbor naval-military complex came under Japanese aerial attack. Honolulu became a prime staging area for the remainder of World War II, a position it retained during the Korean War and until the end of the Indochina (Vietnam) conflict in 1973. Military expenditure remains an important source of income.

The port serves numerous manufacturing plants in the city-county, including pineapple canneries, sugar refineries, clothing factories, and steel, aluminum, oil, cement, and dairying enterprises. The international airport is one of the busiest in the United States, with nearby Waikiki as the primary destination of tourists.

Honolulu is the educational nucleus of the state and is the site of the University of Hawaii in Manoa Valley (1907) with its East-West Center (established in 1960 for technical and cultural exchange); Chaminade University (1955); several colleges, including Hawaii Pacific (1953), and Honolulu (1920) and Kapiolana (1964) community colleges; and the Kamehameha Schools (1887) for children of Hawaiian descent. The Bernice P. Bishop Museum (1889) has noted Polynesian collections, and the Honolulu Academy of Arts (1927), considered to be the cultural centre of Hawaii, sponsors a wide range of programs. Punchbowl, a 2,000-foot- (600-metre-) wide crater 1 mile (2 km) inland, contains the National Memorial Cemetery of the Pacific with some 24,000 graves of World War II, Korean, and Vietnam War dead. The focus of Honolulu's civic centre is the Iolani Palace (completed 1882); it is now a museum but served as the legislative seat until replaced by the nearby new State Capitol (an unusual rectangular structure featuring legislative chambers shaped like volcanoes and columns shaped like royal palms). Within a two-block radius of the palace are several historic buildings, including Kawaiahao Church (1841) and the early Mission Houses, built in the 1820s from lumber brought from Boston around Cape Horn by the first missionary contingents. The Library of Hawaii and the Honolulu Hale (City Hall) are also in the vicinity. Inc. city, 1909. Pop. (1988 est.) city, 376,100; metropolitan area (MSA), 838,500.

Honolulu Race (yachting): *see* Transpacific Race.

Honor, Medal of, byname CONGRESSIONAL MEDAL OF HONOR, the foremost U.S. military decoration, instituted by Congress in 1861 for the navy and in 1862 for the army, at first awarded only to enlisted men, with officers being permitted to receive the award later. It is given for "conspicuous gallantry and intrepidity at the risk of life, above and beyond the call of duty." The army medal has always been awarded solely for valour in combat, but the navy medal could be, and was, awarded for noncombat purposes such as lifesaving, although since 1942 it has been awarded only for combat.

The medal is suspended from a blue ribbon with a centre pad containing 13 white stars. The army medal is formed of a bronze star with the head of Minerva in the centre, suspended from a bar bearing the word "Valor" on which sits an eagle with outspread wings. The reverse of the bar has "The Congress to . . ." and the name of the recipient. The naval design has a star suspended from an anchor with the centre device showing Minerva repulsing Discord. The air force design has a centre device displaying the head of the Statue of Liberty; the star is suspended from a thunderbolt with a bar marked "Valor."

honorific, a grammatical form used in speaking to a social superior. In English it has largely disappeared, retained only in the use of the third person when speaking to someone clearly superior in rank ("Does your highness wish it?"). In other Indo-European languages it has a vestigial form in the degree of formality attached to the use of second-person pronouns: *e.g.,* in German *Sie* ("you") rather than the familiar *du* ("you," or "thou").

Japanese, Korean, and Javanese have extensive honorific systems, influencing vocabulary, verb conjugation, and the inflection of nouns. Nothing can be expressed in Japanese without at the same time expressing a level of politeness related to the speakers' sexes, ages, relative status, and degree of intimacy. In Japanese the deferential prefix *o-* can be attached to the addressee's name or to an object being discussed. The frequent use of *o-* shows refinement. Japanese has 10 words for "I" (differentiated by sex, formality, social status, and so on) and even an honorific, *kun,* to be used among boys.

Honorius, name of rulers grouped below by country or papacy and indicated by the symbol •.

PAPACY

• Honorius I (b. Roman Campania [Italy]—d. Oct. 12, 638), pope from 625 to 638 whose posthumous condemnation as a heretic subsequently caused extensive controversy on the question of papal infallibility.

Nothing is known of his life before he became pope; he was elected to succeed Pope Boniface IV on Oct. 27, 625. Modeling his pontificate after Pope St. Gregory I the Great, he worked for the Christianization of the Anglo-Saxons, bestowing the pallium (*i.e.,* the symbol of metropolitan jurisdiction) on Archbishop St. Honorius of Canterbury and Bishop St. Paulinus of York, inducing the Christian Celts to accept the Roman liturgy and date of Easter and dispatching St. Birinus (later bishop of Dorchester) to mission in the ancient English kingdom of Wessex.

Influential in Italy, Honorius helped rescue Roman structures from ruin and sponsored a restoration program of important Christian edifices, including Santa Agnese Fuori le Mura. He ended the schism caused when Istria was among certain provinces refusing to accept the second Council (553) of Constantinople's condemnation of the Three Chapters, a massive theological controversy between West and East over the Nestorian church. In cooperation with several church councils, Honorius reorganized the church in Spain's recently converted Visigothic kingdom.

The crux of Honorius' pontificate was his role in the Byzantine church's controversy concerning monophysitism, a heresy teaching that Christ has only one nature rather than two (*i.e.,* human and divine), and monothelitism, a related heresy maintaining that Christ has only one will. When in 634 Patriarch Sergius of Constantinople called for an end to the controversy and proposed that both East and West support the doctrine of "one will" in Christ, Honorius replied by referring to the Council of Chalcedon's confession of faith (451), which held that Christ's natures were indivisible and which he interpreted as meaning a single will in Christ. He then forbade further discussion on the subject.

In 680 the third Council of Constantinople was summoned by the Byzantine emperor Constantine IV Pogonatus to settle the controversy, which still raged. Because the council decreed that Christ had two wills, Honorius' doctrine was condemned as being



Honorius I, detail from a 7th-century mosaic, in the apse of the Church of Santa Agnese, Rome

Alinari—Art Resource/EB Inc.

pro-monothelitic. Pope St. Leo II confirmed the condemnation in 682, saying that Honorius "allowed the immaculate faith to be stained" by teaching not "in accord with apostolic tradition." Refusing to accept Honorius' doctrine, his successors condemned monothelitism, thus straining relations between Rome and Constantinople. Further, his questionable orthodoxy was revived and used by opponents of papal infallibility at the first Vatican Council (1869–70). Honorius' defenders denied that his statements were official, maintaining that his teaching was imprudent rather than heretical, and many scholars believe that it is debatable whether he was a heretic. They hold that he seems to have misunderstood the point at issue, noting that his language is partially vague.

• **Honorius (II),** original name CADELO, Latin CADALUS (b. 1009/10, Verona?, March of Verona and Aquileia [Italy]—d. 1072, Parma?, Lombardy), antipope from 1061 to 1072.

As bishop of Parma (*c.* 1045), he opposed the church reform movement of the second half of the 11th century led by Cardinal Hildebrand (later Pope Gregory VII). With his fellow reformers, Hildebrand had swayed the election of Alexander II as pope (Sept. 30, 1061), without the sanction of the Holy Roman emperor.

Aided by Lombard and German bishops, Empress Agnes—mother of the German king Henry IV (later emperor)—had Cadalus chosen pope at Basel, Upper Burgundy, as Honorius II (Oct. 28, 1061). He was installed at Rome by force of arms in April 1062. Duke Godfrey of Tuscany succeeded in persuading Honorius and Alexander to await an imperial decision over which contender was the legal pope. The schism soon ceased, for Agnes lost the regency when Henry was kidnapped by a group of nobles led by Archbishop Anno of Cologne. Anno, Agnes' successor, ordered an investigation that chose Alexander as pope. In May 1063 Cadalus again established himself in Rome but left in 1064, when the Council of Mantua, Tuscany, favoured Alexander. Cadalus then lived in obscurity, apparently maintaining his claims to the end.

• **Honorius II,** original name LAMBERTO SCANNABECCHI (b. Fagnano, near Imola, Romagna [Italy]—d. Feb. 13, 1130, Rome), pope from 1124 to 1130.

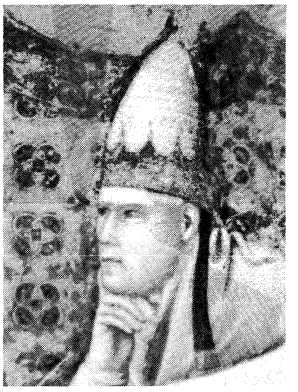
Made cardinal bishop of Ostia (1117) by Pope Paschal II, he became Pope Calixtus II's emissary to Germany. At the Concordat of Worms (1122) he helped to end the investiture controversy, a conflict flourishing in the 11th and 12th centuries over whether the papacy or the Holy Roman emperor had the right to appoint the clergy to clerical offices. In the conclave to elect Calixtus' successor, the choice of Honorius was challenged by a faction supporting Cardinal Teobaldo Buccapeco (Antipope Celestine II). When Honorius offered to resign, the cardinals renewed his election (Dec. 20, 1124).

His pontificate achieved reform within the church and peace between the Holy See and world rulers. Honorius supported the election of Count Lothair II/III of Supplinburg as the German king (1125). He ensured amicable relations with Lothair by excommunicating Lothair's rival, Conrad of Hohenstaufen (later the German king Conrad III). When Count Roger II of Sicily and Calabria (later king of Sicily) had himself created duke of Apulia, Honorius raised a league of cities and barons in rebellion against Roger, who defeated Honorius' army and forced the pope to invest him as duke in return for his oath of fealty. Honorius' death was followed by a schism in which Roger supported Antipope Anacletus II against Honorius' successor, Innocent II.

• **Honorius III,** original name CENCIO SAVELLI (b. Rome [Italy]—d. March 18, 1227, Rome), pope from 1216 to 1227, who is often considered one of the great administrators in papal history.

A Roman aristocrat, he became treasurer of the Holy See in 1188. He was made cardinal priest by Pope Innocent III, whom he succeeded on July 18, 1216, and whose policies he developed, particularly on church reform and on the recovery of the Holy Land from the Muslims.

Honorius immediately activated Innocent's plan, already endorsed by the fourth Lateran Council (1215), for a crusade to restore the kingdom of Jerusalem. The crusade was to be led by his former pupil, King Frederick II of Sicily, but Frederick evaded his vow because of a complex papal–imperial dispute over Sicily. The king opposed Honorius for perpetuating Innocent's desire to bring Sicily under the rule of the papacy. Having been twice crowned king of the Germans (1212 and 1215), and having had Honorius confirm the election of his nine-year-old son King Henry VII of Sicily as king of the Romans (1220), Frederick furthered his ultimate plan to unite all of Italy under imperial domination. In June 1219 quarreling Roman families forced Honorius to flee to Viterbo, Italy. Frederick reconciled the rebellious Romans with Honorius, who, despite his misgivings, crowned Frederick emperor in Rome on Nov. 22, 1220, and finally gave Frederick permission to keep the



Honorius III, detail from a fresco by Giotto in the Church of San Francesco, Assisi, Italy

Alinari—Art Resource/EB Inc.

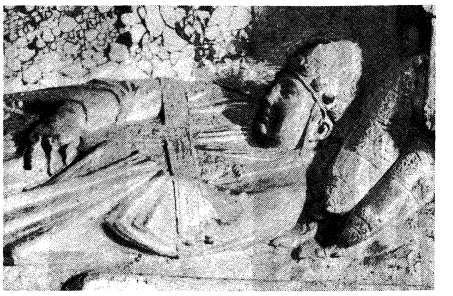
Holy Roman Empire and Sicily united. After Frederick repeatedly postponed the crusade, in 1225 Honorius threatened to excommunicate him if he did not embark on the crusade by August 1227; Frederick's crusade did not commence until after Honorius' death.

Throughout his conflict with Frederick, Honorius adroitly managed to keep peace among quarreling Catholic states. He undertook a crusade in 1218 against the Moors in Spain, where he also kept peace between the feuding kings St. Ferdinand III of Castile and Alfonso IX of León. In 1223 he settled the Barons' War in England that followed the death of King John by threatening to excommunicate all who supported Prince Louis (later King Louis VIII) of France over John's nine-year-old son and papal vassal, King Henry III. In 1225 he brought about the release of King Valdemar II of Denmark, who had been imprisoned by Count Heinrich of Schwerin.

In 1226 he bade Louis VIII direct the crusade begun by Innocent against the Albigenses, a heretical Christian sect, in southern France. Under Honorius, three new orders were approved: the Dominicans (1216), the Franciscans (1223), and the Carmelites (1226). *Compilatio quinta* ("Fifth Compilation"), a collection of his decretals, is regarded as the first official book of canon law. He also wrote lives of popes Celestine III and St. Gregory VII.

• **Honorius IV,** original name GIACOMO SAVELLI (b. 1210?, Rome [Italy]—d. April 3, 1287, Rome), pope from 1285 to 1287.

Grandnephew of Pope Honorius III, he studied at Paris and was made cardinal in 1261 by Pope Urban IV. Although old and crippled, he was elected on April 2, 1285, to succeed Pope Martin IV. His pontificate favoured the



Honorius IV, detail from a monument, 14th century; in the Church of Santa Maria in Aracoeli, Rome

Alinari—Art Resource/EB Inc.

mendicant orders (*i.e.*, religious orders avowing poverty and mobility) and promoted the study of Oriental languages at the University of Paris to aid those working toward a reunion of Western and Eastern churches. In his striving to restore Sicily to papal vassalage, he clashed with King Peter III of Aragon, who supported Sicilian independence.

ROMAN EMPIRE

• **Honorius,** in full FLAVIUS HONORIUS (b. Sept. 9, 384—d. Aug. 15, 423), Roman emperor in the West from 393 to 423, a period when much of the Western Empire was overrun by invading tribes and Rome was captured and plundered by the Visigoths. The younger son of Theodosius I (emperor 379–395) and Aelia Flacilla, Honorius was elevated to the rank of augustus by Theodosius on Jan. 23, 393, and became sole ruler of the West at age 10, upon his father's death (Jan. 17, 395). His brother Arcadius was the Eastern emperor.

During the first half of Honorius' reign, power was exercised by his master of soldiers, Flavius Stilicho. In 398 the emperor married Stilicho's daughter Maria. When Maria died he married her younger sister, Thermantia, but terminated the union after Stilicho was executed on suspicion of treason in August 408.

During this early period of Honorius' reign, the Vandals, Alani, and Suebi plundered Gaul (406) and then crossed into Spain. Imperial defenses deteriorated to such an extent that in 409 Honorius notified the cities of Britain that they could not rely on Rome for reinforcements against tribal incursions. In August 410 the Visigoths, under Alaric, occupied Rome, and Honorius fled to Ravenna. He watched from there while loyal generals overthrew usurpers and rebels, including Priscus Attalus, Maximus, and Jovinus. In 411 the rival emperor Constantine III of Gaul and Britain was crushed by Constantius, Honorius' master of the soldiers. Constantius died late in 421, only a few months after Honorius had proclaimed him co-emperor. Constantius' son, Valentinian III, succeeded Honorius as emperor of the West.

Honorius was one of the weakest of the Roman emperors. When he did intervene in politics, his actions were usually disastrous; thus, if he had been less obstinate in rejecting terms offered by Alaric before 410, Rome might have been spared the Gothic occupation.

Honos, ancient Roman deified abstraction of honour, particularly as a military virtue. The earliest shrine of this deity in Rome was per-

haps built not earlier than the 3rd century BC and was located just outside the Colline Gate. A double temple of Honos and Virtus stood outside the Porta Capena, and another, built by Marius, was probably located on the Capitoline Hill.

Honour, Order of the Legion of: *see* Legion of Honour, Order of the.

Honourable Company of Edinburgh Golfers, one of the world's oldest golfing societies, founded in 1744 by a group of gentlemen who played on a five-hole course at Leith, which is now a district of Edinburgh. In that year the group petitioned the city officials of Edinburgh for a silver club to be awarded to the winner of a golf competition. It further established the earliest-known rules of the game, a code of 13 articles recorded in its first minute book. They were adopted almost without change in 1754 by the Royal and Ancient Golf Club of St. Andrews, later to become the governing body for the sport in Great Britain. The Honourable Company later transferred its activities farther east to the town of Musselburgh and then to the Muirfield course, with which it had been associated in modern times.

Honshu, largest of the four main islands of Japan, lying between the Pacific Ocean (east) and the Sea of Japan (west). It forms a northeast–southwest arc extending about 800 miles (1,287 km) and varies greatly in width. The coastline extends 7,571 miles (12,182 km). Honshu has an area of 89,185 square miles (230,989 square km) and contains almost three-fourths of the total number of *ken* (prefectures) of Japan.

Honshu is regarded as the Japanese mainland. Much of the country's early history took place in its southern region. The Pacific coast is the country's main economic centre, lined with the metropolitan areas of Tokyo–Yokohama and Ōsaka–Kōbe. Honshu contains Japan's largest mountain, Mount Fuji, and its largest lake, Lake Biwa.

Hontan, Louis-Armand de Lom d'Arce, baron de La: *see* La Hontan, Louis-Armand de Lom d'Arce, baron de.

Hontheim, Johann Nikolaus von, pseudonym JUSTINUS FEBRONIUS (b. Jan. 27, 1701, Trier [Germany]—d. Sept. 2, 1790, Montequentin, Luxembourg), historian and theologian who founded Febronianism, the German form of Gallicanism, which advocated the restriction of papal power.

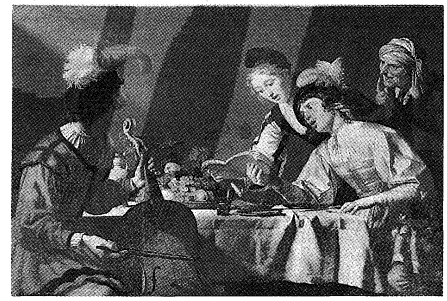
Hontheim's extensive European travels brought him to Rome, where he was ordained a Roman Catholic priest in 1728. He became professor of civil law at the University of Trier in 1734 and parish priest at Koblenz, Trier, in 1739. In 1748 he was appointed auxiliary bishop and vicar-general of Trier.

Under the pseudonym Justinus Febronius he published in 1763 his most important work, *De Statu Ecclesiae et Legitima Potestate Romani Pontificis* ("Concerning the State of the Church and the Legitimate Power of the Roman Pope"). Moved by concern over a divided Christendom and influenced by 18th-century rationalism, Hontheim urged the limitation of papal power and its subjection to the bishops (the pope's equals, among whom he is first) and to general councils. His motive was to attract German Protestants to the Roman Catholic church by removing Protestant fears of the papacy. He reinforced this motive by pointing out that sovereigns are not subject to the pope and stipulating that sovereigns and bishops must resist the Roman tendency to encroach on their powers.

Despite Hontheim's avowed intention not to attack papal power but to strengthen it by defining its limits, *De Statu* was condemned at Rome in February 1764 and placed on the *Index of Forbidden Books*. On the following May 21, Pope Clement XIII commanded all German bishops to suppress it. In 1781 Hontheim published a formal retraction, but its silence on the question of papal political power caused some subsequent doubt. He was reconciled with the church shortly before his death.

Honthorst, Gerrit van, byname GHERARDO DELLA NOTTE (b. Nov. 4, 1590, Utrecht, Neth.—d. April 27, 1656, Utrecht), Dutch painter, a leading member of the Utrecht school influenced by the Italian painter Caravaggio.

Like his slightly older contemporary Hendrik Terbrugghen, Honthorst first studied under Abraham Bloemaert in Utrecht. In about 1610 he moved to Italy, where he had leading



"A Concert," painting by Gerrit van Honthorst, *c.* 1619–21; in the Borghese Gallery, Rome

SCALA,—Art Resource/EB Inc.

nobles as patrons and assimilated Caravaggio's realism and dramatic use of artificial light into a personal idiom. Notable works of his Italian sojourn include "The Beheading of St. John the Baptist" (S. Maria delle Scala, Rome), "Christ Before the High Priest" (*c.* 1617, National Gallery, London), and the "Supper Party" (1620, Uffizi, Florence), all nocturnal scenes. Returning to the Netherlands in 1620, Honthorst stayed in Utrecht until 1627, the year of Rubens' visit to his home. He was dean of the Utrecht Guild of St. Luke in 1625–26, and in 1628 he worked at the court of Charles I in London. The rest of his life was spent primarily in The Hague and, after 1652, at Utrecht.

Although Honthorst accepted commissions for decorative cycles and painted at least one illusionistic ceiling, his most significant contribution to Dutch painting was his joint leadership, with Terbrugghen, of the Utrecht followers of Caravaggio. Rembrandt's use of Caravaggesque devices in his early works derives in large part from his knowledge of Honthorst's paintings. Honthorst's brother Willem van Honthorst (1594–1666), who was also an accomplished painter, sometimes worked with him.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

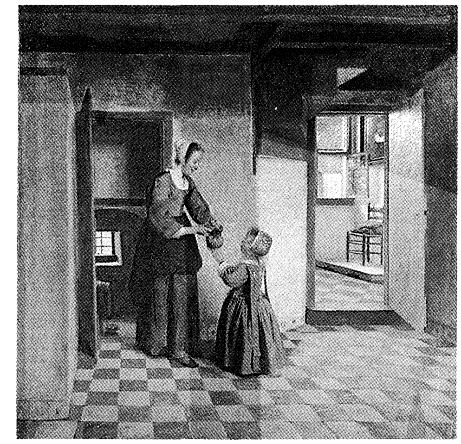
Honwana, Luís Bernardo (b. November 1942, Lourenço Marques, Mozambique), journalist and one of Africa's outstanding short-story writers, who has been praised for poetic insight in his portrayal of village life in Mozambique.

Honwana grew up in Moamba, a suburb of the capital city Lourenço Marques (now Maputo). He held jobs as a government cartographer and as reporter and then editor of two newspapers in Beira (Mozambique's second largest city) while working toward his secondary degree. After completing high school he devoted himself to literary activities. In *Nós Matámos a Cão Tinhosa* (1964; *We Killed Mangy-Dog & Other Stories*), he is never didactic, but beneath the deceptively simple surface of his narrative is an implied criticism of a society that has adopted the wrong values. His stories exhibit deep understanding of human experiences and needs. His writing was interrupted by imprisonment (1964–67) for his political activities. Upon his release he moved to Portugal for three years and spent some time in Switzerland, Algeria, and Tanzania before returning home to work with the transitional government. By 1984 he was chief of staff to the president of Mozambique and had completed a novel. He also made several documentary films.

Hooch, Pieter de, Hooch also spelled HOOGH, or HOOGHE (baptized Dec. 20, 1629, Rotterdam, Neth.—d. *c.* 1684, Amsterdam?), Dutch genre painter of the Delft school, noted for his interior scenes and use of light.

Hooch was a pupil of Claes Berchem at Haarlem. From 1653 he was in the service of Justus de Grange and lived in Delft, The Hague, and Leiden. From 1654 to 1657 he was a member of the painters' guild of Delft, but after that date there are no traces of his career until about 1667, when his presence was recorded in Amsterdam.

His work, both in style and subject matter, shows affinity with the painting of Vermeer, who was living in Delft at the same time. His paintings, like Vermeer's, are small works that display perfect finish and a great power of compositional discrimination. Though he sometimes painted open-air scenes—*e.g.*, "A Woman and Her Maid in a Court" (1658; National Gallery, London)—and tavern gen-



"The Pantry," oil painting by Pieter de Hooch, *c.* 1658; in the Rijksmuseum, Amsterdam

By courtesy of the Rijksmuseum, Amsterdam

res—*e.g.*, "Backgammon Players" (*c.* 1653; National Gallery of Ireland, Dublin)—he preferred painting two or three figures occupied with humble daily duties in a sober interior, the still atmosphere of which is broken only by the radiant entry of outdoor light illuminating the scene—*e.g.*, "The Pantry" (*c.* 1658; Rijksmuseum, Amsterdam), "A Mother Beside a Cradle" (*c.* 1659–60; Staatliche Museen Preussischer Kulturbesitz, Berlin), and "At the Linen Closet" (1663; Rijksmuseum, Amsterdam). These depictions of the serene simplicity of Dutch domestic life are free of sentimentality. Largely done between about 1655 and 1663 while de Hooch was living in Delft, they are considered his best works. In them he was preoccupied with the relation of light to different surfaces, the effect of enclosures and apertures on light intensity, the variation of tone, the complex arrangement of spatial units, and linear perspective.

Hood, John B(ell) (b. June 1, 1831, Owingsville, Ky., U.S.—d. Aug. 30, 1879, New Orleans), Confederate officer known as a fighting general during the American Civil War,

whose vigorous defense of Atlanta failed to stem the advance of Gen. William T. Sherman's superior Federal forces through Georgia in late 1864.

A graduate of West Point who served in the U.S. Cavalry until the outbreak of hostilities,



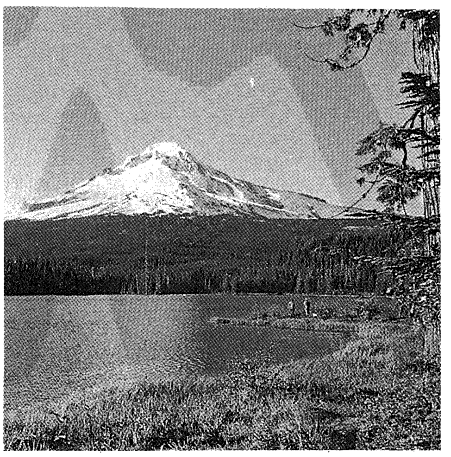
John Hood

By courtesy of the Library of Congress, Washington, D.C.

Hood rapidly rose to the rank of colonel in the Confederate Army. He was seriously wounded at the Battle of Gettysburg (July 1863), where he commanded an assault on the Federal left at Round Top, and lost a leg at the Battle of Chickamauga (September).

In the spring of 1864, Hood was appointed a lieutenant general under Gen. Joseph E. Johnston to help defend Atlanta against Sherman's forces. Johnston's continual withdrawals impelled Confederate president Jefferson Davis to transfer the command in July to Hood, whom he considered more aggressive. In a vain effort to save Atlanta, Hood promptly attacked but was forced back into the city, which he held for five weeks. He then led his men on a long march north and west, intending to strike Sherman's rear. This plan was thwarted, however, when he was confronted by the Army of the Cumberland, under Gen. George H. Thomas, which had moved back to check him. Two battles ensued in Tennessee—Franklin (November) and Nashville (December)—both decisive defeats for Hood, whose retreating army was pursued by Thomas and virtually destroyed. His command ended at his own request the following month. He spent his retirement years in New Orleans in business and in writing his memoirs.

Hood, Mount, highest peak (11,235 ft [3,424 m]) in Oregon, U.S., in the Cascade Range, 45 mi (70 km) east-southeast of Portland. It is an extinct volcano that last erupted about 1865. First sighted in 1792 by the English navigator William Broughton, and named for the British admiral Lord Hood, the snowcapped peak was used as a landmark by early settlers. It is the focal point of Mt. Hood National Forest, a popular tourist and recreation area.

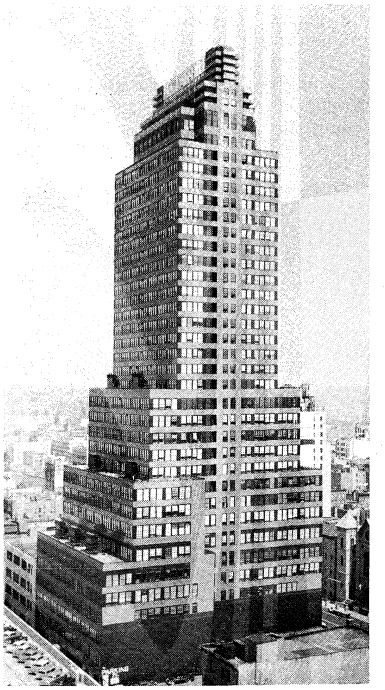


Mt. Hood as seen from Trillium Lake, Oregon

Bob and Ira Spring—EB Inc.

Hood, Raymond M(athewson) (b. March 29, 1881, Pawtucket, R.I., U.S.—d. Aug. 14, 1934, Stamford, Conn.), U.S. architect noted for his designs of skyscrapers in Chicago and New York City.

Educated at the Massachusetts Institute of



McGraw-Hill Building, New York City, designed by Raymond Hood and J.A. Fouilhoux, 1930–31

McGraw-Hill

Technology and the École des Beaux-Arts (Paris), Hood gained national recognition in 1922 when the Neo-Gothic design submitted by John Mead Howells and his associate, Hood, won first prize in the Chicago Tribune Building competition. The Tribune Building was one of many Neo-Gothic skyscrapers influenced by Cass Gilbert's Woolworth Tower (New York City, 1913). Later, in partnership with J.A. Fouilhoux, Hood turned away from revival of past styles. Their Daily News (New York City, 1930) and McGraw-Hill buildings (New York City, 1930–31) have cleaner lines, foreshadowing their Rockefeller Center (New York City, 1929–40), a 14-building complex in which two other architectural firms—Reinhard & Hofmeister; and Corbett, Harrison and MacMurray—collaborated.

Hood (of Whitley), Samuel Hood, 1st Viscount, also called (1782–96) BARON HOOD OF CATHERINGTON (b. Dec. 12, 1724 —d. Jan. 27, 1816), British admiral who served during the Seven Years' War and the American and the French Revolutionary wars.

Hood entered the navy in 1741, becoming a lieutenant in 1746. During the Seven Years' War he served in the English Channel and then the Mediterranean. In 1778, after further service in North America, he became commissioner of the dockyard at Portsmouth and governor of the naval academy.

He was promoted rear admiral in 1780 and sent to the West Indies and the coast of North America as second in command under Rodney.

In the West Indies he was for a time in independent command because of Rodney's absence in England: and, when the British islands of St. Kitts and Nevis were attacked by the French admiral Comte de Grasse, Hood, after initial defeats, succeeded in beating off the attacks of the enemy. He was made an Irish peer for his share in the defeat of de Grasse on April 9 and 12 near Dominica.

On the outbreak of the French Revolutionary War, Hood was sent to the Mediterranean as commander in chief. His period of command (May 1793–October 1794) was extremely active. In August 1793 Hood occupied Toulon on the invitation of the French royalists and in cooperation with the Spaniards. In December of the same year the allies, who did not work harmoniously together, were driven out of the city, mainly by the generalship of Napoleon.

In October 1794 Hood, who was then a full admiral, was recalled to England. He held no further command at sea, but in 1796 he was named governor of Greenwich Hospital, a post he held until his death. A peerage of Great Britain was conferred on his wife as Baroness Hood of Catherington in 1795, and he was himself created Viscount Hood of Whitley in 1796.

Hood, Thomas (b. May 23, 1799, London—d. May 3, 1845, London), English poet whose humanitarian verses, such as "The Song of the Shirt," served as models for a whole school of social-protest poets, not only in Britain and the U.S. but in Germany and Russia, where he was widely translated. He also is notable as a writer of comic verse, having originated several durable forms for that genre.

The son of a bookseller, Hood was apprenticed to an engraver as a young boy. In 1815 he was sent to Dundee for his health's sake (his lifelong illness is thought to have been rheumatic heart disease). On his return to London in 1817 he resumed work as an engraver and then became a "sort of sub-editor" of the *London Magazine* during its heyday, when its circle of brilliant contributors included Charles Lamb, Thomas De Quincey, and William Hazlitt. In 1827 he published a volume of poems strongly influenced by Keats, *The Plea of the Midsummer Fairies.* Several of the poems in it suggest that Hood might possibly have become a poet of the first rank. However, the success of his amusing *Odes and Addresses to Great People* (1825), written in collaboration with his brother-in-law, J.H. Reynolds, virtually obliged him to concentrate on humorous writing for the rest of his life.



Thomas Hood, detail of an oil painting by an unknown artist; in the National Portrait Gallery, London

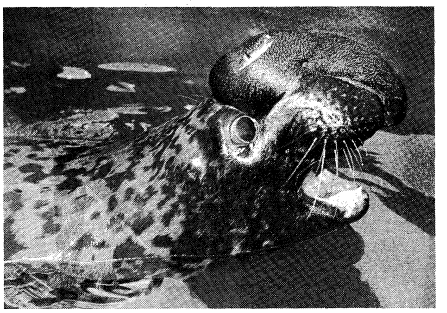
By courtesy of the National Portrait Gallery, London

There is something sinister about Hood's sense of humour, a trait that was to reappear in the "black comedy" of the latter 20th century. His pages are thronged with comic mourners and undertakers, and a corpse is always good for a laugh. He was famous for his punning, which appears at times to be almost a reflex action, serving as a defense against painful emotion. Of his later poems, the grim ballads "The Dream of Eugene Aram, the Murderer" and "The Last Man," "The Song of the Shirt," "The Lay of the Labourer," and "The Bridge of Sighs" are moving protests against social evils of the day—sweated labour, unemployment, and the double sexual standard.

Hood Island (Galápagos Islands): *see* Española Island.

Hood River, city, seat of Hood River County, northern Oregon, U.S., on the Columbia River, there bridged to White Salmon, Wash., 60 mi (97 km) northeast of Portland. It lies at the mouth of the Hood River, which was probably named after the British admiral Lord Hood. Settled in 1854, its development began after the railroad arrived in the 1880s. Vast acreages of land were planted in orchards in the 1890s; the first shipment of apples to the eastern U.S. in 1900 stimulated the Pacific Northwest's fruit industry. The cultivation and processing of fruit (apples, pears, cherries, and strawberries) continues to be the city's basic economic activity. The Hood River County Historical Museum is in the city, and Mount Hood National Forest and Bonneville Dam are nearby. Inc. 1895. Pop. (1980) 4,329.

hooded seal, also called BLADDERNOSE SEAL (*Cystophora cristata*), dark-faced seal of the family Phocidae, found in open waters of the North Atlantic and Arctic oceans. It is characterized by a large "hood" on the top

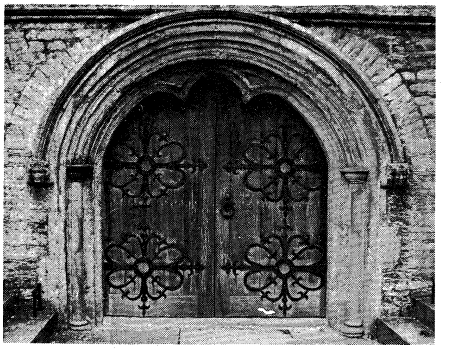


Hooded seal (*Cystophora cristata*)
Tierbilder Okapia—Frankfurt am Main

of the snout. Grayish with either light or dark blotches (less distinct in the female), the hooded seal is gregarious and apparently feeds mainly on fish. The adult male may be about 3.5 metres (12 feet) long and weigh 400 kilograms (880 pounds); the female is smaller. Because of overhunting, the hooded seal is no longer numerous enough to be of much commercial importance. It is frequently found living near the harp seal.

hooded shrimp, any member of the order Cumacea (superorder Peracarida), a group of small marine crustaceans immediately recognizable by their unusual body shape. The head and thorax is robust and inflated, in sharp contrast to the slender, cylindrical, flexible abdomen from which extends a long, forked tail. About 1,000 species are known. The body of most hooded shrimp measures from 2 to 10 millimetres (0.08 to 0.4 inch) long, though that of the giant arctic species *Diastylis goodsiri* occasionally reaches a length of more than 30 mm. Cumaceans are sometimes found intertidally, but they are most abundant in shallow offshore waters. They also are numerous in the deep sea. Many species live buried in mud or sand, feeding on microorganisms or organic detritus. Nearly all of them, however, can swim well, especially the males, which in some species swarm in surface waters at night. Eggs and newly hatched young are carried in a ventral brood pouch.

hoodmold, also called DRIPSTONE, or LABEL, molding projecting from the face of the wall, immediately above an arch or opening whose curvature or outline it follows. The hoodmold, which originated during the Romanesque period to protect carved moldings and to direct rainwater away from the opening, was later developed into an important decorative feature. It appears almost universally over exterior arches in the Gothic architecture of France, Germany, and Spain; and in England it was commonly used in interior work, especially for nave arcades.



Hoodmold on the west door of the Bishop's palace chapel, Somerset, England, 1220–30
By courtesy of the Courtauld Institute of Art, London; photograph, Peter Draper

In profile the hoodmold generally has a downward sloping upper surface and a hollow below to act as a drip; at its lower end, near the spring of the arch, it either rests upon the capital of a column or terminates on the wall in the form of a carved, ornamented boss (decorative projection designed to cover the intersection of ribs in a vault). When used in a place other than an arch or opening, it is known as a drip mold.

hoof-and-mouth disease: *see* foot-and-mouth disease.

Hooft, Pieter Corneliszoon (b. March 16, 1581, Amsterdam—d. May 21, 1647, The Hague), Dutch dramatist and poet, regarded by many as the most brilliant representative of Dutch Renaissance literature. Hooft's prose style continued to provide a model into the 19th century.

During three years spent in France and Italy, Hooft came completely under the spell of the new learning and art; the impact of that ex-



Hooft, detail of an oil painting by Joachim von Sandrart, 1641; in the Rijksmuseum, Amsterdam
By courtesy of the Rijksmuseum, Amsterdam

perience is shown by the contrast between his letter in pre-Renaissance verse sent from Florence to his friends in Amsterdam and the first poetry he wrote after his return: love lyrics and the pastoral play *Grandida* (1605). That play is noted for the delicacy of its poetry and the simplicity of its moral—that individuals and nations can be at peace only when rulers and subjects alike shun ambition and seek only to serve.

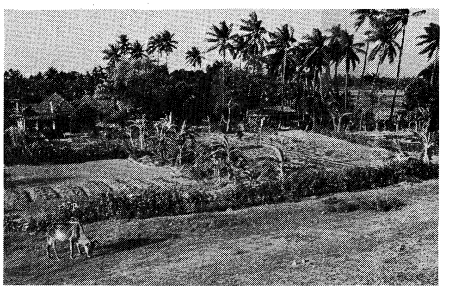
Hooft's personal and pragmatic ethic is more explicit in the *Sticht-rijmen* (1618 or 1619; "Edifying Verses") and two Senecan tragedies. *Geeraert van Velsen* (1613) is a quasi-historical dramatization of the murder of Count Floris V, and *Baeto* (1617) portrays an Aeneas-type hero who goes into exile rather than cause civil war. Both plays reveal Hooft's pacifist hatred of tyranny.

In *Nederlandse historiën* (20 vol., published 1642, a continuation in 1654), the glory of the epic hero, the prince of Orange, is reflected in Hooft's affection for the commoners who fought for the new democracy in Holland (now part of The Netherlands). Tacitus was his model for this monumental work, on which he spent 19 years chronicling only the period from 1555 to 1585.

The Muiderslot (the castle that he restored) became, after his second marriage in 1627, the centre of the Muiderkring, a circle of accomplished and cultured friends including Constantijn Huygens and Joost van den Vondel.

Hoogh, Pieter de: *see* Hooch, Pieter de.

Hooghly-Chinsura, town, Hooghly district, West Bengal state, northeastern India. The town lies just west of the Hooghly River and is a major road and rail connection. Rice milling and rubber-goods manufacture are the chief industries.



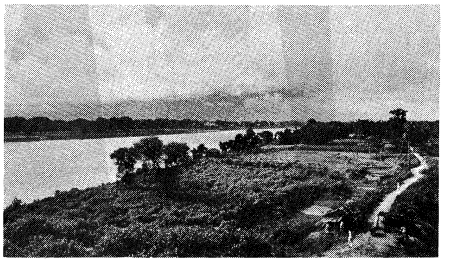
Banana plantation in Hooghly district, West Bengal, India
Shostal—EB Inc.

Hooghly, also spelled Hūgli, was founded by the Portuguese in 1537 following the decline of Sātgaon, the mercantile capital of lower Bengal; it was also the first English settlement (1651) in lower Bengal until it was abandoned in 1690 for Calcutta.

Chinsura was an important 17th-century settlement of the Dutch, who built a factory (trading station) there in 1656. In 1825, Chinsura and other Dutch settlements were ceded to the British in exchange for holdings in Sumatra. Important historical buildings include a Muslim *imām-baṛah* ("meeting place"), a Portuguese church (1660), and a Sandeswar temple. Hooghly and Chinsura, constituted a joint municipality in 1865, have three colleges affiliated with the University of Calcutta and three affiliated with the University of Burdwān.

Hooghly district (area 1,214 sq mi [3,145 sq km]) comprises a fertile, low-lying alluvial tract dotted with marshes and abandoned river channels and drained by the Rūpnārāyan (*q.v.*) and Dāmodar rivers. Rice, jute, sugarcane, and potatoes are the main crops; bananas and mangoes are cultivated. The Hooghly's riverbank is densely populated and heavily industrialized, with jute, rice, and cotton mills and rubber and chemical factories. Early European settlements include Serampore and Chandernagore (*qq.v.*). Pop. (1981) town, 125,193; district, 3,557,306.

Hooghly River, also spelled HŪGLI, river in West Bengal state, northeastern India, an arm of the Ganges, providing access to Calcutta



Hooghly River near Baharampur, West Bengal, India
Kaypix—Shostal/EB Inc.

from the Bay of Bengal. It is formed by the junction of the Bhāgīrathi and Jalangi rivers at Nabadwīp. From there the Hooghly flows generally south for about 160 miles (about 260 km) to the Bay of Bengal, through a heavily industrialized area with more than one-half of West Bengal's population. The river's lower reaches are fed by the Ajay, Dāmodar, Rūpnārāyan, and Haldi (Kāsai) rivers, which rise to the northwest on the Chota Nāgpur plateau. Although above Calcutta the river is silted up, it is navigable to the city by ocean liners. Navigation is facilitated by constant dredging and the scour of a tidal bore that rushes inland at high tide. Negotiations with Bangladesh have been held to divert waters in the Ganges River in such a way as to prevent silting at Calcutta. From Calcutta the Hooghly flows west and south to the Rūpnārāyan Estuary, then twists south and southwest, entering the Bay of Bengal through an estuary 3 to 20 miles wide. It is spanned by a cantilever bridge between Howrah and Calcutta and by Bally Bridge between Bally and Baranagar.

Hook, Sidney (b. Dec. 20, 1902, New York City—d. July 12, 1989, Stanford, Calif., U.S.), American educator and social philosopher who studied historical theory in relation to American philosophy. He was among the first U.S. scholars to analyze Marxism and was firmly opposed to all forms of totalitarianism, holding liberal democracy as the most viable political structure for social and scientific advancement.

After receiving a doctorate from Columbia University (1927) with John Dewey as his mentor, Hook taught at New York University (1927–69) until he retired to become senior research fellow at the Hoover Institution on War, Revolution, and Peace at Stanford University (1973–89). An exponent of pragmatism, secularism, and rationalism, he advocated a general philosophy of personal development. He wrote and edited more than 35 books including *Towards the Understanding of Karl Marx: A Revolutionary Interpretation* (1933), *The Hero in History* (1943), *Education for Modern Man* (1946; rev. ed. 1963), *In Defense of Academic Freedom* (1971), and *Revolution, Reform, and Social Justice* (1975). His autobiography, *Out of Step: An Unquiet Life in the 20th Century,* was published in 1987.

Hook, Theodore Edward (b. Sept. 22, 1788, London—d. Aug. 24, 1841, London), prolific English playwright and novelist, the best-remembered of the fashionable novelists who, in the early 19th century, aimed to describe English society from the inside for those on the outside.



Theodore Hook, oil painting by E.U. Eddis; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

The son of a popular songwriter, Hook, while a schoolboy at Harrow, had written the words for his father's comic operas and, by the age of 16, had become well known in London theatre greenrooms. He wrote farces and melodramas, ran into debt, and became dissolute, but in 1813 his friend the prince regent procured him the post of accountant general to Mauritius.

Hook took to novel writing in an attempt to pay off the legal costs of his trial for mismanagement of public money: in 1817, when some £12,000 was found to have been stolen, Hook, although guilty only of negligence, was recalled, tried, and imprisoned. The success in 1824 of his *Sayings and Doings,* tales with a fashionable setting, each illustrating a proverb, was such that he extended their three volumes to nine in 1828. From 1824 to 1842 he wrote some 40 fictional works in a similar style.

Hooke, Robert (b. July 18, 1635, Freshwater, Isle of Wight, Eng.—d. March 3, 1703, London), English physicist who discovered the law of elasticity, known as Hooke's law, and who did research in a remarkable variety of fields.

In 1655 Hooke was employed by Robert Boyle to construct the Boylean air pump. Five years later, Hooke discovered his law of elasticity, which states that the stretching of a solid body (*e.g.,* metal, wood) is proportional to the force applied to it. The law laid the basis for studies of stress and strain and for understanding of elastic materials. He applied these studies in his designs for the balance springs of watches. In 1662 he was appointed curator of experiments to the Royal Society of London and was elected a fellow the following year.

One of the first men to build a Gregorian reflecting telescope, Hooke discovered the fifth star in the Trapezium, an asterism in the constellation Orion, in 1664 and first suggested that Jupiter rotates on its axis. His detailed sketches of Mars were used in the 19th century to determine that planet's rate of rotation. In 1665 he was appointed professor of geometry in Gresham College. In *Micrographia* (1665; "Small Drawings") he included his studies and illustrations of the crystal structure of snowflakes, discussed the possibility of manufacturing artificial fibres by a process similar to the spinning of the silkworm, and first used the word cell to name the microscopic honeycomb cavities in cork. His studies of microscopic fossils led him to become one of the first proponents of a theory of evolution.

He suggested that the force of gravity could be measured by utilizing the motion of a pendulum (1666) and attempted to show that the Earth and Moon follow an elliptical path around the Sun. In 1672 he discovered the phenomenon of diffraction (the bending of light rays around corners); to explain it, he offered the wave theory of light. He stated the inverse square law to describe planetary motions in 1678, a law that Newton later used in modified form. Hooke complained that he was not given sufficient credit for the law and became involved in bitter controversy with Newton. Hooke was the first man to state in general that all matter expands when heated and that air is made up of particles separated from each other by relatively large distances.

Hooker, Joseph (b. Nov. 13, 1814, Hadley, Mass., U.S.—d. Oct. 31, 1879, Garden City, N.Y.), Union general in the American Civil War (1861–65) who successfully reorganized the Army of the Potomac in early 1863 but who thereafter earned a seesaw reputation for defeat and victory in battle.

A West Point graduate and veteran of the Mexican War (1846–48), Hooker left his California home at the outbreak of the Civil War to serve as brigadier general of volunteers. In 1862 he participated in all the major Eastern campaigns and was dubbed "Fighting Joe" because of his vigorous leadership in the field. When General A.E. Burnside resigned command of the Army of the Potomac after the



Joseph Hooker

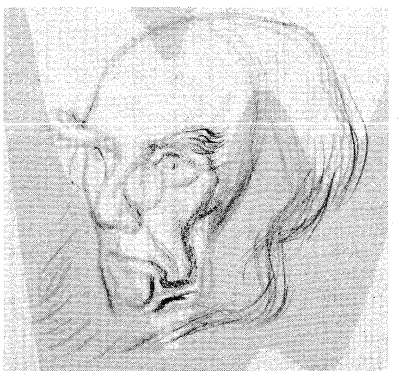
By courtesy of the Library of Congress, Washington, D.C.

Union disaster at Fredericksburg (November–December), Hooker was appointed to succeed him.

Immediately the new commander effected several much-needed organizational reforms and prepared to challenge the South at the Battle of Chancellorsville (May 1–4, 1863). His grave defects as a commanding officer became apparent when Confederate general Robert E. Lee, with fewer than half the number of troops, outmaneuvered him and caused a Union retreat. This defeat resulted in the loss of 17,000 Union soldiers. When Lee advanced into Pennsylvania in June, Hooker followed him closely until, rebuffed by Washington in his request for additional troops to meet the enemy at Gettysburg in July, he sensed his superiors' distrust and resigned his command on the eve of battle.

Three months later Hooker was sent by rail in command of two corps of the Army of the Potomac to help relieve General W.S. Rosecrans, besieged at Chattanooga, Tenn. On Nov. 24, 1863, he won the "Battle Above the Clouds" on Lookout Mountain, clearing the way for the crowning Union victory on Missionary Ridge. Denied advancement during the Atlanta Campaign in 1864, he thereafter ceased to play any active part in the war.

Hooker, Sir Joseph Dalton (b. June 30, 1817, Halesworth, Suffolk, Eng.—d. Dec. 10, 1911, Sunningdale, Berkshire), English botanist noted for his botanical travels and studies and for his encouragement of Charles



Sir Joseph Hooker, drawing by W. Rothenstein, 1903; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

Darwin and of Darwin's theories. The younger son of Sir William Jackson Hooker, he was assistant director of the Royal Botanic Gardens at Kew from 1855 to 1865 and, succeeding his father, was then director from 1865 to 1885.

Hooker, unlike his father, had the benefit of a formal education and was graduated from the University of Glasgow with an M.D., in 1839. Through his familiarity with his father's herbarium, he was well prepared for the first of his many travels—as surgeon-botanist aboard HMS *Erebus* on the Antarctic expe-

dition of 1839–43. Thereafter, a steady stream of publications followed, punctuated by his own travels: *The Botany of the Antarctic Voyage of H.M. Discovery-Ships Erebus and Terror in 1839–1843* (1844–60); *Rhododendrons of Sikkim Himalya* (1849); *The Flora of British India* (1872–97); *Handbook of the New Zealand Flora* (1864); and *Journal of a Tour in Marocco and the Great Atlas* (1878). His last major botanical expedition, to the Rocky Mountains and California (1877), led to the publication of several important papers concerning the relationship of American and Asian floras. His travels resulted in the discovery of species new to science, many of which were soon introduced to horticultural circles. Even more important, however, were the data, which gained him an international reputation as a plant geographer.

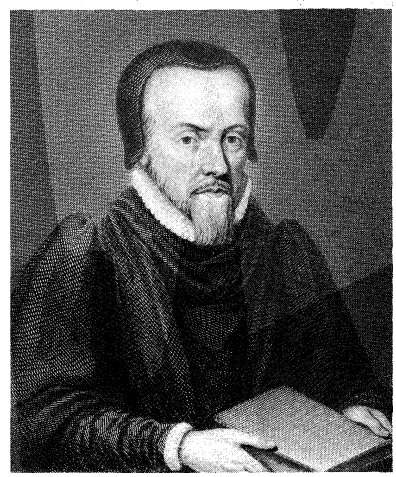
In 1851 Joseph Hooker married Frances Henslow, the daughter of a botanist. Six children survived her death in 1874. By his second wife, Hyacinth Symonds Jardine, whom he married in 1876, he had two sons. He became assistant director of Kew in 1855, a position he retained until 1865, when he succeeded his father as director, serving in that capacity until his own retirement in 1885. Many honours came to Hooker, including the presidency of the Royal Society (1872–77) and a knighthood (1877). He remained active until shortly before his death.

One of the most significant results of his travels was an attempt to explain the geographical distribution of plants and their seemingly anomalous variations. As a close friend of Charles Darwin and one well acquainted with the latter's early work, Hooker, along with the geologist Sir Charles Lyell, presided at the historic meeting of the Linnaean Society in July 1858. It was their function to adjudicate the priority claims concerning natural selection as the mechanism for evolution, which had been advanced simultaneously by Darwin and Alfred Russel Wallace. By lending his support to a scientific claim that was soon to be attacked on extrascientific grounds, Hooker was among the first to demonstrate the importance and applicability of the evolutionary theory to botany in general and to plant geography in particular. The capstone to Hooker's career came in 1883 with the publication of the final volume of the *Genera Plantarum,* written in conjunction with George Bentham. This world flora, describing 7,569 genera and approximately 97,000 species of seed-bearing plants, was based on a personal examination of the specimens cited, the vast majority of which were deposited at Kew.

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Hooker, Richard (b. March 1554?, Heavitree, Exeter, Devon, Eng.—d. Nov. 2, 1600, Bishopsbourne, near Canterbury, Kent), theologian who created a distinctive Anglican theology, and a master of English prose and legal philosophy. In his masterpiece, *Of the lawes of ecclesiasticall politie,* which was incomplete at the time of his death, Hooker defended the Church of England against both Roman Catholics and Puritans and affirmed the Anglican tradition as that of a "threefold cord not quickly broken"—Bible, church, and reason.

Years at Oxford. Hooker was born toward the end of 1553 or the beginning of 1554 near the city of Exeter. His family did not have the financial means to send young Richard to



Richard Hooker, engraving by E. Finden after a print by W. Hollar

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

the university, but, with John Jewel, bishop of Salisbury, as his patron, in 1568 he entered Corpus Christi College at Oxford. At that time in the life of the Church of England, the dominant influence was Calvin's *Institutes of the Christian Religion,* and thus Hooker was trained in the traditions of Genevan Protestantism. Leading scholars at Oxford were, however, loyal to the Anglican *Book of Common Prayer* and used the vestments demanded by the ecclesiastical law of the realm. Hooker, always a staunch Anglican, went far beyond even liberal Calvinism and read widely the best scriptural interpretation of his day, the early Church Fathers, and even Renaissance Thomism (the philosophical school influenced by the thought of St. Thomas Aquinas). He thus avoided the limits of narrow academic Calvinism and became a man of wide Renaissance learning. Hooker said that he grew in his opinions and gave up narrow conceptions previously held.

Master of the Temple. Hooker became a scholar of Corpus Christi College in 1573 and took his M.A. in 1577. In the same year he became a fellow of his college. In 1585 he was elected master of the Temple. The other candidate for this position was Walter Travers, an ardent Calvinist. Travers, an able man, had written a scholarly book, *Ecclesiasticae disciplinae defensio* ("Defense of Ecclesiastical Discipline"). Although he had not received Anglican orders, he was made lecturer (preacher) of the Temple Church. Hooker, a loyal Anglican, preached in the morning, and Travers, a firm Calvinist, in the afternoon. Thus it was said that the Temple Church congregations heard Canterbury in the morning and Geneva in the afternoon.

With the defeat of the Spanish Armada in 1588, the Church of England passed beyond the crisis of the threat of Roman Catholicism. Now the threat was that of Calvinism, not only in doctrine but in ecclesiastical organization as well. Small cells, or conventicals, of reformed worship were formed throughout the realm. Their very radicalism appealed, and their hold on general sympathy was so strong that even the bishops were lukewarm about suppressing them and allowed their growth to increase unchecked. Travers, in fact, set up an organization in the afternoon congregation on the model of the Reformed Church in the Low Countries and chided Hooker for not using the Reformed organization in the Temple Church.

The difference between the two men was radical. Hooker did not approve of many of the decisions of the Roman Catholic Council of Trent (1545–63), which attempted to reform the Catholic Church following the Protestant Reformation, but he did approve of many of the medieval Scholastic philosophers and theologians, such as St. Thomas Aquinas, and he used their teaching with approval. This was anathema to Travers, who thought of the teaching of the Scholastics as sheer rubbish. Hooker does not seem to have lived in the parsonage of the Temple, but with John Churchman, a good friend of the Church of England. There were two reasons for this: first, the parsonage was not in good repair, and, second, Travers lived there.

On Feb. 13, 1588, while still master of the Temple, Hooker married Joan Churchman, daughter of his friend and host. Izaak Walton, the English author and biographer, was responsible for the story, accepted for 300 years, that his future father-in-law tricked him into the marriage with his ill-favoured daughter. In 1940 it was proved by examination of the Court of Chancery records about Hooker's estate that the story was a tale devised to explain the incompleted state of the last books of the *Politie.* Joan Churchman brought with her a large dowry. At the time of his marriage Hooker had no known financial means, and yet at his death he left a considerable estate.

His major work. After he ceased to be master of the Temple in 1591, Hooker resided at his father-in-law's house and wrote his masterpiece, *Of the lawes of ecclesiasticall politie.* The *Politie* was the last link in a long strife known as the admonition controversy: in June 1572 radical religious reformers had issued from a secret press *An Admonition to the Parliament,* which, though Queen Elizabeth forbade its consideration by Parliament, became the platform of the Puritans—those within the Church of England who wished for radical reforms along the lines developed in Geneva by Calvin. The leading bishops, now alarmed by the influence of the *Admonition,* knew that an answer was needed, and the Archbishop of Canterbury turned to John Whitgift, vice chancellor of the University of Cambridge, to reply to the *Admonition.* This Whitgift did and was answered in turn by Thomas Cartwright, professor at Cambridge and the leading Puritan clergyman. The controversy was continued in a whole series of books.

The *Admonition* was still much in the mind of England when Hooker left the Temple, and he set himself the task of replying to it. The *Politie* was to be a work of eight books, but the fifth book was the last one to appear in Hooker's lifetime. The tradition that his manuscripts were destroyed by Puritan ministers who were assisted by Hooker's wife does not seem to be correct. The incomplete condition of the last books of the *Politie* merely means that Hooker had not yet revised them at the time of his death.

In the *Politie,* Hooker defended the Elizabethan church against Roman Catholics and Puritans alike. He upheld the threefold authority of the Anglican tradition—Bible, church, and reason. Roman Catholics put Bible and tradition on a parity as the authorities for belief, while Puritans looked to Scripture as sole authority. Hooker avoided both extremes, allowing to Scripture absolute authority when it spoke plainly and unequivocally; where it was silent or ambiguous, wisdom would consult the tradition of the church; but he insisted that a third element lay in man's reason, which should be obeyed whenever both Scripture and tradition needed clarification or failed to cover some new circumstance. The core of Hooker's thinking on the relations of church and state is unity. In his view, the Puritans adopted an impossible position; they claimed to be loyal to the Queen while repudiating the Queen's church. By law and by reason, an Englishman must be an Anglican, pledged to serve Elizabeth as the supreme magistrate of

his country and the supreme governor of his church.

According to tradition Hooker served the churches at Drayton Beauchamp and Boscombe following his term as master of the Temple, but more probably he practiced pluralism, which means he received his salary as a vicar but allowed a lesser clergyman to perform the duties the parish required. In 1595 he accepted an appointment as vicar of Bishopsbourne, near Canterbury, and in 1597 the fifth book of the *Politie* was published. He died three years later and was buried at Bishopsbourne. (J.S.Ma.)

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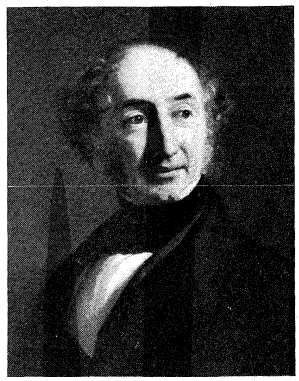
Hooker, Thomas (b. probably July 7, 1586, Markfield, Leicestershire, Eng.—d. July 7, 1647, Hartford, Conn.), prominent American colonial clergyman and a founder of Hartford, sometimes called "the father of American democracy."

After preaching briefly in the parish of Esher in Surrey, about 1626 Hooker became lecturer to the Church of St. Mary at Chelmsford, Essex, where he delivered fervent evangelical addresses. Such church lectureships, an innovation of Puritanism, came under attack in 1629, and in 1630 Hooker was cited to appear before the Court of High Commission. He fled to Holland, forfeiting his bond, and in 1633 emigrated to Massachusetts Bay Colony. At New Towne (now Cambridge), he became the pastor of a company of Puritans who had arrived from England the previous year; in expectation of his joining them, they had been called Mr. Hooker's Company. But Hooker and his supporters became restive, and in 1636 he led a group to Connecticut to settle Hartford, where he served as pastor until his death.

Critical of limiting suffrage to church members, he told the Connecticut General Court in 1638 that the people had the God-given right to choose their magistrates. Though his view was an advanced one for his time and led many historians to call him "the father of American democracy," Hooker had no intention of separating church and state; he declared that the privilege of voting should be exercised according to the will of God. Active in formulating the Fundamental Orders for governing Connecticut (1639), in church governance he preferred the more autonomous Congregational model to the hierarchical structure of Presbyterianism. He defended his views in *A Survey of the Summe of Church Discipline* (1648).

Hooker, Sir William Jackson (b. July 6, 1785, Norwich, Norfolk, Eng.—d. Aug. 12, 1865, Kew, Surrey), English botanist who was the first director of the Royal Botanic Gardens at Kew, near London. He greatly advanced the knowledge of ferns, algae, lichens, and fungi, as well as of higher plants.

Hooker was the son of a merchant's clerk and descendant of Richard Hooker, noted theologian of the 16th century. A fortuitous discovery in 1805 of a rare moss, which he communicated to James Edward Smith, founder of the prestigious Linnaean Society,



Sir William Jackson Hooker, detail of a painting by S. Gambardella, 1843; in the collection of the Linnean Society of London

By courtesy of the Linnean Society of London

redirected his interests from general natural history to botany. His early education at Norwich Grammar School was followed by a voyage to Iceland in 1809, a period of extensive study in England, and a trip to France, Switzerland, and Italy in 1814–15, where he met some of the leading continental botanists. He married Maria Turner, daughter of the botanist Dawson Turner, in 1815. Joseph Dalton Hooker (*q.v.*), the second of their five children, also became a famous botanist. In 1820 Hooker accepted the chair of Regius Professor of Botany at Glasgow, a position he held until 1841. Until his death at Kew, he was actively engaged in promoting the importance of botany. He was made a knight of Hanover in 1836.

Beginning with William Hooker's *Journal of a Tour in Iceland in the Summer of 1809,* published in 1811, more than 20 major works as well as numerous periodical articles appeared in the following 50 years. His main interest was in cryptogamic botany (*e.g.,* ferns, mosses, fungi), as shown by his publications: *British Jungermanniae,* 1816; *Musci Exotici,* 1818–20; *Icones Filicum,* with R.K. Greville (1829–31); *Genera Filicum* (1838); and *Species Filicum* (1846–64). He also published important floristic studies—*Flora Scotica* (1821); *The British Flora* (1830); *Flora Borealis Americana: or the Botany of the Northern Parts of British America* (1840)—and was a pioneer in the study of economic botany. The publications, together with his own herbarium, which he generously made available to all scholars, and the journals that he founded and edited, made him the centre of English botany. The climax of his career came in 1841, when he was appointed the first director of Kew Gardens. Under his leadership, Kew Gardens became the world's leading botanical institution. Now a vast complex, including laboratories, a museum, a library, and greenhouses, it is a national showpiece as well as his personal monument. Before his retirement in 1865, he founded the Museum of Economic Botany at Kew (1847).

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Hooke's law, law of elasticity discovered by the English scientist Robert Hooke in 1660, which states that, for relatively small deformations of an object, the displacement or size of the deformation is directly proportional to the deforming force or load. Under these conditions the object returns to its original shape and size upon removal of the load. Elastic behaviour of solids according to Hooke's law can be explained by the fact that small displacements of their constituent molecules, atoms, or ions from normal positions is also proportional to the force that causes the displacement.

The deforming force may be applied to a solid by stretching, compressing, squeezing, bending, or twisting. Thus a metal wire exhibits elastic behaviour according to Hooke's law because the small increase in its length when stretched by an applied force doubles each time the force is doubled. Mathematically Hooke's law states that the applied force F equals a constant k times the displacement or change in length x, or $F = kx$. The value of k depends not only on the kind of elastic material under consideration but also on its dimensions and shape.

At relatively large values of applied force, the deformation of the elastic material is often larger than expected on the basis of Hooke's law, even though the material remains elastic and returns to its original shape and size after removal of the force. Hooke's law describes the elastic properties of materials only in the range in which the force and displacement are proportional. Sometimes Hooke's law is formulated as $F = -kx$. In this expression F no longer means the applied force but rather the equal and oppositely directed restoring force that causes elastic materials to return to their original dimensions.

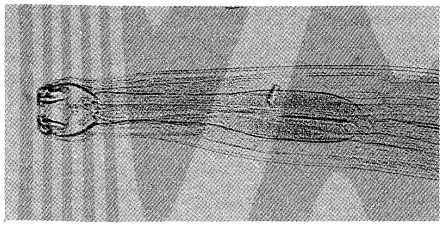
Hooke's law may also be expressed in terms of stress and strain. Stress is the force on unit areas within a material that develops as a result of the externally applied force. Strain is the relative deformation produced by stress. For relatively small stresses, stress is proportional to strain. For particular expressions of Hooke's law in this form, *see* bulk modulus; shear modulus; Young's modulus.

Hooks, Benjamin L(awson) (b. Jan. 31, 1925, Memphis, Tenn., U.S.), U.S. jurist, minister, and government official who became executive director of the National Association for the Advancement of Colored People (NAACP) in 1977.

Hooks attended Le Moyne College in Memphis, 1941–43, and served in the U.S. Army during World War II. He later studied law at De Paul University in Chicago (J.D., 1948); no law school in Tennessee was admitting blacks at that time. From 1949 until 1965 he practiced law in Memphis. He participated in restaurant sit-ins of the late 1950s and early 1960s and joined the Board of Directors of Martin Luther King's Southern Christian Leadership Conference, among many other civil rights and public service organizations. Ordained a Baptist minister in the mid-1950s, he preached regularly at churches in both Memphis and Detroit, and he won a wide following for his eloquence as a public speaker.

Assistant public defender of Shelby County (Memphis) from 1961, he was appointed judge of Shelby County Criminal Court in 1965, the first black to hold that position. He was elected for a full eight-year term in 1966, but he resigned in 1968. In July 1972 Hooks was appointed to the U.S. Federal Communications Commission and became the first black FCC commissioner. He resigned to become executive director of the NAACP on Aug. 1, 1977, succeeding Roy Wilkins. Hooks stressed the need for affirmative action and pressed for increased minority voter registration. He deplored under-representation of minorities in media ownership.

hookworm disease, also called ANCYLOSTOMIASIS, or UNCINARIASIS, a parasitic infestation of humans, dogs, or cats caused by blood-sucking worms living in the small intestine that may be associated with secondary anemia. Several species of hookworm can cause the disease. *Necator americanus*, which ranges in size from 5 to 11 millimetres (0.2 to 0.4 inch),



Hookworm (*Ancylostoma*)
Runk/Schoenberger from Grant Heilman—EB Inc.

is responsible for about 90 percent of human hookworm infections that occur in tropical and subtropical regions of the world. *Ancylostoma duodenale*, 8 to 13 millimetres long, is found on all continents but is most prevalent in warm regions. *A. braziliense*, from 8 to 11 millimetres long, is normally parasitic in dogs and cats; man, however, is sometimes infected by this species in the southern United States, South America, and Asia. *A. ceylanicum*, normally parasitic in dogs, is sometimes found in man in South America and Asia. *A. duodenale*, possesses four hooklike teeth in its adult stage, and *N. americanus* has plates in its mouth rather than teeth.

Both species of hookworm have similar life cycles. The adult worm attaches itself to the mucosal tissue lining the small intestine, where the female may produce several thousands eggs a day, which are passed in the feces. If the fecal matter reaches suitable soil, the eggs are hatched, and the infective, threadlike larvae may penetrate human skin, usually that of the foot, by way of the sweat glands and hair follicles. They then invade the lymph and blood vessels, reach the lungs, and pass up the respiratory tree to reach the mouth, where they are swallowed and sent to the small intestine; there they mature and start a new reproductive cycle. The intestinal parasites are reputedly long-lived, with a lifetime that may span some 10 years.

The symptoms of hookworm disease ordinarily begin with ground itch, an itchy skin irritation caused by the larvae when they penetrate the skin and marked by papules and vesicles that are often located between the toes. In passing through the lungs, the larvae may produce coughing and fever. In the intestine, the mature worm sustains its life by bloodsucking, and persistent feeding by many worms over many years results in secondary anemia.

In heavy infestations (which may involve more than 500 larvae), the general symptoms include pallor of the skin and mucous membranes, fluid retention in the face and extremities, constipation alternating with diarrhea, abdominal tenderness, increased appetite for bulky or strange substances (*e.g.*, clay), delayed puberty and stunted growth, fatigue, dullness, and apathy. Hookworm infestation tends to be constantly widespread in tropical and subtropical regions of the world; moisture, warmth, loose soil, promiscuous defecation, and absence of shoes are the chief factors responsible for infection. One single oral dose of tetrachlorethylene on an empty stomach will remove about 90 percent of the *Necator*. Bephenium hydroxynaphthoate is especially effective against *Ancylostoma*. Iron supplements and a diet high in protein will speed recovery. Immediate prognosis is good, but the likelihood of reinfection constitutes a major health problem. Periodic mass treatment of the population has been used in some hookworm control programs. The prevention of hookworm disease consists of ensuring the sanitary disposal of human excreta.

hoop, circular toy adaptable to many games, children's and adults', probably the most ubiquitous of the world's toys, after the ball. The ancient Greeks advocated hoop rolling as a beneficial exercise for those not very strong. It was also used as a toy both by Greek and Roman children, as graphic representations indicate. Most of these ancient hoops were of metal. Most later hoops were of wood, though occasionally fitted with metal tires, as in the hoop-rolling-fad days of 19th-century England and the United States. North American Indians used the hoop as a target in teaching accuracy of throwing to the young. Adult Eskimos played a game that involved throwing poles through a rolling hoop.

Bowling a hoop along the ground or a sidewalk or street was done with a stick, called a skimmer, or with the hand. In addition to being rolled, hoops can be thrown (quoits), spun, or used as a target (basketball). Hoop playground games include hoop-catch, stepping through hoops (used in training by U.S. football players, with automobile tires as hoops), spear the hoop, and hoop-flicking (spinning). In the late 1950s, the hula-hoop craze had millions, children and adults, stepping into plastic hoops and attempting to keep them revolving around their waists by swivelling their hips.

hoop pine: *see* Moreton Bay pine.

hoop skirt, also called HOOP PETTICOAT, garment with a frame of whalebone or of wicker or osier basketwork. Reminiscent of the farthingale (*q.v.*), the petticoat was reintroduced in England and France around 1710 and remained in favour until 1780. The French



Woman wearing hoop skirt, Meissen porcelain figurine, German, 1741; in the Victoria and Albert Museum, London
By courtesy of the Victoria and Albert Museum, London

name *panier* ("basket") was used for skirts distended at the sides rather than all the way around. They could be as wide as 18 feet (5 metres), and satirists talked of hoops 7 or 8 yards (6 or 7 metres) wide.

Materials were lighter than in the time of the farthingale, and the skirt was more mobile. Only at court did the fashion persist until the end of the 18th century. *See also* crinoline.

Hooper, Franklin Henry (b. Jan. 28, 1862, Worcester, Mass., U.S.—d. Aug. 14, 1940, near Saranac Lake, N.Y.), U.S. editor in chief of *Encyclopædia Britannica* from 1932 to 1938, brother of the *Britannica*'s publisher Horace Everett Hooper.

In 1899 Hooper joined the staff of the *Britannica*, in which his brother Horace, James Clarke, and others had acquired an interest. Franklin Hooper was connected with five editions of the *Britannica* in the ensuing 30 years: associate editor of the 10th edition (1902), managing editor of the 11th (1910–11), and U.S. editor of the 12th (1921–22), 13th (1926), and 14th (1929) editions. He succeeded James Louis Garvin as editor in chief in 1932. Hooper also edited *Britannica Junior* (first published 1934) and, just before his retirement, the first issue (1938) of the *Britannica Book of the Year*.

Hooper, Horace Everett (b. Dec. 8, 1859, Worcester, Mass., U.S.—d. June 13, 1922, Bedford Hills, N.Y.), U.S. publisher of *Encyclopædia Britannica* from 1897 until his death, a master salesman and an innovator in publishing.

Hooper left school at the age of 16, clerked in bookstores for a time, and then went to Denver, Colo., where he organized the Western Book and Stationery Company to sell books in the western states. In 1893 he moved to Chicago, where he directed a highly successful advertising and sales campaign for the *Century Dictionary*. While visiting London in 1897 he became convinced that the 9th edition (1875–89) of the *Britannica* could be marketed by similar methods. With Walter Montgomery Jackson and the brothers James and George Clarke, he secured reprint rights from A. and C. Black, the work's publishers, and then persuaded *The Times* (London) to support the venture. *Times* officials expected meagre financial results, but Hooper's reduction of the price and his institution of an installment payment plan greatly stimulated sales. He then began to prepare an 11-volume supplement, which, added to the 9th (24 volumes and index), formed the 10th edition (1902–03).

His success with the *Britannica* reprint caused *The Times* to appoint Hooper advertising director. In 1905, with the aid of the British journalist C.F. Moberly Bell, he organized the Times Book Club. Shortly after Baron Northcliffe (afterward 1st Viscount Northcliffe) became proprietor of *The Times* in 1908, Hooper left the paper. He continued to live in England for some years, engaging in a lawsuit with Jackson over *Britannica* editorial policy and supervising a wholly new 11th edition (29 vol., 1910–11). Unlike previous editions, this one was to be published as a single unit and not volume by volume. Subsequently, Hooper brought out the *Britannica Year-Book* (published 1913, covering 1911–12); the Handy Volume Issue (1915–16), a smaller and cheaper photographic reprint of the 11th edition; and the 12th edition (1922), comprising the 29 volumes of the 11th and a 3-volume supplement.

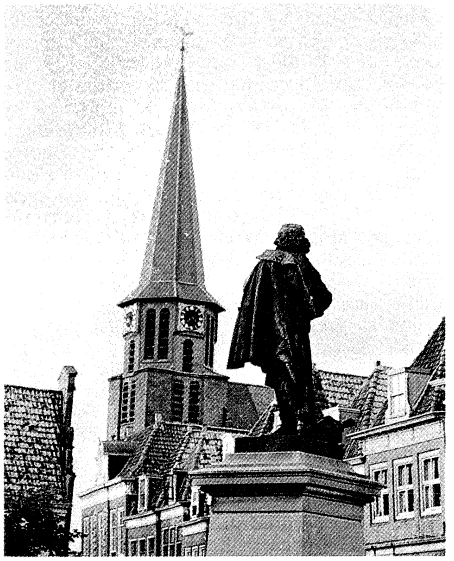
hoopoe (*Upupa epops*), strikingly crested bird found from southern Europe and Africa to southeastern Asia, the sole member of the family Upupidae of the roller order, Coraciiformes. About 28 centimetres (11 inches)



Hoopoe (*Upupa epops*)
Erik Hosking

long, it is pinkish brown on the head and shoulders, with a long, black-tipped, erectile crest and black-and-white barred wings and tail. The hoopoe takes insects and other small invertebrates by probing the ground with its long, downcurved bill. Some systems of classification recognize one other species (*U. africana*), found from Ethiopia to South Africa.

Hoorn, *gemeente* (municipality), Noordholland *provincie* (province), northwestern Netherlands, on the IJsselmeer (Lake IJssel). Founded *c.* 1300 and chartered in 1357, it was the capital of medieval West Friesland. Its



Statue of Jan Pieterszoon Coen, facing the Noorderkerk (North Church), Hoorn, Neth.
Elliott Erwitt—Magnum

horn-shaped harbour (for which it is named) was one of the principal ports of the Netherlands until the Zuiderzee silted up in the 18th century. The first great net for herring fishing was made in Hoorn in 1416. Willem Schouten (who discovered the passage around Cape Horn [Hoorn]), Jan Coen (the Dutch East Indian empire builder), and Abel Tasman (discoverer of Tasmania) were born in Hoorn.

Hoorn is now a market centre for vegetables and dairy products; other economic activities include fishing, printing, the building of plastic boats, and the manufacture of textiles and electrical machinery. Two medieval churches survive, the Gothic Noorderkerk and the Oosterkerk. The St. Mary tower (1508) and the east gate (1578) remain of the original fortifications. Other notable buildings are the town hall (1613), the hospital of St. John (1563), the 17th-century Bossu houses, the St. Pietershof (an almshouse established 1617), the Weighhouse (1609), and the West Frisian Museum (1632). Pop. (1983 est.) 46,824.

Hoorne, Filips van Montmorency, graaf van (count of) (b. 1524?, Nevele, Flanders—d. June 5, 1568, Brussels), stadholder of Gelderland and the Netherlands, admiral of Flanders, and member of the council of state of the Netherlands (1561–65), who sought to preserve the traditional rights and privileges of the Netherlands and to end the Spanish Inquisition.

A gentleman-in-waiting at the court of the Holy Roman emperor Charles V, he led imperial troops in the Schmalkaldic War (1546–47) and commanded Philip II's bodyguard (1550). He was appointed stadholder of Gelderland and the Netherlands (September 1555), invested as a knight of the Golden Fleece (1556), and served as an admiral of the Spanish fleet (1559).

A member of the regent's council of state (1561–65), Hoorne joined William I the Silent, prince of Orange, and Lamoraal, graaf van Egmond, in opposing the repressive religious and political policies of the leader of the council, Antoine de Granvelle, cardinal archduke of Mechelen, and successfully forced the King to order Granvelle's retirement (1564). The King's continued persecution of the Protestants resulted in the formation of the Compromise, or League of Nobles, a group of 400 lesser nobles who petitioned for an end to the Inquisition, the tribunal established to discover and punish heresy. This league was largely responsible for the anti-Catholic uprisings in 1566–67 and further government repressions after the King denied even the regent's request for religious toleration.

Although Hoorne had aligned himself with the Calvinists at Tournai in 1566, he obeyed the regent's order to return to Brussels (October 1566). At a meeting (December 1566) with Orange and Egmond, Hoorne, like Egmond, refused to support the Prince of Orange's plan for armed resistance against the King; Hoorne then retired to his home in Weert, the Netherlands, where he remained in seclusion.

Lured to Brussels by expressions of reconciliation by the Duke of Alba, who had arrived in August 1567 to assume control of the government, Hoorne, along with Lamoraal, was imprisoned (Sept. 9, 1567) by Alba, convicted of treason and heresy by the Council of Troubles (Council of Blood), the court established by Alba to prosecute rebels and heretics, and was executed.

Hoorne Islands (Pacific Ocean): *see* Futuna Islands.

Hoosac Tunnel, first American rock tunnel, east of North Adams, Mass., that provides a rail connection between Boston and the west. Though only four miles (six kilometres) long, the tunnel took 24 years (1851–75) to complete, because of numerous technical, financial, and political difficulties. Nevertheless, the tunnel, begun under the direction of Herman Haupt and completed by the firm of W. & J. Shanley of Montreal, provided a notable first in civil engineering—the use of nitroglycerin as a blasting agent. This practice was introduced, along with electric firing, by Thomas Doane, the resident engineer. Even more important, the development of compressed-air drilling machinery on the Hoosac helped launch the American pneumatic-tool industry, of immense significance in mining and construction.

Hooton, Earnest A(lbert) (b. Nov. 20, 1887, Clemansville, Wis., U.S.—d. May 3, 1954, Cambridge, Mass.), physical anthropologist who investigated human evolution and racial differentiation, classified and described human populations, and examined the relationship between personality and physical type, particularly with respect to criminal behaviour. He established Harvard University as a principal U.S. centre for physical anthropology and wrote a number of popular works that stimulated general interest in that discipline.

Hooton joined the teaching staff of Harvard in 1913 and served as professor from 1930 to 1954. Many of the professional U.S. physical anthropologists for a generation were his students, and his influence was exceptional. His first major study, *The Ancient Inhabitants of the Canary Islands* (1925), classified prehistoric Guanche skeletons and craniums and reconstructed a history of the population of the islands. Out of his 1930 study of the skeletons of the extinct Pecos (N.M.) pueblo, he developed a scheme of racial types that he believed comprised the Indian stock as a whole, suggesting components such as Mediterranean and Negroid.

During the 1930s he surveyed the U.S. criminal population to determine whether criminal behaviour might be linked to physical or racial factors. His two major works in this area are *The American Criminal* (1939) and *Crime and the Man* (1939), both of which provoked considerable controversy.

Hooton's influence extended beyond professional anthropology in his books for laymen. *Up from the Ape* (1931), widely used as a textbook, was followed by *Apes, Men, and Morons* (1937), *Why Men Behave Like Apes, and Vice-Versa* (1940), and *Man's Poor Relations* (1942).

Hoover, Herbert (Clark) (b. Aug. 10, 1874, West Branch, Iowa, U.S.—d. Oct. 20, 1964, New York City), 31st president of the United States (1929–33), whose humanitarian image, earned as chief Allied relief administrator during World War I, was tarnished when his Republican administration failed to alleviate the economic hardships of the Great Depression.

Orphaned before he was nine, Hoover was



Herbert Hoover
EB Inc.

reared by an uncle in Oregon. He graduated as a mining engineer in Stanford University's first class (1895) and gained broad experience during the next 18 years as administrative engineer on industrial projects on four continents.

Caught in China during the Boxer Rebellion (June 1900), Hoover was active in directing relief work for foreigners. In London at the outbreak of World War I (1914), he was made head of Allied relief operations and later chairman of the Commission for Relief in Belgium. With the U.S. entry into the war (April 1917), he was appointed national food administrator to stimulate production and conserve supplies. In a 12-month period of 1918–19 his food administration furnished 18,500,000 tons of food to the Allies and to famine areas of Europe. His operations spread over 30 European countries and distributed $100,000,000 worth of aid. Later, he headed Mississippi flood relief activities (1927) and also participated in post-World War II famine relief work in Europe.

Appointed secretary of commerce in 1921, Hoover undertook the reorganization of the department, in addition to organizing new divisions to cover radio broadcasting, commercial aviation, better housing, and greater highway safety. His endeavours as chairman of the Colorado River Commission and of the St. Lawrence Waterways Commission culminated in the construction of Hoover Dam and the St. Lawrence Seaway.

When Pres. Calvin Coolidge decided not to run again in 1928, Hoover received his party's presidential nomination, though his independent views alienated many Republican bosses. In the ensuing campaign, he held the traditional Republican vote while attracting many Southerners, who were reluctant to support the Democratic nominee, Alfred E. Smith, who was a Roman Catholic.

Once in office, Hoover's hopes for a "New Day" geared to America's scientific potential were soon overwhelmed, when the stock-market crash in October 1929 propelled the

country into the worst depression in its history. In accordance with his deeply felt philosophy of individual freedom, Hoover chose to depend mainly on private charity to ameliorate suffering. Failing to prod the business community into assuming leadership, he finally supplied a degree of federal relief to beleaguered farmers and financial institutions through the Federal Farm Board and the Reconstruction Finance Corporation. But he was adamant against federal aid to the unemployed urban masses, feeling such aid would lead to corruption and waste. He vetoed a bill that would have created a federal unemployment agency and mobilized congressional opposition to another bill for public works and direct aid to the unemployed.

Renominated in 1932, he was overwhelmingly defeated by Franklin D. Roosevelt. Throughout the rest of the 1930s, Hoover opposed every substantive measure for depression relief, particularly attacking "radical influences" in Washington. After World War II, he headed two federal commissions (1947–49 and 1953), one on the elimination of waste and another on inefficiency in government.

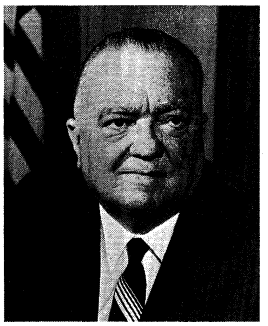
Hoover's writings include a small but influential book, *American Individualism* (1922), as well as his *Memoirs* (1951).

Where the same name may denote a person, place, or thing, the articles will be found in that order

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Hoover, J(ohn) Edgar (b. Jan. 1, 1895, Washington, D.C.—d. May 2, 1972, Washington, D.C.), U.S. public official who, as director of the Federal Bureau of Investigation from 1924 until his death, was credited with making the initials FBI a symbol of U.S. law enforcement.

Hoover studied law at night at George Washington University, where he received degrees as bachelor of laws in 1916 and as master of laws in the following year. He entered the Department of Justice as a file reviewer in 1917, and two years later became special assistant to Atty. Gen. A. Mitchell Palmer. He was named acting director of the Bureau of Investigation (as it was then called) in May 1924 and confirmed as director seven months later. Finding the organization in disrepute because of the scandals of the Harding administration, he instituted rigorous methods of selecting and training personnel. He established a fingerprint file, which became the world's largest; a scientific crime-detection laboratory; and the FBI National Academy, to which selected law enforcement officers from all parts of the country were sent for special training.



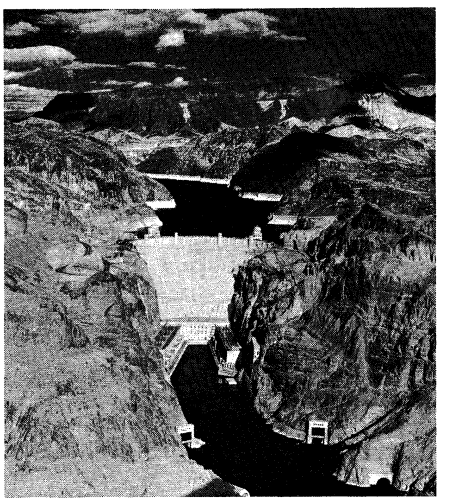
J. Edgar Hoover
AP/Wide World Photos

In the early 1930s the exploits of gangsters in the U.S. were receiving worldwide publicity. Hoover took advantage of this to publicize the achievements of the FBI in tracking down and capturing well-known criminals. Under his leadership the FBI became known for its integrity and freedom from political control, though it was subject to criticism for its methods and performance during the later years under Hoover's direction.

By the 1970s Hoover himself was frequently under public criticism for what some called his authoritarian administration of the FBI. So great was his prestige, however, that no president was prepared to remove him. He retained his post until he died at the age of 77.

Hoover Commission, formally COMMISSION ON ORGANIZATION OF THE U.S. EXECUTIVE BRANCH (1947–49, 1953–55), either of two temporary advisory bodies, both headed by the former president Herbert Hoover. They were appointed to find ways to reduce the number of federal government departments and increase their efficiency in the post-World War II and post-Korean War periods. The commissions were composed equally of Democratic and Republican members. Their recommendations, over 70 percent of which were implemented by executive and legislative action, resulted in the elimination and consolidation of some departments but also in the creation of such new bodies as the Department of Health, Education, and Welfare and the General Services Administration. In emulation of the federal government, many states set up similar bodies, known as "little Hoover commissions."

Hoover Dam, formerly called BOULDER DAM, in Black Canyon on the Colorado River, at



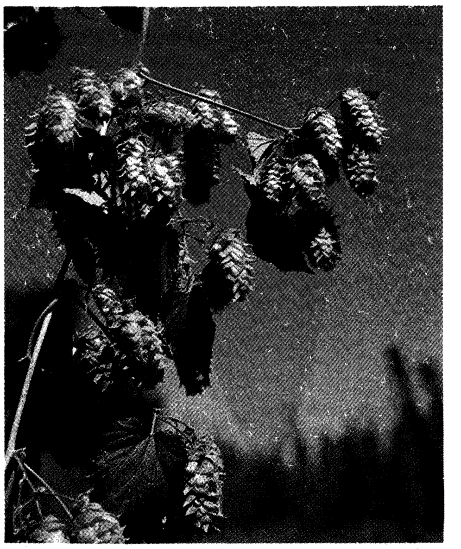
Hoover Dam
By courtesy of the U.S. Bureau of Reclamation

the Arizona–Nevada border, U.S. Constructed between 1930 and 1936, it was renamed in 1947 to honour Pres. Herbert Hoover. The dam, which impounds Lake Mead, is supervised by the Federal Bureau of Reclamation; it is used for flood and silt control, power, irrigation, and domestic and industrial water supplies. An arch-gravity structure 726 feet (221 metres) high and 1,244 ft long (along the crest), it has a power capacity of 1,345 megawatts and a volume of 4,400,000 cubic yards (3,360,000 cubic metres).

hop, either of two species of the genus *Humulus,* nonwoody annual or perennial vines in the hemp family (Cannabeceae) native to temperate North America, Eurasia, and South America. The hops used in the brewery industry are the dried female flower clusters (cones) of the common hop (*H. lupulus*). The Japanese hop (*H. japonicus*) is a quick-growing annual species used as a screening vine.

Hops have been used almost exclusively for brewing purposes for 1,200 years or more. The brewing value of the cones is based on their content of bitter (soft) resins, essential oils, and perhaps tannins. These constituents, which are extracted from hops by boiling in wort (an aqueous infusion of malt), impart the desired mellow bitterness and delicate hop aroma to brewed beverages and aid in their preservation.

The common hop is a long-lived herbaceous perennial with rough twining stems, often 25



Hop (*Humulus lupulus*)
Grant Heilman—EB Inc.

feet long, that always wind in a clockwise direction. New vines are produced each season and die following maturity. An extensive root system penetrates the soil to a depth of 15 ft or more.

Hops are grown commercially over a wide range of climatic and soil conditions. In general, rich alluvial soils or deep sandy or gravelly, well-drained loams are preferred. Hops are commonly produced under irrigation in the United States where summertime precipitation is low. Irrigation is not practiced in England where rainfall during the growing season is usually sufficient. Hop cones are harvested when fully mature. They can be picked either by hand or by machine. Freshly picked hops have a high moisture content and must be dried in kilns before they can be used in brewing. After drying, they are cured and baled and are then ready for marketing.

hop-hornbeam, any of about seven species of ornamental trees constituting the genus *Ostrya* of the birch family (Betulaceae), native to Eurasia and North America. A hop-hornbeam has shaggy, scaling bark and thin, translucent, green leaves with hairy leafstalks. The hoplike, green fruits are composed of many bladderlike scales, each bearing a small, flat nut. The European hop-hornbeam (*Ostrya carpinifolia*) and the Japanese hop-hornbeam (*O. japonica*) may reach 21 metres (70 feet); the other species are much smaller. The eastern



Hop-hornbeam (*Ostrya virginiana*)
Clarence E. Lewis

or American hop-hornbeam (*O. virginiana*) is known as ironwood for its hard, heavy wood, used locally for fence posts and small articles such as tool handles.

hop, step, and jump (track and field event): *see* triple jump.

hop tree, also called WAFER ASH (*Ptelea trifoliata*), tree, of the rue family (Rutaceae), native to eastern North America. It has small, greenish-white flowers; strong-smelling leaves



Hop tree (*Ptelea trifoliata*)
Walter Dawn

in groups of three leaflets; and buff-coloured, wafer-shaped, winged fruits. The hop tree is cultivated as an ornamental.

hopak, also spelled GOPAK, Ukrainian folk dance, once for men only but later danced by couples, male soloists, and mixed groups of dancers. In the western Ukraine, as the *hopak-kolo,* it is danced in a closed circle. The *hopak* has no fixed pattern of steps. Men competitively improvise steps, high leaps, squatting kicks, and turns; women dance simple steps, sway, clap, or circle. Changes of step do not



Ukrainian *hopak* performed by the Druzhba amateur dance ensemble
Novosti—Sovfoto

necessarily correspond with the musical metre ($\frac{2}{4}$). Composers who have used *hopaks* in concert music include Mussorgsky, Tchaikovsky, and Rimsky-Korsakov.

hopbush, common name for certain tropical and subtropical bushes and trees of the genus *Dodonaea*, within the soapberry family (Sapindaceae), in particular *D. viscosa*—also called akeake—a widely distributed shrub or



Hopbush (*Dodonaea viscosa*)
J.L. Watcham

small tree. *D. viscosa* grows to about 4.5 metres (15 feet) tall and is somewhat resistant to drought and smog. The inconspicuous flowers grow in terminal clusters.

Hope, town, southwestern British Columbia, Canada, at the confluence of the Coquihalla and Fraser rivers in the forested Coast Mountains, near Mt. Hope (6,000 ft [1,829 m]), 90 mi (145 km) east of Vancouver. The Hudson's Bay Company established Ft. Hope in 1848–49 on the site, an event commemorated by a cairn at the intersection of the Trans-Canada Highway and Wallace Street. Hope became a busy outpost during the Fraser River gold rush in the late 1850s. Now a major railway and highway junction, its economy depends largely on lumbering, mining (nickel and copper), and tourism (based on local scenic and recreational attractions such as the Fraser River Canyon and Skagit Valley). Inc. village, 1929; town, 1965. Pop. (1981) 3,205.

Hope, city, seat (1939) of Hempstead County, southwestern Arkansas, U.S. It was founded in 1852 as a station on the Cairo and Fulton (now Missouri Pacific) Railroad and was named after the daughter of James Loughborough, a railroad land commissioner who laid out the townsite. It developed as a shipping centre for agricultural products, notably watermelons, beef cattle, eggs, and poultry. Timber is also a significant economic factor. A University of Arkansas agricultural experimental station is nearby. Arkla Village, northeast at Emmet, is a replica of a frontier town of the 1850s. A few miles northwest is Old Washington Historic State Park, site of the Confederate State Capitol (1863–65) and other period buildings. Inc. town, 1875; city, 1906. Pop. (1980) 10,290.

hope, in Christian thought, one of the three theological virtues, the others being faith and charity (love). It is distinct from the latter two because it is directed exclusively toward the future, as fervent desire and confident expectation. According to St. Augustine, "hope deals only with good things, and only with those which lie in the future, and which pertain to the man who cherishes the hope." When hope has attained its object, it ceases to be hope and becomes possession. Consequently, whereas "love never ends," hope is confined to man's life on Earth.

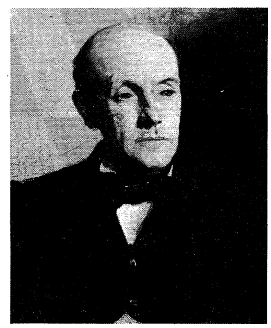
The ancient Greeks used the term hope (*elpis*) in reference to an ambiguous, open-ended future; but the Resurrection of Jesus Christ gave the term, for Christians, a positive expectation and a moral quality. Throughout the New Testament, Christian hope is closely tied to the ultimate hope of the return of Jesus Christ as the judge of the living and the dead. Yet this eschatological hope does not eliminate intermediate hopes for lesser goods, even for material blessings.

Generally, Christian manuals of doctrine and ethics have given more attention to faith and charity and to the relationship between them than to a detailed discussion of hope as such. Nevertheless, whenever there has been an unusual concern about "the resurrection of the dead and the life of the world to come," theological discussions of hope have become very prominent, as has happened, for example, in mid-20th-century discussions of "the theology of hope."

Hope, A(lec) D(erwent) (b. July 21, 1907, Cooma, N.S.W., Australia), Australian poet who is best known for his elegies and satires.

Hope was educated in Australia and at Oxford and taught at various Australian universities until his retirement in 1969. Though traditional in form, his poetry is thoroughly modern, two outstanding examples being "Conquistador" (1947) and "The Return from the Freudian Iles" (1944). Both poems are typical in their satirical approach and striking clarity of diction. Though he began to publish his verse in literary periodicals as early as 1930, his first book of poems, *The Wandering Islands* (1955), did not appear until 1955. It was followed by several volumes of new poems and of collected poems. He also wrote essays and criticism, including *A Midsummer Eve's Dream* (1970), *The Cave and the Spring* (1965), and *Native Companions* (1974). He was made a member of the Order of the British Empire in 1972.

Hope, Anthony, in full SIR ANTHONY HOPE HAWKINS (b. Feb. 9, 1863, London—d. July 8, 1933, Walton-on-the-Hill, Surrey, Eng.), English author of cloak-and-sword romances,



Anthony Hope, detail of an oil painting by Alfred Wolmark; in the National Portrait Gallery, London
By courtesy of the National Portrait Gallery, London

of which the best known is *The Prisoner of Zenda.*

Educated at Marlborough and at Balliol College, Oxford, he became a lawyer in 1887. The immediate success of *The Prisoner of Zenda* (1894), his fourth work—and its sequel, *Rupert of Hentzau* (1898)—turned him entirely to writing. Hope's other works include the high-society conversations *The Dolly Dialogues* (1894) and a series of problem novels, such as *The God in the Car* (1894), which was based on the career of Cecil Rhodes. In 1918 he was knighted for war work.

Hope, Bob, original name LESLIE TOWNES HOPE (b. May 29, 1903, Eltham, near London), British-born U.S. entertainer and actor.

Hope was the fifth of six sons of a stonemason and a former Welsh concert singer; his family immigrated to the United States when Hope was four years old. He grew up in Cleveland, manifesting the first signs of his vocation when he won a Charlie Chaplin imitation contest at the age of 10. His song-and-comedy vaudeville act eventually took him to Broadway, where he appeared in *The Sidewalks of New York* in 1927 and landed his first substantial role, in the musical *Roberta*, in 1933. The popularity of his satirical radio monologues won him a part in the film *The Big*

Broadcast of 1938, singing "Thanks for the Memory," which was to become his theme song.

In 1940 Hope made *The Road to Singapore*, creating a comic persona of transparent bravado, glib repartee, and ingratiating mediocrity. There were six other "Road" pictures in this popular series, all costarring Bing Crosby and Dorothy Lamour: *The Road to Zanzibar* (1941), . . . *Morocco* (1942), . . . *Utopia* (1946), . . . *Rio* (1947), . . . *Bali* (1952), and . . . *Hong Kong* (1962). His other comedy roles included *Caught in the Draft* (1941), *Let's Face It* (1943), *The Paleface* (1948), *Fancy Pants* (1950), and *My Favorite Spy* (1951).

In 1944 Hope's was the top-rated program on American radio, and in 1950 he made his television debut, appearing thereafter throughout his career in highly rated specials. He was given distinguished service awards from every branch of the armed forces for his more than 40 USO-sponsored Christmas tours to entertain U.S. troops. He was made an honorary Commander of the Order of the British Empire and received a People to People Award from President Dwight D. Eisenhower, the Congressional Gold Medal from President John F. Kennedy, and the Medal of Freedom from President Lyndon B. Johnson. He received special Oscars from the Academy of Motion Picture Arts and Sciences for humanitarian service in 1940, 1944, 1952, 1959, and 1965. He was the author of eight books of light memoirs.

Hope, John (b. June 2, 1868, Augusta, Ga., U.S.—d. Feb. 20, 1936, Atlanta, Ga.), American educator and advocate of advanced liberal-arts instruction for blacks at a time when the opposing views of Booker T. Washington for technical training held sway. Hope became president of Atlanta University, the first graduate school for blacks, and one of the founders of the Niagara Movement, a forerunner of the National Association for the Advancement of Colored People.



John Hope

By courtesy of Atlanta University, Georgia; photograph, Blackstone Studios, Inc.

Hope was the son of a white father and a black mother. In 1894 he graduated from Brown University, Providence, R.I. He taught at Roger Williams University (Nashville, Tenn.) until 1898 and became professor of classics at Atlanta Baptist College (later Morehouse College). He was appointed the first black president of Morehouse in 1906.

After Booker T. Washington made his "Atlanta Compromise" address in 1895, calling for blacks to concentrate on achieving technical proficiency and to abandon, at least for the time being, the struggle for political and social equality, Hope publicly disagreed with Washington. He proclaimed the need for full social and political equality and argued that technical skill would prove worthless without it.

Hope served as a YMCA secretary with black soldiers in France in 1918–19. Returning disillusioned by the way the soldiers were treated and by race riots in the United States, he and Will W. Alexander, a white Southerner, helped organize the Commission on Interracial Cooperation. Hope became its first president.

In 1929, when Morehouse and Spelman, a black women's college, affiliated with Atlanta University and took responsibility for undergraduate studies, the university devoted itself solely to graduate work. Hope was the unanimous choice for president of Atlanta University and served in that position until his death.

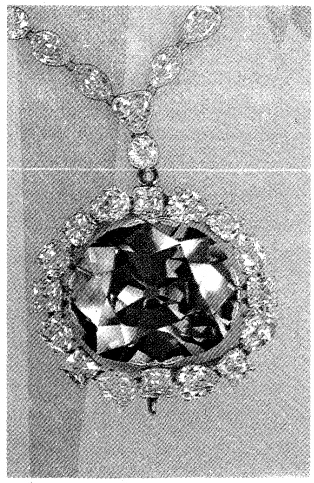
Hope, Thomas (b. 1769, Amsterdam, Neth.—d. Feb. 3, 1831, London, Eng.), English author and furniture designer who was a major exponent of the Regency style of English decorative arts.

Hope was a member of a rich banking family that had emigrated from Scotland to Holland. During his youth he studied architecture and traveled extensively in Mediterranean countries, the probable source of his passion for classical art and architecture. He settled in London about 1796 and in 1807 purchased Deepdene, the country house in Surrey that he decorated and furnished in the Regency style. Included in its furnishings were statues executed by John Flaxman, a leading English Neoclassical sculptor, and an Egyptian sofa and chair now in the Victoria and Albert Museum, London.

Hope's major work on interior design is *Household Furniture and Interior Decoration* (1807; facsimile ed., 1937), which influenced the Neoclassical movement. He also wrote *The Costumes of the Ancients* (1809) and *Designs of Modern Costume* (1812). His most popular work was the novel *Anastasius; or, Memoirs of a Greek Written at the Close of the Eighteenth Century* (1819). He also wrote on philosophy and architecture.

Hope, Victor Alexander John: *see* Linlithgow, Victor Alexander John Hope, 2nd Marquess of.

Hope diamond, sapphire-blue gemstone from India, one of the largest blue diamonds known. It is thought to have been cut from a 112-carat stone brought to France by the jewel trader Jean-Baptiste Tavernier and purchased by Louis XIV in 1668 as part of the French crown jewels. This stone, later called the French Blue, was recut into a 67-carat heart in 1673 and disappeared after the crown-jewel robbery of 1792. The 45.5-carat Hope diamond, named for the London banker Thomas Hope, who purchased it in 1830, was apparently formed from it. The Hope diamond is on display in the Smithsonian Institution, Washington, D.C.



The Hope diamond; in the Smithsonian Institution, Washington, D.C.

Lee Boltin

Hope-Jones, Robert (b. Feb. 9, 1859, Hooton Grange, Cheshire, Eng.—d. Sept. 13, 1914, Rochester, N.Y., U.S.), British-American organ builder who introduced several innovations into electric-organ construction and influenced organ development in the United States.

A church organist as well as head electrician of the National Telephone Co., Hope-Jones established an organ-manufacturing business in 1889. He immigrated to the United States in 1903, and four years later, after working with the E.M. Skinner Co. of Boston, he founded the Hope-Jones Organ Co. (Tonawanda, N.Y.), which he sold in 1908 to the Rudolph Wurlitzer Co. Hope-Jones, in his organ-building innovations, entirely abandoned the chorus and mutation stops and relied, instead, upon diapasons of vast scale on heavy-pressure wind, with reeds to match, backed up by huge-scaled flutes, tiny-scaled string stops, and powerful stops of his own invention called diaphones.

Hope Theatre, London playhouse that served as both a theatre and an arena for bull- and bearbaiting, located on the Bankside in Southwark in what had been the Bear Garden. Philip Henslowe and Jacob Meade built the theatre in 1613–14, fulfilling their agreement with Lady Elizabeth's Men, which required them to provide a theatre for that troupe. The contract for the Hope, dated Aug. 29, 1613, and one of the few surviving documents describing the structure of Jacobean theatres, indicates that it was modeled after the Swan Theatre, except that the Hope had a movable stage.

One of the first plays written for the Hope was Ben Jonson's *Bartholomew Fair*, performed by Lady Elizabeth's Men in the fall of 1614. Although the agreement with this troupe stipulated that bearbaiting would occupy the Hope only once every two weeks, that sport proved to be more profitable than the plays, and disputes soon developed over priorities, provoking players to quit the theatre after Henslowe's death in 1616. Although the theatre was rarely used for plays after that, bearbaiting continued until 1656, when authorities closed the Hope in response to several bearbaiting accidents.

Hopefield, town, southwestern Cape province, South Africa, north of Cape Town. The town was laid out in 1852 and was named for the two Cape Colony government officials who were responsible, named Hope and Field. Municipal status was granted in 1914. Hopefield is situated in a semiarid agricultural region; wheat is the principal product, but sheep raising and honey production are also important. The town is connected with Cape Town by rail.

The archaeological site of Elandsfontein is located 8 miles (13 km) southwest of Hopefield, about 10 miles (16 km) inland from an estuary of Saldanha Bay and 330 feet (100 m) above sea level. In the early 1950s a large collection of fossilized bones and Paleolithic artifacts was discovered in chalky concretions exposed between high dunes by the prevailing winds. Under the direction of Ronald Singer of the University of Cape Town, more than 20,000 faunal remains and 5,000 artifacts were removed from the site. About 50 mammalian species, approximately half of them extinct, are represented among the fossil bones. The extinct species include an ancestral springbok, a sabre-toothed tiger, and very large wild pigs, lion, baboon, and buffalo; the horns of the buffalo have a span of 10 to 12 feet (3 to 3.6 m). In 1953 Keith Jolly, an archaeologist working with Singer, discovered fragments of a hominid skull known as Saldanha man (formerly Hopefield man). The skull, which dates from the same period as the fauna, is very similar to those found in 1921 at Broken Hill, Northern Rhodesia (now Kabwe, Zambia),

and called Rhodesian man. The site appears to have been occupied about the end of the middle Pleistocene and the beginning of the late Pleistocene, between 150,000 and 60,000 years ago. Pop. (1985) 3,163.

Hopeh, Wade–Giles HO-PEI, Pinyin HEBEI, *sheng* (province) in northern China, located between the province of Shansi, on the west, and the Po Gulf and Manchuria on the east. It is bounded on the north by China's Inner Mongolia Autonomous Region and on the south by the provinces of Shantung and Honan.

A brief treatment of Hopeh follows. For full treatment, *see* MACROPAEDIA: China.

From 1644 to 1911/12 Hopeh was ruled by the Ch'ing (Manchu) dynasty. After its overthrow a Nationalist government ruled fitfully until 1937, when Hopeh was occupied by the Japanese. The occupiers surrendered to the Chinese Nationalists in 1945, and it fell to the Chinese Communist forces near the end of the civil war (1946–49). The provincial capital was at Pao-ting until 1958, when it was transferred first to Tientsin and then, in 1967, to Shih-chia-chuang Shih, 160 miles (260 km) southwest of Peking and at the junction of three major railways. Peking, the national capital, lies within Hopeh province but is independent of the provincial administration. Culturally and economically, Hopeh is the most advanced province in northern China.

The province consists of two almost equal sections: the northern part of the North China Plain and the mountain ranges along the northern and western frontiers. The former, sometimes called the Hopeh Plain, slopes gently from west to east and is bounded by the Yen Mountains on the north. This range forms the northern rim of the North China Plain, displaying an endless sea of rounded hills, with peaks averaging 4,900 feet (1,500 m) above sea level. The Great Wall of China zigzags along its crests. Beyond these mountains the Mongolian Plateau stretches from the northernmost part of Hopeh to the Mongolian People's Republic. This part of Hopeh has an average elevation of 3,900 to 4,900 feet (1,200 to 1,500 m). The plateau's rim is rugged and not hospitable to human settlement. The province has a continental climate.

The North China Plain has been inhabited by humans for several millennia. The Hopeh Plain was the home of *Homo erectus pekinensis* (Peking man), one of the oldest known examples of fossil man, who lived about 400,000 years ago and used tools and fire.

The ethnic composition of the Hopeh population is almost entirely Chinese. Minority groups include Chinese Muslims and Mongolians. Urban dwellers make up approximately one-fifth of the total population of Hopeh, the highest proportion in North China, exceeded only by Kiangsu province among the provinces south of the Great Wall. The Peking-Tientsin industrial region, extending from the base of Yen and T'ai-hang mountains to the sea, is the largest and most important in North China. It includes the major industrial cities of T'ang-shan and Ch'in-huan-tao in the east, Pao-ting and Shi-chia-chuang in the west, and Liu-li-ho in Peking Municipality. Important ports are Tientsin, T'ang-ku, and the major coal-handling port of Ch'in-huang-tao.

Heavy industry is closely associated with the major coal mines and railways. Tientsin, the second largest city, is the primary industrial and commercial centre of North China, the second most important trade centre in all China, and an important educational and cultural centre as well. Like Peking, it has its own administrative district. T'ang-shan, the third city in the region, is another centre of heavy industry, producing steel, cement, and railway-repair materials. Light industry includes textiles, paper, flour mills, and ceramics.

Other important cities in Hopeh include the ancient and still bustling city of Pao-ting; the provincial capital, Shih-chia-chuang; ancient Han-tan, Hopeh's fastest-growing urban-industrial centre; and Chang-chia-k'ou, food-processing centre and producer of mining machinery. Hopeh province and the separate municipalities of Peking and Tientsin form three of the 30 primary administrative divisions of the People's Republic of China. Area 78,200 square miles (202,700 square km). Pop. (1988 est.) 56,958,000.

Hopetown, town, northeast Cape province, South Africa, near the Orange River and westernmost point of Orange Free state. Founded in 1854, Hopetown was named for Major William Hope, an official of the Cape Colony government. It became a town in 1858. The first diamond found in South Africa, a 21.25-carat stone discovered in 1867 by children on a farm near the town, led to the great South African diamond rush. However, no other major diamond discoveries were made in the vicinity of Hopetown. The economy of the surrounding area is now based on irrigation farming and stock raising, chiefly of Dorper sheep (for which the region is noted), Merino sheep, some cattle, and, more recently, Karakul sheep. With the beginning of the Orange River Project in the 1960s, Hopetown underwent a rapid expansion, and a town-planning scheme was undertaken. Pop. (1985) 4,338.

Hopewell, city, in, but independent of, Prince George county, eastern Virginia, U.S., and an inland port at the confluence of the James and Appomattox rivers, 20 miles (32 km) south of Richmond. It was named for Hopewell Farms, an estate founded in 1635. Hopewell was organized in 1913, when a munitions plant was established there. Hopewell was the birth place (1773) of statesman John Randolph of Roanoke. Its Appomattox Manor (1653) was shelled by troops led by Benedict Arnold during the American Revolution. The city served as the headquarters of General Ulysses S. Grant (June 1864–April 1865) during the Civil War siege of nearby Petersburg. In 1923 adjacent City Point was annexed.

Manufactures include chemicals, textiles, and paper and fibre products. Fort Lee is nearby. Inc. city, 1916. Pop. (1988 est.) 24,578.

Hopewell culture, the most notable ancient Indian culture of the east-central area of North America. It flourished from about 200 BC to AD 400 chiefly in what is now southern Ohio, with related groups in Michigan, Wisconsin, Indiana, Illinois, Iowa, Kansas, Pennsylvania, and New York. The name is derived from the Hopewell farm in Ross county, Ohio, where the first site—centring on a group of burial mounds with extensive enclosures of banked earth—was explored. The term Mound Builders, once applied to this culture, is now considered a misnomer. Later investigations revealed that the practice of constructing earth mounds was widespread and served greatly differing purposes.

Hopewell villages lay along rivers and streams. The inhabitants raised maize and possibly beans and squash but still relied upon hunting and fishing and the gathering of wild nuts, fruits, seeds, and roots. The amount of pottery and ornamental stonework and metalwork that has been found suggests some division of labour; moreover, the nature and size of the earthworks at many sites suggest that forms of public labour, whether voluntary or conscripted, may have been employed. The earthworks sometimes suggest defensive purposes, but more often they served as burial mounds or apparently formed the bases of temples or other structures.

Their best pottery was well made, with decoration applied by incised or stamped lines, often in naturalistic outlines. Even more notable were effigy pipes carved in stone and polished, representing birds, fish, and other animals. Their metalwork (consisting of beating and annealing) has been called the finest in North America in pre-Columbian times. Copper sheet was used extensively; some silver and meteoric iron, and occasionally gold, entered into various ornaments and utility pieces. Sheets of mica also characterize the culture.

Trade routes were evidently well developed, for material from as far away as the Rocky Mountains and the coasts of the Gulf of Mexico and the Atlantic are found in Hopewell sites, and articles identified as manufactured by the Hopewell Indians are found in localities as far distant.

After about AD 400 the more spectacular features of the Hopewell culture gradually disappeared. The quantity and quality of fine articles and mounds declined, and the people apparently became less sedentary and more loosely organized.

Hophra (Egyptian king): *see* Apries.

Hopi, the westernmost group of Pueblo Indians (*q.v.*), situated in northeastern Arizona



Hopi town of Walpi, from the northeast, 1897

By courtesy of the Los Angeles County Museum of Natural History, California

in the midst of the Navajo Reservation and on the edge of the Painted Desert. Formerly known also as the Moki, or Moqui, they speak a Shoshonean language of Uto-Aztecan stock. In the late 20th century there were about 6,000 Hopi, living in typically terraced pueblo structures of stone and adobe and clustered into a number of independent towns. Most of their settlements were on high mesas.

The precise origin of the Hopi is unknown, nor is it known why they lived in so many independent communities. Their own origin myths merely hold that their ancestors climbed upward through four underground chambers called kivas and lived in many places before reaching their present locations. And, indeed, archaeology has revealed that some abandoned pueblos, such as Sikyatki and Awatovi, were once occupied by Hopi people.

Matrilineal descent was the tribal rule. Oraibi's populace, for example, used to be divided into 30 or 31 matrilineal clans, which were grouped into nine larger social units, or phratries, many of which are now extinct. Formerly, too, the Hopi were strictly matrilocal, which meant that a bride remained in her mother's house. This custom no longer prevails.

The Hopi supported themselves by farming and sheepherding. Their chief crop was corn, but they also grew beans, squash, melons, and a variety of other vegetables and fruits. Men farmed and herded, in addition to building houses, performing most of the ceremonies, making moccasins, and weaving garments and blankets. The women, besides performing the usual domestic tasks, made baskets and pottery, fetched water, did supplementary gardening, and helped with housebuilding.

Like other Pueblo Indians, the Hopi were peaceful and monogamous. Both sexes began their ceremonial careers soon after reaching six years of age by being inducted into the kachina (katcina) cult. Hopi kachinas were masked impersonations, always by men, of a wide variety of gods, spirits, departed ancestors, and clouds. Women seldom took active part in ceremonies, except as voluntary members of one or more of three feminine secret societies. However, in each village men had the option of joining a wide number of secret societies, including those that conducted a strenuous tribal initiation, and which staged an annual winter solstice (*Soyal*) celebration. So important was the *Soyal* that its leadership was always entrusted to a high official, usually the town's chief.

Most widely publicized of Hopi rituals was the Snake dance, held in late August, during which the performers danced with live snakes in their mouths. Actually the public saw only a brief, though exciting, portion of a lengthy ceremony, most of which was conducted secretly in kivas.

With the breakdown of isolation, growing numbers of Hopi have abandoned the ways of their ancestors. Caught up in a process of rapid cultural change, they no longer turn their efforts inward, toward their pueblos, but outward, toward the white man's towns and cities and economic and recreational systems. As a result the traditional culture of the Hopi has been steadily disintegrating.

Hopi language, a North American Indian language of the Uto-Aztecan family, spoken by the Hopi people of northeastern Arizona. Hopi is of particular interest because of the way in which concepts of time and space are expressed in it: in its verb forms, for example, an event at a great distance from the speaker is characterized as having occurred in the distant past; the shorter the spatial distance, the less the temporal distance is seen to be. Hopi verbs have no real tense but instead are distinguished by aspect (the length of time an event lasts), validity (whether an action is completed or ongoing, expected, or regular and predictable), and clause-linkage (giving the temporal relationship of two or more verbs). In addition, verbs can be inflected to show that an action occurs in repeated segments: *e.g., ríya* ("it makes a quick spin") and *riyáyata* ("it is spinning").

In the 1930s the linguist Benjamin Lee Whorf seized on these characteristics of the verbs of the Hopi language to illustrate the "Whorfian hypothesis": language closely governs our experience of reality. The Hopi language frames the way in which the Hopi talk about their universe. The same holds true, in Whorf's view, for all individual languages and people.

Hôpital, Michel de L': *see* L'Hospital, Michel de.

Hopkins, Esek (b. April 26, 1718, Providence, R.I.—d. Feb. 26, 1802, Providence, R.I., U.S.), first commodore of the United States Navy in the period of the American Revolution (1775–83).

Hopkins, who went to sea at the age of 20, proving his ability as a seaman and trader, and a marriage into wealth put him at the head of a large merchant fleet prior to the French and Indian War (1754–63). By privateering during that war, he added to his fortune and won a considerable naval reputation. Rhode Island named him a brigadier general of its land forces at the outbreak of the Revolution, but a



Esek Hopkins, detail from a mezzotint after a mezzotint by Thomas Hart, 1776

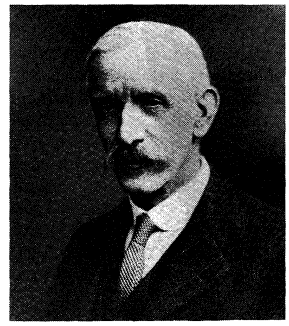
By courtesy of the U.S. Navy

call from the Continental Congress, where his brother was chairman of the naval committee, induced him to forsake the army and accept the command (Dec. 22, 1775) of the first Continental fleet then outfitting at Philadelphia. Instructed to attack the British fleet under John Murray, 4th earl of Dunmore, in Chesapeake Bay, Hopkins considered his orders discretionary and the enemy too strong. He therefore sailed his fleet of eight armed vessels to the Bahamas, captured considerable war matériel at New Providence Island, and upon his return fought an inconclusive action with the British ship "Glasgow" (April 1776).

Dissatisfaction with the achievements of the fleet and its subsequent inactivity in Rhode Island led to an investigation by Congress. Censured for disobedience of orders, Hopkins returned to the fleet, but his continued inactivity and quarrels with his officers induced Congress to suspend him from his command in March 1777. He was dismissed from the navy in 1778 and thereafter played a prominent part in Rhode Island politics.

Hopkins, Sir Frederick Gowland (b. June 20, 1861, Eastbourne, East Sussex, Eng.—d. May 16, 1947, Cambridge), British biochemist, who received (with Christiaan Eijkman) the 1929 Nobel Prize for Physiology or Medicine for discovery of essential nutrient factors—now known as vitamins—needed in animal diets to maintain health.

In 1901 Hopkins discovered the amino acid tryptophan, isolated it from protein, and eventually (1906–07) showed that it and certain other amino acids (known as essential amino acids) cannot be manufactured by certain animals from other nutrients and must be supplied in the diet. Noticing that rats failed to



Sir Frederick Gowland Hopkins

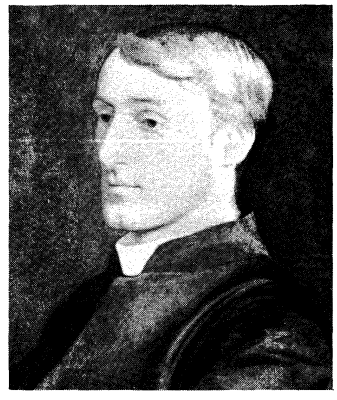
By courtesy of the World Health Organization

grow on a diet of artificial milk but grew rapidly when a small quantity of cow's milk was added to their daily ration, Hopkins realized that no animal can live on a mixture of pure protein, fat, and carbohydrate, even when mineral salts are added, and termed the missing factors—later called vitamins—"accessory substances."

In 1907 Hopkins and Sir Walter Fletcher laid the foundations for a modern understanding of the chemistry of muscular contraction when they demonstrated that working muscle accumulates lactic acid. Fifteen years later, Hopkins isolated from living tissue the tripeptide (three amino acids linked in sequence) glutathione and showed that it is vital to the utilization of oxygen by the cell.

Hopkins spent most of his career at Cambridge University (1898–1943). He was knighted in 1925 and received many other honours, including the presidency of the Royal Society (1931) and the Order of Merit (1935).

Hopkins, Gerard Manley (b. July 28, 1844, Stratford, Essex, Eng.—d. June 8, 1889, Dublin), English poet and Jesuit priest, one of the most individual of Victorian writers. His work was not published in collected form un-



Gerard Manley Hopkins, detail of a portrait by Harry Ellis Wooldridge; in a private collection

til 1918, but it influenced many leading 20th-century poets.

Hopkins was the eldest of the nine children of Manley Hopkins, an Anglican, who had been British consul general in Hawaii and had himself published verse. Hopkins won the poetry prize at the Highgate grammar school and in 1863 was awarded a grant to study at Balliol College, Oxford, where he continued writing poetry while studying classics. In 1866, in the prevailing atmosphere of the Oxford Movement, which renewed interest in the re-

lationships between Anglicanism and Roman Catholicism, he was received into the Roman Catholic Church by John Henry (later Cardinal) Newman. The following year, he left Oxford with such a distinguished academic record that Benjamin Jowett, then a Balliol lecturer and later master of the college, called him "the star of Balliol." Hopkins decided to become a priest. He entered the Jesuit novitiate in 1868 and burned his youthful verses, determining "to write no more, as not belonging to my profession."

Until 1875, however, he kept a journal recording his vivid responses to nature as well as his expression of a philosophy for which he later found support in Duns Scotus, the medieval Franciscan thinker. Hopkins' philosophy emphasized the individuality of every natural thing, which he called "inscape." To Hopkins, each sensuous impression had its own elusive "selfness"; each scene was to him a "sweet especial scene."

In 1874 Hopkins went to St. Beuno's College in North Wales to study theology. There he learned Welsh, and, under the impact of the language itself as well as that of the poetry and encouraged by his superior, he began to write poetry again. Moved by the death of five Franciscan nuns in a shipwreck in 1875, he broke his seven-year silence to write the long poem "The Wreck of the Deutschland," in which he succeeded in realizing "the echo of a new rhythm" that had long been haunting his ear. It was rejected, however, by the Jesuit magazine *The Month.* He also wrote a series of sonnets strikingly original in their richness of language and use of rhythm, including the remarkable "The Windhover," one of the most frequently analyzed poems in the language. He continued to write poetry, but it was read only in manuscript by his friends and fellow poets, Robert Bridges (later poet laureate), Coventry Patmore, and the Rev. Richard Watson Dixon. Their appreciation of the strangeness of the poems (for the times) was imperfect, but they were, nevertheless, encouraging.

Ordained to the priesthood in 1877, Hopkins served as missioner, occasional preacher, and parish priest in various Jesuit churches and institutions in London, Oxford, Liverpool, and Glasgow and taught classics at Stonyhurst College, Lancashire. He was appointed professor of Greek literature at University College, Dublin, in 1884. But Hopkins was not happy in Ireland; he found the environment uncongenial, and he was overworked and in poor health. From 1885 he wrote another series of sonnets, beginning with "Carrion Comfort." They show a sense of desolation produced partly by a sense of spiritual aridity and partly by a feeling of artistic frustration. These poems, known as the "terrible sonnets," reveal strong tensions between his delight in the sensuous world and his urge to express it and his equally powerful sense of religious vocation.

While in Dublin, Hopkins developed another of his talents, musical composition; the little he composed shows the same daring originality as does his poetry. His skill in drawing, too, allowed him to illustrate his journal with meticulously observed details of flowers, trees, and waves.

His friends continually urged him to publish his poems, but Hopkins resisted; all that he saw in print in his lifetime were some immature verses and original Latin poems, in which he took particular pleasure.

Hopkins died of typhoid fever and was buried in the Glasnevin Cemetery, Dublin. Among his unfinished works was a commentary on the *Spiritual Exercises* of St. Ignatius of Loyola, founder of the Jesuit order.

After Hopkins' death, Robert Bridges began to publish a few of the Jesuit's most mature poems in anthologies, hoping to prepare the way for wider acceptance of his style. By 1918, Bridges, then poet laureate, judged the time opportune for the first collected edition. It appeared but sold slowly. Not until 1930 was a second edition issued, and thereafter Hopkins' work was recognized as among the most original, powerful, and influential literary accomplishments of his century; it had a marked influence on such leading 20th-century poets as T.S. Eliot, Dylan Thomas, W.H. Auden, Stephen Spender, and C. Day Lewis.

Hopkins sought a stronger "rhetoric of verse." His exploitation of the verbal subtleties and music of English, of the use of echo, alliteration, and repetition, and a highly compressed syntax were all in the interest of projecting deep personal experiences, including his sense of God's mystery, grandeur, and mercy, and his joy in "all things counter, original, spare, strange," as he wrote in "Pied Beauty." He called the energizing prosodic element of his verse "sprung rhythm," in which each foot may consist of one stressed syllable and any number of unstressed syllables, instead of the regular number of syllables used in traditional metre. The result is a muscular verse, flexible, intense, vibrant, and organic, that combines accuracy of observation, imaginative daring, deep feeling, and intellectual depth.

Hopkins' letters reveal a brilliant critical faculty, scrupulous self-criticism, generous humanity, and a strong will. His friends paid tribute to his personal integrity and to his rare "chastity of mind." Coventry Patmore wrote of him: "There was something in all his words and manners which were at once a rebuke and an attraction to all who could only aspire to be like him." (J.C.Rd.)

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Hopkins, Harry L(loyd) (b. Aug. 17, 1890, Sioux City, Iowa, U.S.—d. Jan. 29, 1946, New York City), U.S. New Deal Democratic administrator who personified the ideology of vast federal work programs to relieve unemployment in the 1930s; he continued as Pres. Franklin D. Roosevelt's emissary and closest personal adviser during World War II.

Hopkins was a social worker in New York City through the 1920s. In response to the pressing needs arising in the economic depression stemming from the stock-market crash of 1929, Hopkins was appointed (1931) executive director (later chairman) of the New York State Temporary Emergency Relief Administration established by Roosevelt, then governor. When Roosevelt became president (1933), he brought Hopkins with him to the nation's capital. In his new post as administrator of the Federal Emergency Relief Administration, he combined crusading moral fervour with executive ability.



Harry Hopkins

By courtesy of the Library of Congress, Washington, D.C.

Heavy Democratic victories in the 1934 elections encouraged Hopkins to pressure the President to recommend extensive reforms in the program the following year—including the introduction of the Works Progress (later Work Projects) Administration (WPA), which he directed. While opponents heaped scorn upon Hopkins for what they termed a gigantic giveaway program to earn votes, millions of Americans were put to work on a wide range of public projects. With enormous zest and dedication, Hopkins had by 1938 directed the spending of more than $8,500,000,000 for unemployment relief, aiding some 15,000,000 people, with the record marred by only a few insignificant scandals. In this period, he also served on the President's Drought Committee, the Committee on Economic Security, the National Emergency Council, and the National Resources Planning Board and headed the Federal Surplus Relief Corporation.

By the time of the 1936 election, Hopkins had become deeply interested in politics and increasingly served as an adviser to Roosevelt, who appointed him secretary of commerce in 1938. When a serious illness put an end to Hopkin's political ambitions, he became more valuable to the President as a trusted confidant. He acted as personal manager to Roosevelt at the Democratic National Convention in July 1940, after which he resigned his Cabinet post. As World War II broadened, Hopkins made several trips for the President to London and later to Moscow to discuss assistance and military strategy. He was appointed to head the lend-lease program to aid the Allies (1941) and was also a member of the War Production Board and the Pacific War Council. He functioned mainly, however, as the President's intimate adviser, even living at the White House. His final service after Roosevelt's death (April 1945) was to visit Moscow to help arrange the Potsdam Conference. A revealing biography is *Roosevelt and Hopkins* (1948) by Robert Sherwood.

Consult the INDEX *first*

Hopkins, Johns (b. May 19, 1795, Anne Arundel County, Md., U.S.—d. Dec. 24, 1873, Baltimore), U.S. millionaire merchant and investor who in his will left large endowments to found Johns Hopkins University and Johns Hopkins Hospital.

The son of a Quaker tobacco planter, Johns Hopkins quit school at the age of 12 to work the family fields after his parents—in accord with their Quaker conscience—had emancipated their slaves. Awareness of his own educational limitations and of the needs of the

newly freed blacks would stay with him and influence him for the rest of his life.

At the age of 17, Hopkins went to live with his uncle in Baltimore and learn the wholesale grocery business. He managed the business well but quarreled with his uncle in 1819 when the uncle refused to permit farmers to pay for goods in whiskey. Johns Hopkins thereupon went into business with a partner and later with three of his brothers.

Hopkins Brothers prospered, delivering goods throughout Maryland, Virginia, North Carolina, and even into Ohio. The firm freely accepted payment in whiskey, which it then sold as Hopkins' Best. Johns Hopkins devoted himself entirely to the business, never traveling, never marrying, and seldom spending money on personal pleasures. When he retired in 1847, he was a very wealthy man.

He increased his wealth through farsighted investments in Baltimore real estate and businesses, becoming the largest private individual stockholder in the Baltimore and Ohio Railroad. He was also a director of several banks and a major investor in insurance companies, warehouses, and steamship lines, and he exerted a major influence on the development of Baltimore's commerce.

Six years before his death, Johns Hopkins organized two corporations, one for a hospital and one for a university, and his will (1870) divided $7,000,000 equally between them. He also endowed an orphanage for black children. Johns Hopkins University opened its doors in 1876, the hospital in 1889; and a medical school utilizing the facilities of both held its first class—admitting women on the same basis as men—in 1893.

Hopkins, Mark (b. Feb. 4, 1802, Stockbridge, Mass., U.S,—d. June 17, 1887, Williamstown, Mass.), American educator and theologian of whom U.S. President James A. Garfield, a former student, once declared, "I am not willing that this discussion should close without mention of the value of a true teacher. Give me a log hut, with only a simple bench, Mark Hopkins on one end and I on the other, and you may have all the buildings, apparatus, and libraries without him."

Hopkins graduated from Williams College, Williamstown, Mass., in 1824 and from Berkshire Medical College, Pittsfield, Mass., in 1829. He practiced medicine briefly in New York City, but in 1830 he returned to Williams, where he instructed the senior class in moral philosophy and rhetoric and, from 1836 to 1872, served as president of the college. Although he had no formal training in theology, he was ordained a Congregationalist minister in 1836. His strong religious convictions were reflected in his teachings, which stressed piety and moral values as much as, or even more than, intellectual achievements. He also emphasized self-education, preferring the Socratic method of teaching to more dogmatic or didactic forms, and placed great importance on material prosperity, which he believed should be treated with the responsibility of Christian stewardship. His influence spread beyond the college when a series of lectures he delivered at the Lowell Institute in Boston were published in *Lectures on the Evidences of Christianity* (1846), *Lectures on Moral Science* (1862), *The Law of Love and Love as a Law* (1869), and *An Outline Study of Man* (1873), all of which went through several editions.

Hopkins, Mark (b. Sept. 3, 1814, Richmond County, Va., U.S.—d. March 29, 1878, Yuma, Arizona Territory), California capitalist who helped build the Central Pacific (later the Southern Pacific) Railroad and for whom San Francisco's Mark Hopkins Hotel atop Nob Hill was named.

After his birth, his family settled in North Carolina. In 1845 he and his brother Moses left home for Kentucky and, when news of the Gold Rush reached them, moved on to California (May 1851). By the spring of 1852 Hopkins had given up unprofitable gold mining and started a grocery business in Placerville and, the next year, in Sacramento. In 1855 he joined with another Sacramento merchant, Collis P. Huntington, to form Huntington & Hopkins, which became one of the most prosperous mercantile houses in the state. In 1861 the two men were approached by an enterprising engineer, Theodore Dehone Judah, who envisaged a new transcontinental railroad; and in June a company called the Central Pacific Railroad was organized, with Hopkins, Huntington, and fellow merchants Leland Stanford and Charles Crocker as the major directors (the "Big Four"). In 1869 the main line was completed, meeting the Union Pacific at Promontory, Utah; feeder lines were soon added throughout California.

Hopkins' three partners eventually moved to San Francisco, and he began building a spectacular mansion there (at the site of the present-day Mark Hopkins Hotel). He remained in Sacramento, however, and the house was not completed until after his death. He died about a week after seeking a health cure in the Arizona desert.

Mark Hopkins, the businessman, was apparently not related to Mark Hopkins, the educator, as sometimes reported. For many years, there was also much confusion of identity between him and another Mark Hopkins (1813–76/77), who was originally from New York state and lived and operated businesses in Sacramento during the same period.

Hopkins, Samuel (b. Sept. 17, 1721, Waterbury, Conn. [U.S.]—d. Dec. 20, 1803, Newport, R.I.), American theologian and writer who was one of the first Congregationalists to oppose slavery.

After studying divinity in Northampton, Mass., with the Puritan theologian Jonathan Edwards, in whose home he lived, Hopkins



Samuel Hopkins, engraving by Abner Reed, 1803
By courtesy of the Newport Historical Society, Rhode Island

was ordained (1743) as minister of the Congregational Church at Housatonic (now Great Barrington), Mass. He served there until 1769, but his reputation as an inept preacher, combined with his unorthodox attitudes toward church membership and baptism, led to his dismissal. From 1770 until his death he was minister of the First Congregational Church in Newport, where he was active in opposing the slave trade that flourished there. He raised money to free numerous slaves, but he failed to realize his plan to establish colonies for them in Africa.

Hopkins' belief in the need and the desirability of social service is implicit in his major work, *The System of Doctrines Contained in Divine Revelation* (1793). His system, which became popular as "Hopkinsianism," reflected many of Edwards' views on the relation of God to man. He contended that man must overcome self-love (sin) by disinterested benevolence and by complete submission to God's will—even if submission means a willingness to be damned. Hopkins' views helped to expand missionary activity in America and abroad, particularly in Africa.

Hopkinson, Francis (b. Oct. 2, 1737, Philadelphia, Pa. [U.S.]—d. May 9, 1791, Philadelphia), American lawyer, musician, author, member of the Continental Congress, and signer of the Declaration of Independence.

Hopkinson was educated at the College of Philadelphia (later the University of Pennsylvania) and also studied law. After a brief business career, he launched a successful legal practice in New Jersey.

In 1774 Hopkinson was appointed to the governor's council, and in 1776 he represented New Jersey in the Continental Congress. He signed the Declaration of Independence and later served in several minor offices in the new American government. From 1779 to 1789 he was judge of the admiralty court for Pennsylvania, and from 1789 to his death he was U.S. district judge for eastern Pennsylvania. An ardent backer of the Constitution, he wrote several effective articles that contributed to the ratification effort in Pennsylvania.

Hopkinson was an accomplished player of the harpsichord and a composer of both religious and secular songs. In addition, he wrote poetry and literary essays. During the Revolution, he ridiculed the British and their Loyalist sympathizers with pointed political satires. After the Revolution, he maintained a steady correspondence with Benjamin Franklin, George Washington, and Thomas Jefferson.

Among his varied pursuits, Hopkinson was also an artist. He designed the seal of the American Philosophical Society, the seal for the State of New Jersey, and seals for various departments of the U.S. government. There is evidence to support the view that he helped design the American flag; the U.S. Congress, however, turned down his petition for payment, asserting that others had contributed to the design.

Hopkinson, John (b. July 27, 1849, Manchester, Eng.—d. Aug. 27, 1898, Mount Petite Dent de Veisivi, Switz.), British engineer and physicist who invented the three-wire system for electricity distribution and improved the design and efficiency of electric generators. In 1872 he became engineering manager of Chance Brothers and Company, a glass manufacturer in Birmingham, where he studied the problems of lighthouse illumination and advocated the use of flashing groups of lights for more efficient lighthouse operation.

He also studied electrostatic storage capacity, the phenomenon of residual charge, and other problems arising from the electromagnetic theory of James Clerk Maxwell.

Hopkinson set up a successful practice as an electrical-engineering consultant in 1878. In collaboration with his brother Edward, he worked out the general theory of alternating current and the operation of ac generators in parallel (*i.e.,* operation together to produce current over one line).

In 1890 he became a professor at King's College, London, where he was placed in charge of the newly founded Siemens Laboratory. Hopkinson, together with a son and two daughters, was killed in an accident while climbing Mount Petite Dent de Veisivi.

Hopkinsville, city, seat of Christian county, southwestern Kentucky, U.S. It originated as Elizabethtown, which became county seat in 1797 and was renamed to honour Samuel Hopkins, Revolutionary War soldier and pioneer. It became a service centre for farmers and developed as a market for livestock and for burley and dark-fired tobacco, with some light manufacturing. The city is the seat of Hopkinsville Community College, an extension of the state university. Fairview, birth-

place of Jefferson Davis (a state shrine, marked by a 351-ft- [107-m-] high obelisk), is 11 mi (18 km) east. Ft. Campbell, a military base, is 16 mi south. Inc. town, 1804; city, 1897. Pop. (1980) 27,318.

hoplite, ancient Greek heavily armed foot soldier whose function was to fight in close formation. Until his appearance, probably in the late 8th century BC, individual combat predominated in warfare. New and heavier armour now gave the foot soldier stronger protection: he wore a metal helmet, breastplate, and greaves; on his left forearm he carried a shield that replaced one hung around the neck; and he carried a sword and a six-foot-long thrusting, instead of throwing, spear.

From then on it was the compactness and weight of the massed hoplite phalanx breaking through enemy ranks that won battles, not the individual brilliance of aristocratic champions. The normal depth of the line was eight ranks, but the Thebans in the 4th century were known to concentrate 50 ranks in one flank.

While the phalanx formation was unwieldy, the equipment heavy, and pursuit difficult, Greek hoplites were the best fighters in the Mediterranean world and in great demand as mercenaries in Lydia, Babylonia, and Egypt.

Hoppe, Willie, byname of WILLIAM FREDERICK HOPPE (b. Oct. 11, 1887, Cornwall-on-the-Hudson, N.Y., U.S.—d. Feb. 1, 1959, Miami), U.S. master of carom (balkline and three-cushion) billiards, was one of the most durable of all sports champions, winning 51 world titles between 1906 and 1952.

After being taught billiards by his father, a hotelkeeper, so that he could win money from travelling salesmen, Hoppe (then 18) captured the world 18.1 balkline championship from Maurice Vignaux in Paris in 1906. He then set a world record (not broken until 1926) by running 622 points in an 18.2 balkline exhibition. In balkline play he was world champion for many years in both 18.1 (1906–07, 1909–11, 1914–26, 1927; competition discontinued after he regained the title in 1927) and 18.2 (1907, 1910–20, 1923–24, 1927). Subsequently concentrating on the three-cushion game, he won 12 annual world championship tournaments (1936, 1940–44, 1947–52). In the 1940 tournament in Chicago he was undefeated in 20 matches. He retired after successfully defending his title in 1952.

Hoppe-Seyler, Ernst Felix (Immanuel) (b. Dec. 26, 1825, Freyburg an der Unstrut, Halle—d. Aug. 10, 1895, Wasserburg am Bodensee), German physician, known for his work toward establishing physiological chemistry (biochemistry) as an academic discipline. He was the first to obtain lecithin in a pure form and introduced the word proteid (now protein). Additional contributions included metabolic studies and researches on chlorophyll and on blood, especially hemoglobin, which he obtained in crystalline form.

Hoppe-Seyler founded (1877) and edited the first biochemical journal, *Zeitschrift für Physiologische Chemie*, and, apart from numerous scientific papers, published *Physiologische Chemie*, 4 vol. (1877–81), and *Handbuch der Physiologisch- und Pathologisch-Chemischen Analyse* (1858).

Hopper, Edward (b. July 22, 1882, Nyack, N.Y., U.S.—d. May 15, 1967, New York City), U.S. painter whose realistic depictions of everyday urban scenes shock the viewer into recognition of the strangeness of familiar surroundings. He strongly influenced the Pop art and New Realist painters of the 1960s and 1970s.

Hopper was initially trained as an illustrator, but, between 1901 and 1906, he studied painting under Robert Henri, a member of a group of painters called the Ashcan School. Hopper travelled to Europe three times between 1906 and 1910, but he remained untouched by the experimental work then blossoming in France and continued throughout his career to follow his own artistic course. Although he exhibited paintings in the Armory Show of 1913, he devoted most of his time to advertising art and illustrative etchings until 1924. He then began to do such watercolours as "Model Reading" (1925; Art Institute of Chicago), as well as oil paintings. Like the painters of the Ashcan School, Hopper painted the commonplaces of urban life. But, unlike their loosely organized, vivacious paintings, his "House by the Railroad" (1925; Museum of Modern Art, New York City) and "Room in Brooklyn" (1932; Museum of Fine Arts, Boston) show still, anonymous figures and stern geometric forms within snapshot-like compositions that create an inescapable sense of loneliness. This isolation of his subjects was heightened by Hopper's characteristic use of light to insulate persons and objects in space, whether in the harsh morning light ("Early Sunday Morning," 1930; Whitney Museum of American Art, New York City) or the eerie light of an all-night coffee stand ("Nighthawks," 1942; Art Institute of Chicago).



"Early Sunday Morning," oil on canvas by Edward Hopper, 1930; in the Whitney Museum of American Art, New York City

By courtesy of the Whitney Museum of American Art, New York City

Hopper's mature style was already formed by the mid-1920s. His subsequent development showed a constant refinement of his vision. Such late paintings as "Second-Story Sunlight" (1960; Whitney Museum of American Art, New York City) are distinguished by extremely subtle spatial relationships and an even greater mastery of light than is seen in his work of the 1920s.

Hoppner, John (b. April 4, 1758, London—d. Jan. 23, 1810, London), painter of the English portrait school during the late 18th and early 19th centuries who emulated the earlier style of Sir Joshua Reynolds.

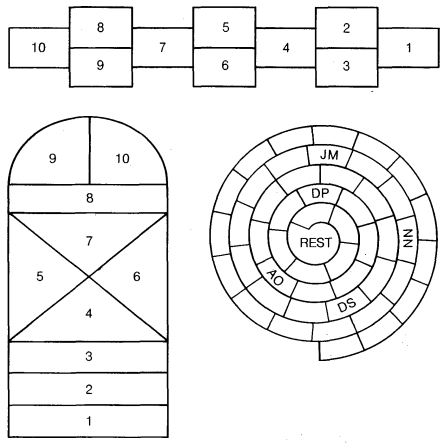


"Miss Harriet Cholmondeley," oil painting by John Hoppner, *c.* 1800; in the Tate Gallery, London

By courtesy of the trustees of the Tate Gallery, London; photograph, A.C. Cooper Ltd.

His father was of German extraction, and his mother was one of the German attendants at the royal palace. As a boy he was a chorister at the royal chapel and in 1775 entered as a student at the Royal Academy. In 1778 he took a silver medal for life drawing, and in 1782 he won the Academy's highest award, the gold medal for historical painting. He first exhibited at the Royal Academy in 1780. His earliest interest was for landscape, but necessity obliged him to turn to the more lucrative business of portrait painting. At once successful, he had throughout life the most fashionable and wealthy sitters and was the greatest rival of the king's painter, Thomas Lawrence. The prince of Wales especially patronized him, and many of his finest portraits are in the state apartments at St. James's Palace.

hopscotch, age-old children's game based on an idea of not treading on lines. Variations of the game are played in many countries.



Examples of hopscotch diagrams. Letters in the spiral are initials of players

The game's English name expresses its object: to hop over the "scotch," a line, or scratch, drawn on the ground. Lines are drawn in a variety of patterns. Spaces in the diagrams are numbered, and they must be traversed in order.

In one version of the game, the player tosses a small, flat stone into the first numbered space. If the stone does not land clearly in the correct space, without touching a line, the player loses a turn. If the stone does land fairly, the player hops on one foot to the second square and thence through the succeeding squares, in order and without touching a line, falling, or dropping the trailing foot. In some diagrams, certain pairs of squares are traversed astride, with one foot simultaneously in each space; in others, certain squares may designate rest spaces, in which the player may put both feet down. Upon reaching the last numbered square, the player turns and moves through the spaces as before, lifts the stone, and hops out of the diagram. A player who completes the diagram without making a mistake may continue, tossing the stone into the second square, hopping into the first space then over the second and into the third, and so on, until the whole diagram has been played in this manner. On completing the diagram, the player may initial any one of its spaces, which space the other players must then avoid, although the initialling player may use it as a rest space. The game ends by mutual consent or when all spaces have been initialled. The player who has initialled the most spaces is the winner.

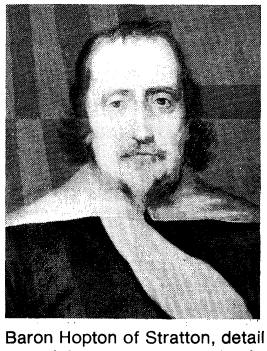
In a common variation, the stone must be kicked with the hopping foot from space to space. Or the player tosses the stone into the first space, then hops on one foot into that

space and kicks the stone back across the base line and out of the diagram, continuing this procedure for each space in sequence. In *Hinkspiel,* a German variation, a player who completes the sequence turns away from the diagram and tosses the stone over his shoulder. The space in which it lands is his "house," a rest space that the other players must then avoid unless its "owner" gives them permission to use it.

Hopscotch may also be played with a spiral diagram, in which players hop on one foot to a central rest spot and then back out again. Each player who succeeds may initial a space. The game continues until it becomes impossible to reach the centre or until all spaces are initialled.

Hopton (of Stratton), Ralph Hopton, Baron (b. 1596, Witham, Somerset, Eng.—d. September 1652, Bruges), Royalist commander in the first phase of the English Civil Wars between King Charles I and Parliament. One of the most talented of the King's generals, he secured southwestern England for the Royalist cause.

After studying at Oxford University and the Middle Temple, London, Hopton served in the army of the Elector Palatine in the early campaigns of the Thirty Years' War (1618–48), and in 1624 he entered the House of Commons. As a Puritan, he initially supported Parliament in its conflict with the King. But when Parliament went so far as to claim control over the armed forces (1642), Hopton changed sides and became an ardent Royalist. With the outbreak of the Civil War, the King made him a lieutenant general for western



Baron Hopton of Stratton, detail of a portrait by an unknown artist; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

England. Hopton won a brilliant victory at Stratton, Cornwall, in May 1643, and in June he overran the neighbouring county of Devon. He was badly wounded, however, while inflicting a defeat on Sir William Waller at Lansdown, Somerset, on July 5. Waller then had him surrounded at Devizes until Royalist reinforcements broke the siege on July 13.

In September 1643 Hopton was made Baron Hopton of Stratton, but by the time he succeeded to the command of the Royalist army early in 1646, it was no longer possible to prevent the Parliamentary victory. After one last, futile stand at Torrington, Devon, he surrendered to Gen. Thomas Fairfax on March 14, 1646. He tried unsuccessfully to hold the Scilly Isles off Cornwall for the Royalists and then retired into exile. Hopton's marriage resulted in no issue, and the barony became extinct. F.T.R. Edgar's biography, *Sir Ralph Hopton* was published in 1968.

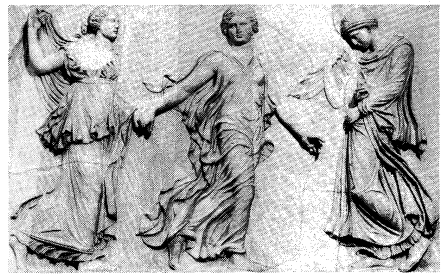
Hopwood's Ferry (Australia): *see* Echuca–Moama.

hoquet (music): *see* hocket.

Hoquiam, city, Grays Harbor County, western Washington, U.S., on Grays Harbor at the mouth of the Hoquiam River, a deepwater port 12 mi (19 km) from the Pacific and adjacent to Aberdeen, immediately to its east. The earliest settlement in the Grays Harbor region, it was established in 1859 by pioneers attracted there by the expanse of virgin forest. Hoquiam developed as a lumbering centre, and its manufactures include wood products and machine tools. Fishing and fish canneries are also important. The city's name is derived from an Indian word meaning "hungry for wood" and refers to the driftwood at the river's mouth. Inc. 1890. Pop. (1980) 9,719.

Hor (Egyptian god): *see* Horus.

Hora, plural HORAE, in Greco-Roman mythology, any one of the personifications of the seasons and goddesses of natural order; in the *Iliad* they were the custodians of the



Horae dancing, Greek marble relief; in the Uffizi, Florence

By courtesy of the Galleria degli Uffizi, Florence

gates of Olympus. According to Hesiod, the Horae were the children of Zeus, the king of the gods, and Themis, a Titaness, and their names (Eunomia, Dike, Eirene—*i.e.,* Good Order, Justice, Peace) indicate the extension of their functions from nature to the events of human life. At Athens they were apparently two in number: Thallo and Carpo, the goddesses of the flowers of spring and of the fruits of summer. Their yearly festival was the Horaea. In later mythology the Horae became the four seasons, daughters of the sun god, Helios, and the moon goddess, Selene, each represented with the conventional attributes. Subsequently, when the day was divided into 12 equal parts, each of them took the name of Hora.

hora, folk dance of Romania and Israel, performed in a linked circle. The most popular Romanian hora, the Hora Mare, or Great Hora, is danced both on special occasions such as weddings and for relaxation. It is a metaphor for the community: the circle opens to admit nubile women, adolescent boys entering manhood, and those ending mourning; conversely, it shuts out anyone who has violated local moral standards. The dance steps are simple: the dancers face the centre, take one step forward, one back, three to the left, and five to the right, so that soon the circle moves counterclockwise.

The Israeli hora, imported from the Balkans, does not carry social import or festive significance; rather, it is an expression of happiness. Unlike the Romanian Great Hora, it is performed with grapevine steps. The hora, related to the Yugoslav kolo and the Bulgarian *horo,* is one of many European circular chain dances surviving from ancient times. *See also* carole.

Horace, Latin in full QUINTUS HORATIUS FLACCUS (b. December 65 BC, Venusia, Italy—d. Nov. 27, 8 BC, Rome), outstanding Latin lyric poet and satirist under the emperor Augustus. The most frequent themes of his *Odes* and verse *Epistles* are love, friendship, philosophy, and the art of poetry.

Horace was probably of the Sabellian hillman stock of Italy's central highlands. His father had once been a slave but gained freedom before Horace's birth and became an auctioneer's assistant. He also owned a small property and could afford to take his son to Rome and ensure personally his getting the best available education in the school of a famous fellow Sabellian named Orbilius



Horace, bronze medal, 4th century; in the Bibliothèque Nationale, Paris

By courtesy of the Bibliotheque Nationale, Paris

(a believer, according to Horace, in corporal punishment). In about 46 BC Horace went to Athens, attending lectures at the Academy. After Julius Caesar's murder in March 44 BC, the eastern empire, including Athens, came temporarily into the possession of his assassins Brutus and Cassius, who could scarcely avoid clashing with Caesar's partisans, Mark Antony and Octavian (later Augustus), the young great-nephew whom Caesar, in his will,



Romanian hora

By courtesy of the Editura Enciclopedica Romana, Bucuresti

had appointed as his personal heir. Horace joined Brutus' army and was made *tribunus militum,* an exceptional honour for a freedman's son.

In November 42, at the two battles of Philippi against Antony and Octavian, Horace and his fellow tribunes (in the unusual absence of a more senior officer) commanded one of Brutus' and Cassius' legions. After their total defeat and death, he fled back to Italy—controlled by Octavian—but his father's farm at Venusia had been confiscated to provide land for veterans. Horace, however, proceeded to Rome, obtaining, either before or after a general amnesty of 39 BC, the minor but quite important post of one of the 36 clerks of the treasury (*scribae quaestorii*). Early in 38 BC he was introduced to Gaius Maecenas, a man of letters from Etruria in central Italy who was one of Octavian's principal political advisers. He now enrolled Horace in the circle of writers with whom he was friendly. Before long, through Maecenas, Horace also came to Octavian's notice.

During these years Horace was working on Book I of the *Satires,* 10 poems written in hexameter verse and published in 35 BC. The *Satires* drew on Greek roots, stating Horace's rejection of public life firmly and aiming at wisdom through serenity. He discusses ethical questions: the race for wealth and position, the folly of extremes, the desirability of mutual forbearance, and the evils of ambition. His 17 *Epodes* were also under way. Mockery here is almost fierce, the metre being that traditionally used for personal attacks and ridicule, though Horace attacks social abuses, not individuals. The tone reflects his anxious mood after Philippi.

In the mid-30s he received from Maecenas, as a gift or on lease, a comfortable house and farm in the Sabine hills (identified with considerable probability as one near Licenza, 22 miles [35 kilometres] northeast of Rome), which gave him great pleasure throughout his life. After Octavian had defeated Antony and Cleopatra at Actium, off northwestern Greece (31 BC), Horace published his *Epodes* and a second book of eight *Satires* in 30–29 BC. Then, while the victor, styled Augustus in 27 BC, settled down, Horace turned, in the most active period of his poetical life, to the *Odes,* of which he published three books, comprising 88 short poems, in 23 BC. Horace, in the *Odes,* represented himself as heir to earlier Greek lyric poets but displayed a sensitive, economical mastery of words all his own. He sings of love, wine, nature (almost romantically), of friends, of moderation; in short, his favourite topics. Some of the *Odes* are about Maecenas or Augustus: although he praises the ancient Roman virtues the latter was trying to reintroduce, he remains his own master and never confines an ode to a single subject or mood. At some stage Augustus offered Horace the post of his private secretary, but the poet declined on the plea of ill health. Notwithstanding, Augustus did not resent his refusal, and indeed their relationship became closer.

The last ode of the first three books suggests that Horace did not propose to write any more such poems. (He was possibly disappointed with their reception following publication in 23 BC.) The last of his epistles (in Book II, published 20–19 BC)—literary "letters" that were more mature and profound versions of the *Satires*—certainly announces an abandonment of "frivolous" lyric poetry for this more moralistic kind of verse. Very shortly afterward, he set to work on three further epistles (much longer than any in the first book), all relating in different ways to poetic activities. In these, Horace abandoned all satirical elements for a sensible, gently ironical stance, though the truisms praising moderation are never dull in his hands. Two epistles make up a second book, and the third, the *Epistles to the Pisos,* was also known, at least subsequently, as the *Ars poetica.* These last three epistles embody literary criticism in a loose, conversational frame, the "Epistle to Florus" (Book II, Epistle 2) choosing to explain why Horace abandoned lyric poetry for "philosophy." The best poems, Horace thought, edify as well as delight; the secret of good writing is wisdom (implying goodness); the poet needs teaching and training to give of his best. The "Epistle to Florus" may have been written in 19 BC, the *Ars poetica* (consisting of nearly 30 maxims for young poets' guidance) in *c.* 19–18 BC, and the last epistle of Book I in 17–15 BC. This last named is dedicated to Augustus, from whom there survives a letter to Horace in which the Emperor complains of not having received such a dedication hitherto. In the last epistle contemporary poetry is asserted against Rome's earlier literary background, but this was doubtless a defense of Horatian methods.

By this time Horace was virtually in the position of poet laureate, and in 17 BC he composed the *Secular Hymn (Carmen saeculare)* for ancient ceremonies called the Secular Games, which Augustus had revived to provide a solemn, religious sanction for the regime and, in particular, for his moral reforms of the previous year. The hymn was written in a lyric metre, Horace having resumed his compositions in this form; he next completed a fourth book of 15 *Odes,* mainly of a more serious (and political) character than their predecessors. The latest of these poems belongs to 13 BC. In 8 BC Maecenas, who had been less in Augustus' counsels during recent years, died. One of his last requests to the Emperor was: "Remember Horace as you would remember me." A month or two later, however, Horace himself died, after naming Augustus as his heir. He was buried on the Esquiline Hill near Maecenas' grave.

During the latter part of his life, Horace had been accustomed to spend the spring and other short periods in Rome, where he appears to have possessed a house. He wintered sometimes by the southern sea and spent much of the summer and autumn at his Sabine farm or sometimes at Tibur (Tivoli) or Praeneste (Palestrina), both a little east of Rome. A short "Life of Horace," of which the substance apparently goes back to Suetonius, a biographer of the 2nd century AD, quotes a jocular letter he received from Augustus, from which it emerges that the poet was short and fat. He himself confirms his short stature and, describing himself at the age of about 44, states that he was gray before his time, fond of sunshine, and irritable but quickly appeased.

Influences, personality, and impact. To a modern reader, the greatest problem in Horace is posed by his continual echoes of Latin and, more especially, Greek forerunners. The echoes are never slavish or imitative and are very far from precluding originality. For example, in one of his satires Horace wrote what looks at first like a realistic account of a journey made to Brundisium (Brindisi, on Italy's "heel") in 37 BC. Two of the incidents, however, prove to have been lifted—and cleverly adapted—from a journey by the earlier Latin satirist Lucilius. Often, however, Horace provides echoes that cannot be identified since the works he was echoing have disappeared, though they were recognized by his readers.

Another disconcerting element is provided by Horace's own references to his alleged models. Very often he names as a model some Greek writer of the antique, preclassical, or classical past (8th–5th centuries BC), whom he claims to have adapted to Latin—notably, Alcaeus, Archilochus, and Pindar. Yet his style of writing is much nearer to that of the more "modern," refined, and scholarly Greek writers of the Hellenistic, Alexandrian period (3rd and 2nd centuries BC), though to these (as to certain important Latin predecessors) his acknowledgments are selective and inadequate.

If this continuous relationship with the literary tradition is borne in mind, together with certain other factors that preclude wholly direct expression, such as the political autocracy of the time and Horace's own detached and even evasive personality, then it does become possible, after all, to deduce from his poetry certain conclusions about his views, if not about his life. The man who emerges is kindly, tolerant, and mild but capable of strength; consistently humane, realistic, astringent, and detached, he is a gentle but persistent mocker of himself quite as much as of others.

His attitude to love, on the whole, is flippant; without telling the reader a single thing about his own amorous life, he likes to picture himself in ridiculous situations within the framework of the appropriate literary tradition—and relating, it should be added, to women of Greek names and easy virtue, not Roman matrons or virgins. To his male friends, however—the men to whom his *Odes* are addressed—he is affectionate and loyal, and such friends were perhaps the principal mainstay of his life. The gods are often on his lips, but, in defiance of much contemporary feeling, he absolutely denied an afterlife. So "gather ye rosebuds while ye may" is an ever recurrent theme, though Horace insists on a Golden Mean of moderation—deploring excess and always refusing, deprecating, dissuading.

Some of his modern admirers see him as the poet of the lighter side of life; others see him as the poet of Rome and Augustus. Both are equally right, for this balance and diversity were the very essence of his poetical nature. But the second of these roles is, for modern readers, a harder and less palatable conception, since the idea of poetry serving the state is not popular in the West—and still less serving an autocratic regime, which is what Horace does. Yet he does it with a firm, though tactful, assertion of his essential independence. Not only is he unwilling to become Augustus' secretary, but, pleading personal inadequacy, he also gracefully sidesteps various official, grandiose poetic tasks, such as the celebration of the victories of Augustus' admiral Agrippa. And he refers openly to his own juvenile military service against the future Augustus, under Brutus at Philippi. He himself ran away, he characteristically says, and threw away his shield. But that, equally characteristically, turns out to be copied from a Greek poet—indeed from more than one. It is not autobiography; it is a traditional expression of the unsuitability of poets—and of himself—for war. The whole poem absolves Horace of any possible charge of failing, because of his current Augustan connections, to maintain loyalty to his republican friends.

Horace's intellectual formation had to a large extent been completed before the Augustan regime began; yet he came to admire Augustus sincerely and deeply, owing him many practical benefits. But, above all, he deeply admired him for ending a prolonged, nightmarish epoch of civil wars. So great was that achievement that Horace, at least, had no eye for any crudities the new imperial regime might possess. This was one of the ages when people wanted order more than liberty, though Augustus was an adept at investing his new order with a sufficient respect for personal freedom and a sufficient facade of republican institutions to set most men's minds at rest. He also restored the temples, and to Horace, though he probably did not believe in the gods whose names he called upon, the religious traditions and rituals of the Roman state seemed an integral, venerable part of Rome's greatness. The Emperor was on more delicate ground when he sought, by social legislation, to purify personal morals and to protect and revive the Roman family. But here, too, Hor-

ace, in spite of his own erotic frivolity, was with him, perhaps because of the famous austerity of his Sabine stock. And so the *Secular Hymn* contains a specific allusion (poetically not altogether successful) to these reforms.

Yet, before the hymn, Horace had already written the magnificent *Roman Odes,* numbers one to six of Book III—a great tribute to Augustus' principate, perhaps the greatest political poetry that has ever been written. But these *Odes* are by no means wholly political, for much other material, including abundant Greek and Roman mythology, is woven into their dense, compact, resplendent texture. This cryptic, riddling sonority is the work of a poet who saw himself as a solemn bard (*vates*), a Roman reincarnation of Pindar of Thebes (518–438 BC), a stately Greek lyricist. Pindar increasingly becomes Horace's model in the further state odes of his fourth and last book.

After Horace's *Secular Hymn,* his works were known and appreciated by all educated Romans. Already at the time of Horace's death, his *Odes* were suffering the fate he deprecated for them and had become a school textbook. But their excellence was so great that they had few ancient lyrical successors, until some early Christian writers—Ambrose, Prudentius, and Paulinus—occasionally echoed Horace's forms, though with a difference in spirit. Thereafter, the medieval epoch had little use for the *Odes,* which did not appeal to its piety, although his *Satires* and *Epistles* were read because of their predominantly moralistic tones. The *Odes* came into their own again with the Renaissance and, along with the *Ars poetica,* exerted much influence on Western poetry through the 19th century. The English Victorian poet Alfred, Lord Tennyson, hailed the lines of the *Odes* as:

> Jewels five-words-long
> That on the stretch'd forefinger of all Time
> Sparkle for ever.

The many-facetted intricacy of these "jewels" has challenged translators throughout the centuries; in spite, or because, of their not wholly conquerable problems, every ode has been translated hundreds—perhaps thousands—of times. And still new versions, some of them admirable, continue to appear. (M.Gr.)

MAJOR WORKS. Among Horace's earlier poems, the following may be found particularly interesting: *Satires,* Book 1, fifth, sixth, and ninth satires; Book 2, sixth, seventh, and eighth satires; *Epodes,* ninth and 16th. Most of the *Odes* and *Epistles* are important. For a selection of translations of various epochs, see Michael Grant (ed.), *Roman Readings,* pp. 180–221 (1958, reprinted 1967); and for the *Odes, The Odes of Horace,* trans. by James Michie (1963).

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Horace Mann School, private elementary and secondary school in New York City founded in 1887 as a coeducational demonstration school and taken over in 1891 by the Teachers College of Columbia University to test progressive educational theories under the observation of Teachers College students. In 1914 the boys' division of the school moved to the Riverdale section of the Bronx, where it became a pioneer in the country day school movement. In 1940 Teachers College took over the Lincoln School, an experimental school previously operated by the Rockefeller-funded General Education Board, and merged it with Horace Mann. Teachers College discontinued the combined school in 1946, after which the elementary and girls' divisions of Horace Mann closed down, while the boys' division continued under a separate charter. Horace Mann absorbed the New York School for Nursery Years in 1969 and the Barnard Elementary School in 1972; in 1975 the high school became coeducational once more. The school also operates the John Dorr Nature Laboratory in Washington, Conn.

Horae (Greco-Roman mythology): *see* Hora.

Horatian ode, short lyric poem written in stanzas of two or four lines in the manner of the 1st-century-BC Latin poet Horace. In contrast to the lofty, heroic odes of the Greek poet Pindar (*compare* epinicion), most of Horace's odes are intimate and reflective; they are often addressed to a friend and deal with friendship, love, and the practice of poetry.

Horace introduced early Greek lyrics into Latin by adapting Greek metres, regularizing them, and writing his Romanized versions with a discipline that caused some loss of spontaneity and a sense of detachment but produced elegance and dignity. But he cautioned Latin writers not to attempt to emulate Pindar, a task that he likened to Icarus' presumptuous flight. Horace's carmina, written in stanzas of two or four lines, are now universally called odes, but they have nothing in common with the passionate brilliance of Pindaric odes. Horace's tone is generally serious and serene, often touched with irony and melancholy but sometimes with gentle humour. His urbane Epicureanism and personal charm, his aphoristic philosophy and studied perfection won him recognition as Rome's leading poet after the death of his friend Virgil.

In later periods when technical felicity was more highly regarded than imagination and spontaneity, Horace's odes were prized and imitated. Among the poets of the Pléiade in 16th-century France, Pierre de Ronsard attempted to model his first odes on Pindar. Defeated, he contented himself with being, in his opinion, better than Horace. Nicolas Boileau and Jean de La Fontaine in the 17th century preserved the Horatian tradition.

Michael Drayton, in *Poems Lyric and Pastoral* (1606), acknowledged his indebtedness to Horace, and Andrew Marvell produced one of the finest English Horatian odes in 1650 on Cromwell's return from Ireland. In the early 18th century, Matthew Prior, Jonathan Swift, and Samuel Johnson revived the Horatian spirit, as did Giacomo Leopardi and Giosuè Carducci in Italy in the 19th century. Since the odes of the Romantic period, which were successful imitations of the manner but not the form of Pindar, few English poets have attempted to return to the classical forms. *See also* ode.

Horatii and Curiatii, in Roman legend, two sets of triplet brothers whose story was probably fashioned to explain existing legal or ritual practices. The Horatii were Roman and the Curiatii Alban, although an alternative version reversed this order. During the war between Rome and Alba Longa in the reign of Tullus Hostilius (traditionally 672–642 BC), it was agreed that settlement of the dispute should depend on the outcome of combat between the two groups of brothers.

In the contest two of the Horatii were quickly killed; but the third, feigning flight, managed to slay his wounded pursuers one by one. When the survivor entered Rome in triumph, his sister recognized among his trophies a cloak she had made for one of the Curiatii to whom she was betrothed. She could not conceal her grief and was killed by her brother, who declared, "So perish any Roman woman who mourns the enemy." For this act Horatius was condemned to death, but he was saved by an appeal to the people.

The tale might have been devised to provide an august origin for the legal practice that granted every condemned Roman the right to appeal to the populace. Alternatively, perhaps it was used to explain the ritual of the *tigillum sororium* ("sister's beam"), the yoke under which Horatius had to pass to be purified of his crime.

The story forms the subject of Pierre Corneille's 17th-century French tragedy *Horace* and of a painting in the Louvre by the 18th-century French artist Jacques-Louis David.

Horatius Cocles, Roman hero traditionally of the late 6th century BC but undoubtedly legendary, who first with two companions and finally alone defended the Sublician bridge (in Rome) against Lars Porsena and the entire Etruscan army, thereby giving the Romans time to cut down the bridge. He then threw himself into the Tiber to swim to the other shore. Versions differ as to whether he reached safety or was drowned. The myth possibly arose in explanation of an ancient statue of a crippled, one-eyed man in the nearby Temple of Vulcan. The ancients claimed this represented the wounded Cocles, but it is probably a statue of the god Vulcan, who was both lame and traditionally associated with the Cyclops (One-Eyed).

Horatius Flaccus, Quintus: *see* Horace.

Hordaland, *fylke* (county), southwestern Norway. Its mainland portion is roughly semicircular, focussing on the city of Bergen (*q.v.*), which is Hordaland's county seat. The total area is 6,036 sq mi (15,634 sq km), including numerous offshore islands. The *fylke* is split from southwest to northeast by the long, deep Hardangerfjorden, one of Norway's main fjords and a great tourist attraction. The land is mountainous and rugged throughout, and there are two large ice fields, the Folgefonni (south) and Hardangerjøkulen (east).

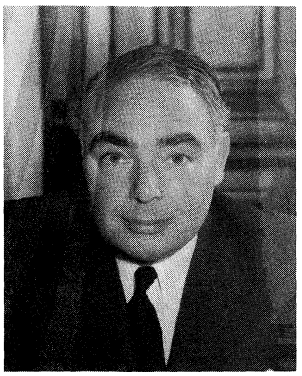
The eastern part of Hordaland is dominated by the Hardangervidda, an extensive, undulating plateau. Most of the inhabitants live on the narrow strips of lowland along the fjords and along the coast of the Norwegian Sea and on the offshore islands. Agriculture (grains and hay), pasturing of cattle and goats, fishing, and diversified manufacturing (chiefly in the Bergen metropolitan area) are the economic bases of the *fylke.* Tourism is also important. Pop. (1982 est.) 394,545.

hordeolum (medicine): *see* sty.

Hore-Belisha (of Devonport), (Isaac) Leslie Hore-Belisha, Baron (b. Sept. 7, 1893, London—d. Feb. 16, 1957, Reims, Fr.), British secretary of state for war (1937–40) who instituted military conscription in the spring of 1939, a few months before the outbreak of World War II.

He was educated at Clifton College, served overseas with the British army in World War I, and went to St. John's College, Oxford. He was called to the bar in 1922 and was elected Liberal member of Parliament for Devonport in December 1923. This constituency he continued to represent, as a National Liberal from 1931 or as an Independent from 1942, until 1945. He later joined the Conservative Party and fought Coventry South unsuccessfully in 1950.

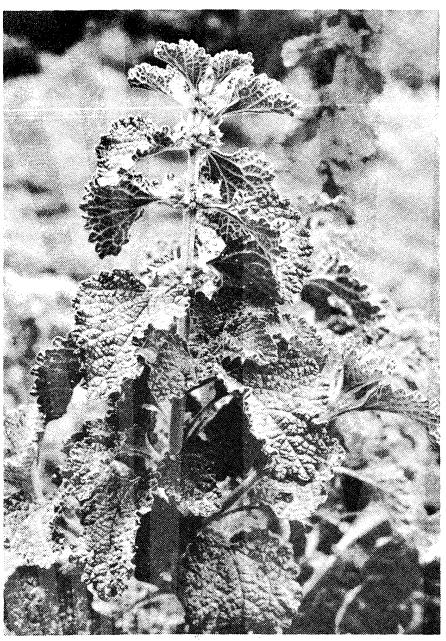
Hore-Belisha helped to form the National Liberal Party in 1931 in support of the national coalition government. As minister of transport (1934–37), he gave his name to the "belisha beacon" (a yellow globe on a black and white post), used to mark pedestrian crossings on British roads. He once advocated a common citizenship for the British Empire and the United States.



Hore-Belisha, 1937
UPI/Bettmann Newsphotos

As secretary of state for war, Hore-Belisha insisted on easier promotion from the ranks to the officer corps and the appointment of relatively young generals along with quick retirement for those who were older. The antagonism he aroused among senior army officers forced Prime Minister Neville Chamberlain unwillingly to remove him from office in January 1940. Anti-Semitism is said to have frustrated Chamberlain's plan to offer him the ministry of information (Hore-Belisha was a Sephardic Jew). In 1945 he served as minister of national insurance. He was created baron in 1954; there were no children by his marriage, and the peerage became extinct.

horehound, also spelled HOARHOUND, also called WHITE HOREHOUND (*Marrubium vulgare*), bitter perennial herb of the mint family (Lamiaceae, or Labiatae) whose leaves and flowering tops are used as flavouring for beverages and candies and as a traditional medicine. Infusions or extracts of horehound in the form of syrups, beverages, or lozenges are popular in the United States as remedies for coughs and minor pulmonary disturbances. Native to Europe, North Africa, and Central Asia, horehound is naturalized in North America. It is cultivated in Great Britain and is occasionally found as an escape, growing wild on drier soils.



Horehound (*Marrubium vulgare*)
G.R. Roberts

The plant is coarse, strongly aromatic, and less than 1 m (3 feet) tall. Its blunt-toothed, broad, oval leaves are wooly white below and pale green and downy above. The flowers are small, whitish, and densely clustered in axillary whorls.

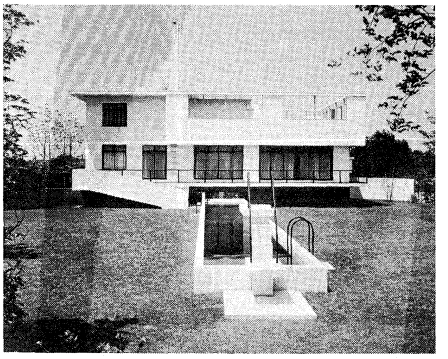
Black horehound, *Ballota nigra,* is a hairy perennial herb with a fetid odour, belonging to the same family. It has purplish flowers and lacks the wooly white appearance of white horehound. It is sometimes used to adulterate extracts of white horehound. It is native to the same regions as white horehound and is naturalized in North America.

Horemheb, also spelled HARMHAB, or HAREMHAB, also called DJESERKHEPERE (fl. 14th–13th century BC), last king of the 18th dynasty of Egypt (reigned 1319–1292 BC); he restored the traditional Amon religion that a previous ruler, Akhenaton, had replaced with the worship of the god Aton.

Having been general commander of the army in northern Egypt before he took the throne, Horemheb appointed soldiers to major offices and made Memphis his capital. He destroyed all symbols of the Aton religion, built and restored buildings in honour of Amon, and removed the names of heretic kings from the list of pharaohs. As a gift to Amon, Horemheb began work on the great hypostyle hall at Karnak, the largest room ever constructed in Egypt. He restored Egypt's prosperity and its authority in foreign lands by resuming the trading expeditions that had almost ceased during the religious heresy. Ramses I, whom Horemheb had chosen as his vizier, became his successor and founded the 19th dynasty.

A large tomb built by Horemheb before he took the throne was discovered in 1975 at Ṣaqqārah, near Memphis. It remained unused, however, as Horemheb was buried in a royal tomb in the Valley of the Tombs of the Kings.

Horiguchi Sutemi (b. Jan. 6, 1895, Gifu prefecture, Japan), one of the first Japanese architects to introduce modern European architectural forms to Japan.



Wakasa House, Tokyo, by Horiguchi Sutemi, 1939
By courtesy of the International Society for Educational Information, Tokyo; photograph, Yoshio Watanabe

Horiguchi graduated from the University of Tokyo in 1920 (Dr.Arch., 1944). The Machinery Hall, which he designed for the Tokyo Peace Exhibition of 1922, was among the important works of the Secessionist group of young architects, who rebelled against the tradition of formalism in Japan. Shortly thereafter, Horiguchi went to Europe for two years, visiting the leading German and Dutch architects of the day. Upon returning to Japan, he wrote a book on modern Dutch architecture, and European influence is apparent in his works of this period, such as the meteorological station on the island of O-shima. A noted authority on residential dwellings, he designed several houses during the next decade: Kikkukawa House (1930), Okada House (1934), Nakanishi House (1936), and Wakasa House (1939). His major works since World War II include the Hasshokan Hotel at Nagoya and the Japanese pavilion for the Quadriennale (1954) at São Paulo, Braz. He has written a number of books on Japanese teahouses and dwellings.

horizon, in astronomy, boundary where the sky seems to meet the ground or sea. (In astronomy it is defined as the intersection on the celestial sphere of a plane perpendicular to a plumb line.) The higher the observer, the lower and more distant is his visible horizon. To one 5 feet (1.5 m) above the surface, the horizon is about 2.8 statute miles (4.5 km) away; and for one at 10,000 feet (3,048 m) altitude, it is about 126 miles (203 km). The distance in statute miles equals 1.224 times the square root of the height, in feet, above the surface. On bodies of different radius from that of the Earth, the horizon's distance is also different; *e.g.,* when the eye is 5 feet (1.5 m) above a level lunar plain, the horizon is only 1.4 miles (2.3 km) away.

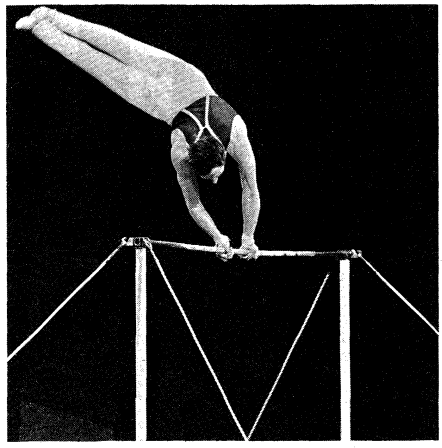
horizon, in pedology, distinct layer of soil forming part of the vertical sequence in a soil profile. Each horizon differs from the one above or below it in colour, chemical composition, texture, and structure. The horizons become differentiated during soil development because conditions vary with depth. In humid regions, for example, physical and chemical reactivity and biotic activity are much more intense in the materials at the surface than in those in lower layers. Dispersed and dissolved products are transported from the surface horizon to the subsurface layers, or they are leached completely from the developing soil profile. In desert regions, chemical and biotic soil-forming processes are much less intense than in humid regions, and the zone of greatest chemical or biotic activity is usually in the subsurface horizons rather than at the surface.

There are generally three major layers within any given soil profile, and they are designated, from surface downward, as A, B, and C horizons. The A horizon contains more organic matter than does either of the other two, except in certain desert soils in which the production, preservation, and accumulation of organic material may be favoured somewhat more by conditions found lower down—namely, in the B horizon. The A horizon is also the most weathered and leached. In the soils of cold, humid, temperate regions, weathering and leaching have left residues in the A horizon that are high in silica and low in iron and aluminum oxides and other sesquioxides. The opposite is true of the soils of the humid tropics, in which such soil-forming processes leave behind residues high in the sesquioxides and low in silica.

The B horizon tends to be a zone of accumulation, since all or part of the mineral matter removed from the A horizon in solution may be deposited in it. Such is the case with the B horizons of soils in humid temperate climates, which are enriched with clay minerals carried by percolating water from the horizon above.

The C horizon consists chiefly of the materials from which the A and B layers were derived. These substances, called parent materials, are only slightly altered, because they are in general not subjected to soil-forming processes.

horizontal bar, also called HIGH BAR, gymnastic apparatus introduced in the early 19th century by the German Friedrich Jahn, usually considered the father of gymnastics. It is a polished steel bar 28 mm (1.1 inches) in diameter, 2.35 to 2.5 m (7.7 to 8.2 feet) long, and about 2.5 m above the floor. Competitors



Horizontal bar
Stewart Fraser—Colorsport

(men only) generally wear hand protectors and go through a routine that lasts from 15 to 30 seconds. Exercises include upstarts (by which the gymnast swings himself from a hang to a support above the bar); giant circles (rotating around the bar from a handstand position with the arms fully extended) with inverted or dislocated grips and changes of direction; vaulting over the bar, releasing the grip, and regrasping the bar; movements requiring turns and changes of the position of the body and the releasing and regrasping of the bar; and finishes with straddles over the bar or forward and backward somersaults from the bar. See Sporting Record: Gymnastics. See also Olympic Games.

Hormisdas, SAINT (b. Roman Campania—d. Aug. 6, 523, Rome; feast day August 6), pope from 514 to 523, who reunited the Eastern and Western churches, separated since the Acacian Schism (*q.v.*) of 484.

From a wealthy family of Frosinone in the Campania, Hormisdas was married before he rose in the church. (His son became pope as Silverius.) Pope Symmachus made him deacon, and he was prominent in attendance on Symmachus, whom he succeeded on July 20, 514.

His great achievement was the reunion of the Eastern and Western churches, separated since the excommunication of Acacius in 484. After two unsuccessful attempts under the Byzantine emperor Anastasius I, Hormisdas settled the Acacian Schism with Anastasius' successor, Justin I, in 518 and with Patriarch John of Cappadocia. In 519 union was resumed between Constantinople and Rome.

Hormizd, also spelled ORMAZD, or ORMIZD, name of Sāsānian kings, grouped below chronologically and indicated by the symbol •.

• **Hormizd I,** byname HORMIZD THE BRAVE (fl. 3rd century), king of the Sāsānian Empire (reigned AD 272–273); he was the son and successor of Shāpūr I. Known before his accession as Hormizd-Ardashīr, he acted as viceroy of the Persian province of Armenia. During Shāpūr's capture of Antioch from the Romans after 256, Hormizd exercised important command, presumably earning his surname at that time. During his brief reign he was apparently tolerant of the activities of the religious leader Mani, founder of Manichaeism.

• **Hormizd II** (d. 309), king of the Sāsānian Empire (reigned AD 302–309); he was the son and successor of Narses. Little is known of Hormizd's reign, although according to one ancient source he executed some members of the Manichaean religion.

At Hormizd's death the powerful nobles killed his son Adhur-Narses, who had assumed the throne, and imprisoned another son, Hormizdas. In 324 Hormizdas escaped to the court of the Roman emperor Constantine the Great.

• **Hormizd IV** (d. 590), king of the Sāsānian Empire (reigned 578/579–590); he was the son and successor of Khosrow I. According to one ancient source, Hormizd protected the common people while maintaining severe discipline in his army and court. When the priests demanded a persecution of the Christians, he refused on the grounds that the throne and government could be safe only with the good will of both religions.

From his father, Hormizd inherited wars against the Byzantine Empire and the Turks. Though negotiations for peace had begun with the Byzantine emperor Maurice, Hormizd declined to cede any of his father's conquests.

In 588 his general, Bahrām Chūbīn, defeated the Turks, but in the next year he was beaten



Hormizd IV, coin, late 6th century; in the British Museum

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

by the Romans. When Hormizd dismissed Bahrām, the general rebelled with his army; an insurrection followed. Hormizd was deposed and killed, and his son was proclaimed king as Khosrow II.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

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hormone, organic substance that is produced in one part of a multicellular organism but exerts effects on another, sometimes far distant, part. Hormones regulate a variety of physiological activities concerned with growth, reproduction, and the maintenance of a constant internal environment (homeostasis).

A brief treatment of hormones follows. For full treatment, *see* MACROPAEDIA: Biochemical Components of Organisms.

Among animals, the hormones of the vertebrates—particularly those of humans and other mammals—are the best known. Most vertebrate hormones originate in specialized tissues, called endocrine tissues, and are carried to their targets through the bloodstream.

A major endocrine gland in vertebrates is the pituitary, which consists of two distinct sections: the anterior pituitary (or adenohypophysis) and the posterior pituitary (or neurohypophysis). The anterior pituitary is sometimes called the "master gland," because it secretes several hormones that affect the other endocrine glands. For example, the anterior pituitary hormones thyrotropin and adrenocorticotropic hormone (ACTH) regulate endocrine activity in the thyroid and the outer region (cortex) of the adrenal glands, respectively. The anterior pituitary also secretes two hormones that affect the sex glands. One of these is follicle-stimulating hormone (FSH), which stimulates egg production in the ovaries and sperm production in the testes. The other is luteinizing hormone (LH). In females, LH works in conjunction with FSH to regulate the female reproductive cycle and the secretion of female sex hormones. In males, LH controls the production of the male sex hormones. Other hormones produced in the anterior pituitary include growth hormone, which is responsible for normal body growth, and prolactin, which promotes milk production in mammals.

Its designation as the master gland notwithstanding, the anterior pituitary itself is regulated by substances called releasing hormones that are secreted by the hypothalamus, the part of the brain located directly above the pituitary. These hypothalamic hormones stimulate—or, in some cases, inhibit—the secretions of the anterior pituitary.

The posterior pituitary stores and releases two hormones: oxytocin, which causes the uterus to contract during birth, and vasopressin, which acts on the kidneys to restrict the output of urine. These two hormones are actually produced by the hypothalamus, which is linked directly to the posterior pituitary.

Other endocrine glands in vertebrates include the thyroid, parathyroids, adrenals, pancreas, and gonads (sex glands). The thyroid produces hormones that control metabolic rate and oxygen consumption. Hormones from the parathyroids are concerned with calcium concentration in the blood, and the pancreas releases insulin and glucagon, hormones that, respectively, lower and raise the blood-sugar level. Hormones from the adrenal cortex regulate glucose and sodium metabolism. Those secreted by the central portion (medulla) of the adrenals affect the heart and the circulatory and respiratory systems; these hormones are important in helping an individual cope with stress.

The female sex hormones—the estrogens and progesterone—are produced by the ovaries. Together with FSH and LH, these hormones control the cyclical changes in the female reproductive system—the menstrual cycle in human females and the estrous cycle in other female mammals. The estrogens also are responsible for female sexual characteristics. Progesterone is concerned with the maintenance of pregnancy.

The chief male sex hormone—testosterone—is secreted by the testes. Testosterone is responsible for the maintenance of male sexual characteristics.

Structurally, vertebrate hormones fall into two main classes. Those of the adrenal cortex and the sex organs are steroids, a major class of lipid compounds. Virtually all other known vertebrate hormones consist of amino acids. Most of these nonsteroidal hormones are composed of chains of amino acids—either short chains (polypeptides) or long chains (proteins). The hormones of the adrenal medulla, however, are composed of amino acid derivatives called amines, and those of the thyroid are made up of a single amino acid combined with atoms of iodine.

It is believed that hormones achieve their effects on target tissues and organs through either of two mechanisms. The steroid hormones and the hormones of the thyroid can, as a result of their chemical structures, pass through cell membranes. These hormones apparently enter a target cell and combine with an intracellular receptor protein. The hormone–receptor complex then enters the cell's nucleus, where it apparently affects the activity of specific genes. Genes carry the cell's hereditary blueprint for protein synthesis, and so the interaction of the hormone–receptor complex with the genes influences the cell's production of proteins. Because many proteins function as enzymes within the cell, this influence on protein synthesis can have far-reaching effects on the cell's activities.

The polypeptide, protein, and amine hormones are believed to operate by a different mechanism. These hormones do not enter the target cell; instead, they combine with a re-

ceptor protein on the cell's outer membrane. This hormone–receptor complex apparently triggers an enzyme in the membrane, causing the synthesis of a so-called "second-messenger" compound within the cell. This second messenger—in many cases, cyclic adenosine monophosphate (cyclic AMP)—apparently activates enzyme systems that bring about the desired action by the cell.

It is interesting to note that both proposed mechanisms of hormone action involve the binding of the hormone to a specific receptor molecule. This feature accounts for the specificity of hormones; a hormone can have an effect only on cells that possess the appropriate receptor.

Hormones probably exist in all invertebrates. In insects, neurosecretory cells in the brain produce thoracotropic hormone. This hormone stimulates glands in the thorex to secrete the hormone ecdysone, which causes the periodic molting, or shedding, of the hard exoskeleton. Another insect hormone, called juvenile hormone, maintains the larval state. A decrease in juvenile hormone triggers the development of the adult characteristics.

Plants also have a hormonal system, which includes auxins, gibberellins, and cytokinins, all of which promote growth. Plant hormones also include several growth inhibitors, which regulate such activities as the fall of deciduous leaves in autumn and the development of dormancy in buds and seeds.

Hormozgān, *ostān* (province), southern Iran, bordering the Persian Gulf and the Gulf of Oman on the south and bounded by the *ostān*s of Būshehr and Fārs on the west and northwest, Kermān on the east and northeast, and Sīstān-e Balūchestān on the southeast. It covers an area of 25,819 sq mi (66,870 sq km). The province was named after Hormuz, an 8th-century principality on the Rūdkhāneh-ye (stream) Mīnāb, later abandoned for a new site, subsequently named Hormuz, on the island of Jarun. Bandar 'Abbās, the capital of the *ostān,* was founded by 'Abbās I the Great in 1622 and was conceded with the adjoining territory to the Sulṭān of Muscat (Oman) in 1793; it remained part of this sultanate until 1868. The region was controlled by the South Persia Rifles, organized by Major Percy Sykes as a counter to the Russians, during World War I. Hormozgān was part of former Banāder va Jazāyer-e Khalīj-e Fārs va Daryā-ye 'Omān *ostān* until the mid-1970s.

Forming part of the wider physiographic region of Tangistān, the Zagros highlands in Hormozgān rise from the Persian Gulf with no intervening coastal plain. Ridges front much of the coast and have produced a coastline with few indentations. Farther east, near Bandar 'Abbās, are numerous salt domes; some reach altitudes of 4,000 ft (1,200 m). The main streams are the Mīnāb and the Kui, whose small size and deeply indented valleys have reduced the possibility of irrigated agriculture and the occurrence of natural pastures. There is cultivation of barley, wheat, rice, tobacco, indigo plants, dates, mangoes, and vegetables. Goats, sheep, and camels are raised. Development of Bandar 'Abbās as a major port in the 1970s led to the establishment of many industries, including a cement unit, electricity-generation plant, a steel mill and desalination plant, food-processing units, and fisheries. Salt, iron ore, copper, and sulfur are mined. Roads emanate from Bandar 'Abbās and connect it with ports on the Persian Gulf and the Gulf of Oman; a railway route links it with the Trans-Iranian Railway at Kermān. Pop. (1983 est.) 568,000.

Hormuz, Persian JAZĪREH-YE HORMOZ, also called ORMUZ, mostly barren, hilly island of Iran on the Strait of Hormuz, between the Persian Gulf and the Gulf of Oman, 5 mi (8 km) off the coast. The population may decline by half in summer through migration. Hormuz village is the only permanent settlement. Resources include red ochre for export.

After the Arab conquest, Hormuz early became the chief market of Kermān, with palm groves, indigo, grain, and spices. By *c.* 1200 it monopolized India's and China's trade. The famous Venetian traveller Marco Polo twice visited Hormuz. Around 1300 the Arab ruler of Hormuz abandoned the mainland because of robbers and founded New Hormuz on the island; it gradually superseded Qeys as the most important Persian Gulf emporium, again becoming a market for India, and dominated other gulf islands and occasionally mainland Oman.

In 1514 the Portuguese captured Hormuz and built a fort. For more than a century the island remained Portuguese, but the rise of the English locally and the Persian shah's resentment of Portuguese occupation culminated, in 1622, in Hormuz' capture by joint Anglo-Persian forces. Hormuz, along with the nearby larger island of Jeshun and the mainland port of Bandar 'Abbās, was leased to the rulers of Muscat and Oman between 1798 and 1868. Of the old and famous city scarcely anything now remains except for part of the Portuguese fort. Pop. (latest census) 2,410.

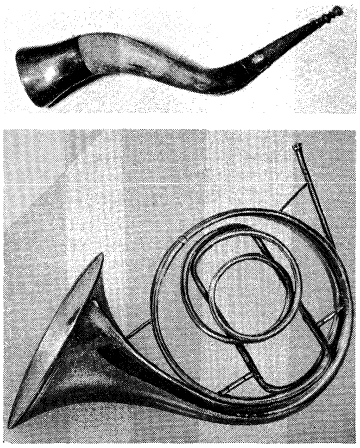
Hormuz, Strait of, also called STRAIT OF ORMUZ, channel linking the Persian Gulf (west) with the Gulf of Oman and the Arabian Sea (southeast). The strait is 35 to 60 mi (55 to 95 km) wide and separates Iran (north) from the Arabian Peninsula (south). It contains the islands of Qeshm (Qishm), Hormuz, and Hengām (Henjām) and is of great strategic and economic importance, especially as oil tankers collecting from various ports on the Persian Gulf must pass through the strait.

horn, in zoology, either of the pair of hard processes that grow from the upper portion of the head of many hoofed mammals. The term is also loosely applied to antlers and to similar structures present on certain lizards, birds, dinosaurs, and insects. True horns—simple unbranched structures that are never shed—are found in cattle, sheep, goats, and antelopes. They consist of a core of bone surrounded by a layer of horn (keratin) that is in turn covered by keratinized epidermis.

The antlers of deer are not horns. Shed yearly, they are composed entirely of bone, though they bear a velvety epidermal covering during the growth period. They become increasingly branched with age. The "horn" of a rhinoceros is composed of fused, heavily keratinized hairlike epidermis. Horns serve as weapons of defense against predators and of offense in battles between males for breeding access to females.

horn, French COR, German HORN, in music, any of several wind instruments sounded by vibration of the player's tensed lips against a mouthpiece and primarily derived from animal horns blown at the truncated narrow end or, as among many tropical peoples, at a hole in the side. Metal construction, at first imitating natural shapes, dates as far back as the Danish Bronze Age *lur*s, cast in the shape of mammoth tusks, and the Roman *buccina* and semicircular cornu. Instruments of horn were known in ancient Egypt, Mesopotamia, Israel (the shofar), Greece, and throughout South and West Africa and continue to be played by shepherds in Scandinavia, the Balkans, parts of Spain, and The Sudan.

Medieval European ivory horns, imported from Byzantium in the 10th century, were associated with royalty; these ivory (sometimes bone) horns, often richly carved, were called oliphants. The oxhorns of medieval huntsmen and watchmen sounded but one or two notes of the natural harmonic series—*i.e.,* the notes produced on a horn or trumpet without finger holes or valves, caused by the air column vibrating in fractional segments (as for the fundamental note C: c–g–c′–e′–g′–bb′ [approximate pitch]–c″–d″–e″, etc.). From these instruments later modern metal horns were developed. This process included refining the bore profile (which remains mainly conical except where impractical, as through the valve mechanism) and the bell form, and the prolongation of the bore to lower the fundamental pitch so as to bring higher notes of a tube's natural series within the upper sound-wave frequency limit of a player's lip vibration, thereby extending the instrument's melodic possibilities. Horns retaining the curved shape but with lengthened tube include the 18th-century bugle horn. An English straight-built group, derived from early 19th-century hunting horns, includes the brass post horn (employing harmonics 2–5, written c′–g′–c″–e″ but sounding a sixth higher); the copper coach horn; and the 20th-century English hunting horn, a reduced version with one note only.



(Top) Signal horn, in the Museum of Fine Arts, Boston; (bottom) hand horn, 18th century

(Top) Leslie Lindsay Mason Collection of Musical Instruments (formerly the Galpin Collection), Museum of Fine Arts, Boston; (bottom) photograph, A.C. Baines

Accommodation of increased length by making one or more coils in the tube was well known in the 16th century, both in small once-coiled horns that led to continental hunting and post horns (whence the cornet) and in close-coiled helical horns with 5 or more feet (about 1½ metres) of tubing. The large circular French hunting horn, the *trompe* (or *cor*) *de chasse,* appeared in about 1650; the modern orchestral, or French, horn derives from it. Still played in modern France and Belgium by huntsmen, brass bands, and horn-playing clubs, it varies in diameter and number of coils but is often about 15 inches (38 centimetres) across, coiled three times, with 15 feet (4½ metres) of tubing. It is held on the player's arm with one hand alone; the harmonics most used are numbers 4 to 12 (written in C but sounding in D a seventh lower), though numbers 2 and 3 are used as bass notes when the horns are played in harmony. *See also* French horn; mellophone; saxhorn.

Horn (af Ekebyholm), Arvid Bernhard, Greve (Count) (b. April 6, 1664, Åbo, Fin.—d. April 17, 1742, Ekebyholm, Swed.), Swedish soldier and statesman who played a key role in beginning Sweden's 18th-century Age of Freedom—a 52-year period of parliamentary rule.

Entering the Swedish Army in 1682, Horn served with distinction in Hungary and in the Low Countries. His military prowess led to his being chosen military tutor for the future king Charles XII (reigned 1697–1718). Horn saw action early in the Great Northern War (1700–21) and was then sent by Charles XII on various diplomatic missions. He was made



Horn, detail from a portrait by David von Krafft; in the House of Nobility, Stockholm

By courtesy of the Svenska Portrattarkivet, Stockholm

a count and a state councillor in 1705, and he presided over Swedish home affairs during a long period in which the King was abroad. Although trusted by Charles XII, Horn turned against Charles's policies after 1709. Charles, while disappointed, did not remove Horn from his posts.

After Charles's death in 1718, Horn sided with anti-absolutist parliamentary forces, who wanted a weak monarchy subordinated to the state council and the Riksdag (parliament). He persuaded Charles XII's sister and successor, Ulrika Eleonora, to abdicate in favour of her husband, Frederick of Hesse-Kassel, who came to the throne as Frederick I. The new king gave up much royal power to the state council and Riksdag, and Horn, elected speaker of the noble chamber of the Riksdag in 1720, saw his power greatly enhanced. Until the time of his retirement in 1738, Horn supported a policy of retrenchment and mercantilism at home and a peace-oriented foreign policy.

Horn, Cape, Spanish CABO DE HORNOS, steep rocky headland on Isla (island) Hornos, Tierra del Fuego Archipelago, Magallanes region, southern Chile. The southernmost extremity of South America, it was named Hoorn after the birthplace of the Dutch navigator, Willem Corneliszoon Schouten, who rounded it in 1616. Falso Cabo de Hornos (False Cape Horn), on Isla Hoste, 35 mi (56 km) northwest, is sometimes mistaken for it. Navigation of the rough waters around the Cape is hazardous. The climate is windy and cold year-round.

horn coral, any coral of the order Rugosa, which first appeared in the geologic record during the Ordovician Period, which began 500,000,000 years ago; the Rugosa persisted through the Permian Period, which ended 225,000,000 years ago. Horn corals, which are named for the hornlike shape of the individual structures built by the coral animal, were either solitary or colonial forms. Of the many forms known, some are important as index, or guide, fossils for specific spans of geologic time and serve to correlate sometimes widely separated rock units. Because of their mode of growth, some horn corals have been employed as biological clocks to determine the length of the day and year in the distant geologic past.

horn dance, English ritual dance of Abbots Bromley, Staffordshire; it is related to Morris dancing. *See* Morris dance.

horn fly (*Haematobia irritans*), insect of the family Muscidae (order Diptera) and a serious cattle pest. Adult horn flies cluster at the base of horns and on the neck and rump of cattle and suck blood. Their attacks cause loss of weight and milk production in affected cattle.

The horn fly, about half the size of the housefly, breeds only in fresh cow dung; the life cycle requires 10 to 12 days. It was carried from Europe to North America in about 1887. Control methods include the use of chemical sprays and the addition of chemicals to the cows' diet to discourage horn flies from breeding in their dung.

horn mercury (mineral): *see* calomel.

horn of plenty: *see* cornucopia.

horn silver (mineral): *see* cerargyrite.

horn-tooth moss, any of the plants of the genus *Ceratodon* (order Bryales). The most abundant species, *C. purpureus*, has a worldwide distribution and is conspicuous because of its purple capsule (spore case), especially when growing on bare, acidic soil or burned areas. Horn-tooth mosses are one to two centimetres (about 2/5 to 4/5 inches) high and grow in mats or tufts in dry habitats such as on walls, lawns, and sidewalks; but they may sometimes be found in swamps. Male and female reproductive organs are borne on separate plants. The capsules are held horizontally and have long, deep furrows when mature.

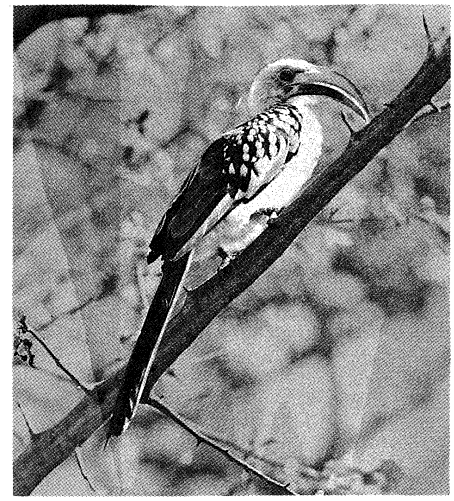
hornbeam, any of about 25 species of hardy, slow-growing ornamental and timber trees comprising the genus *Carpinus* of the birch family (Betulaceae), distributed throughout the Northern Hemisphere. The hop-hornbeam (*q.v.*) is in a different genus of the birch family. A hornbeam has smooth, grayish bark, a short, fluted trunk, and horizontally spreading branches. It differs from other trees in the birch family in that male catkins are not formed until the spring in which they mature. A leaflike, three-lobed husk surrounds each fruit, a nutlet about one centimetre (1/2 inch) long. The egg- or lance-shaped, alternate leaves may remain on the tree into winter.

The European hornbeam (*C. betulus*) has a twisted trunk that branches profusely; the tree may grow to 20 metres (65 feet). One variety bears normal and oaklike leaves on the same tree. The American hornbeam (*C. caroliniana*) is also known as water beech and blue beech, the latter for its blue-gray bark. It seldom reaches 12 m, although some trees in the southern U.S. may grow to 18 m tall. The smooth trunk has a sinewy or muscular appearance and divides into slender, slightly pendulous branches. The egg-shaped, bronze-green leaves, up to 10 centimetres long, are white haired when unfolding; they are blue green at maturity and become scarlet or orange yellow in autumn. Because of its hard, heavy wood, the American hornbeam is commonly called ironwood. *C. cordata*, an Asian species, usually 15 m tall, has heart-shaped leaves up to 15 cm long. In the Japanese hornbeam (*C. japonica*), the downy leaves are reddish brown when unfolding; the smaller Korean hornbeam (*C. eximia*), usually nine metres tall, has egg-shaped, slender-pointed, downy leaves.

The European hornbeam has a whitish, tough wood used in agricultural implements. The tree is a common ornamental in hedges and covered walks of Old World gardens and is often pruned into strange shapes. The American hornbeam is less popular as an ornamental; it requires partial shade and wind protection.

hornbill, family name BUCEROTIDAE, any of about 45 species of Old World tropical birds (order Coraciiformes) noted for the presence, in a few species, of a bony casque, or helmet, surmounting the prominent bill. Hornbills range in size from 40 centimetres (16 inches), in the smaller *Tockus* species, to 160 cm (63 in.), in the great hornbill (*Buceros bicornus*). They are typically large-headed, with thin necks, broad wings, and long tails. The plumage is brown or black, usually with bold white markings.

Hornbills nest in cavities, usually in large trees. In all species except the two ground hornbills (*Bucorvus*), the male walls the female in the nest, closing the hole with mud, except for a small opening through which he passes food. After the eggs hatch, the female breaks out, but the young may be walled in again.



Red-billed hornbill (*Tockus erythrorhynchus*)

Mark Boulton—The National Audubon Society Collection/Photo Researchers

hornblende, any of a subgroup of amphibole (*q.v.*) minerals that are calcium-rich and monoclinic. Hornblende's generalized chemical formula is $(Ca,Na)_2(Mg,Fe,Al)_5(Al,Si)_8O_{22}(OH)_2$. The four end-members and the cation content of their respective compositions are as follows: common hornblende, $Ca_2(Mg_4Al)(Si_7Al)$; tschermakite, $Ca_2(Mg_3Al_2)(Si_6Al_2)$; edenite, $NaCa_2(Mg)_5(Si_7Al)$; pargasite, $NaCa_2(Mg_4Al)(Si_6Al_2)$. Extensive solid solution occurs, and each end-member has iron-rich equivalents; minor elements, including manganese, titanium, chromium, potassium, fluorine, and yttrium, are usually present. Hornblendes exhibit typical amphibole structures; these are based on double tetrahedral chains between which four metal sites are located. Tetrahedral substitution of aluminum for silicon is common and provides charge balance for trivalent and univalent substitution in the metal sites. For detailed physical properties of common hornblende, *see* amphibole (table).

Hornblende occurs widely in metamorphic and igneous rocks. Common hornblende is usually found in middle-grade metamorphic rocks, whereas tschermakite and pargasite occur in high-grade metamorphic rocks that tend to have more aluminum. Such metamorphic rocks with abundant hornblende are called amphibolites.

Hornblower, Jonathan Carter (b. July 5, 1753, Chacewater, Cornwall, Eng.—d. March 1815, Penryn, Cornwall), British inventor of the double-beat valve, the first reciprocating compound steam engine. His invention, patented in 1781, was a steam engine with two cylinders, a significant contribution to efficiency. The firm of James Watt (Boulton & Watt) challenged his invention, claiming infringement of patent. With the decision against him, Hornblower lost the opportunity to develop further the compound engine, and the principle fell out of sight until it was rediscovered in 1804 by Arthur Woolf, of Great Britain.

Hornblower patented other inventions, a rotative engine and a steam wheel, or steam engine, and amassed a fortune in engineering.

hornbook, form of children's primer common in both England and America from the late 16th to the late 18th century. A sheet containing the letters of the alphabet was mounted on a wooden frame and protected with thin, transparent plates of horn. The

frame was shaped like a table-tennis paddle, had a handle, and was usually hung at the child's belt. The earliest sheets were of vellum; later they were of paper. They contained first a large cross, from which the hornbook was called the Christ's Cross row, or crisscross row. The alphabet in large and small letters followed. The vowels then formed a line, and their combinations with the consonants were given in a tabular form. The usual blessing—"In the name of the Father and of the Sonne and of the Holy Ghost, Amen"—followed, then the Lord's Prayer, the whole concluding with the Roman numerals.

Hornbostel, Erich Moritz von (b. Feb. 25, 1877, Vienna, Austria—d. Nov. 28, 1935, Cambridge, Cambridgeshire, Eng.), Austrian musicologist and ethnologist.

Brought up in a highly musical home, Hornbostel studied piano, harmony, and counterpoint. Although by his late teens he was a skilled performer and composer, his university studies (at Heidelberg, 1895–99) were in the natural sciences and philosophy, and his Ph.D. was in chemistry (Heidelberg, 1900). He then moved to Berlin, where, influenced by Carl Stumpf, he combined his musicological studies with experimental psychology, especially the phenomena of tone psychology. He became assistant to Stumpf at the Psychological Institute, and, when its archives became the foundation of the Berlin Phonogramm-Archiv in 1906, Hornbostel was named its first director, a post he held until he was dismissed in 1933 by the Nazi regime. (His mother, the singer Helene Magnus, was Jewish.)

From Germany Hornbostel escaped first to Switzerland and then emigrated with his family to the United States. He moved in 1934 to England, where he spent the last year of his life editing and transcribing a collection of recordings of "primitives." Hornbostel was coeditor (with Stumpf) of the *Sammelbände für vergleichende Musikwissenschaft* ("Collected Volumes for Comparative Musicology") from 1922 until his death.

Hornbostel was a specialist in Asian, African, and other non-European music (his first field research was among the Pawnee Indians in North America in 1906). Collaborating with Stumpf and Otto Abraham, he devised a system combining the concepts of acoustics, psychology, and physiology for the study of non-European musical cultures, a procedure that has been credited with establishing comparative musicology as a recognized discipline. With Abraham he published a series of essays on non-European music (including Japanese, Turkish, and Indian) and formulated a method for transcribing music from recordings; in 1904 they proposed an approach to the study of comparative musicology roughly parallel to that used in comparative linguistics. Hornbostel also demonstrated the importance of observable, measurable musicological data to ethnological research.

Among his most valuable contributions to ethnomusicology are his studies on the psychology of musical perception, the relationship between a culture and its tuning system, and the innovative classification of musical instruments (with Curt Sachs, 1914).

Horne, Herman Harrell (b. Nov. 22, 1874, Clayton, N.C., U.S.—d. Aug. 16, 1946, Leonia, N.J.), American educational philosopher who represented the idealistic viewpoint in contrast to the pragmatism of John Dewey and his followers.

Horne earned his undergraduate and master's degrees at the University of North Carolina in Chapel Hill (1895). He received his doctorate in philosophy at Harvard (1899) and later (1906–07) studied at the University of Berlin.

Horne's teaching career, which spanned nearly half a century, began at the University of North Carolina, where from 1894 to 1896 he taught French. After earning his doctorate, he taught philosophy at Dartmouth in Hanover, N.H. (1899–1909), and moved to New York University (NYU) in New York City as professor of the philosophy of education in the graduate school and the School of Pedagogy (1909–22). When in 1922 the School of Pedagogy became the School of Education, Horne taught the history of education there as well as the philosophy of education. He also served as head of both the history and the philosophy departments at NYU's School of Education, retiring in 1942.

Horne wrote more than 20 books, along with numerous articles, and he was the first professor to broadcast a lecture over radio. A recognized spokesman for the idealistic point of view, he analyzed and criticized Dewey's *Democracy and Education* in a book entitled *The Democratic Philosophy of Education* (1932), Horne's best-known work. Other of his books presenting the idealistic position in education include *The Philosophy of Education* (1904), *Psychological Principles of Education* (1906), *Idealism in Education* (1910), and *This New Education* (1931). He also wrote on educational methodology, general philosophy, and religion.

Horne, Îles de (Wallis and Futuna): *see* Futuna Islands.

Horne, John: *see* Tooke, John Horne.

Horne, Marilyn (b. Jan. 16, 1934, Bradford, Pa., U.S.), American mezzo-soprano noted for the seamless quality and the exceptional range and flexibility of her voice, especially in coloratura roles by Gioacchino Rossini and George Frideric Handel. She was also instrumental in reviving interest in their lesser-known operas.

Under her father's guidance, Horne began singing as a child. At the University of Southern California she studied under both William Vennard and Lotte Lehmann. In 1954 she dubbed the singing voice for Dorothy Dandridge in the motion picture *Carmen Jones;* the same year she made her opera debut at the Los Angeles Guild Opera as Hata in Bedřich Smetana's *The Bartered Bride.* In 1956 she



Marilyn Horne
Christian Steiner

joined the Gelsenkirchen City Opera Company in West Germany, where she remained for several seasons, performing mainly soprano roles, including Mimi in Giacomo Puccini's *La Bohème* and more unusual roles, such as Jacques Offenbach's Giulietta (in *The Tales of Hoffmann*), Handel's Fulvia (in *Ezio*), Puccini's Minnie (in *The Girl of the Golden West*), and Marie in Alban Berg's *Wozzeck.* She made her triumphant return to the United States in the latter role in 1960 in San Francisco. In 1961, as Agnese, she joined Joan Sutherland in a concert performance at Carnegie Hall, New York City, of Vincenzo Bellini's *Beatrice di Tenda.* This marked a turning point in her career: it was her first bel canto role and the first of many performances with Sutherland, including triumphs in Rossini's *Semiramide* and Bellini's *Norma.* Horne made her debut at La Scala, Milan, in Igor Stravinsky's *Oedipus Rex* and Rossini's *Siege of Corinth* in 1969, and in 1970 she made her long-awaited debut at the Metropolitan Opera, New York City, as Adalgisa, in *Norma.*

Although Horne drew international attention for her interpretations of Rosina in Rossini's *The Barber of Seville* and of Carmen, many of her greatest successes were in "trouser roles" (male characters intended to be sung by male castrati or by women), such as Rossini's *Tancredi* and Handel's *Rinaldo.* Horne's efforts to resurrect these and other seldom-performed operas were rewarded in 1982, when she was awarded the first Golden Plaque of the Rossini Foundation, honouring her as "the greatest Rossini singer in the world." The next year she was made Commendatore of the Italian Republic, an honour conferred by the president of Italy. Horne continued to draw acclaim for her numerous recordings and her performances in opera houses and concert halls throughout the world. In 1984 she sang *Rinaldo* at the Met, the first Handel opera ever performed there.

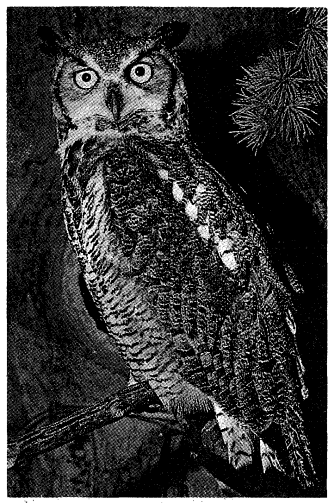
Marilyn Horne: My Life (written with Jane Scovell) was published in 1983.

Horne Tooke, John: *see* Tooke, John Horne.

horned liverwort: *see* hornwort.

horned lizard (reptile): *see* horned toad.

horned owl, in general, any owl of the genus *Bubo* (family Strigidae), with hornlike tufts



Great horned owl (*Bubo virginianus*)
E.R. Degginger—Van Cleve Photography

of feathers. The name refers especially to the great horned owl (*B. virginianus*) of America. The great horned owl ranges from Arctic tree limits to the Strait of Magellan. It is a powerful mottled-brown predator that is often more than 60 cm (about 2 feet) in length, with a wingspread often approaching 200 cm (80 inches) in the female. Although its usual fare is small rodents and birds, the great horned owl has been known to carry off larger prey (such as hens). Adapted to desert and forest, the great horned owl migrates only during time of food shortage.

Other horned owls are the eagle owl, or Eurasian eagle owl (*B. bubo*) of Europe, Asia, and northern Africa and related species that occur in Africa, India, Myanmar (Burma), and the Malay Archipelago (*see* eagle owl).

horned passalus beetle: *see* bess beetle.

horned poppy, also called SEA POPPY (genus *Glaucium*), any of about 25 species of a genus within the poppy family (Papaveraceae). All are orange-juiced, weedy garden plants native to Eurasia. The yellow horned poppy



Horned poppy (*Glaucium flavum*)
A to Z Botanical Collection—EB Inc.

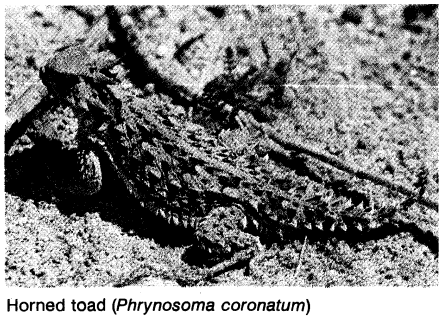
(*G. flavum*) is native to sea beaches of Great Britain and southern Europe and has become established in the eastern United States. Its slender seed pods are 30 cm (one foot) long. The 5-centimetre-long, four-petaled, yellow to orange blooms are borne on 30- to 90-centimetre- (12- to 35-inch-) tall plants with hairy, lobed, fleshy, blue-green leaves. The red horned poppy (*G. corniculatum*) from continental Europe is smaller and has crimson blooms often with black spots at the petal bases. Horned poppies have been used to anchor beach sand and in beach gardens.

horned pout (fish): *see* bullhead.

horned rattlesnake: *see* sidewinder.

horned shark (genus *Heterodontus*), any member of the only genus in the family Heterodontidae (class Selachii), characterized by a large, heavy spine on the anterior edge of each dorsal fin. There are about 10 marine, bottom-dwelling species of these sharks, which are found almost everywhere except in the Mediterranean and Atlantic. Horned sharks may grow to 1.4 m (5 feet) long. Their jaws are covered with sharp teeth, incisor-like ones in the front and large molar-like ones on the sides. They feed on invertebrates such as sea urchins and crustaceans.

horned toad, also called HORNED LIZARD (genus *Phrynosoma*), any of about 14 species of lizards belonging to the family Iguanidae



Horned toad (*Phrynosoma coronatum*)
Herbert Clarke

that are usually characterized by daggerlike head spines, or horns. Both the flattened oval body and pointed fringe scales along the sides of the body are typical features. The lizards range in length from less than 7.5 to more than 12.5 cm (3 to 5 inches).

They inhabit western North America from British Columbia southward to Guatemala and from Arkansas and Kansas westward to the Pacific coast. The usual habitat is desert or semidesert sandy country. Horned toads conceal themselves by colour-pattern change and by wriggling sideways into the sand until the entire body, except the head, is covered. They are food specialists, eating mainly ants. Defense mechanisms include the ability to inflate the body quickly by gulping air, and (rarely) spurting blood from the eyes. They are often kept as pets but seldom live long in captivity.

Hornemann, Friederich Konrad (b. September 1772, Hildesheim, Hanover [Germany]—d. February 1801, Nupe kingdom [now in Nigeria]), the first modern European to make the dangerous crossing of the northeastern Sahara. His journal, later published, contained a substantial amount of information on the then-unknown terrain and inhabitants of the central Sudan and western Sahara..

In London (1796) he offered to serve as an explorer for the African Association. Disguised as a Muslim, on Sept. 5, 1798, at Cairo, he joined a caravan returning from Mecca and bound for the Maghrib (northwestern Africa). He traveled by way of the Siwa Oasis, Egypt, and Temissa, Fezzan, and reached Marzūq (now in Libya) on Nov. 17, 1798. There he remained until June 1799, when he went to Tripoli (now in Libya) to send his journals to London. He returned to Marzūq with the intention of traveling southward to the country of the Hausa people, now chiefly within Nigeria. Nothing more was heard of him until a report reached Marzūq in 1819 that he had reached "Noofy" (Nupe) and had died there in February 1801. An English translation of his journal, *The Journal of Frederich Hornemann's Travels from Cairo to Mourzouck,* appeared in 1802.

Horney, Karen, *née* DANIELSEN (b. Sept. 16, 1885, Hamburg, Ger.—d. Dec. 4, 1952, New York, N.Y., U.S.), German-born American psychoanalyst who departed from some of the basic principles of Sigmund Freud, suggesting that environmental and social conditions, rather than biological drives, determine much of individual personality and are the chief causes of neuroses and personality disorders.

After receiving her M.D. from the University of Berlin (1912), she underwent psychoanalytic training with Karl Abraham, a friend and close associate of Freud. In about 1915 she began five years of outpatient and clinical work in Berlin hospitals, and from 1920 to 1932 she conducted a private practice and taught at the Berlin Psychoanalytic Institute. She then went to the United States to become associate director of the Institute for Psychoanalysis in Chicago, moving to New York City in 1934 to return to private practice and teach at the New School for Social Research. There she produced her major theoretical works, *The Neurotic Personality of Our Time* (1937) and *New Ways in Psychoanalysis* (1939), in which she disputed several major tenets of Freud's psychoanalytic theory, holding instead that neuroses were caused by disturbances in interpersonal relationships.

In particular, Horney objected to Freud's concepts of the libido, a death instinct, and penis envy, which she felt could be more adequately explained by cultural and social conditions. She objected that the idea of penis envy treated female psychology as no more than an offshoot of male psychology and that it was inadequate to explain sex-based behavioral differences. Horney believed that a primary condition responsible for the later development of neurosis was the infant's experience of basic anxiety, in which the child felt "isolated and helpless in a potentially hostile world." The various strategies the child adopts to cope with this anxiety can eventually become persistent and irrational needs that cause both neurosis and personality disorder.

Many of Horney's ideas, rooted as they were in her wide clinical experience, were translated into a new approach to psychoanalytic therapy. She sought to help patients identify the specific cause of current anxieties, feeling that it was just as important to the goals of psychoanalysis to deal with real-life, present-day problems as it was to reconstruct childhood emotional states and fantasies. In many cases, she suggested that the patient could even learn to psychoanalyze himself.

Her refusal to adhere to strict Freudian theory caused Horney's expulsion from the New York Psychoanalytic Institute in 1941, which left her free to organize a new group, the Association for the Advancement of Psychoanalysis. She continued to write, further expounding her views in *Our Inner Conflicts* (1945) and *Neurosis and Human Growth* (1950). Horney's analysis of the causes and dynamics of neurosis and her revision of Freud's theory of personality have remained influential.

hornfels facies, a major division of metamorphic rocks (rocks that form by contact metamorphism in the inner parts of the contact zone around igneous intrusions). All of the rocks called hornfels—a hard, fine-grained, flinty rock—are created when heat and fluids from the igneous intrusion alter the surrounding rock, changing its original mineralogy to one that is stable under high temperatures. Temperatures as high as 700°–800° C (1,300°–1,470° F) may be reached, depending upon the pressure at the depth of the intrusion. The minerals of the hornfels facies depend largely upon the composition of the parent rock.

Horniman, Annie (Elizabeth Fredericka) (b. Oct. 3, 1860, Forest Hill, London, Eng.—d. Aug. 6, 1937, Shere, Surrey), English theatre manager who pioneered the British repertory movement, influencing 20th-century drama, acting, and production.

The heiress of a wealthy tea merchant, Horniman studied at the Slade School of Fine Art (1882–86), but after visiting Germany, where she was impressed by the state-subsidized repertory theatre and by productions of Henrik Ibsen's plays, she decided to make the theatre her lifework. In 1894–95 she secretly subsidized a repertory season at the Avenue Theatre in London, during which *Arms and the Man,* George Bernard Shaw's first publicly produced play, and William Butler Yeats's *Land of Heart's Desire* were important landmarks. Thus introduced to the new Irish theatre movement, Horniman spent five years as Yeats's unpaid secretary, during which time she financed the conversion of an old building into the new home of the Abbey Theatre in Dublin (1904).

In 1908 she began her own repertory theatre, the Gaiety, in Manchester. Good plays—from Greek tragedy to works by Shaw, John Galsworthy, Arnold Bennett, Harley Granville-Barker, and St. John Ervine—a first-rate company, and her own managerial talents made Horniman's Gaiety famous. The company toured England and the United States, stimulating the formation of other repertory groups. Financial difficulties beset the company, however, and it was disbanded in 1917; Horniman sold the theatre in 1921. In 1933 she was made a Companion of Honour.

Hornindals Lake, lake, Sogn og Fjordane *fylke* (county), western Norway. Occupying the trough of a glacial valley, the long and narrow lake has a length of about 16 miles (25 km) and a maximum width of 3 miles (5 km). In the west it tapers to a sharp point and drains westward into Nord Fjord, which it parallels. The lake's total area is approximately 20 square miles (50 square km). One of the clearest lakes in Scandinavia, Hornindals has a maximum depth of 1,600 feet (500 m), making it the deepest lake in Europe.

hornpipe, name of a wind instrument and of several dances supposedly performed to it. The instrument is a single-reed pipe with a cowhorn bell (sometimes two parallel pipes

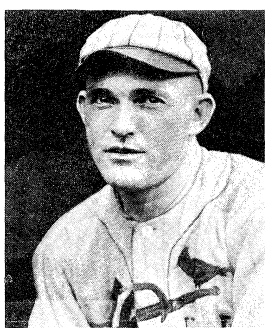
with a common bell) and is often converted into a bagpipe. Known since antiquity, it is today played in Spain and North Africa, east to Arabia and parts of Russia.

Hornpipe refers also to several dances that Renaissance courtiers believed were once performed to the rustic instrument. At times it meant a jig, a reel, or a country dance. As an Irish, Scottish, or English solo dance, the hornpipe is in $\frac{4}{4}$ time and is related to the jig and the solo reel. It has intricate steps and often imitates a sailor's dance. Hornpipes are often danced with clogs, especially in northern England.

In a musical suite the hornpipe is a stylized version of a country dance in $\frac{3}{2}$ time. An example occurs in George Frideric Handel's *Water Music* suite.

Hornsby, Rogers (b. April 27, 1896, Winters, Texas, U.S.—d. Jan. 5, 1963, Chicago, Ill.), American professional baseball player, generally considered the game's greatest right-handed hitter. His major league career batting average of .358 is second only to Ty Cobb's .367.

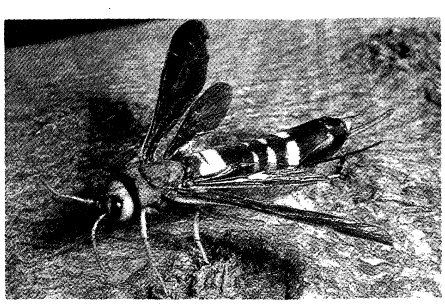
Playing second base for the St. Louis Cardinals (1915–26), Hornsby led the National



Hornsby, 1926
UPI Compix/EB Inc.

League in batting for six consecutive seasons, 1920–25. In 1928, when he was with the Boston Braves, he again led the league. For five years, 1921–25, he averaged .401, hitting over .400 in three of those seasons. His 1924 average of .424 is the highest attained in the major leagues in the 20th century. In 1926, as the Cardinals' playing manager, he led the team to a World Series victory over the New York Yankees. He later managed the Boston (1928), Chicago (1930–32), and Cincinnati (1952–53) teams in the National League and the St. Louis Browns (1933–37, 1952) in the American League. He was elected to the Baseball Hall of Fame in 1942.

horntail, any member of the insect family Siricidae, a group of solitary (nonsocial) wasps



Pigeon tremex (*Tremex columba*)
E.R. Degginger—EB Inc.

of the order Hymenoptera. Five genera and about 60 species have been described. Horntails are moderately large, some reaching 3.75 cm (about 1.5 inches) in length. The cylindrical body is usually brown, blue, or black, often with yellow spots or bands. The abdomen is connected broadly to the thorax, or midsection, and terminates in a harmless hornlike projection, for which the insect is named. The head is strikingly broad, and the eyes are small.

Female horntails use a conspicuous ovipositor to lay eggs. The ovipositor is used to drill a hole into a hardwood tree, particularly elm, beech, maple, or apple. The larvae tunnel through the tree for about two years, eating the wood. The insects are seldom economically destructive. Pupation takes place in a cocoon of silk and sawdust.

The most common North American species is the pigeon tremex (*Tremex columba*). The adult is black and brown with yellow body stripes and yellow legs; its length is about 3.75 cm. The most common British species is *Urocerus gigas,* which feeds on the wood of pine trees.

hornwort, also called HORNED LIVERWORT, any of four to six genera of creeping annual or perennial plants of the class Anthocerotopsida. In some classification systems, hornworts have been grouped as horned liverworts in the subclass Anthocerotidae (class Hepaticae), class Anthocerotopsida, order Anthocerotales, or entirely separated from the bryophytes in the division Anthocerotophyta.

The largest genus, *Anthoceros,* has a worldwide distribution. *Dendroceros* and *Megaceros* are mainly tropical genera. Hornworts usually grow on damp soils or on rocks in tropical and warm temperate regions. The plants' gametophytes (sexual generation) are typically flattened, irregularly lobulated (thallose) structures that are usually less than 2 cm (0.8–1.6 inches) in diameter. The sporophyte, or asexual generation, forms a tapered cylinder. The sporophyte is dependent on the attached gametophyte for nutrients and water. Most sporophytes grow to up to 5 cm (2 inches). The thallus, or flat, gametophyte, usually lacks a midrib. The sexual organs are sunk into the upper surface of the thallus. Rhizoids (rootlike structures) on the undersurface anchor the plant. Cavities in the thallus sometimes contain colonies of the blue-green alga *Nostoc.*

Hornworts differ also in having a region of continuous growth at the base of the sporophyte, and a large, irregular foot. The stalk that attaches the foot to the sporebearing capsule in liverworts is absent in hornworts.

Hornworts reproduce sexually by means of water-borne sperm, which travel from the male sex organ (antheridium) to the female sex organ (archegonium). A fertilized egg in a female sex organ develops into an elongate sporangium, which splits lengthwise as it grows, releasing the spores that have developed within it. Elaters (elongated cells that aid in spore dispersal) are usually irregular and multicellular.

horny sponge, any sponge of the orders Dictyoceratida and Dendroceratida (class Demospongiae). It has a skeleton consisting exclusively of fibrous organic components. Most other sponges, by contrast, have siliceous or calcareous elements as well as organic materials in their skeletal tissue. Collagen, the main organic component of horny sponges, may appear as dispersed fibrillar collagen as in other animal groups or in the form of a substance known as spongin, which is unique to the phylum Porifera. Members of the Dictyoceratida are often large, irregularly shaped sponges with a netlike skeleton of spongin fibres. The well-known commercial bath sponges (*Hippospongia* and *Spongia*) belong to this order. Horny sponges are sometimes eaten by sea slugs, starfish, and fish. *Compare* calcareous sponge; siliceous sponge.

horo, communal dance of Bulgaria. Performed for enjoyment at festive gatherings, it has many varieties, the moods of which range from solemn to exuberant. *Horos* are danced in linked circles, in serpentine chains, and in straight lines. Women's steps are often



Bulgarian *horo*
By courtesy of the Bulgarian Tourist Office, New York

simple and subdued, men's steps complicated. Frequently, the music, especially for women's dances, is sung. Musical metres such as $\frac{7}{16}$ and $\frac{11}{16}$ are common. The *horo,* like the related Yugoslav kolo and Romanian hora, is one of a complex of European chain dances performed since ancient times. *See also* carole.

horoscope, in astrology, a chart of the heavens, showing the relative positions of the Sun, the Moon, the planets, and the ascendant and midheaven signs of the zodiac at a specific moment in time. A horoscope is used to provide information about the present and to predict events to come.

An individual horoscope usually plots the moment of birth and is used by astrologers to analyze character, as well as—in conjunction with other astrological data—to predict the future. This is in accordance with the belief that each celestial body has its own mythological character, modified according to its geometric relationship with the other celestial bodies at a given moment. Everything in the universe being interrelated, these bodies exert an influence, particularly on the newborn. In casting a horoscope, the heavens are commonly represented by a circle divided into 12 intersections, called houses. Each of these houses is assigned several departments of human life, such as wealth or marriage. The planet that falls within a particular house is said to influence matters pertaining to that house.

Horowhenua, local government region, southern North Island, New Zealand. It consists of the scenic coastal plain along the Tasman Sea and the western slopes of the Tararua Range north of the Wellington local government region. Horowhenua has an area of 623 square miles (1,614 square km). Market gardens and dairy farms dominate the hinterland, and the coast is a recreation area for the inhabitants of Wellington, the nation's capital. Levin is the largest settlement in the region. Pop. (1988 est.) 55,400.

Horowitz, Vladimir (b. Oct. 1 [Sept. 18, Old Style], 1903, Berdichev, Russia [now in Ukraine, U.S.S.R.]—d. Nov. 5, 1989, New York, N.Y., U.S.), Russian-born American virtuoso pianist in the Romantic tradition, celebrated for his flawless technique and an almost orchestral quality of tone. Horowitz's performances of works by Franz Liszt, Sergey Rachmaninoff, Frédéric Chopin, Aleksandr Scriabin, Domenico Scarlatti, and Sergey Prokofiev were admired for their technical precision and dynamic range. His interpretations of keyboard miniatures, such as Robert

Schumann's *Kinderszenen* (*Scenes of Childhood*), were noted for their delicacy.

Horowitz entered the Kiev conservatory at age 12. While a student, he preferred composing to giving concerts, and only after his family had been left destitute by World War I and the Russian Revolution did he make his concert debut (1922, Kharkov). His reputation was assured in the Soviet Union when, at age 20, he played a series of 23 recitals in Leningrad with no duplications, performing a total of more than 200 works. Spectacular successes followed in European and American



Horowitz
Pictorial Parade—EB Inc.

tours. In 1933 he married Arturo Toscanini's daughter, Wanda. He settled in the United States in 1940, becoming a citizen in 1944. From 1953 to 1965 he withdrew completely from the concert stage, although he continued to make recordings. His return to the American concert stage after 12 years' absence and again briefly in 1974 and 1981 were musical events of great moment. Then, in 1982, after 31 years' absence he capped his career by touring Europe once again. In 1986 he returned to the Soviet Union to perform two concerts. His final tour was a series of recitals in Europe in 1987. He was buried in the Toscanini family plot in Milan, Italy.

Horrocks, Jeremiah, Horrocks also spelled HORROX (b. *c.* 1617, Toxteth Park, near Liverpool [now in Merseyside], Eng.—d. Jan. 3, 1641, Toxteth Park), British astronomer and clergyman who applied Johannes Kepler's laws of planetary motion to the Moon and whose observations of a transit of Venus (1639) are the first recorded.

Horrocks studied at the University of Cambridge from 1632 to 1635; he then became a tutor at Toxteth and studied astronomy in his spare time. He was ordained to the curacy of Hoole, Lancashire, in 1639. The transit of Venus, which had been overlooked in Kepler's tables but which Horrocks had predicted, took place on Sunday, November 24 (Old Style), and he observed it between church services.

He showed the Moon's orbit to be approximately elliptical, thus making a partial basis for Sir Isaac Newton's later work. Horrocks also studied tides and the mutual perturbation of Jupiter and Saturn. He calculated an improved value of 14 minutes for the solar parallax, a measure of the Earth's mean distance from the Sun, and suggested correctly that the Sun had a perturbing effect on the Moon's orbit.

horror film, motion picture calculated to cause intense repugnance, fear, or dread. Horror films may incorporate incidents of physical violence and psychological terror; they may be studies of deformed, disturbed, psychotic, or evil characters, stories of terrifying monsters, or mystery thrillers that use atmosphere to build suspense. The genre often overlaps science fiction films and film noir.

In the earliest horror films, which were influenced by German expressionist cinema, the effect of horror was usually created by means of a macabre atmosphere and theme; *The Student of Prague* (1913), an early German film dealing with a dual personality, and *The Golem* (1914), based on the medieval Jewish legend of a clay figure that comes to life, were the first influential horror films. In the 1920s such German films as *The Cabinet of Dr. Caligari* (1919), *Nosferatu* (the first filming of the Dracula story; 1922), and *Waxworks* (1924) were known throughout the world. In the United States a number of outstanding horror films were produced in the 1920s. *Dr. Jekyll and Mr. Hyde* (1920) became a classic of the silent screen, and Lon Chaney terrified audiences as *The Hunchback of Notre Dame* (1923) and *The Phantom of the Opera* (1925). *The Cat and the Canary* (1927) was an atmospheric thriller set in a fog-shrouded house honeycombed with secret passages.

The great popular success of *Dracula* (made in the United States in 1931), *Frankenstein* (1931), and *The Mummy* (1932) led to a long series of successful horror films including *King Kong* (1932) and *The Black Cat* (1934). Among some of the best-known horror classics of this period are *The Werewolf of London*



Scene from *The Phantom of the Opera*, 1925, starring Lon Chaney
By courtesy of Universal Pictures; photograph, from the Museum of Modern Art Film Stills

(1935), *The Wolf Man* (1941), and *Cat People* (1942).

The influence of science fiction can be seen in horror films of the 1950s that concerned monsters from other planets (*The Thing,* 1951) and mutations (*Them!,* 1954). Japanese studios released monster films, such as *Gojira* (1954; U.S. title *Godzilla, King of the Monsters,* 1956) and *Radon* (1956; U.S. title *Rodan,* 1957), while British companies such as Hammer Studios shifted the emphasis from atmospheric terror to scenes of bloody violence in motion pictures such as *The Curse of Frankenstein* (1957) and *The Horror of Dracula* (1958). Sophisticated films of the mystery-thriller type such as Alfred Hitchcock's *Psycho* (1960) and Roman Polanski's *Repulsion* (1965) continued to be made. Over time the horror-film genre came to be represented by several subgenres, including films about the supernatural such as *The Exorcist* (1973) and *The Shining* (1980); the "psycho-slasher" films, perhaps best represented by John Carpenter's *Halloween* (1978); and science-fiction thrillers, such as Ridley Scott's *Alien* (1979). The popularity of B-grade, low-budget horror films grew with the introduction in the 1970s of the videocassette and cable television.

Horsa (Anglo-Saxon leader): *see* Hengist and Horsa.

horse (species *Equus caballus*), a hoofed, herbivorous mammal of the family Equidae, order Perissodactyla, long associated with humans as a means of transport and as a draft animal. Selection and breeding have resulted in a variety of breeds that can be grouped as light (typified by the Arabian and Thoroughbred), heavy (Belgian, Percheron, etc.), and pony (Shetland, Iceland, etc.).

A brief treatment of horses follows. For full treatment, *see* MACROPAEDIA: Horses and Horsemanship.

Fossil evidence indicates that the horse family evolved primarily in North America, whence it spread via land bridges to the Old World and to South America. For uncertain reasons, the equids disappeared from the Americas some 8,000 to 10,000 years ago. According to many experts, the domestic horse breeds developed from three wild types of *E. caballus*—Przewalski's horse of central Asia, the tarpan of eastern Europe and the Ukraine, and the forest horse of northern Europe. These wild horses were probably first hunted for food and certainly were not domesticated until long after dogs and cattle. Once tamed, the horse served as a draft animal and was used as transportation and in sport.

A mature male horse is called a stallion, or, if used for breeding, a stud; mature females are mares. A castrated stallion is called a gelding. Young horses (foals) are also known as colts (males) and fillies (females). The height of a horse is measured in 4-inch (10-centimetre) units, or hands, from the highest point of the back (withers) to the ground. Its size and build determine its classification; draft horses (such as the Shire) are heavy-limbed and up to 20 hands high, ponies are less than 14.2 hands high, and light horses are intermediate, rarely exceeding 17 hands.

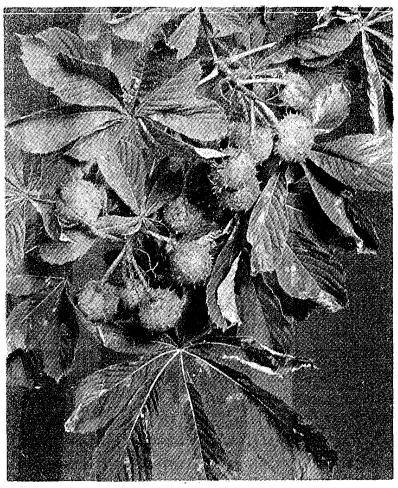
horse brass, decorative metal plaque fitted to the martingale, a set of straps attached to saddle and bridle and serving to steady a horse's head or check its upward movement. The use of these ornaments is of considerable antiquity, but most English horse brass dates from after 1830. Earlier examples are known, but these are rare. Before 1830 latten, an alloy of brass, was used, the pierced design being cut by hand. Most of the later varieties are of cast brass, sometimes plated. Many were produced in Walsall and Birmingham, particularly in the latter half of the 19th century. Over 1,000 different designs of horse brasses have been recorded, ranging from the early sun flashes, worn on the horse's face, to the later regional and commemorative horse brasses made in the 20th century.

horse chestnut (genus *Aesculus*), any of several trees belonging to a genus in the horse chestnut family (Hippocastanaceae), native to the North Temperate Zone. They have palmately compound leaves and erect flower clusters, often in the shape of an inverted cone. Prickly green husks ripen and split in fall to release one or two shiny mahogany-brown nuts. The tree's common name is said to come from Turkey, where the nuts were fed to horses to cure broken wind.

Perhaps the best-known species is the common, or European, horse chestnut (*A. hippocastanum*), native to southeastern Europe but widely cultivated as a large shade and street tree; it grows to a height of 30 m (100 feet). The famous Champs-Élysées in Paris is lined with rows of horse-chestnut trees.

Japanese horse chestnut (*A. turbinata*) is as tall as the European species but is distinctive for its remarkably large leaves, up to 60 cm (2 feet) across. The Indian horse chestnut (*A. in-*

dica), with slender, pointed leaflets, has attractive feathery flower spikes with a bottlebrush effect. Red horse chestnut (*A.* × *carnea*), a hybrid of *A. hippocastanum* and *A. pavia,* grows



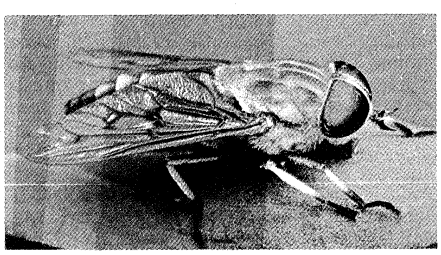
European horse chestnut (*Aesculus hippocastanum*)
Grant Heilman—EB Inc.

up to 20 m (65 feet) and has flesh-coloured to scarlet flower spikes.

horse clam: *see* gaper clam.

horse dressing glass (furniture): *see* cheval glass.

horse fly, any member of the insect family Tabanidae (order Diptera), but more specifically any member of the genus *Tabanus.* These stout flies, as small as a housefly or as large as a bumble bee, are sometimes known as green-headed monsters; their metallic or iridescent eyes meet dorsally in the male and are separate in the female. Gad fly, a nickname, may refer either to the fly's roving habits or to its mouthparts, which resemble a wedge-shaped miner's tool. Other such names are breeze fly and ear fly. One of the most common species



Horse fly (*Tabanus trimaculatas*)
Fran Hall from The National Audubon Society Collection/Photo Researchers—EB Inc.

(*Tabanus lineola*) has bright-green eyes and is known as green head. The genus *Chrysops,* usually known as deer fly, is slightly smaller than *Tabanus* and has dark markings on the wings.

Adult horse flies are fast, strong fliers that are usually found around streams, marshes, and wooded areas. They may be carriers of various animal diseases such as anthrax, tularemia, and trypanosomiasis. Females deposit long, flat, black eggs in clusters; the eggs are laid on the grass. Horse flies overwinter in the larval stage, pupate in spring, and emerge as adults by late June.

The bloodsucking females may be serious pests to humans and animals. When abundant they sometimes suck three ounces or more of blood a day from a host. When the genus *Haematopota* becomes too abundant, agricultural work can only be done at night when the fly is not active. The males feed on nectar, honeydew, and plant sap.

Control methods include draining or oiling of breeding places; sprays are not usually successful. Covering a horse with a blanket or fly net helps protect it from horse fly attacks.

horse latitude, either of two subtropical atmospheric high-pressure belts that encircle the Earth around latitudes 30°–35° N and 30°–35° S and that generate light winds and clear skies. Because they contain dry, subsiding air, they produce arid climates in the areas below them. The belts are best developed over the oceans; the Southern Hemisphere, which has more water area than the Northern, has the larger and more continuous belt. The belts contain several separate high-pressure cells and shift a few degrees away from the equator in summer.

The horse latitudes were possibly named by the crews of sailing ships, who sometimes threw horses overboard to conserve water when their ships were becalmed in the high-pressure belts. The Northern Hemisphere belt is also called the calms of Cancer and the Southern Hemisphere belt the calms of Capricorn.

horse racing, sport of running horses at speed, mainly Thoroughbreds with a rider astride or Standardbreds with the horse pulling a conveyance with a driver. These two kinds of racing are called racing on the flat and harness racing. Some races on the flat involve jumping. This article is confined to Thoroughbred horse racing on the flat without jumps. For jumping races, *see* steeplechase; point-to-point; and hurdle races. For racing on the flat with horses other than Thoroughbreds, *see* quarter-horse racing. *See also* harness racing.

Although horse racing is one of the oldest of all sports, its basic concept has undergone virtually no change over the centuries. It has developed from a primitive contest of speed or stamina between two horses into a spectacle involving large fields of runners, sophisticated electronic monitoring equipment, and immense sums of money, but its essential feature has always been the same: the horse that finishes first is the winner. In the modern era horse racing developed from a diversion of the leisure class into a huge public-entertainment business. Derby Day at Epsom, Eng., where the public is admitted onto parts of the grounds at no fee, has drawn as many as 500,000 spectators. Attendance at both flat and harness racing in many countries is the highest or among the highest of all sports.

Early history. Knowledge of the first horse race is lost in prehistory. Both four-hitch chariot and mounted (bareback) races were held in the Olympic Games of Greece over the period 700–40 BC. Horse racing, both of chariots and of mounted riders, was a well-organized public entertainment in the Roman Empire. The history of organized racing in other ancient civilizations is not very firmly established. Presumably, organized racing began in such countries as China, Persia, Arabia, and other countries of the Middle East and of North Africa, where horsemanship early became highly developed. Thence came too the Arabian, Barb, and Turk horses that contributed to the earliest European racing. Such horses became familiar to Europeans during the Crusades (11th to 13th century), from which they brought those horses back.

Racing in medieval England began when horses for sale were ridden in competition by professional riders to display the horses' speed to buyers. During the reign of Richard the Lion-Heart (1189–99), the first known racing purse was offered, £40, for a race run over a 3-mile (4.8-kilometre) course with knights as riders. In the 16th century Henry VIII imported horses from Italy and Spain (presumably Barbs) and established studs at several locations. In the 17th century James I sponsored meetings in England. His successor, Charles I, had a stud of 139 horses when he died in 1649.

Organized racing. Charles II (reigned 1660–85) became known as "the father of the English turf" and inaugurated the King's Plates, races for which prizes were awarded the winners. His articles for these races were the earliest national racing rules. The horses raced were six years old and carried 168 pounds (76 kg), and the winner was the first to win two 4-mile (6.4-kilometre) heats. The patronage of Charles II established Newmarket as the headquarters of English racing.

In North America Richard Nicolls, governor of the colony of New York, in 1665 offered a silver cup, the first known North American racing trophy, to be run for at Hampstead Plain, Long Island. Thus began course racing in North America.

In France the first documented horse race was held in 1651 as the result of a wager between two noblemen. During the reign of Louis XIV (1643–1715), racing based on gambling was prevalent. Louis XVI (reigned 1774–93) organized a jockey club and established rules of racing by royal decree that included requiring certificates of origin for horses and imposed extra weight on foreign horses.

Match races. The earliest races were match races between two horses, or at most three, the owners providing the purse, a simple wager. An owner who withdrew commonly forfeited half the purse, later the whole purse, and bets also came under the same "play or pay" rule. Agreements were recorded by disinterested third parties, who came to be called keepers of the match book. One such keeper at Newmarket, John Cheny, began publishing *Cheny's Horse Matches* (1727), a consolidation of match books at various racing centres; and this work was continued annually with varying titles, until in 1773 James Weatherby established it as the *Racing Calendar,* continued thereafter by his family.

Open field racing. By the mid-18th century, the demand for more public racing had produced open events with larger fields of runners. Eligibility rules were developed based on the age, sex, birthplace, and previous performance of horses and the qualifications of riders. Races were created in which owners were the riders (gentlemen riders); in which the field was restricted geographically to a township or county; and in which only horses that had not won more than a certain amount were entered. An act of the British Parliament of 1740 provided that horses entered had to be the bona fide property of the owners, thus preventing "ringers," a superior horse entered fraudulently against inferior horses; horses had to be certified as to age; and there were penalties for rough riding.

Contemporary accounts identified riders (in England called jockeys—if professional—from the second half of the 17th century and later in French racing), but their names were not at first officially recorded. Only the names of winning trainers and riders were at first recorded in the *Racing Calendar,* but by the late 1850s all were named. This neglect of the riders is partly explained in that when races consisted of 4-mile heats, with two heats won needed for victory, the individual rider's judgment and skill were not so vital. As dash racing (one heat) became the rule, a few yards in a race gained importance, and consequently so did the rider's skill and judgment in coaxing that advantage from his mount.

Bloodlines and studbooks. All horse racing on the flat except quarter-horse racing involves Thoroughbred (*q.v.*) horses. Thoroughbreds evolved from a mixture of Arab, Turk, and Barb horses with native English stock. Private studbooks had existed from the early 17th century, but they were not invariably reliable. In 1791 Weatherby published *An Introduction to a General Stud Book,* the pedigrees

being based on earlier *Racing Calendars* and sales papers. After a few years of revision, it was updated annually. All Thoroughbreds are said to descend from three "Oriental" stallions (the Darley Arabian, the Godolphin Barb, and the Byerly Turk, all brought to Great Britain, 1690–1730) and from 43 "royal" mares (those imported by Charles II). The preeminence of English racing and hence of the *General Stud Book* from 1791 provided a standard for judging a horse's breeding (and thereby, at least to some degree, its racing qualities). In France the *Stud Book Française* (beginning in 1838) originally included two classifications: *Orientale* (Arab, Turk, and Barb) and *Anglais* (mixtures according to the English pattern), but these were later reduced to one class "*chevaux de pur sang Anglais*" ("horses of pure English blood"). *The American Stud Book* dates from 1897 and includes foals from Canada, Puerto Rico, and parts of Mexico, as well as from the United States.

The longstanding reciprocity among studbooks of various countries was broken in 1913 by the Jersey Act passed by the English Jockey Club, which disqualified many Thoroughbred horses bred outside England or Ireland. The purpose of the act was ostensibly to protect the British Thoroughbred from infusions of North American (mainly U.S.) sprinting blood. After a rash of victories in prestigious English races by French horses with "tainted" American ancestry in the 1940s, the Jersey Act was rescinded in 1949.

Jockey clubs and racing commissions. The Jockey Club (*q.v.*), founded at Newmarket about 1750, wrote its own rules of racing. In contrast to the earlier King's Plates rules, these new rules took into account different kinds of contests involving horses of different ages and were thus made more detailed. The new rules originally applied only to Newmarket, but, when the rules were printed in the *Racing Calendar,* they served as a model for rules everywhere. The Jockey Club acquired the *Racing Calendar* and the *General Stud Book* and finally in the 19th century came to control English racing, as it still does.

In France, La Société d'Encouragement pour l'Amélioration des Races de Chevaux en France (founded 1833) administers French racing, owns major racetracks and training centres, and, since 1969, has published the country's racing calendar. The studbook is published by the Ministry of Agriculture.

In the United States, the governance of racing resides in state commissions. Track operation is private. The (North American) Jockey Club, founded in 1894 in New York, at one time exercised wide but not complete control of American racing. It publishes the *Racing Calendar* and the *American Stud Book.*

English racing spread to Australia, New Zealand, Canada, South Africa, and India in the 19th century, and many of their governing bodies emulate the British.

Evolution of races. The original King's Plates were standardized races—all were for six-year-old horses, carrying 168 pounds, at 4-mile heats, a horse having to win two heats to be adjudged the winner. Beginning in 1751, five-year-olds carrying 140 pounds and four-year-olds carrying 126 pounds were admitted to the King's Plates, and heats were reduced to 2 miles. Other racing for four-year-olds was well established by then, and a race for three-year-olds carrying 112 pounds in one three-mile heat was run in 1731. Heat racing for four-year-olds continued in the United States until the 1860s. By that time, heat racing had long since been overshadowed in Europe by dash racing, a "dash" being any race decided by only one heat, regardless of its distance.

The modern age of racing. The beginning of the modern era of racing is generally considered to have been the inauguration of the English classic races: the St. Leger in 1776, the Oaks in 1779, and the Derby in 1780. All were dashes for three-year-olds. To these races were later added the Two Thousand Guineas in 1809 and the One Thousand Guineas in 1814. During the 19th century, races of the English classic pattern—dashes for three-year-olds carrying level weights—spread all over the world. The French classics are the Prix du Jockey Club (1836), the Grand Prix du Paris (1863), and the Prix de l'Arc de Triomphe (1920). The American classics are the Belmont Stakes (1867), the Preakness Stakes (1873), and the Kentucky Derby (1875). For individual winners, *see* Sporting Record: *Horse racing.*

Handicap racing. One major type of Thoroughbred horse race is the handicap race, in which the weights horses must carry during a race are adjusted in relation to their age (the more immature the horse, the less weight it carries). In this system, a two-year-old, the youngest racer, competes with less weight to carry than a horse that is three years or older. In general, a horse is reckoned as being fully aged at five years and is handicapped accordingly. There are also sex allowances for fillies, so that they carry slightly lower weights than males. Weight penalties or allowances are also provided on the basis of individual horses' past performance. Such handicaps may be set centrally where racing is so controlled or by individual tracks, the goal being to render all horses as nearly equal as possible by establishing what is called racing form. The handicap race thus represents an outright repudiation of the classic concept that the best horse should win. Instead, handicaps are assigned with the specific objective of giving all the horses in a race an equal chance of winning.

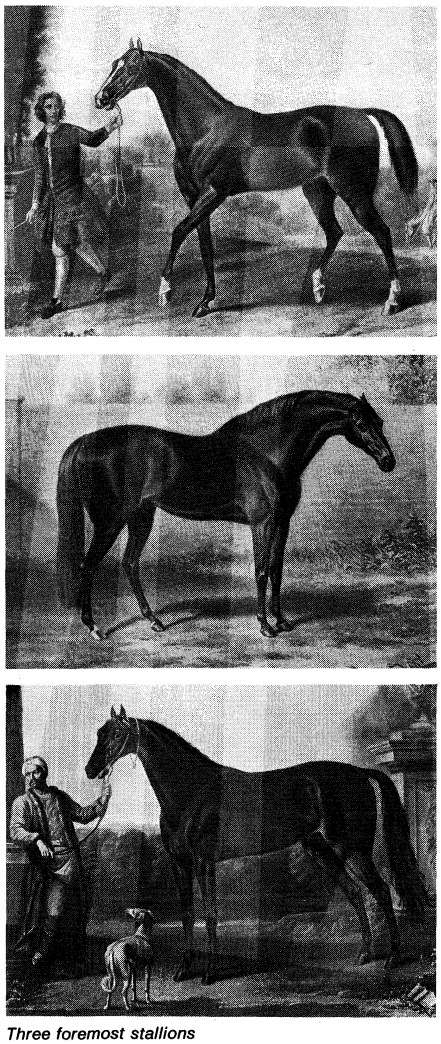
Some handicap races are major sporting events. For instance, the Melbourne Cup, a handicap inaugurated in 1861, is the most important race of the Southern Hemisphere. In the United States the Metropolitan, Brooklyn, and Suburban handicaps—all dating to the 19th century—were once the most valuable American events and remain reasonably comparable to the classics. The Santa Anita Handicap, first run in 1935, pioneered among such races with $100,000 or more purse value.

Racing ages. A race horse achieves peak ability at age five, but the classic age of three years and the escalating size of purses, breeding fees, and sale prices have led to fewer races held with horses beyond age four. There are notable exceptions to this, however. Famous races that admit horses older than three include the Prix de l'Arc de Triomphe, the Gran Premio Internacionale Carlos Pellegrini in Argentina, the Caulfield and Sydney Cups in Australia, the Grande Premio São Paolo Internacional in Brazil, the King George VI and Queen Elizabeth Stakes in England, the Gran Premio del Jockey Club and Gran Premio di Milano in Italy, the Emperor's Cup and Arima Memorial Stakes in Japan, the Wellington Cup in New Zealand, Rothman's July Handicap in South Africa, and the Gran Premio Clasico Simón Bolívar in Venezuela. Of about 60 races in the United States with purses of $100,000 or more, about half are open to horses older than three years.

Purse money and stake fees. Sponsored races in which much of the purse money is put up by commercial firms include the King George and Queen Elizabeth Stakes and Rothman's July Handicap. In the United States most of the purse money for the richest events is provided by the stakes fees of the owners. Purses were winner-take-all in the early days of racing, but as the racing of fields of horses came to predominate, a second prize came to be offered. Gradually third and fourth prizes were added, and occasionally fifth. On the average, modern-day purses are allocated about 60 percent to the winner, 20 percent to the second-place finisher, l0 percent to the third, and 5 percent to the fourth.

Wagers. The same historical progression was followed for wagers, with the bets in early (two-horse) races being simply to win, and modern bets being placed on the first three horses (win, place, and show). From private bets, wagering was extended in the 19th century to bookmaking (a bookmaker is a professional bet accepter who tries to set his odds so that a percentage is working in his favour). Later in the century, betting was taken over worldwide by the racetrack managements in the form of the pari-mutuel. This is a common betting pool in which those who bet horses finishing in the first three places share the total amount bet minus a percentage for the management. The pari-mutuel was perfected with the introduction in the 20th century of the totalizator, a machine that mechanically records bets and can provide an almost instant reflection of betting in all pools. It displays the approximate odds to win on each horse and the total amount of wagering on each horse in each of various betting pools. The customary pools are win, place, and show, and there are such specialty wagers as the daily double (winners of the first two races), perfecta (win and place winners in order in one race), quiniela (as in the perfecta but not in order), and trifecta (win, place, show winners in order in one race, usually the last).

As racing became big business, governments entered wagering with off-track betting, which was very beneficial to racing in Australia, New Zealand, and France and less so in En-



Three foremost stallions
(Top) The Darley Arabian, (centre) the Godolphin Barb, and (bottom) the Byerly Turk
Fores Ltd.

gland and in New York City. In the United States illegal bookmaking off track became the province of organized crime.

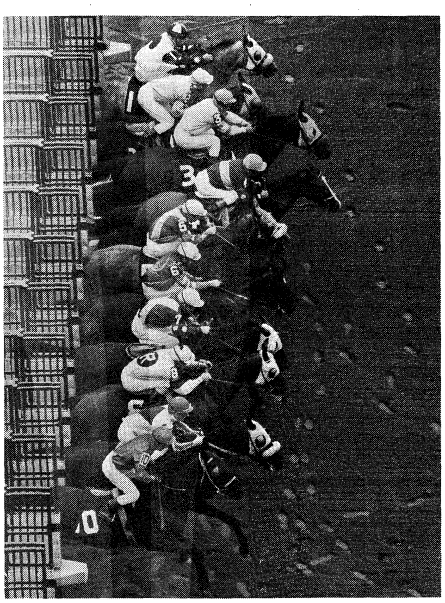
Breeding theory and practice. The guiding principle for breeding winning racehorses has always been best expressed as "breed the best to the best and hope for the best." The performance of a breeding horse's progeny is the real test, but, for horses untried at stud, the qualifications are pedigree, racing ability, and physical conformation.

Racecourses. The ownership of racetracks ranges from complete state control, as in the Soviet Union (where the national government owns the tracks and horses and employs trainers, jockeys, grooms, and other necessary personnel), to complete private enterprise, as in most of the United States (where tracks are privately owned and operated for profit, as are the horses, and trainers and jockeys are independent contractors). In-between conditions include government ownership of tracks and in some cases horses, which are leased, and nonprofit privately owned tracks, as in Australia and the New York Racing Association.

Racetrack stands range from the elegant (Longchamp in France, Ascot in England) to the modest and purely functional (Cologne, the Curragh in Ireland). The same variety is true of the saddling area, the paddock. Most European and other racing surfaces are grass; in North and South America the common surface is dirt, though grass became increasingly popular in the 20th century. Racing is mainly in the daytime.

Older racetracks, mainly European, conform to natural terrain, accommodations for spectators having been added later. The course at Newmarket, for example, can accommodate a race of 2.25 miles (3,600 m) with a gentle change of direction of less than 90 degrees, but spectators cannot see all the race. Newer tracks are elliptical mile-long tracks.

Racing procedure. The eligibility of racers is checked the day before they are raced. Before the race, jockeys weigh out and report to the paddock for instructions by trainers and mount up, the identity of the horses having been checked. Horses and riders proceed to the track in a parade to the post for the stewards' inspection and a brief warm-up gallop. Horses are almost universally started from electrically operated starting gates, the horses being walked or led into their stalls prior to the start of the race. The starter actuates the upward swing of the barrier from the stalls when all are in place. During the race, stewards and patrol judges are alert for racing violations, supplemented by a motion-picture patrol. The finish is photographed by a special camera, and when the race is close the picture is awaited before winners are announced. The race's result does not become official until the jockeys have weighed in and the riders of horses that finished in the money are certified to have carried the proper weight. At weighing in, a jockey, owner, or trainer may claim foul against a horse that interfered with his mount. The judgment of the stewards may result in a horse being lowered in order of finish from first to last. The stewards declare the race official, and then payoffs are flashed on the totalizator. Post-race urine tests are made of winning horses and a sample of the field, and if results show the presence of forbidden substances, the results may be changed on payment of purses but not on bets.



Horses breaking from the starting gate at Aqueduct, Long Island, N.Y.
Photo Trends

Most time records are clustered in North America, where speed has long been a desideratum. Races in the United States are timed to 1/5 of a second, as opposed to 1/100 of a second elsewhere.

Racing strategy. The typical Thoroughbred horse is capable of running only a quarter of a mile or so at very top speed, and much of the strategy of racing lies in determining the best moment at which to unleash this burst. The factors the jockey must consider include the distance of the race, the size of the field, the layout of the track, and the nature of a particular horse and of the opposition. The burst cannot be delayed too long in a sprint, nor should it be turned on when there is heavy traffic ahead or while going wide around a turn and thus losing ground. On the other hand, if a fast horse is left unchallenged, he might exert himself so little as to be fresh enough to repel challenges at the end.

Training. The training of racehorses, simply expressed, is maintaining a horse in the best condition to run. Exercise and feeding programs and knowledge of the individual horse are factors involved. A good trainer selects a jockey who suits the horse and, perhaps more important, enters the horse in suitable races. A trainer of a horse for a classic race not only must develop the horse into peak condition but must time the development so that the horse reaches its peak on a certain day, which is the most difficult art of all.

The state of racing. By the second half of the 20th century, horse racing had become big business indeed. Fields regularly number a dozen or more. Once race meetings lasted a day or two, later a week or two. Now, particularly where climate allows, races are scheduled for half the days of a year or more. More racing dates require more horses, and horses are raced more intensively.

Purses grew, particularly after World War II. A new American race, the Arlington Million, in reference to the size of the purse, was first run in 1981. All of the horses racing on the flat who earned more than $1,000,000 in purses ran after World War II. By the 1980s two horses had earned more than $2,000,000 in purses.

Not all owners made and spent such money. The median racing earnings of American horses were less than $2,000. Where there is gambling there is cheating, and the history of racing repeats itself with recurrent race fixing and running of ringers. A new threat to the sport arose in the 1960s with the widespread use of anti-inflammatory and coagulant drugs on horses. The winner of the Kentucky Derby in 1968 was disqualified when a post-race urine test showed a forbidden drug. Various racing bodies limited or forbade the use of such drugs; others did not. Over-racing, particularly in the United States, encouraged their use.

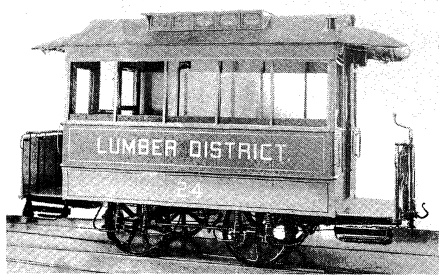
horse show, exhibition of horses and horsemanship, derived from the medieval tournaments and agricultural fairs of Europe. Horse shows range from small, informal affairs to elaborate week-long displays. Horses may be classed and judged by breed, by function (as hunting, jumping, polo, riding, or harness), or by such qualifications of horse or rider as age or number of ribbons previously won. In equitation classes only the skill of the rider is judged.

The Fédération Équestre Internationale and such member national organizations as the American Horse Shows Association regulate and promote the shows.

horse sugar (shrub): *see* sweetleaf.

horse trials: *see* three-day event.

horsecar, street carriage on rails, pulled by horse or mule, introduced into New York City's Bowery in 1832 by John Mason, a bank president. The horsecar, precursor of the motorized streetcar, spread to such large cities as Boston, New Orleans, and Philadelphia, then to Paris and London, and later to small cities and towns in the United States. A common variety of horsecar held 30 passengers and had one open compartment with transverse seats, a centre aisle, and front and rear platforms for the driver and conductor. There were also enclosed and double-decker horsecars. Small, low cars without a rear platform were called bobtails.



Horsecar, *c.* 1885; in the Henry Ford Museum, Dearborn, Mich.
Owned by the Henry Ford Museum

By the 1880s there were about 18,000 horsecars in operation in the United States alone. In the 1890s the horsecar gradually vanished in the United States and Europe because of the competition of cable and electric railways. Horsecars were also early railway carriages drawn by horses.

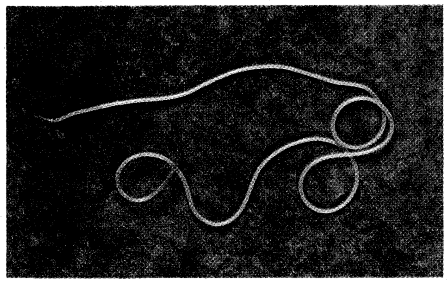
horsehair, animal fibre obtained from the manes and tails of horses and ranging in length from 8 inches (20 cm) to 3 feet (90 cm) and most often of black colour. It is coarse, strong, lustrous, and resilient and usually has a hollow central canal, or medulla, making it fairly low in density. Hair taken from the mane is softest and ranges from 50 to 150 microns (a micron is about 0.00004 inch) in diameter. Hair from the tail, coarser and with greater resilience, ranges from 75 to 280 microns in diameter and is marketed separately.

The longest hairs are used for fabrics; medium lengths are used to make bristles for paint, industrial, and domestic brushes; and very short hair is curled for use as stuffing in upholstered furniture and mattresses. High-grade white horsehair is used for the strings of fine violin bows.

Horsehair fabric, or haircloth, stiff and with an open weave, is usually made with lengthwise yarns of another fibre, such as cotton, and long, crosswise yarns of horsehair. It is used as interlining or stiffening for tailored garments and millinery but is gradually being replaced for such purposes by materials of synthetic fibres. The fabric, at one time made into shirts worn by religious penitents,

became a popular upholstery material in the 19th century. Horsehair for the textile industry is exported chiefly by Argentina and Canada; other producers include Mongolia, China, the U.S.S.R., and Australia.

horsehair worm, also called HAIRWORM, or GORDIAN WORM, any of the approximately 250 to 300 species of the class Nematomorpha, or Gordiacea (phylum Aschelminthes).



Horsehair worm (*Gordius villoti*)
M.W.F. Tweedie from the Natural History Photographic Agency—EB Inc.

The young of these long, thin worms are parasitic in arthropods. The adults are free-living in the sea or in fresh water. The hairlike body sometimes grows to a length of 1 metre (about 39 inches).

Horsehead Nebula (catalog number IC 434), ionized-hydrogen region in the constellation Orion. The nebula consists of a cloud of ionized gas lit from within by young, hot stars; a dark cloud containing interstellar dust lies immediately in front. The dust absorbs the light from part of the ionized cloud. A portion of this dark cloud has a shape somewhat resembling a horse's head. The nebula is located 350 parsecs (1,100 light-years) from the Sun. It has a diameter of approximately 5 parsecs (16 light-years) and a total mass of about 300 solar masses.

horsemanship, the art of training, riding, and handling horses. Good horsemanship requires that a rider control the animal's direction, gait, and speed with maximum effectiveness and minimum effort. Riders are able to communicate to their horses through the use of aids; in theory, natural aids are a rider's balance, seat (riding position or style), hands, voice, and legs, whereas artificial aids include bits, reins, saddles, and spurs.

A brief treatment of horsemanship follows. For full treatment, *see* MACROPAEDIA: Horses and Horsemanship.

Throughout the ages, horses have been ridden for transport, for hunting and fighting, and for competitive sports and recreation. Sculptures, drawings, and tapestries that date from the 2nd millennium BC show men and women on horseback, and the 4th-century-BC treatise *Hippikē* by the Greek historian Xenophon includes comments on training horses that are still valid. Horse racing as sport had begun by the 7th century BC, and organized games were held in the ancient Olympic Games of Greece.

The art of riding was long practiced by cavalrymen, cowboys, and others whose work required riding on horseback. During the Middle Ages, when the cavalry was the predominant force in battles, the increasing heaviness of military armour brought about a need for more massive horses, and the breeding of horses developed into a profitable business. Manoeuvrability of the horse, however, was almost impossible.

The development of firearms led to the shedding of armour, and modifications were made to the saddle, stirrup, and other riding aids, as well as to the training of horses and styles of riding. The classical riding seat, in which the rider sits deep in the saddle while holding his body erect, was developed at the Imperial Riding School in Vienna in the 18th century. This technique remains the classical style used in dressage competition, which is a test of a horse's general training and obedience, but for cross-country and race riding, a less formal forward seat is preferred.

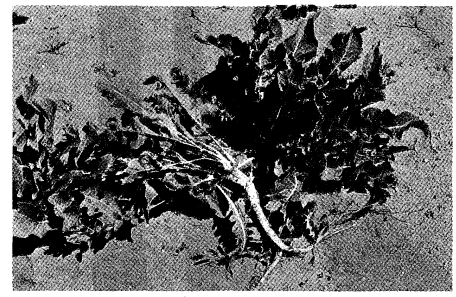
Beginning in the 19th century, mechanized transport made the horse less important, and horses are now used mainly for spectator sports and horse shows, in which show jumping has become increasingly popular. The Royal Dublin Society organized the first international horse show in 1864. It continues to be an exhibition of various types and classes of horses but also features international riding and jumping contests. In the United Kingdom the most important equestrian events are the Horse of the Year and the Royal International Horse shows. In the United States the National Horse Show in New York City is preeminent. Equestrian competition has been a part of the Olympic Games since 1912; the program consists of a dressage and a jumping grand prix and a three-day (all-around) event, all open to team or individual competition. See Olympic Games.

Horsens, city, Vejle *amtskommune* (county), eastern Jutland, Denmark, at the head of Horsens Fjord, southwest of Århus. Founded in the 11th or 12th century, it was a fortified town with several monasteries. The port received its first market charter in 1442 and had become a commercial centre by the 18th century. Horsens is the birthplace of Vitus Bering (who discovered the Bering Strait in 1728). A Franciscan monastery chapel and the late Romanesque Vor Frelsers Kirke (Church of Our Saviour), dating from the late 13th century, have been restored. There is a museum and several 18th-century merchants' houses. It is the site of a Danish prison (1853). Horsens is now a commercial, shipping, and industrial centre and a rail junction. Major products are textiles, machinery, tobacco, and dairy foods. Pop. (1981) city, 46,855; (1982 est.) mun., 54,565.

horsepower, the common unit of power; *i.e.,* the rate at which work is done. In the English system, one horsepower equals 33,000 foot-pounds of work per minute; *i.e.,* the power necessary to lift a total of 33,000 pounds mass one foot in one minute. This value was adopted by the Scottish engineer James Watt in the late 18th century, after experiments with strong dray horses, and is actually about 50 percent more than the rate that an average horse can sustain for a working day. The electrical equivalent of one horsepower is 746 watts in the international, or SI, system of units, and the heat equivalent is 2,545 BTU (British Thermal Units) per hour. Another unit of power is the metric horsepower, which equals 4,500 kilogram-metres per minute (32,549 foot-pounds per minute) or 0.9863 horsepower.

Horsepower at the output shaft of an engine, turbine, or motor is termed brake horsepower or shaft horsepower, depending on what kind of instrument is used to measure it. Horsepower of reciprocating engines, particularly in the larger sizes, is often expressed as indicated horsepower, which is determined from the pressure in the cylinders. Brake or shaft horsepower is less than indicated horsepower by the amount of power lost of friction within the engine itself, which may amount to 10 percent or more of the indicated horsepower. Electric motor horsepower can be determined from the electrical input in watts, allowing for heat and friction losses in the motor itself. Thrust horsepower of jet engines and rockets is equal to the thrust in pounds force times the speed of the vehicle in miles per hour divided by 375 (which is equal to one horsepower measured in mile-pounds per hour).

horseradish (*Armoracia lapathifolia*), hardy perennial plant of the mustard family (Brassicaceae, or Cruciferae) or its hotly pungent, fleshy root, used as a condiment or table relish mainly in the form of a sauce



Horseradish (*Armoracia lapathifolia*)
Joan L. Watcham

to enhance seafoods and meats; the root is traditionally considered medicinal. Native to Mediterranean lands, horseradish is now grown throughout the temperate zones. In many cool, moist areas it has become a troublesome weed.

Large, coarse, glossy-green basal leaves arise on long stems from the crown atop the large white root. Small white flowers are borne in terminal or axillary racemes; small oblong pods are tipped by a short, persistent style. Cultivators propagate horseradish in the spring by placing pieces of pencil-sized roots in the soil at a slight angle with the upper ends covered 0.4 to 0.8 inch (1 to 2 centimetres) deep. All but the terminal shoots are removed to prevent later formation of multiple crowns, and the side roots are also rubbed off to minimize branching and crooked formation. All of this work is done by hand. The process is repeated after six weeks, removing the soil from the upper part of the root and replacing it afterward.

Roots are harvested after one growing season. They are plowed from the soil, washed, and trimmed for sale. Processors grate the root tissue and pack it in white vinegar in glass containers.

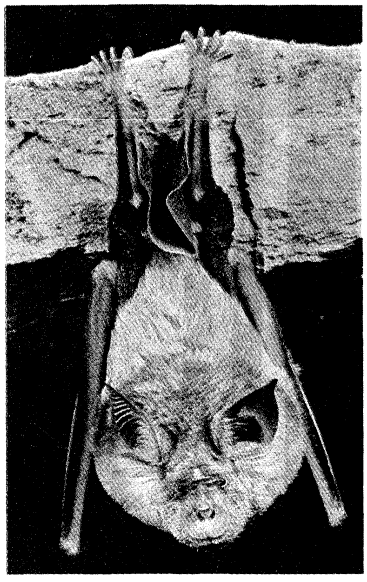
horseradish tree: *see* drumstick tree.

horseshoe, U-shaped metal plate by which horses' hooves are protected from wear on hard or rough surfaces. Horseshoes apparently are a Roman invention; a mule's loss of its shoe is mentioned by the Roman poet Catullus in the 1st century BC.

The density and insensitivity of the hoof makes it feasible to attach shoes securely by nailing. The craft of the smith, or blacksmith, the process of forging and affixing horseshoes, became one of the great staple crafts of medieval and modern times and contributed to the development of metallurgy.

horseshoe bat, any of about 70 species of large-eared, insect-eating bats of the genera *Rhinolophus* and *Rhinomegalophus*, family Rhinolophidae. Horseshoe bats are found in tropical and temperate regions from Europe to Japan. Their name refers to the large, complex nose leaf (fleshy structure on the muzzle) in which one of the three sections resembles a horseshoe. Horseshoe bats are usually brown—occasionally red. Members of the genus *Rhinolophus*, one of the most successful genera of bats in terms of numbers of species (about 50) and individuals, are about 3.5–11 centimetres (1 2/5–4 1/3 inches) long without the 2.5–4.5-cm tail and weigh 5–30 grams (1/6–1 ounce). Horseshoe bats live in groups and roost in damp, dark places, such as caves. Species native to temperate regions hibernate in winter.

The bats of the family Hipposideridae are closely related to horseshoe bats and are some-



Greater horseshoe bat (*Rhinolophus ferrum-equinum*)
S.C. Bisserot, F.R.P.S.

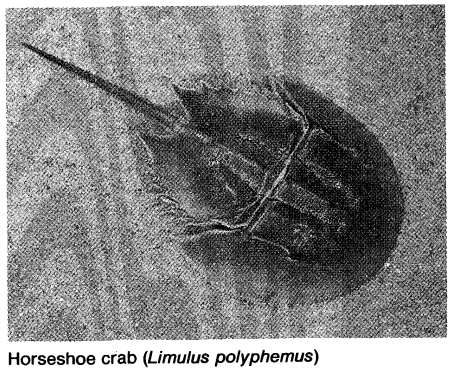
times included in this family as the subfamily Hipposiderinae or Rhinolophinae.

horseshoe crab, any of several large marine invertebrates of the order Xiphosura (four species, two genera) of the phylum Arthropoda found on the east coasts of Asia and North America. These animals, related to the scorpions, spiders, and extinct trilobites, are often referred to as living fossils.

The familiar genus *Limulus* is at least 200,000,000 years old. Fossil representatives similar to the modern-day horseshoe crabs date back to the Jurassic Period (beginning 190,000,000 years ago).

Horseshoe crabs have been used as food and fertilizer and are a serious enemy of the soft-shelled crab.

The body of the horseshoe crab is divided into three parts that are hinged together: a broad, low prosoma, a much smaller opisthosoma, and a long, sharp tail-spine, or telson. The smoothly arched upper surface of the prosoma has a pair of lateral compound eyes and a much smaller median pair of eyes that respond to ultraviolet light. The chelicerae (first pair of legs) are used to extract worms and thin-shelled mollusks. The mouth, situated on the lower surface, is surrounded by five pairs of legs. Spiny biting projections at the base of each leg separate the food and roll it into the mouth. Further grinding occurs in the gizzard; digestive enzymes are secreted into a long stomach-intestine by a large organ called the hepatopancreas. Blood circulates to all parts of the body in a highly developed vascular system. The principal organ of excretion apparently is a pair of long coxal glands that open just behind the base of the fourth pair of legs. The chief ganglia (masses of nervous tissue) are fused into a ring around the esophagus. The gonads (reproductive organs) branch profusely through much of the body. Behind the legs is a transverse flap, or operculum, which covers the book gills. The gills are ventilated by their rhythmic beating. Although xiphosurans can swim on their backs, propelled by the beating gill flaps, they usually plow through the mud, arching the body and then pushing with the telson and last pair of legs.



Horseshoe crab (*Limulus polyphemus*)
Runk/Schoenberger from Grant Heilman—EB Inc.

Spawning takes place on sandy beaches in spring and summer, usually after sunset, frequently during high spring tides. Each female, accompanied by one or more males, scoops out a series of depressions in the sand and lays 200 to 300 eggs in each. The males then cover the eggs with sperm. After several weeks the larvae hatch from the eggs. They are about 5 millimetres (1/5 inch) long, have no telson, and live off a store of yolk. The second larval stage has a short telson, feeds on small organisms, and passes the winter in mud flats. The third stage resembles a miniature adult. Between each stage the larvae molt; *i.e.,* the cuticle (outer covering) splits around the margin of the prosoma and is shed. Growth in length is about 25 percent immediately after each molt. It is thought that sexual maturity is reached after about 16 molts, at an age of 9 to 12 years. The mature adults feed on marine worms and often become covered with a variety of organisms.

Horseshoe Falls, Canadian section of Niagara Falls (*q.v.*) on the Niagara River, 20 mi (32 km) from Lake Erie and 14 mi from the river's mouth on Lake Ontario. It is separated from the American Falls by Goat Island and derives its name from its curving 3,000 ft (900 m) crest. Horseshoe Falls carries about 94 percent of the river's flow and has a drop of 162 ft, slightly less than the American Falls.



Horseshoe Falls at Niagara, Ont.
Tourism Canada

horseshoe pitching, game for two or four players, most popular in the United States and Canada, in which players attempt to throw horseshoes so as to encircle a stake or to get them as close to the stake as possible. When two play, they pitch from a pitching box, 6 ft (1.8 m) square, in the centre of which is an iron or steel stake extending 14 in. (36 cm) from the surface and inclined 3 in. toward another stake 40 ft away (30 ft for women and juniors). After both players have pitched two shoes each (an inning), they walk to the opposite box and pitch from it. When four play, each pair of partners pitches from opposite boxes. Regulation games are played to a winning score of 50, more informal games, to 21. After all shoes have been pitched in an inning, scoring is as follows: one point for each shoe closer than an opponent's, if the shoe is six inches or closer to the stake, and three points for each ringer (shoe enclosing the stake). If shoes are equally distant or if opponents have the same number of ringers, these are considered ties and no points are scored. A leaning shoe has no more value than one touching the stake. Horseshoes designed for pitching (usually made of iron or steel) weigh 2½ lb (1 kg) and are 7½ in. long, 7 in. wide at the greatest width, with a space 3½ in. between the calks, as the small toes at each open end are called.

Horseshoe pitching probably derived from the game of quoits played by Roman officers during the Roman occupation of Britain (1st to 5th century). Their men, lacking quoits, presumably used horseshoes. The sport was introduced in North America in colonial times. The National Horseshoe Pitchers Association of America became the governing body of the sport in the United States in 1926 and holds national and world championship tournaments annually.

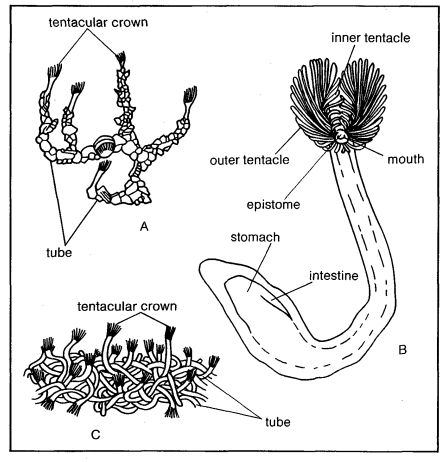
horseshoe shrimp, any member of the marine crustacean subclass Cephalocarida, named because of the curving, horseshoe-like shape of the body. A few species are known, the first of which was described in 1955.

A very primitive group, the horseshoe shrimp have no eyes; in addition, appendages occur only on the thorax, or midsection. They are hermaphroditic—*i.e.,* functional reproductive organs of both sexes occur in the same individual.

Hutchinsoniella macracantha, which attains a length of 37 millimetres (1.5 inches), occurs on the Atlantic coast of northeastern United States. *Lightiella incisa,* about 2.6 millimetres (0.10 inch) in length, is found in waters near Puerto Rico; *L. serendipita,* 3.2 millimetres (0.13 inch) long, occurs in San Francisco Bay on the coast of California. *Sandersiella acuminata,* 2.4 millimetres (0.094 inch) long, is found in waters near Japan and New Caledonia.

horseshoe worm, phylum name PHORONIDA, a small group of wormlike marine invertebrates that live in tubes secreted by special glands.

These protective tubes become encrusted with shells or are buried in sand. Horseshoe worms, or phoronids, either are solitary or occur in groups of many thousands of individuals; one species is colonial and buds asexually. The body of the horseshoe worm is elongated and measures from 15 to 200 millimetres (0.6 to 8 inches) in length. It has a U-shaped



Structure of phoronids
(A) *Phoronis psammophila* with tubes coated with rock grains and shells, (B) young adult *Phoronis architecta,* and (C) aggregation of *P. hippocrepia*
From L. Hyman, *The Invertebrates: Smaller Coelomate Groups,* vol. 5 (1959); McGraw-Hill Book Company

gut and nerve, excretory, and reproductive organs. Feeding is by means of a protrusible lophophore, a structure at the anterior end that bears a circle or paired spiral of up to 1,600 ciliated tentacles. The cilia produce a water current, and the tentacles filter food particles beneath a flap (epistome) that covers the central mouth. Groups of lophophores are often grazed on by fish but are then regenerated.

Some species of phoronids have separate sexes, but others are hermaphroditic (*i.e.*, both male and female organs occur in the same individual). All have free-swimming larvae.

Although most horseshoe worms are found intertidally or in shallow ocean regions in temperate zones, their habitats also include tropical regions and ocean depths. In general, horseshoe worms are not common; certain species, however, may carpet the bottoms of shallow bays. Horseshoe worms are of little practical value to man, but their unusual life cycle and obscure ancestry have made them objects of biological interest.

Since their discovery in 1846, horseshoe worms have been associated with every animal phylum, yet the relationship of horseshoe worms to other animals remains controversial. They have not been preserved in the geological record, although fossil tubes (called *Scolithus*) may belong to horseshoe worms. Embryological stages often are useful in relating animal groups, but the actinotroch larva of horseshoe worms is unique. On the basis of adult body form, especially similar body regions, the phoronids are grouped near the colonial bryozoans and the shell-bearing brachiopods. The 16 species in the phylum Phoronida are very similar in body form; only two genera, *Phoronis* and *Phoronopsis* (and no higher groups), are recognized.

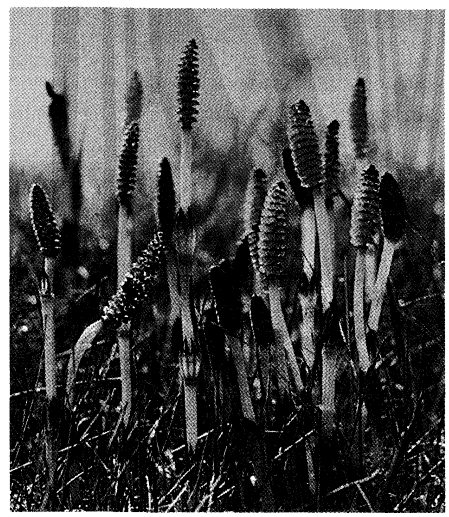
horsetail, also called SCOURING RUSH (*Equisetum* species), plants of the genus *Equisetum,* 30 species of rushlike, conspicuously jointed, perennial herbs. *Equisetum* is the only living genus of the order Equisetales and the class Sphenopsida. Horsetails grow in moist, rich soils in all parts of the world except Australasia. Some species produce two kinds of shoots: those with conelike clusters (strobili) of spore capsules and those lacking such structures. Some are evergreen; others send up new shoots annually from underground rootstalks. Their hollow, jointed, ridged stems contain silicate and other minerals. The leaves are reduced to sheaths that clasp and encircle the shoots.

A widespread species along stream banks and in meadows in North America and Eurasia is the common horsetail (*E. arvense*), about 30 centimetres (one foot) tall. The central cavity of each stem is about a quarter of its outside diameter. Fairly thick, solid branches arise from below the sheaths, circling the shoots like spokes on a wheel. Stems that bear terminal spore cones are often flesh-coloured. Wood horsetail (*E. sylvaticum*) grows in moist, cool woods and has many delicate branches that circle the shoots. Variegated horsetail (*E. variegatum*) is evergreen and has black markings on the sheaths. Dutch rushes (*E. hyemale*), common in moist woods and on riverbanks, reach well over a metre in height. The evergreen shoots often are used for scouring.

Giant horsetail (*E. praealtum*) of North America and Asia, which reaches 3½ metres (11½ feet), also is evergreen. Each shoot has as many as 48 ridges. The giant horsetail of Europe (*E. telmateia*) is about the same height as Dutch rush. The tallest of all horsetails is a slender South American species (*E. giganteum*), which sometimes grows to 10 m (about 32 ft) in height with a diameter of about two centimetres (less than an inch) and is supported by the tall grasses or shrubs around it.

Horsetails, although poisonous to livestock, are used by man in folk medicines. Some species are utilized in polishing tools because of their abrasive stems.





(Top) Branched vegetative stem and (bottom) fertile stems bearing terminal spore cones of horsetail (*Equisetum*)

(Top) Dan Morrill, (bottom) Fritz Schremmer

Horsham, city, west central Victoria, Australia, on the Wimmera River. Proclaimed successively a borough (1882), a town (1932), and a city (1949), Horsham was named after the West Sussex hometown of James Darlot, its first settler (1841). Connected by rail to Melbourne, 180 mi (290 km) to the southeast, it lies at the intersection of the Western (Melbourne–Adelaide), Wimmera, and Henty (Mildura–Portland) highways. The city is an important stock-selling centre in an irrigated area of fruit, vegetable, and cereal farming. Its agriculturally based industries are augmented by textile mills, foundries, and plaster and brick works. Horsham is the site of Longerenong Agricultural College, the Victorian Wheat Research Institute, Wimmera Base Hospital, and noted botanical gardens. Pop. (1981) 12,034.

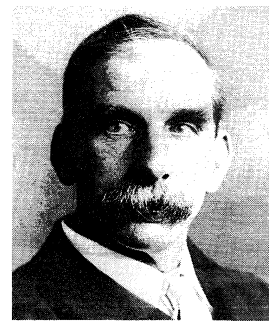
Horsham, district, county of West Sussex, England, with an area of 209 sq mi (533 sq km). It serves an extensive area of the Sussex Weald as an agricultural market and shopping centre. Christ's Hospital School (Bluecoat School) was moved there in 1902 from the City of London. The only major town, Horsham, has light engineering and a few other industries. Pop. (1981 prelim.) town, 25,438; (1982 est.) district, 105,600.

Horsley, John Callcott (b. Jan. 29, 1817, London—d. Oct. 18, 1903, London), British narrative painter best known as the designer of the first Christmas card (*q.v.*). Created in 1843 for his friend Sir Henry Cole, an edition of 1,000 cards was placed on sale in London. It was lithographed on stiff cardboard, 5⅛ by 3¼ inches, in dark sepia and hand-coloured. The card shows a family party in progress, beneath which is the greeting, "A Merry Christmas and a Happy New Year to You."

As a painter, he was called "Mr. J. C(lothes) Horsley" because of his protests against paintings of the nude. A pupil of the Royal Academy, he achieved popular success before the age of 20, although he was criticized for his failure to master the fundamentals of structure and movement because of his reluctance to study the nude model.

Horsley, Sir Victor (Alexander Haden) (b. April 14, 1857, London—d. July 16, 1916, Amārah, Iraq), British physiologist and neurosurgeon who was first to remove a spinal tumour (1887). He also made valuable studies of thyroid activity, rabies prevention, and the functions of localized areas of the brain.

By removing the thyroid glands of monkeys, he was able to establish (1883) the gland's role in determining the body's rate of growth, development, and metabolism and to implicate thyroid malfunction as the cause of myxedema (a condition characterized by dry, waxy swelling) and cretinism. As secretary to a government commission (1886) appointed to study the effectiveness of Louis Pasteur's rabies vaccine, Horsley corroborated Pasteur's results and led the campaign to eradicate the disease in England. He developed operative techniques that made brain surgery a practical reality and, by 1890, was able to report 44 successful operations. He was knighted in 1902.



Sir Victor Horsley, *c.* 1910

BBC Hulton Picture Library

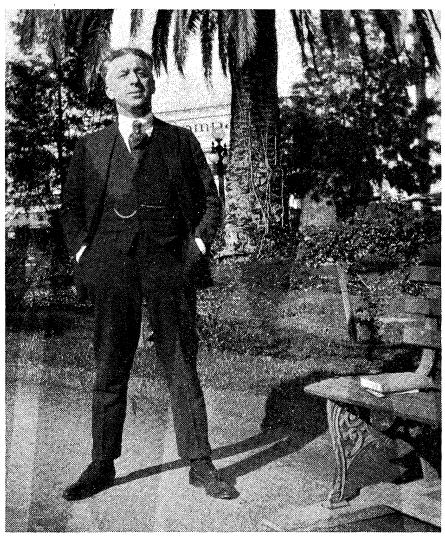
He died of heatstroke while serving as field surgeon for the British Army in Mesopotamia during World War I.

Horst, Louis (b. Jan. 12, 1884, Kansas City, Mo., U.S.—d. Jan. 23, 1964, New York City), U.S. pianist, composer, and one of the first persons anywhere to teach choreography as a distinct discipline; known particularly for his long associations as musical director with Denishawn and Martha Graham.

After studying piano and violin in San Francisco, he became musical director for the Denishawn Dancers (1915–25), where he encouraged company members—including Martha Graham, Doris Humphrey, and Charles Weidman—to develop their own dance styles. He accompanied Graham's solo debut in New York City in 1926 and remained with her as musical director until 1948, composing the scores for her early works *Primitive Mysteries* (1931), *Frontier* (1935), and *El Penitente* (1940).

Horst was on the staffs of the most notable American schools of modern dance: Neighbor-

hood Playhouse School of Theatre, New York City (1928–64); Bennington College Summer Sessions (1934–45); Connecticut College Summer School (1948–63); and Juilliard School of Music (1951–64). Horst did not want the modern dance to develop without principles of structure and gave his students a background in such dance forms from the 16th and 17th centuries as the pavane and the galliard. To chronicle the development of American mod-



Horst

By courtesy of the Dance Collection, New York Public Library, Astor, Lenox and Tilden Foundations

ern dance, Horst founded and edited the journal *Dance Observer* (1933–64). He also wrote *Pre-classic Dance Forms* (1937) and *Modern Dance Forms* (1961).

horst and graben, elongate fault blocks of the Earth's crust that have been raised and lowered, respectively, relative to their surrounding areas as a direct effect of faulting. Horsts and grabens may range in size from blocks a few centimetres wide to tens of kilometres wide; the vertical movement may be up to several thousand feet. They are bounded on both sides by steeply dipping normal faults, along which movement has been essentially equal, resulting in blocks that are scarcely tilted. The faults forming horsts generally dip away from each other: those forming grabens generally dip toward each other. Two or more horsts and grabens may occur adjacently. They are thought to be due to lateral tension possibly produced by regional uplift or salt dome formation; they often occur on the crests of domes or anticlines. Valleys formed in grabens are commonly called rift valleys and may exhibit features of vulcanism often associated with graben formation. Examples of grabens are the Jordan–Dead Sea depression and Death Valley. The Vosges Mountains of France and the Palestine Plateau are typical horsts.

Hort, Fenton J(ohn) A(nthony) (b. April 23, 1828, Dublin—d. Nov. 30, 1892, Cambridge, Cambridgeshire, Eng.), English New Testament scholar who produced, with Brooke Foss Westcott, a major critical text of the Greek New Testament. Hort was known for his theological depth and knowledge of the writings of the early Church Fathers.

Hort was educated at Cambridge, where he joined a group of biblical scholars including Westcott and Joseph Barber Lightfoot, and he maintained the connection throughout his life. From 1852 to 1857, he was a fellow of the university, returning in 1872 as professor, which position he retained until his death. In



Hort, engraving

By courtesy of the Mary Evans Picture Library

1856 he was ordained in the Anglican Church and for 15 years served as a minister near Cambridge. During most of this period, he worked with Westcott on their critical edition of the New Testament, published in 1881. This work served as the basis for the New Testament portion of the English Revised Version of the Bible (1881). Hort also produced a major essay on philosophical theology, *The Way, The Truth, and The Life* (1893), dealing with the coexistence of an open, critical mind with acceptance of biblical truths.

Horta, capital, Horta district, on the southeastern coast of Ilha (island) do Faial, part of the Portuguese Azores archipelago in the North Atlantic. Founded in 1466 by the Fleming Jobst van Heurter under Portuguese royal authority, it later served as an American Atlantic whaling base (1700–1910). In the 20th century Horta became important as a submarine cable station, a seaplane base for transatlantic flights, the site of a powerful naval radio transmitter, and an Allied naval and air base. Its harbour is shielded on either side by a promontory of lava.

The district, consisting of the islands of Faial, Flores, Pico, and Corvo, has an area of 300 sq mi (780 sq km) and produces wine, oranges, dried fish, dairy products, and cattle. Pop. (1981) town, 5,941; district, 15,563.

Horta, Victor, Baron (b. Jan. 6, 1861, Ghent—d. Sept. 8, 1947, Brussels), an outstanding architect of the Art Nouveau style, who ranks with Henry van de Velde and Paul Hankar as a pioneer of modern Belgian architecture.

Trained at the Académie des Beaux-Arts in Brussels, 1876–81, Horta became a pupil of



Horta in his residence in Brussels, 1903

By courtesy of the Archives d'Architecture Moderne, Brussels

the Neoclassical architect Alphonse Balat. His first independent building, the four-storied Hôtel Tassel in Brussels (1892–93), was among the first continental examples of Art Nouveau, although it incorporated Neo-Gothic and Neo-Rococo stylistic elements. An important feature was its octagonal hall with a staircase leading to various levels. The curved line, characteristic of the Art Nouveau style, was used on the facade and also in the interior. Other buildings in Brussels in his rich, elegant style are Hôtel Solvay (1895–1900), notable for the plastic treatment of its facade, and Hôtel Winssingers (1895–96), as well as his own house on the rue Américaine (1898). His chief work is the Maison du Peuple, Brussels (1896–99), which was the first structure in Belgium to have a largely iron and glass facade. In its auditorium the iron roof beams are both structural and decorative.

After 1900 Horta simplified his style, using decoration more sparingly and eliminating exposed iron. In 1912 he became the director of the academy and designed the Palais des Beaux-Arts (1922–28) in a simple and severe classical style; his last major undertaking was the central railway station in Brussels, begun just before World War II.

Hortense, original name EUGÉNIE-HORTENSE DE BEAUHARNAIS (b. April 10, 1783, Paris—d. Oct. 5, 1837, Arenenberg, Switz.), queen of Holland, stepdaughter of Napoleon I, and mother of Napoleon III.



Hortense, portrait by an unknown artist after a painting by François Pascal Gérard; in the Château de Malmaison, near Paris

Giraudon—Art Resource/EB Inc.

The daughter of the future empress Joséphine and of her first husband, Alexandre de Beauharnais, Hortense became one of the attractions of the court after Napoleon became first consul of the French in 1799. To strengthen her position, Joséphine encouraged a marriage between Hortense and Louis Bonaparte, Napoleon's brother (1802). The marriage, although an unhappy one, produced three children, the third of whom, Charles-Louis-Napoléon Bonaparte, survived to become Napoleon III. In 1806, when Louis became king of Holland, Hortense accompanied him to The Hague. Although Napoleon divorced Joséphine in 1809, he refused to allow Hortense and Louis a divorce but countenanced their separation in 1810, when Holland was annexed to France. Returning to Paris, Hortense in 1811 gave birth to a son by her lover, the Comte de Flahaut; this son, who was adopted by a relative, was the future duc de Mornay.

When Napoleon was exiled in 1814, Hortense, although under the protection of the Allies and created duchesse de Saint-Leu, became the centre of Bonapartist intrigue; and her support of Napoleon during his return (the Hundred Days) led to her banishment from France in 1815. She finally settled in Arenenberg, Switz., where she lived until her death, devoting herself to her writing and to the protection of her sons. Her memoirs were

published between 1831 and 1835 (Eng. trans., *Memoirs of Queen Hortense,* 2 vol., 1862).

Hortensia (fl. last half of 1st century BC), daughter of the Roman orator Quintus Hortensius, known for her speech against the taxation of women without representation, related by Appian (*Civil Wars*, iv, 32–34). In 43 the triumvirate of Mark Antony, Octavian (later the emperor Augustus), and Lepidus proposed to raise money for the war against the assassins of Julius Caesar by taxing the property of 1,400 rich women. Hortensia rebuked the triumvirs for proposing to tax women to support wars that they had no part in initiating or conducting. She declared that women would enthusiastically help resist a foreign enemy but would never pay for civil wars. The speech angered the triumvirs, but they reduced the number of women liable to the tax to 400 and imposed a similar levy on men.

Hortensius, Quintus (fl. early 3rd century BC), dictator of Rome in 287 who ended two centuries of "struggle between the orders" (the plebeians' fight to gain political equality with patricians). When the plebeians, pressed by their patrician creditors, seceded to the Janiculan hill, Hortensius was commissioned to end the strife. He passed a law (the *Lex Hortensia*) whereby the resolutions of the plebeians were made binding on all the citizens without requiring the approval of the Senate. He is said to have died while still dictator.

Hortensius Hortalus, Quintus (b. 114 BC—d. 50 BC), Roman orator and politician, Cicero's opponent in the Verres trial. Delivering his first speech at age 19, Hortensius became a distinguished advocate. He was leader of the bar until his clash with Cicero while defending the corrupt governor Verres (70) cost him his supremacy. He became consul in 69 and later collaborated harmoniously with Cicero in a number of trials. His talents proved useful to the conservative senatorial aristocracy.

Of Hortensius' speeches published in his time, virtually no fragments remain, although the subjects of 28 are known. Evidently his oratory was of the "Asianic" style, florid and exuberant, and his gestures accounted for much of the force of his rhetoric.

Hortensius wrote *Annales*, an epic on the Social War (90–88); a treatise on rhetoric; and love poems. He is a character in the first edition of Cicero's *Academica* and in the lost dialogue *Hortensius*.

Horthy, Miklós (Nagybányai) (b. June 18, 1868, Kenderes, Hung., Austria-Hungary—d. Feb. 9, 1957, Estoril, Port.), Hungarian naval officer and conservative leader who defeated revolutionary forces in Hungary after World War I and remained the country's head of state until 1944.

A member of a noble Protestant family, Horthy entered the Austro-Hungarian naval academy at Fiume (now Rijeka, Yugos.) at age 14. Aide-de-camp to the emperor Francis Joseph (1909–14), he distinguished himself as a naval commander in World War I by several times breaking the Allied Adriatic blockade. Promoted to admiral in 1918, he presided over the Austro-Hungarian fleet's transfer to Yugoslavia in October 1918.



Horthy
EB Inc.

The following year, at the request of the counter-revolutionary government at Szeged, Hung., Horthy organized an army to oppose the Communist regime of Béla Kun and led his troops into the capital in November after Kun had fled. The Hungarian Parliament, elected in January 1920, declared for the restoration of the monarchy and elected Horthy regent (March 1). Horthy, however, despite much controversy, thwarted the efforts of King Charles IV to recover his throne.

From 1921 to 1931 Horthy had little to do with public affairs, leaving the conduct of government in the hands of Count István Bethlen. During the troubled 1930s, however, Horthy assumed more and more control, and in 1937 the Parliament voted a considerable extension of his powers. Although he disliked Adolf Hitler, he sympathized with the German dictator's "crusade against Bolshevism," and initially acquiesced in Hungary's adherence to the German side in World War II. His later efforts to extricate Hungary from the war led to his forced abdication and abduction by the Germans in 1944. He was released by Allied troops in May 1945 and allowed to go to Portugal, where his memoirs, *Confidential Papers,* were published in 1965.

horticulture, branch of agriculture concerned with the cultivation of garden crops, generally fruits, vegetables, flowers, and ornamentals such as plants used for landscaping.

A brief treatment of horticulture follows. For full treatment, *see* MACROPAEDIA: Gardening and Horticulture.

Propagation, the controlled perpetuation of plants, is the most basic horticultural practice. Its objectives are to increase the numbers of a plant and to preserve its essential characteristics. Propagation may be achieved sexually by using seeds or asexually by utilizing techniques such as cutting, layering, grafting, and tissue culture.

Seeds are the most commonly used means of growing new plants. Seeds are inexpensive, easy to transport and store, may be kept for long periods, and produce plants that are disease-free. Their disadvantages are the long time required for new plants to develop, and the possibility of the heterozygote seed possessing unwanted, recessive characteristics not apparent in the parent plants. The latter may be controlled in selective breeding programs.

Vegetative (asexual) reproduction is based on the plant's ability to regenerate tissues and parts. It ensures that a superior plant may be reproduced endlessly without variation, and is faster and easier than growth from seed. Many plants reproduce naturally by specialized vegetative structures—runners, rhizomes, corms, bulbs, offshoots, tubers, stems, or roots. Layerage and cuttage are horticultural practices that induce plants to propagate by removing a shoot or adventitious root. Grafting involves joining an added plant part, called the scion, to a rootstock by tissue regeneration. Grafting has uses other than propagation; it promotes plant vigour, hardiness, and disease resistance.

Successful horticulture depends upon extensive control of the environment. The most basic control, of course, is the site where the plant is grown, which determines the amounts of sunlight and water and the type of soil available to the plant.

Temperature of the plant's environment may be controlled by using hot caps, cloches, and similar coverings, mulches, and greenhouses. The storage temperature of perishable fruits, vegetables, and flowers must be carefully monitored to prevent rotting or drying out. Frost damage to outdoor crops may be prevented by minimizing radiation heat loss, conserving, or adding heat. To prevent frost damage to transplanted plants, a process known as hardening off is used, which deters formation of vulnerable growth tissue by withholding water and fertilizer.

Light has a tremendous effect on plant growth. In addition to providing the energy for photosynthesis, it affects flowering, dormancy, tuber formation, and seed and stalk development. In many cases these processes depend on the length of day, or photoperiodicity. Out-of-doors light may be controlled through location, density, and distribution of planting. In greenhouses artificial illumination may be used, although unless the crop is especially valuable this may be too expensive to be practical.

Two important horticultural techniques are training (the orientation of plants in space) and pruning (judicious removal of plant parts). They are frequently used in conjunction with each other to improve the appearance or usefulness of plants. Familiar examples include trimmed privet hedges and Japanese dwarf potted trees, known as bonsai.

Plant growth may be regulated through use of plant hormones, auxins, which may stimulate budding, flowering, and fruit set and growth. Other hormones and chemicals promote ripening of fruit and inhibit sprouting in onions and potatoes.

Soil management is essential in horticulture. Plants are dependent upon soil for 13 of the 16 minerals necessary to their growth. Carbon, oxygen, and hydrogen are derived from air and water, but nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, and various trace elements must be present in usable form in the soil for plants to survive and grow. If any of these elements are missing, they must be added to the soil (or directly to the plant) as fertilizer.

The acidity or alkalinity of the soil also influences plants. Extremes of soil acidity or alkalinity are toxic in themselves, but even slight variations from neutrality affect availability of soil nutrients and must be corrected.

Soil structure determines the plants' supply of water and oxygen, the ease of root growth, and the availability of nutrients. In general, adding decaying organic matter to soil improves its texture.

Water is essential for growth. It may be added to the soil through irrigation. Too much water in the soil suffocates or rots plants and must be drained off.

Soil is not the only medium for plant growth. In hydroponics plants are grown either in water to which all necessary nutrients have been added, or in sand or gravel with nutrients added.

Plants are subject to a wide variety of injuries and diseases caused by viruses, bacteria, fungi, other green plants, worms, insects, mites, birds, and animals. Control of these pests is divided into three categories: plant pathology, entomology (study of insects), and weed control. Pest control involves such different techniques as using chemicals toxic to pests, breeding disease-resistant plants, and introducing natural predators to kill pests.

Ornamental horticulture consists of floriculture and landscaping, and the marketing associated with each. Floriculture is the growing of potted plants and cut flowers and their subsequent arrangement and sale by a florist, usually not the grower. Commercial flowers may be grown out-of-doors but usually require the controlled environment of the greenhouse. Air freight has made it possible for flowers to be grown long distances from their markets.

The nursery business grows plants for landscaping. These plants include ornamental shrubs and trees, fruit trees, bulb crops such as tulips, herbacious perennials, and roses. Since these plants are usually partially grown when

they are sold, provisions must be made for transporting them in viable condition. With trees and shrubs the ball of soil surrounding their roots is removed with the roots and wrapped in burlap. Smaller plants may be sold in pots. Production of turf grass has become a major specialized industry.

Landscape design is a distinct profession, only a portion of which involves horticulture. In its broadest sense it is concerned with all aspects of human use of land. The landscape architect uses growing plants as one element in creating an attractive and functional outdoor area.

Hortobágy, *puszta* (steppe) region in east central Hungary between the Tisza River and the city of Debrecen. In the medieval period there were many flourishing villages in this formerly fertile region, but under Turkish rule the area became depopulated, agriculture declined, and the region became a grazing area known for its horses and horsemen. After the regulation of the Tisza in the 1840s, the Hortobágy became dry and barren, and *betyár* ("highwaymen") roamed the mostly deserted area. In recent years irrigation has made agriculture possible in a large part of the area and the population is increasing.

Traditions and folk art still survive in the towns of Hortobágy, such as Hortobágyi Nagycsárda (Great Inn of the Hortobágy), which has stood on the same location for five centuries. This is the traditional centre of the Hortobágy, where the road between Debrecen and Budapest crosses the Hortobágy River. It has a folk art museum and an annual fair that includes horse shows, contests between horse herds, and the kidnapping of brides, a local custom.

To preserve the rapidly disappearing steppe with its interesting flora and fauna, the National Park of Hortobágy (128,500 ac [52,000 ha]) was created in 1973 in the region between the Tisza and the city of Debrecen. Herds of cattle and semiwild horses driven by herdsmen in traditional costumes roam the immense grassy plain, which is also the abode of many water birds including various types of herons, black storks, white spoonbills, geese, and ducks, as well as buzzards and falcons.

Horton, Robert E(lmer) (b. May 18, 1875, Parma, Mich., U.S.—d. Apr. 22, 1945, Voorheesville, N.Y.), U.S. hydraulic engineer and hydrologist whose most outstanding accomplishment was the establishment of a quantitative basis for the analysis of the drainage of networks of streams. The empirical rules he discovered and set forth are generally referred to as Horton's laws.

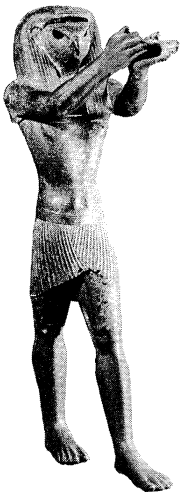
After graduating from Albion College, Albion, Mich., in 1898, Horton spent eight years with the U.S. Geological Survey before joining the engineering staff of the New York State Barge Canal. From 1911 to 1925 he was associated with the Department of Public Works and the Attorney General's office of New York state. Among numerous consulting positions, he served the Albany, N.Y., Board of Water Supply 1924–32. He was president of the American Meteorological Society in 1939. Horton's contributions include the invention of the water-level gauge and a joint for wood-stave pipes.

hortonolite, silicate mineral, a member of the forsterite–fayalite series (*q.v.*) of olivines.

Hørup, Viggo (Lauritz Bentheim) (b. May 22, 1841, Torpmagle, Den.—d. Feb. 15, 1902, Copenhagen), Danish politician and journalist, the leading late 19th-century advocate of parliamentary government in Denmark.

Hørup was the leader of the radical left opposition in the Parliament from 1876 to 1892. Also a prominent journalist, he served as editor of the liberal *Morgenbladet* from 1881 to 1883 and of his own journal, *Politiken,* from 1884 to 1901. He was a leader of the Left Reform Party, founded in the 1890s after the moderate left began to make common cause with the right parties. When full parliamentary government was achieved in 1901, Hørup was named minister of transportation in the Left Reform government. A pacifist, he championed not only responsible government but also neutrality and reduction of defense measures.

Horus, Egyptian HOR, in ancient Egyptian religion, god in the form of a falcon whose eyes were the sun and the moon. He was originally the god of Lower Egypt. At Nekhen (Greek Hierakonpolis), however, the conception arose



Horus offering a libation, statue; in the Louvre, Paris

Giraudon—Art Resource/EB Inc.

that the reigning king was an incarnation of Horus and, after Egypt had been united by the kings from Nekhen, this conception became a generally accepted dogma. The first of the Egyptian king's five names was the Horus name; *i.e.,* the name that identified him with Horus.

According to Egyptian mythology, Horus and the god Seth (*q.v.*), representing Lower and Upper Egypt respectively, lived in peace. When about 2400 BC the cult of Osiris spread over Egypt, Horus was introduced into the myth cycle as son to Osiris. As such he now became an opponent of Seth, who was the murderer of Osiris and the contestant of Horus' heritage, the royal throne of Egypt. According to the myth, Horus defeated Seth, thus avenging his father and assuming the rule. In the fight his left eye (*i.e.,* the moon) was damaged—this being the mythological explanation of the moon's phases—and was healed by the god Thoth. The figure of the restored eye became a powerful amulet.

In later times Horus appeared as a local god in many places and under different names and epithets: for instance, as Harmakhis (Har-em-akhet, Horus Who Is on the Horizon); Harpocrates (Har-pe-khrad, Horus the Child); Harsiesis (Har-si-Ese, Horus, Son of Isis); Harakhte (Horus of the Horizon); and, at Kawm Umbū (Kom Ombo), as Haroeris (Harwer, Horus the Elder). Horus was later identified by the Greeks with Apollo, and Edfu was called Apollinopolis (Apollo's Town) in the Greco-Roman period.

In the Ptolemaic period, the main temples of Horus became centres of Egyptian nationalism, and the vanquishing of Seth became a symbol of Egypt triumphing over its occupiers. At Edfu, where rebellions frequently interrupted work on the temple, a ritual drama depicting Horus as pharaoh spearing Seth in the guise of a hippopotamus was periodically enacted.

Horváth, Ödön Edmund Josef von (b. Dec. 9, 1901, Fiume, Hung.—d. June 1, 1938, Paris), Hungarian novelist and playwright who was one of the most promising German-language dramatists of the 1930s and one of the earliest anti-Fascist writers in Germany.

Horváth, the son of a Hungarian career diplomat, attended schools in Budapest, Vienna, and Munich before settling in Germany permanently. His early plays, such as *Revolte auf Côte 3018* (produced 1927; "Revolt on Hill 3018"; rewritten as *Die Bergbahn,* produced 1929, "The Mountain Railway"), show a fascination with the folk culture and political history of his adopted country. His interest soon grew into concern over the rising tide of Fascism and the moral decay that contributed to it. His most important plays were *Italienische Nacht* (1930; "Italian Night"), a farce about complacent townspeople and bumbling but effective Nazis, and *Geschichten aus dem Wiener Wald* (1930; *Tales from the Vienna Woods,* 1977), a tragic folktale. The success of these plays (particularly the latter) brought Horváth the admiration and friendship of Carl Zuckmayer, as well as the 1931 Kleist Prize.

In 1933 Horváth fled to Austria, where he continued to write plays and novels, including *Die Unbekannte aus der Seine* (written 1933; "The Stranger from the Seine") and *Figaro lässt sich scheiden* (written 1933; "Figaro Gets a Divorce"). After the Nazi invasion of Austria in 1938, he wandered through Europe. He was killed during a rainstorm when he was struck by a falling tree branch.

Ḥorvot Mezada (Israel): *see* Masada.

Hōryū-ji, Japanese Buddhist temple near Nara, founded by Prince Shōtoku in 607, during the Asuka period. It was completely destroyed by fire in 670 and reconstructed by around 708. From this rebuilding it still retains the *chu-mon* ("middle gate") of the enclosing rectangular corridor, a five-storied pagoda, and a *kondō,* or main hall, the oldest known wood buildings in the world.

hose, flexible piping designed to carry liquids or gases. Early hoses were made from leather, which was never wholly satisfactory and was supplanted in the 19th century by natural rubber. Rubber layered on a pole or mandrel produced a flexible and watertight hose; the addition of canvas strengthened the fabric, and helically wound wire gave a degree of rigidity. The introduction of the extrusion process for rubber made possible hoses of any length and enormously increased their usefulness. For vulcanization of a layered hose, a lead sheath is applied; after vulcanization in an autoclave (pressure boiler) the sheath is stripped off.

World War II stimulated the development of numerous synthetic rubbers with greater chemical resistance. The development of polyethylene opened a new field. Polyvinyl chloride, or PVC, provided another versatile material for hose makers. The discovery of polytetrafluoroethylene, or PTFE, produced a plastic with outstanding resistance to most chemicals. Methods have also been developed for producing flexible metal hose and combinations of metal and synthetic fibres, *e.g.,* a Dacron and stainless-steel hose capable of carrying liquid oxygen, liquid nitrogen, and other ultralow-temperature liquids.

Hosea, Book of, also spelled OSEE, the first of 12 Old Testament books that bear the names of the Minor Prophets, considered as one book, The Twelve, in the Jewish canon. According to the superscription, Hosea began his prophetic activity during the reign of Jeroboam II (*c.* 786–746 BC). His prophetic announcements indicate that he was active until

near the fall (721 BC) of the northern kingdom of Israel, the scene of his entire ministry.

The text is quite corrupt and contains difficult problems of interpretation. Yahweh's compassion for Israel, however, is generally the dominant theme. Having "played the harlot" with Canaanite rites and practices, Israel will surely experience Yahweh's wrath, but not forever. Yahweh will welcome Israel like a husband who takes back an unfaithful wife.

The first chapter of Hosea is a biographical report of the prophet's marriage to Gomer, a woman of harlotry; the third chapter is an autobiographical account of a marriage to an adulterous woman. Whether the second account is Hosea's own account of the marriage reported in chapter 1 or whether it refers to a second marriage (remarriage to Gomer?) is much discussed. Whatever the answer, these two accounts are symbolic of Yahweh's love for Israel, portraying Yahweh's willingness to renew his covenantal relationship with his people despite their adulterous participation in the Canaanite religion.

The book has a long history of formation and transmission. Much of the material, in oral form, goes back to Hosea himself. The collection of sayings and individual accounts, however, was probably done in Judah at a much later date.

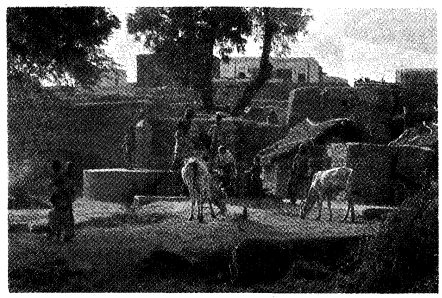
Hoshangābād, town, administrative headquarters of Hoshangābād district, Madhya Pradesh state, central India. The town lies just south of the Narmada River. Founded by Sultan Hoshang Shāh of Mālwa in 1406, it served as a defense against Goṇḍ invaders. Hoshangābād was constituted a municipality in 1867. It is an agricultural trade centre and is engaged in paper milling and the manufacture of roofing tiles, brassware, and bamboo canes. Hoshangābād has two colleges affiliated with the University of Saugar.

Hoshangābād district (3,867 sq mi [10,016 sq km]), a portion of former Nerbudda division of the British Central Provinces and Berār administrative unit, comprises mainly a fertile tract of the Narmada Valley, enclosed by densely forested spurs of the Sātpura Range on the south and outliers of the Vindhya Range on the north. Wheat, millet, legumes, oilseeds, and cotton are the chief crops. Coal, marble, and sandstone deposits are worked; cattle raising is extensive. Itārsi (*q.v.*), which lies south of Hoshangābād town, is a major rail junction. Pop. (1981) town, 39,997; metropolitan area, 46,300; district, 1,003,939.

Hoshea, also spelled HOSEA, or OSEE, Assyrian AUSI, in the Old Testament (II Kings 15:30; 17:1–6), son of Elah and last king of Israel (*c.* 732–724 BC). He became king through a conspiracy in which his predecessor, Pekah, was killed. The Assyrian king Tiglath-pileser III claimed that he made Hoshea king, and Hoshea paid an annual tribute to him. After Tiglath-pileser died (727), Hoshea revolted against the new Assyrian king, Shalmaneser, who then invaded Israel, took Hoshea prisoner, and besieged Samaria. When the city fell three years later, many of Israel's citizens were deported to Assyria, and the Assyrians ruled in Israel.

Hoshiārpur, city, administrative headquarters of Hoshiāpur district, Punjab state, northwestern India. The city is a manufacturing and trade centre and a rail terminus; it also lies at a major road junction. Its industries include silk weaving and oilseed pressing. Hoshiārpur is the location of the Viśveśvarānda Vedic Research Institute and of colleges affiliated with Panjab University.

Hoshiārpur district is 1,501 sq mi (3,887 sq km) in area and comprises the territory west of the Siwālik Range, as well as that to its north and south. A number of rivers flow west and southwest from the range, their flow varying greatly with the seasons. About one-third of



Communal well in Hoshiārpur city, Punjab, India
Shostal—/EB Inc.

the district is under cultivation; wheat, corn (maize), cotton, sugarcane, gram, and rice are the main crops. A religious fair at Mukeriān attracts large numbers of people. Pop. (1981) city, 85,648; district, 1,243,807.

hosiery, knit or woven coverings for the feet and legs designed to be worn inside shoes, particularly women's stockings and tights; also socks for men, women, and children. In Great Britain, hosiery includes all types of machine-knit garments.

In the 8th century BC the Greek poet Hesiod referred to *piloi,* probably matted from animal hairs, as a lining for shoes. The Romans wrapped their feet, legs, and ankles in long strips of leather or woven cloth. *Udones,* first mentioned in the 2nd century AD, were cut and sewn from woven fabric, felt, or skins and were pulled over the foot, but they lacked elasticity. Knit socks from between the 3rd and 6th centuries AD have been discovered in Egyptian tombs.

Hand-knit stockings evolved into their modern form by the 17th century. Queen Elizabeth I refused a patent to the inventor of the first knitting machine, the Rev. William Lee, because his stockings were coarser than those of fine silk imported from Spain. His improved model made finer stockings, but he was again refused a patent because of the fear that it would harm hand knitters. Lee died in poverty in France in about 1610, but his brother returned to England and began the framework-knitting industry.

Lee's machine was so well conceived that it was the only knitting machine for hundreds of years. Its general principles are incorporated in all modern machines, and the bearded-spring needle, part of the original model, is still used in machines producing full-fashioned stockings.

Full-fashioned stockings are knitted flat, then fashioned, or shaped, by hand manipulation and hand seamed up the back. Knitting is back and forth across the fabric (weft knitting) on a straight-bar machine invented in Loughborough, Leicestershire, Eng., by William Cotton in 1864. The stocking is started at the top with the welt, an extra-thick section for gartering. The fabric is shaped by reducing the number of needles at the ankle, then adding needles at the heel, and again reducing the number through the foot.

Seamless stockings are knitted on circular machines, brought out in the mid-19th century. For many years such stockings were a straight, knitted tube that did not fit as well as the full-fashioned, because stitches cannot be added or dropped in circular knitting by machine. But when nylon yarn was introduced in the 1940s its thermoplastic properties enabled the knitted tube to be permanently formed into the desired shape by heating. By the 1950s seamless stockings were so much improved that most women preferred them. In the 1960s a trend developed toward combining stockings into a single garment, panty hose and tights, that reached the waist and covered the feet, legs, and hips.

In 1900 about 88 percent of women's stockings were cotton, about 11 percent were wool, and about 1 percent were silk. Over the next 35 years silk and artificial silk (rayon) made steady gains, until the introduction of nylon, which almost immediately replaced all of the silk and much of the rayon.

Stocking weight depends on yarn size and the needle spacing of the machine, called gauge. Nylon yarn is measured as denier; the smaller the denier number, the finer the yarn. Gauge is the number of needles per 1½ inches in full-fashioned stockings; the higher the gauge number, the closer the stitches. Sheerness depends on both gauge and denier: 60 gauge, 15 denier is closer knit than 51 gauge, 15 denier, and for that reason is less sheer and wears better even though the yarn is the same size; 60 gauge, 30 denier and 51 gauge, 30 denier are heavier and much less sheer.

Hosius OF CÓRDOBA, Hosius also spelled OSSIUS (b. *c.* 256, probably Córdoba, Spain—d. 357/358, Córdoba), Spanish bishop of Córdoba who, as ecclesiastical adviser to Emperor Constantine I, was one of the chief defenders of orthodoxy in the West against the early Donatists (*q.v.*).

Consecrated bishop of Córdoba (*c.* 295), Hosius attended the Council of Elvira (Granada, *c.* 300) and from 312–326 acted as ecclesiastical adviser at the court of Constantine, who in 324 sent him as imperial emissary to the East to settle the Arian dispute (*see* Arianism). Hosius convoked a synod at Alexandria of Egyptian bishops and another at Antioch of Syrian bishops, at both of which Arius and his followers were condemned.

Prompted by Hosius, Constantine then summoned the first ecumenical Council of Nicaea (325), where Hosius was influential in securing the inclusion in the Nicene Creed of the key word *homoousios* (*q.v.*). In 342/343, he presided at the Council of Sardica (Sofia), which the Eastern bishops boycotted because the Westerners insisted on the presence of Bishop St. Athanasius the Great of Alexandria, a principal opponent of Arianism.

From 353 to 356 Hosius strongly resisted the efforts of the Arian emperor Constantius II to have Athanasius condemned by the Western bishops and in a famous letter reproved Constantius for intruding into ecclesiastical matters. Summoned to Sirmium in 356 and detained at court for a year, after threats and physical violence, Hosius signed the Arian formula of Sirmium (357) but retracted his signature before he died.

Hosius, Stanislaus, Polish STANISŁAW HOZJUSZ (b. May 5, 1504, Kraków, Pol.—d. Aug. 5, 1579, Capranica, Papal States), Polish cardinal, one of the most significant figures of the Counter-Reformation, particularly in Poland.

Consecrated bishop of Chełmno, Pol., in 1549, he was transferred to East Prussia (1551), from where he conducted his campaign by convoking synods, fighting heresy, and rallying Roman Catholics. At the Synod of Piotrków, Pol. (1551), he drafted a profession of faith, later expanded into his celebrated *Confessio catholicae fidei Christiana* ("Christian Confession of Catholic Faith"), which appeared in 30 editions in his lifetime. In 1561 he was made cardinal and was appointed presiding papal legate to the Council of Trent. He was described by St. Peter Canisius as the most brilliant writer, the most eminent theologian, and the best bishop of his time.

Hoskyns, Sir Edwyn Clement, 13TH BARONET (b. Aug. 9, 1884, London—d. June 28, 1937, London), Anglican biblical scholar and theologian.

Educated at Jesus College, Cambridge, and Wells Theological College, Hoskyns was ordained in 1908. He was associated with Cor-

pus Christi College from 1919 to 1932 and was canon theologian of Liverpool cathedral from 1932 to 1935. He succeeded to his father's baronetcy in 1925.

Having applied modern linguistic criticism to New Testament literature (especially in his posthumous work *The Fourth Gospel,* 2 vol. [1940]), he emphasized the complexity of religious mystery in interpreting Christ and the origins of Christianity, as opposed to the naturalism characterizing "the historical Jesus" of liberal Protestantism.

Hosokawa Katsumoto (b. 1430, Japan—d. June 6, 1473, Kyōto), leader of a powerful military faction in medieval Japan whose dispute with Yamana Mochitoyo, the head of the powerful Yamana clan, resulted in the Ōnin War (1467–77). This conflict ravaged the area around the capital at Kyōto and destroyed central control over the country's outlying regions, giving rise to almost a century of internecine warfare throughout Japan.

Hosokawa was a member of a family whose members were among the leading retainers of the Ashikaga shogunate, the hereditary military dictatorship dominating Japan, at least in name, from 1338 to 1573. As such, in 1452, Hosokawa succeeded to the post of *kanrei,* or shogunal prime minister, which he occupied until 1464. During this period the Yamana clan emerged as the dominant power in western Japan, and Yamana Mochitoyo began an attempt to check the power of Hosokawa within the shogunate government. In spite of the efforts of Ashikaga Yoshimasa, who served as shogun from 1449 to 1473, to restrain the two factions, the struggle between Hosokawa and Yamana finally erupted into war in 1467; when Yoshimasa decided to change his choice of heir designate from his younger brother to his infant son, the two factions became enmeshed in the dispute.

The war dragged on inconclusively until 1477, although both Hosokawa and his enemy Yamana died in 1473. With succeeding generations, however, Hosokawa's descendants became much more powerful than those of Yamana.

hospice, a home or hospital established to relieve the physical and emotional suffering of the dying. The term hospice dates back to the Middle Ages, when it denoted places of charitable refuge offering rest and refreshment to pilgrims and travelers. Such homes were often provided by monastic orders; the most famous of them, the hospice of St. Bernard, still functions as a shelter for travelers passing over the Pennine Alps.

Although special hospitals for the terminally ill had existed prior to the 20th century, it was not until after World War II that recognition of the special needs of the dying led to the modern hospice movement. Cicely Saunders, one of the initiators of the movement and the founder of St. Christopher's Hospice, London (1967), and other health professionals realized that many established procedures of modern medical care could be inappropriate when applied to those who are dying. The aggressive life-prolonging measures routinely taken in intensive-care units often only increased the discomfort and isolation of terminally ill patients and deprived them of the opportunity to die in a peaceful and dignified fashion. In response to the absence in the medical system of provisions for the supportive care of this class of patients, the modern hospice was developed.

The hospice functions as a sympathetic and reassuring environment dedicated to making the last days of the dying as pleasant as possible. The prevention of physical pain is the first priority, and analgesics, tranquilizers, and a variety of physical therapies are used to alleviate simple physical suffering. Hospices emphasize the prevention, rather than the mere control, of pain through vigilant monitoring and by the accurate tailoring of drugs and their dosages to patients' individual needs. Patients in hospices receive moral support from loved ones as well as the staff itself, and a variety of measures are used to further their emotional and spiritual well-being. Patients are usually admitted to a hospice upon the referral of a physician after a prognosis for survival of only months or weeks. Hospice care may be provided completely within a health facility, on an outpatient basis, or at home.

hospital, an institution staffed and equipped for the diagnosis and treatment of the sick or injured, for their housing during treatment, for health examinations, and for the management of childbirth. Hospitals have increasingly become important centres of research and technology. Education has also become an integral part of almost every general hospital.

A brief treatment of hospitals follows. For full treatment, *see* MACROPAEDIA: Medicine: *Major Medical Institutions.*

For statistical data on hospitals and health facilities, *see* BRITANNICA WORLD DATA ANNUAL.

The concept of facilities designed to minister to the needs of the sick and injured is often traced to the Middle Ages, where many monasteries set aside areas for the sick as part of the Christian tradition of fellowship.

General hospitals offer a variety of services to the community by means of specialized departments, a trained staff, and various types of sophisticated equipment. Many hospitals also offer outpatient facilities to provide for the short-term physical and emotional needs of ambulatory patients.

The two major ways of classifying hospitals are by type of ownership and by type of service. As to ownership, hospitals are either governmental (national, state, provincial, or local) or nongovernmental. The nongovernmental include the proprietary hospital conducted for private gain and the voluntary hospital conducted on a nonprofit basis by churches, fraternal orders, or independent associations.

Most hospitals in the world, except in the United States, are government-owned. But every country contains a number of small proprietary institutions, usually with a capacity of fewer than 50 beds, owned by one or two physicians for the care of well-to-do patients. They provide less than 5 percent of the total bed capacity of the world.

In the United States the term voluntary is applied to any hospital conducted by a church or religious order, a fraternal society, or an independent nonprofit association for use by the entire population. The affairs of voluntary hospitals are controlled by trustees who serve without pay in these capacities and who are responsible for designating the administrative and medical staffs and for deciding the professional and financial policies of the institution.

Hospitals may be classified as general or special. A general hospital accepts all types of medical or surgical cases, usually concentrating upon acute illnesses requiring short-term care, including maternity service and the care of children. A special hospital is one that limits service primarily to single classes of patients or types of illnesses, particularly to mental and tubercular cases and to those requiring isolation because of contagious conditions. Special hospitals for short-term cases are less common than they were formerly, with a tendency for hospitals for children, maternity, cancer, the crippled, etc., to become affiliated with general hospitals in order to improve quality of service and economy of administration. Special sections for mental and contagious cases have been established in many general hospitals. Another type of hospital is the military hospital, in which sick or wounded soldiers are grouped together and treated by military physicians and their assistants. In the mobile field hospital, physicians, nurses, and supplies follow the movement of troops and provide emergency treatment to the wounded.

Hospitals have made their services increasingly available to people who do not require admission as bed patients. These outpatients, or ambulatory patients, generally outnumber bed patients by at least 5 to 1. The majority of the outpatients are persons who come to the hospital for emergency care or who are referred by private physicians for diagnostic and therapeutic services not available in their personal offices. Many physicians use hospital examination and treatment rooms in the care of their private patients. Some of the doctors also maintain private-practice offices in facilities owned by hospitals.

Hospital, Michel de L': *see* L'Hospital, Michel de.

Hospitaler, also called KNIGHT HOSPITALER, member of ORDER OF THE HOSPITAL OF SAINT JOHN OF JERUSALEM, or SOVEREIGN AND MILITARY ORDER OF THE KNIGHTS HOSPITALER OF SAINT JOHN OF JERUSALEM, also called KNIGHTS OF RHODES, KNIGHTS OF MALTA, or KNIGHTS OF SAINT JOHN OF JERUSALEM, a religious military order founded in the 11th century. The origin of the Hospitalers was a hospital for sick pilgrims in Jerusalem, close to the Church of St. John the Baptist, that was served by a religious fraternity. After the crusaders' conquest of Jerusalem in 1099, the hospital's superior, a monk named Gerard, intensified his work in Jerusalem and founded hostels in Provençal and Italian cities on the route to the Holy Land. Grateful crusader knights healed of their wounds in the hospital bestowed on it part of their estates, while others remained in the Holy Land as members of the hospital, which thus developed into a wealthy and powerful body dedicated to both tending the sick and poor and waging war on the Muslims.

When the crusader principalities came to an end after the fall of Acre in 1291, the Hospitalers retreated to Cyprus and decided to continue their work for the pilgrims and the sick and to remain close to the Holy Land in the hope of its reconquest. In 1309 they acquired Rhodes; they built a hospital and ruled the island as an independent state, becoming a naval power in the eastern Mediterranean. The Ottoman Turks conquered Rhodes in 1522, but in 1530 the emperor Charles V gave the Hospitalers possession of the island of Malta. The knights reached their height of power on Malta as they withstood violent Ottoman attacks, increased their naval strength, and at the same time maintained an advanced hospital. The order suffered a decline during the 17th and 18th centuries, as the Turkish menace receded, and in 1798 they lost Malta to Napoleon. The headquarters of the order, which continues its humanitarian tasks in many parts of the modern world, was established in Rome in 1834. *See also* Teutonic Order.

Hospitalet de Llobregat, city, Barcelona province, in the autonomous community (region) of Catalonia, northeastern Spain; it is a southwestern industrial suburb of Barcelona city and extends from the Marina Mountains to the coastal delta of the Llobregat River. First known as Santa Eulalia de Provenzana, the community adopted its present name (a Catalan diminutive) in the 16th century from the small hospital that has sheltered travelers and pilgrims since the 12th century. Declared a city by Alfonso XIII in 1925, its history is linked with that of Barcelona. Its major industry is steel; other manufactures include chemical fertilizers, dyes, insecticides, and metals. An architectural highlight is the 12th-century Romanesque Hermitage of Santa Eulalia de Provenzana. Pop. (1981) 294,033.

Hossō, school of Japanese Buddhism derived, by way of China, from the Indian Yogācāra school. *See* Yogācāra.

host, in biology, an organism in or on which another organism lives as a parasite or commensal. *See* parasitism.

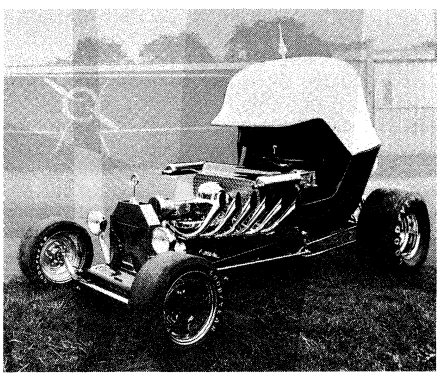
Hostilian, Latin in full GAIUS VALENS HOSTILIANUS MESSIUS QUINTUS (d. 251), Roman emperor in 251.

He was the younger son of the emperor Decius, who made him caesar in 250. After Decius' death in 251, Hostilian was adopted by Vibius Trebonianus Gallus and made joint emperor with the title augustus, but he died of plague shortly thereafter.

Hostilius, Tullus: *see* Tullus Hostilius.

hot rod, privately designed and built automobile constructed along individualistic lines to provide maximum starting acceleration; it is most popular in the United States. Hot-rod competition is largely confined to acceleration contests (*see* drag racing), but hot rods may also compete in various classes against time or distance in speed and endurance attempts. Many national and international records, some previously held by large manufacturers, fell to hot-rod builders and drivers in the period following World War II.

A wide range of automobiles may be called hot rods, and no definition of the term is



"Red Baron," a hot rod built by Chuck Miller, 1969
By courtesy of the International Show Car Association

universally accepted. The cars may be constructed of components from many makes of old or new automobiles. All are usually built with strict regard for safety, and many are intended primarily for exhibition rather than for racing or everyday driving.

hot spring, also called THERMAL SPRING, a type of spring that issues water at temperatures substantially higher than the air temperature of the surrounding region. Most hot springs result from the interaction of groundwater with magma (molten rock) and magmatic gases or with solidified but still-hot igneous rocks at shallow depth. Some thermal springs, however, are not related to volcanic activity. In such cases, deep circulation of water is thought to carry the water to the lower parts of the terrestrial crust, where the temperature of rocks is high because of the normal temperature gradient of the Earth.

A type of hot spring known as a geyser (*q.v.*) spouts intermittent jets of water and steam. Many hot springs that are not geysers exhibit periodicity: some manifest periods of agitation or violent boiling, while others alternately discharge water and gas.

A tremendous amount of heat is released by hot springs, and various applications of this geothermal energy have been developed. In certain areas, buildings and greenhouses are heated with water pumped from hot springs, and in others, water from such sources is used for heating soil to enhance crop production and for seasoning lumber. In a few countries (*e.g.*, Iceland, Japan, and the United States), electricity has been generated with high-temperature steam from geysers.

Hot Springs, resort spa, city, and seat (1874) of Garland County, central Arkansas, U.S. It lies just north of the Ouachita River at the eastern edge of the Ouachita Mountains and the Ouachita National Forest. The springs, long-used by the Indians and probably visited by Hernando de Soto in 1541, were explored in the 1600s, were frequented by Spanish and French health seekers in the 1700s, and were analyzed, routed, and mapped in 1804 by the William Dunbar–George Hunter expedition. The 47 thermal springs, which were set aside as a public reserve in 1832, became the focus for Hot Springs National Park (5,836 acres [2,362 hectares]), established in 1921. More than 1,000,000 gallons of water, with an average temperature of 143° F (62° C), flow from the springs daily. The area also includes some 20 hydrotherapeutic institutions and the Libbey Memorial Physical Medicine Center.

Permanent settlement of the site dates from 1807; the town was incorporated in 1876 and became a city in 1886. Garland County Community College (1973) is in Hot Springs. An aluminum mill and some light manufacturing augment the resort economy. Pop. (1986 est.) 37,196.

Hot Springs (city, New Mexico): *see* Truth or Consequences.

Hot Springs, city, Fall River County, southwestern South Dakota, U.S. It lies along the Fall River in a canyon walled by red rocks, near the Black Hills. Settled in 1879 as Minnekahta, it was renamed Hot Springs when it became the county seat (1882). It developed as a health resort, and a natural warm-water indoor pool, the Evans Plunge, was built (1890). The city's economy depends on diversified agriculture, mining, tourism, the State Soldiers Home, and a Veterans Administration centre. Each summer Crazy Horse Pageant, commemorating the Indian hero, is produced in an outdoor amphitheatre. Wind Cave National Park is 7 miles (11 km) north, and Angostura Dam and Reservoir State Recreation Area is 10 miles (16 km) southeast. Inc. 1882. Pop. (1984 est.) 4,569.

Hotan (China): *see* Ho-t'ien.

Hôtea language: *see* Sedang language.

Hotei, in Japanese mythology, one of the Shichi-fuku-jin ("Seven Gods of Luck"). This popular figure is depicted frequently in con-



Hotei, wood sculpture; in the British Museum
By courtesy of the trustees of the British Museum

temporary crafts as a cheerful, contented Buddhist monk with a large exposed belly, often accompanied by children. Tradition relates him to a Chinese monk called Pu-tai, who because of his benevolent nature came to be regarded as an incarnation of the bodhisattva (the future Buddha) Maitreya (Miroku in Japanese) but whose large protruding stomach led to his being caricatured as the "Laughing Buddha."

hotel, building providing lodging and usually meals to the public on a commercial basis. The word is of ancient origin, but its use in English is relatively recent, having become fashionable in Britain and America in the 19th century. The institution dates from ancient times, inns having flourished along the Roman highways for the use of commercial, government, and other travelers. Inns were also well-known in India, China, and the Middle East. In the Middle Ages the monastic brotherhoods often took over the function of operating hostels in order to guarantee havens for travelers in dangerous regions—for example, the St. Bernard hostelry atop the Great St. Bernard Pass in the Alps.

The rapid proliferation of stagecoach travel during the 18th century stimulated the development of inns. The modern hotel was to a large extent the result of the railroad age; hotels were nearly always built as close as possible to the railroad station. After World War II many hotels were built at or near major airports. Operation of hotel chains has become a characteristic of modern hotelkeeping, which to its traditional function of room and board has added customer services such as laundry, valet, cleaning and pressing, cocktail lounges, nightclubs, and a variety of shops.

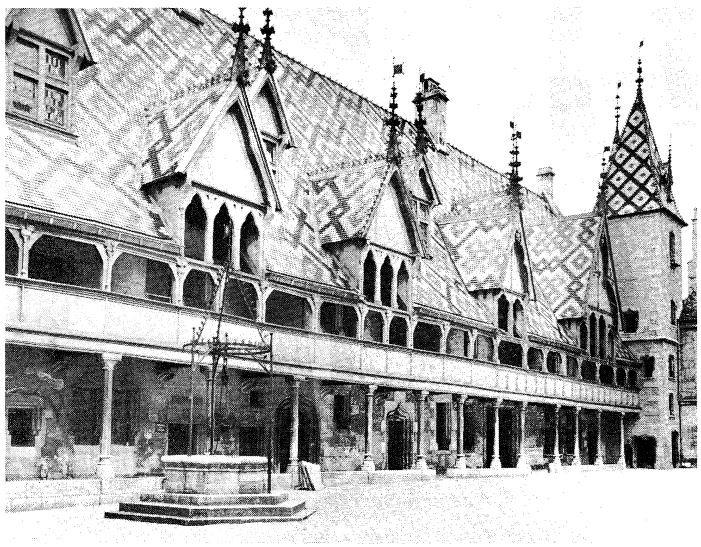
Two special forms of the modern hotel are the residence hotel, which is designed to provide hotel services to permanent occupants, and the resort hotel, a luxury facility intended primarily for vacationers and usually located near special attractions, such as beaches, scenic areas, or ski parks. Some resort hotels operate on the so-called American plan, in which the cost of meals is included in the charge for the room. Others operate on the European plan, in which the rate covers only the room and guests make their own arrangements for meals. Transient hotels generally operate on the European plan.

To make the best use of the Britannica, consult the INDEX *first*

Hôtel de Bourgogne, Théâtre de l', the first permanent theatre in Paris, built in 1548 on the ruins of the palace of the dukes of Burgundy. The theatre was built by the Confrérie de la Passion (*q.v.*; "Confraternity of the Passion"), a group of artisans and tradesmen who held a monopoly on the presentation of plays in the city. The long and narrow theatre had a small playing area that was further restricted by the use of multiple settings on the stage. Most of the audience stood in the pit, and galleries lined the side and back walls. The theatre's total capacity was 1,600. The same year their theatre was finished, the Confrérie was forbidden to perform religious plays and was reduced to acting farces and plays of medieval romance, without much success. Toward the end of the 16th century, it gave up acting and rented the theatre to traveling players, including Italian and English companies. The first really permanent company in Paris, known as Les Comédiens du Roi ("the King's Players") and headed by Valleran-Lecomte, a provincial actor and manager, established itself in the theatre about 1610, the players continuing there after the manager left Paris in 1612. The Comédiens enjoyed considerable suc-

cess and gradually assumed full-time use of the theatre. They were without an important rival until 1634, when a second theatre, the Marais, was built for the Prince of Orange's Players. The King's Players produced many of the great tragedies of Corneille and Racine in the Hôtel de Bourgogne, working there until 1673, when the company was merged with other Parisian players that later formed the Comédie-Française. The new company left for new quarters, and the Hôtel de Bourgogne was used until 1783 by actors of the Comédie-Italienne.

hôtel-Dieu, in France, any medieval hospital; the name now refers only to those whose history goes back to the Middle Ages. Many examples from the Gothic period still remain, notably that of Angers (1153–84), the so-called



Hôtel-Dieu, Beaune, Fr., 1443–45
Wayne Andrews

salle des morts at Ourscamp (early 13th century), and that of Tonnerre (*c.* 1300).

In all of these the most important feature is a vast hall for beds for the sick. In the two earliest the hall is vaulted and divided into three aisles by pillars, on either side of which it was possible to place four rows of beds. At Tonnerre the great hall, nearly 60 feet (18 metres) wide and 300 feet (90 metres) long, was roofed with wooden trusses and had a wooden barrel-vault ceiling. The beds were in little chambers along the sides, open to supervision from a gallery that ran continuously around the side walls immediately below the windowsills.

At Beaune the *hôtel-Dieu,* founded in 1443, is of quite different character. It is a two-storied timber structure and occupies three sides of a courtyard. In addition to the halls for the sick, various other rooms for the use of the nuns were furnished.

Hotman, François, in full FRANÇOIS HOTMAN, SIEUR (sire) DE VILLIERS SAINT-PAUL, Latin FRANCISCUS HOTOMANUS (b. Aug. 23, 1524, Paris—d. Feb. 12, 1590, Basel, Switz.), French jurist and one of the most learned of Humanist scholars, who took a leading part in the legal, political, and religious controversies of his time.

Born in Paris of a family of Silesian origin, Hotman took his doctorate in law at Orléans and practiced law in Paris, where, in 1546, he became professor of Roman law. In 1547 he was converted to the Reformed Church and went to teach law successively at Lyon, Geneva, Lausanne, and Strassburg, where John Calvin went to hear him. In 1563 he returned to France, teaching at Valence and, after 1567, at Bourges, then the foremost law school in Europe. In 1572, after the Massacre of St. Bartholomew's Day, he fled to Geneva and taught again there and later at Basel, where he died in 1590.

Hotman made important contributions to the work of the French school of Romanists who, in opposition to the Italian commentators, sought to restore the texts of classical Roman law. In his *Anti-Tribonian* (1567) he combined an attack on the compilators employed by Justinian with a plea for codification of French law on the basis of native custom and experience and without borrowing excessively from Roman law. In *Franco-Gallia* (1573), which became his most influential work, Hotman showed that there was no historical foundation, other than the absolutist tendency of Roman lawyers, for the growth of royal absolutism in France, which was used to prevent religious reform. In these and numerous other writings, published collectively by J. Lectius (1590–1601), Hotman sought to advance the cause of Humanist learning, of religious freedom, and of government by consent.

Hōtoku, semireligious movement among Japanese peasants initiated in the 19th century by Ninomiya Sontoku, who was known as the "peasant sage." He combined an eclectic, nonsectarian ethic of cooperation and mutual help with practical economic measures such as crop rotation and famine relief. Hōtoku (literally Repay the Indebtedness) emphasized the debt owed by man to gods, nature, ancestors, emperor, and parents. This debt could be repaid only through conformity with the cosmic order, which was equated with moral sincerity, and by economic frugality. Ninomiya Sontoku's teachings were disseminated by his followers and played an important part in shaping 19th- and 20th-century Japanese popular morality.

Hotspur: *see* Percy, Sir Henry.

Hotta Masatoshi (b. 1634, Edo, Japan—d. Oct. 7, 1684, Edo), statesman who began his career as an adviser to the fourth Tokugawa shogun of Japan, Ietsuna (shogun 1651–80), when he was still heir apparent. After Ietsuna became shogun, Hotta was made one of his top officials and did much to reorganize and reconsolidate the Tokugawa administration.

Following Ietsuna's death in 1680, Hotta single-handedly blocked the attempts of another official to have a prince of the royal blood named shogun, which would have transferred the office out of the Tokugawa family and totally altered the structure of the Japanese government. Instead, he had Ietsuna's brother Tsunayoshi named to the throne, and Tsunayoshi immediately returned the favour by appointing Hotta to the position of *tairō* (chief councillor). Before he could enact any great changes, however, Hotta was assassinated by an envious cousin.

Hotta Masayoshi (b. 1810, Edo, Japan—d. April 26, 1864, Sakura), Japanese statesman who negotiated the commercial treaty that established trade between the United States and Japan, thus opening that country to commerce with the outside world for the first time in two centuries.

A prominent feudal lord who had studied Western languages and military techniques, Hotta proposed that the government pursue a course of moderation in dealing with Commo. Matthew C. Perry of the United States, who had arrived in 1853 with a fleet of warships to demand that Japan open itself to relations with the West. After the government defied public sentiment and signed a treaty that permitted an American consul to reside in Japan, the position of the shogun (hereditary military dictator of Japan) deteriorated. In the midst of this crisis, Hotta was appointed head of the *rōjū* (senior councillors), and, to consolidate his rule, he reduced the power of those who were violently opposed to the new foreign policy. For support in his decision to sign a commercial treaty with the U.S., he turned to the great feudal lords, who had heretofore been excluded from government. The storm of criticism that followed caused him to consult with the emperor, whose predecessors for several centuries had exercised no more than a ceremonial function in the government. The emperor's refusal to sign the treaty further weakened the government, and the shogun dismissed Hotta from office. Although the shogunate was temporarily able to reassert its leadership, Hotta's actions helped kindle the movement that restored power to the emperor and toppled the Tokugawa shogunate in 1868.

Hottentot (people): *see* Khoikhoin.

Hottentot bread (plant): *see* elephant's foot.

Hottentot languages: *see* Khoikhoin languages.

Hotteterre, Jacques(-Martin), byname LE ROMAIN (b. Sept. 29, 1674, Paris—d. July 16, 1763, Paris), French musician, teacher, and musical-instrument maker, known for his construction of and performance on a variety of woodwinds.

Hotteterre was descended from a distinguished family of woodwind-makers and performers. His nickname, "le Romain" ("the Roman"), is presumed to be the result of a journey to Italy.

By 1708 Hotteterre was a bassoonist (or bass oboist) in the Grande Écurie, a renowned ensemble. According to the inscription on the title page of his first book of flute pieces (1708), he also was a "flute of the chamber of the king," although he was not formally appointed to that honoured position until 1717. The dedications of his works indicate that Hotteterre was a popular teacher of the wealthy and socially prominent amateurs of his day. He not only played several instruments, including the musette, but he made musettes and flutes. The three extant transverse flutes marked only with the Hotteterre name and the symbol of an anchor may have been produced in his establishment.

Hotteterre's first published work, *Principes de la flûte traversière* (1707), is the first known essay on flute-playing. It contains instructions for playing the recorder and oboe, as well as the flute, and was an immense success throughout Europe, undergoing numerous reprints. This treatise proved to be a valuable source of in-

formation regarding early techniques used in performance on woodwinds, such as tonguing and ornamentation. His later treatises include directions for improvising woodwind preludes, a practical manual for musette performers, and a variety of compositions such as duet suites and trio sonatas. His second essay (1719) also includes an important discussion of possible metric changes and rhythmic devices for transverse flute.

Hotteterre's first book of suites for transverse flute and bass was the second such collection to be published in France and contains an unusually large number of pieces for one and two unaccompanied flutes, some consisting of as many as 11 or 12 movements.

Hötzendorf, Franz (Xaver Josef), Graf Conrad von: *see* Conrad von Hötzendorf, Franz (Xaver Josef), Graf.

Hou Chi, Pinyin HOU JI, in Chinese mythology, Lord of Millet Grains, who was worshiped for the abundant harvests that he graciously provided for his people. The Chinese honoured him not only for past favours but in the hope that devotion to the deity would guarantee continued blessings. An old tradition explained that Hou Chi was miraculously conceived when his childless mother stepped on the toeprint of a god. The child, reared in a forest by birds and animals, served as minister of agriculture in prehistoric times. Sacrifices in his honour were offered by rulers of the Hsia dynasty (22nd–18th/19th century BC) and of the later Chou dynasty (600–255 BC), which claimed him as their ancestor.

Hou I, Pinyin HOU YI, the Lord Archer of Chinese mythology, whose prowess with a bow earned him undying fame. With his bow and arrow he saved the moon during an eclipse and rescued the country from a variety of plagues, one of which involved a wind monster who was wreaking havoc across the land. Hou I is also said to have shot down 9 of 10 suns (one account says 8 of 9 suns) that were burning up the earth in prehistoric times. Though tradition identifies the marksman as an officer in the armed forces of the legendary emperor K'u, he is better-known among the common people as the husband of Ch'ang O, the goddess of the moon. After stealing the pill of immortality, Ch'ang O took refuge in the moon. Hou I followed in hot pursuit, only to be intercepted by the Hare, who would not allow Hou I to pass until he promised reconciliation with his wife. On the 15th day of each lunar month the spouses meet, Hou I traveling from his palace in the sun to the moon palace he constructed for his wife.

Hou T'u, Pinyin HOU TU, in Chinese mythology, the spirit of the earth, first worshiped in 113 BC by Wu Ti, a Han-dynasty emperor. Hou T'u as sovereign earth became identified with the dual patron deity of the soil and harvest, She Chi, and so received sacrifices under this title. In any case, it was the god of the soil who became personified in the person of Kou Lung, a hero related to Shen Nung, the legendary Chinese father of agriculture.

At various times and in various places Hou T'u seems also to have had a cult as the spirit of humanity, as the national earth god (as distinguished from local deities called T'u-ti, and as the spirit of deceased emperors and empresses. In the latter part of the 14th century Hou T'u was, for no clear reason, transformed into a female deity. Modern temples thus enshrine the image of a woman who is known as Hou T'u Nai-nai.

Hou Yi (in Chinese mythology): *see* Hou I.

Houakhong (Laos): *see* Louang Namtha.

Houbraken, Arnold (b. March 28, 1660, Dordrecht, Holland—d. Oct. 14, 1719, Amsterdam), Dutch painter and art writer noted for his three-volume biographical study of Netherlandish painters, *De groote Schouburgh der Nederlantsche Konstschilders en Schilderessen* (1718–21). Houbraken was a competent if rather uninspired academic painter, but his *De Groote Schouburgh* is the single most important source of information about the great Dutch painters of the 17th century.

Houbraken, Jacobus (b. Dec. 25, 1698, Dordrecht, Holland—d. Nov. 14, 1780, Amsterdam), the leading portrait engraver in 18th-century Holland. The son of the painter and art writer Arnold Houbraken, he settled in Amsterdam in 1707, and during his lifetime he engraved 400 portraits after paintings by contemporary Dutch painters.

Houdenc, Raoul de (French trouvère): *see* Raoul de Houdenc.

Houdin, Jean-Eugène (magician): *see* Robert-Houdin, Jean-Eugène.

Houdini, Harry, original name ERIK WEISZ (b. March 24, 1874, Budapest—d. Oct. 31, 1926, Detroit), American magician noted for his sensational escape acts.

Houdini was the son of a rabbi who emigrated from Hungary to the United States and settled in Appleton, Wis. He became a trapeze performer in circuses at an early age, and, after settling in New York City in 1882, he performed in vaudeville shows there without much success. In 1894 he was married to Wilhelmina Rahner, who thereafter as Beatrice Houdini served as his stage assistant. From about 1900 Houdini began to earn an international reputation for his daring feats of extrication from shackles, ropes, and handcuffs and from various locked containers ranging from milk cans to coffins to prison cells. In a typical act he was shackled with chains and placed in a box that was locked, roped, and weighted. The box was submerged from a boat, to which he returned after freeing himself underwater. In another outdoor exhibition he allowed himself to be suspended, head down, about 75 feet (23 m) above ground and then freed himself from a straitjacket. These demonstrations were typically watched by many thousands of people. Houdini's uncanny escape abilities depended partly on his great physical strength and agility and partly on his extraordinary skill at manipulating locks. He exhibited his skills in many motion pictures from 1916 to 1923.



Houdini
Pictorial Parade—EB Inc.

In his later years Houdini campaigned against mind readers, mediums, and others who claimed supernatural powers. He argued that they were charlatans who produced all of their effects through natural means and various tricks. He wrote *Miracle Mongers and Their Methods* (1920) and *A Magician Among the Spirits* (1924). Houdini and his wife, however, agreed to conduct an experiment in spiritualism: the first to die was to try to communicate with the survivor. His widow declared the experiment a failure before her death in 1943.

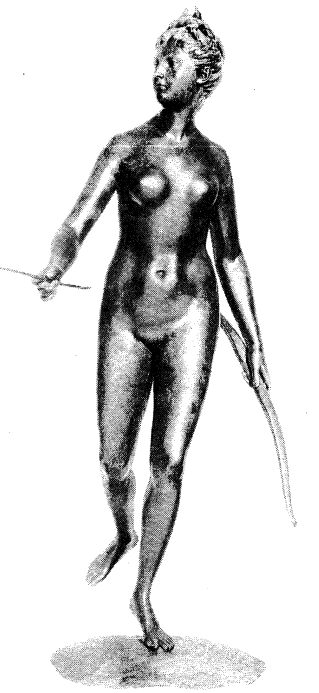
Houdini took his stage name from the name of the French magician Jean-Eugène Robert-Houdin, but he later wrote *The Unmasking of Robert-Houdin* (1908), a debunking study of Houdin's abilities. Houdini wrote the article on conjuring for the 13th edition of the *Encyclopædia Britannica* (1926). He died of peritonitis that stemmed from a stomach injury.

Houdon, Jean-Antoine (b. March 20, 1741, Versailles, Fr.—d. July 15, 1828, Paris), French sculptor whose religious and mythological works are definitive expressions of the decorative 18th-century Rococo style of sculpture. The vividness with which he expressed both physiognomy and character places him among history's greatest portrait sculptors.

Houdon began sculpturing at the age of nine and underwent the long training prescribed by the Académie Royale. In 1761 he won the Prix de Rome, and while in Rome (1764–68) he established his reputation with a large marble statue of St. Bruno (1767; Santa Maria degli Angeli, Rome) and an anatomical study of a standing man, known as "Écorché," which brought him immediate fame and served later as the basis for replicas widely used for instruction.

In 1770, two years after his return to Paris, he presented a reclining figure, "Morpheus," as his reception piece for membership in the Académie Royale (marble version, 1777; Louvre, Paris). He earned his livelihood, however, through portraiture; his sitters included Denis Diderot, Empress Catherine II the Great of Russia, and Benjamin Franklin.

Houdon created four different busts of Voltaire in addition to the renowned seated figure of him at the Comédie-Française, for which he made first studies shortly before the death of the aged philosopher in 1778. Five weeks later, on hearing of the death of Jean-Jacques Rousseau, Houdon hastened to the philosopher's home at Ermenonville and took a cast of the dead man's face, from which he developed the bronze bust that is now in the Louvre. In 1785 Houdon crossed the Atlantic to carry out a commission for a statue of George Washington. Several weeks spent at Washington's home at Mount Vernon were sufficient for him to complete his studies, which he took back to France. The marble statue, signed and dated 1788, was set up in the Virginia state capitol at Richmond in 1796.



"Diana," bronze sculpture by Houdon; in the Louvre
Giraudon—Art Resource/EB Inc.

Houdon modelled his sculpture in clay, although subsequent versions might be of marble, bronze, plaster, or clay. A skilled technician in all of these mediums, Houdon either took full charge of repetitions or limited himself to finishing touches upon his assistants' work. He avoided a high finish that would conceal toolmarks, since the sense of freshness in execution accorded with his concern for a characteristic pose and for the effect of a direct and vivid glance.

The most celebrated of Houdon's mythological works is the "Diana," first shown in 1777, although not at the Salon—possibly to avoid questions of propriety because of the artist's frank treatment of the life-size undraped figure. Versions of this supple, elegant work are in the Louvre (Paris), the Hermitage (Leningrad), and the Henry E. Huntington Library and Art Gallery (San Marino, Calif.). His prestige continued during the turbulence of the French Revolution and the Napoleonic era. After the downfall of the French Empire in 1815, however, he passed out of vogue and spent the remaining 13 years of his life a figure of the past.

Houghton, city, seat of Houghton County, northwestern Upper Peninsula of Michigan, U.S., on Portage Lake and the Keweenaw Waterway, opposite Hancock. It was settled in 1851 and named for Douglass Houghton, a state geologist. The discovery of nearby rich copper lodes between 1855 and 1870 resulted in an economic boom that lasted until after World War I. Houghton is the distribution centre for manufactures, including explosives and wood materials, and for mining, dairy and poultry farming, and fishing. It is the seat of Michigan Technological University (1885), site of the A.E. Seaman Mineralogical Museum with an outstanding collection of mineral specimens. There are summer ferry connections with Isle Royale National Park (offshore in Lake Superior), which has its mainland headquarters in Houghton. Inc. 1867. Pop. (1980) 7,512.

Houghton (of Great Houghton), Richard Monckton Milnes, 1st Baron (b. June 19, 1809, London—d. Aug. 11, 1885, Vichy, Fr.),



Lord Houghton
BBC Hulton Picture Library

eclectic English Victorian poet and man of letters who considerably influenced public taste in literature in his day.

At Trinity College, Cambridge, where he took his M.A. degree in 1831, Houghton joined the socially and artistically progressive Apostles Club, which included among its members the poets Alfred, Lord Tennyson and Arthur Henry Hallam. From 1837 to 1863 he served as member of Parliament, becoming involved in such questions as copyright and establishment of juvenile reformatories. He was made a peer in 1863 with the aid of the prime minister, Lord Palmerston. In the House of Lords he defended the Oxford Movement in the Church of England, and he favoured reform of the franchise.

Houghton was a generous and discriminating patron of writers. He published the pioneer *Life, Letters, and Literary Remains of John Keats* (1848), secured a pension for Tennyson, made the American sage Ralph Waldo Emerson known in England, and was an early champion of the poet Algernon Charles Swinburne. Considered a capable writer, he published two volumes of poetry (1876) and numerous journal articles on a range of subjects from politics to travel. His biography, in two volumes, was published by J. Pope-Hennessy in 1950 and 1952.

Houlton, town, seat (1839) of Aroostook County, northeastern Maine, U.S., on the Meduxnekeag River, 120 mi (193 km) northeast of Bangor. Settled in 1807 and named for one of its founders, Joseph Houlton, it early developed as a lumbering town and was incorporated in 1831. From 1828 to 1847 it was a military station (Hancock Barracks [partially restored] on Garrison Hill) that played an active role during the bloodless Aroostook War caused by the Maine–New Brunswick border dispute (settled in 1842). Ricker College was founded there in 1848. The economy is geared to potato farming, supplemented by beef and dairy production and woodworking industries. Houlton International Airport at the Canadian–U.S. border, immediately to the east, is a port of entry and site of an industrial park. Pop. (1980) 6,766.

Consult the INDEX *first*

Houma, city, seat (1832) of Terrebonne Parish, southeastern Louisiana, U.S., 50 mi (80 km) southwest of New Orleans. It lies on the Bayou Terrebonne and Intracoastal Waterway and is connected to the Gulf of Mexico by the 36-mi Houma Navigation Canal. Founded *c.* 1810 and named after the Houma Indians, it early developed as a fishing, fur, and shrimp port. It is a centre for seafood and refines and ships locally produced oil, gas, sulfur, and sugar. In the vicinity are many antebellum homes, including the Southdown Plantation (*c.* 1850). A U.S. sugar experiment station is nearby. Inc. town, 1848; city, 1911. Pop. (1980) 32,602.

hound's-tongue, about 60 species of the plant genus *Cynoglossum*, including the bright-blue flowered Chinese forget-me-not (*C. amabile*), native in mostly temperate areas of the New World and Old World. They are named for their usually rough, tongue-shaped leaves.

Hound's-tongues of two purplish-red flowered, European species, *C. officinale* and *C. germanicum*, are widespread along roadsides and in dry soils, the former naturalized in



Hound's-tongue (*Cynoglossum officinale*)
R.G. Foord—EB Inc.

North America. They are 60 to 90 centimetres (2 to 3 feet) tall and produce curving sprays of small, five-lobed blooms and sticktight clusters of spined seeds.

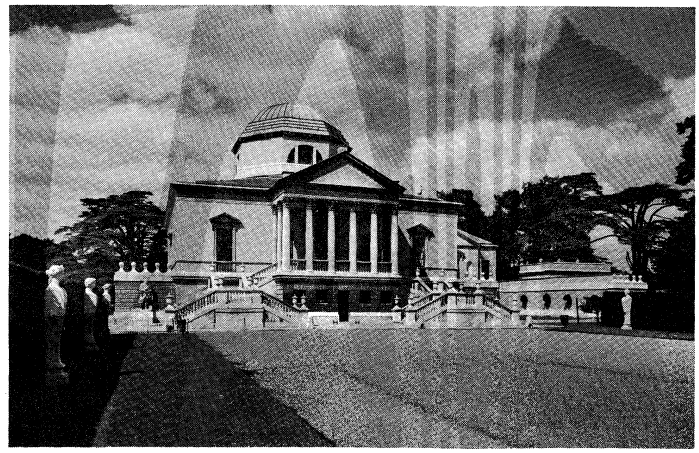
Houni (people): *see* Hani.

Hounsfield, Sir Godfrey Newbold (b. Aug. 28, 1919, Newark, Nottinghamshire, Eng.), English electrical engineer who shared the 1979 Nobel Prize for Physiology or Medicine with Allan Cormack for his part in developing the important diagnostic technique of computerized axial tomography (CAT).

After studying electronics and radar as a member of the Royal Air Force during World War II and at Faraday House Electrical Engineering College in London, Hounsfield joined the research staff of EMI Ltd. in 1951. He led the design team that built the first all-transistor computer in Great Britain, the EMIDEC 1100, in 1958–59. Later, while investigating the problem of pattern recognition, he developed the basic idea of CAT. Various prototype scanners gave encouraging results, and in 1972 the first clinical test of CAT-scanning was performed successfully.

For his work Hounsfield received numerous awards in addition to the Nobel Prize, and he was knighted in 1981.

Hounslow, outer borough of Greater London, in the Thames Valley on the western periphery of the city. The picturesque Thames riverside communities of Chiswick and Strand-on-the-Green contrast with the large industrial complex of Brentford; two of London's major



East front of Chiswick House, Hounslow, London
A.F. Kersting

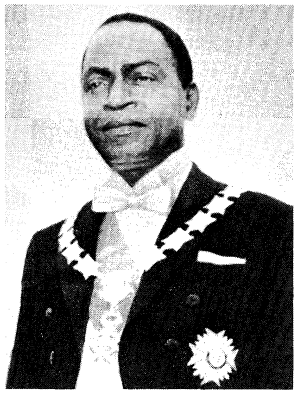
traffic arteries, the Great West Road and the M4 motorway, are located in the north.

Brentford was the scene of the battle (1016) between the Dane Canute (ruled 1016–35) and the forces of Ethelred's son, the Anglo-Saxon Edmund (ruled 1016). In 1281, Edward I (reigned 1272–1307) granted permission for a bridge to be built across the River Brent, and Brentford grew as a market town in rural Middlesex.

Modern industrialization has changed the face of the area as Brentford and Chiswick have become linked. Chiswick has retained much of its elegance, but a variety of factories have sprung up, particularly along the Great West Road. Feltham grew rapidly after World War II, under the influence of the adjoining London (Heathrow) Airport to the west.

Chiswick House, Syon House, and Osterley House are all set in pleasant landscaped parkland. The present Chiswick House was designed (1725) in Italian style by the 3rd earl of Burlington. Syon House, on the site of the wealthy and influential monastery established at Isleworth in 1415, became the home of the dukes of Northumberland. Robert Adam rebuilt and redecorated Osterley House between 1760 and 1780, and the gardens are now a public park. Other mansions include Gunnersbury House, Boston Manor House, and the 17th-century Hogarth House which now displays prints of the painter's work. The borough covers an area of 23 sq mi (59 sq km). Pop. (1982 est.) 204,400.

Houphouët-Boigny, Félix (b. Oct. 18, 1905, Yamoussoukro, Ivory Coast, French West Africa), first president of the Ivory Coast and a



Houphouët-Boigny
By courtesy of the Ivory Coast Information Service

skillful politician who continued close cooperation with France after independence.

Houphouët-Boigny was of chiefly lineage, held a high-status occupation as an "African doctor" (a position that required less than a full medical degree, but was the highest open to a French colonial African), and pursued a second career as a wealthy planter. He used all elements of his background to advantage in building a successful political movement.

Houphouët-Boigny began his political career as a cofounder of the Syndicat Agricole Africain, formed by disgruntled African planters (1944) to protect their interests against European settlers. In the first Ivory Coast elections (1945) he was elected a deputy to the French Assembly and was easily reelected in 1946. That year he also founded the Parti Démocratique de la Côte d'Ivoire (PDCI), affiliated with the French Communist Party and an important component of the inter-territorial French West African Federation party, the Rassemblement Démocratique Africain, of which he was also president.

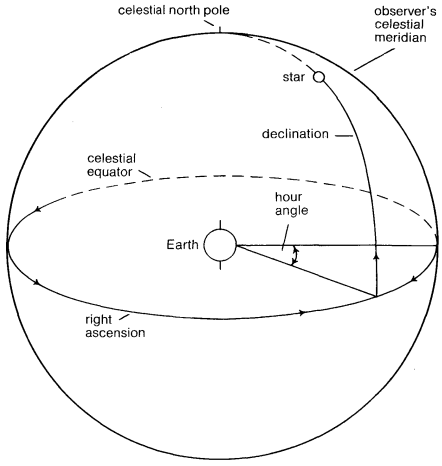
In the late 1940s the French administration became increasingly hostile, especially after the Communist Party went into opposition in France, and in October 1950 Houphouët-Boigny decided to break his party's ties with Communism and to cooperate with the French, all the time building up party strength and organization through successive elections. He divided his time between France, where he was a member of the National Assembly and later a Cabinet minister, and the Ivory Coast, where he was president of the territorial assembly and mayor of Abidjan as well as retaining overall party leadership. Meanwhile, he strongly rejected the idea of a West African federation of independent states because he was unwilling to have the wealthy Ivory Coast subsidizing its poorer neighbours; when Pres. Charles de Gaulle in 1958 offered French territories a referendum on whether to join a new federal community or to become independent, he campaigned successfully for self-government within the French Community.

Houphouët-Boigny became head of the Ivory Coast government in 1959 and president of the independent country in 1960. Although he was not able to placate all elements of opposition to his one-party government, he won over some opponents by giving them government posts and brought potentially dangerous organizations under party or government control. He retained a number of Frenchmen in high positions and continued to cooperate with French interests in the economic sphere.

hour, in timekeeping, 3,600 seconds, now defined in terms of radiation emitted from atoms of the element cesium under specified conditions. The hour was formerly defined as the 24th part of a mean solar day, *i.e.,* of the average period of rotation of the Earth relative to the Sun. The hour of sidereal time, 1/24 of the Earth's rotation period relative to the stars, was about 10 seconds shorter than the hour of mean solar time.

In even earlier systems of timekeeping, an hour was 1/12 of a period of daylight or darkness—hence, variable in length with seasonal changes in the length of day and night. The custom of dividing the cycle of day and night into 24 periods seems to have originated with the ancient Egyptians.

hour angle, in astronomy, the angle between an observer's meridian (a great circle passing over his head and through the celestial poles) and the hour circle (any other great circle passing through the poles) on which some celestial body lies. This angle, when expressed in hours and minutes, is the time elapsed since the celestial body's last transit of the observer's meridian. The hour angle can also be



Measurement of hour angle
From W.T. Skilling and R.S. Richardson, *Astronomy;* reproduced by permission of Holt, Rinehart and Winston, Inc.

expressed in degrees, 15° of arc being equal to one hour. *See also* right ascension.

hour circle, in astronomy, any great circle (similar to longitude) on the celestial sphere that passes through the celestial poles; *i.e.,* is perpendicular to the celestial equator. The declination of a celestial object is measured along its hour circle. The hour circle that at any moment is passing through an observer's zenith is his meridian.

The term also refers to a scale on the mounting of an equatorial telescope, indicating the hour angle at which the telescope is aimed.

houri (Islām): *see* ḥawrāʾ.

hours, canonical, also called LITURGY OF THE HOURS: *see* divine office.

hours of labour: *see* labour, hours of.

Housatonic River, river in southwestern New England, rising in the Berkshire Hills, near Pittsfield, Mass., U.S. It flows southerly for 148 mi (238 km), through Massachusetts past Pittsfield, Lee, and Great Barrington; then through Connecticut past New Milford, Derby, and Shelton to enter Long Island Sound, 4 mi east of Bridgeport. Several hydroelectric plants utilize the drop of 959 ft (292 m) in the first 119 mi to Derby, Conn. Below Derby the river is tidal for about 12 mi. Dams on the river include Shepaug Dam near Sandy Hook, Conn. Lake Zoar is impounded in the river in Paugussett State Forest.

The name Housatonic is supposedly derived from the Mahican Indian word for "place beyond the mountain."

house, in astrology, one of the 12 sectors, or divisions, of the celestial sphere. *See* horoscope.

house (theatre): *see* mansion.

House, Edward M(andell) (b. July 26, 1858, Houston, Texas, U.S.—d. March 28, 1938, New York City), U.S. diplomat and



House, 1920
By courtesy of the Library of Congress, Washington, D.C.

confidential adviser to Pres. Woodrow Wilson (1913–21) who played a key role in framing the conditions of peace to end World War I.

Independently wealthy, House turned from business to politics and between 1892 and 1904 served as an adviser to Texas governors, one of whom gave him the honorary title of colonel. Thereafter he was commonly known as Colonel House. He was active in the presidential campaign of Democrat Woodrow Wilson in 1912, and after Wilson was elected he became the new president's most trusted adviser. He developed excellent relations with congressional leaders and had an important role in winning congressional support for Wilson's legislative program.

After the outbreak of war in Europe in 1914, House became Wilson's principal representative to the governments of Great Britain, France, and Germany. He visited those nations in 1915 and again in 1916 to explore the possibility of mediation by the United States, but found their leaders generally evasive or

unresponsive. With the U.S. declaration of war against Germany (April 6, 1917), House was given responsibility for working with representatives of the Allied nations to coordinate programs in such fields as manpower, finance, supplies, and shipping. He helped the president with many of his wartime speeches, including the one outlining the Fourteen Points, which Wilson proposed as the basis for peace at the end of the war. When Germany requested a discussion of peace terms (October 1918), House represented the United States at the Inter-Allied conference, where he persuaded the Allied leaders to accept the Fourteen Points as the basis for a peace treaty.

House was a member of the U.S. delegation to the Paris Peace Conference of 1919 and worked closely with Wilson in the drafting of the covenant of the League of Nations. As the negotiations wore on, however, House, who was a realist and an apostle of compromise, began to lose the confidence of Wilson, an idealist who found compromise distasteful. The gap between the two men widened, and, after the signing of the Treaty of Versailles (June 28, 1919), they never saw each other again.

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house cat: *see* domestic cat.

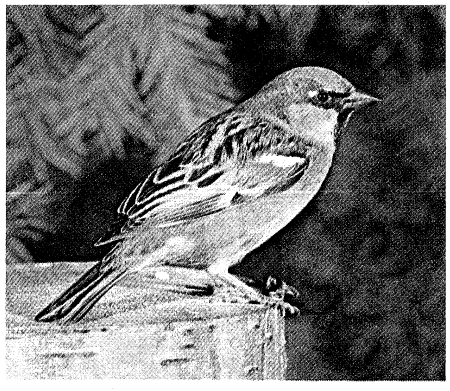
house mouse, common species of mouse (*q.v.*).

House of Representatives (U.S.): *see* Representatives, House of.

house snake, any of several species that occur around dwellings. In the United States this name is often given to the milk snake (*see* king snake).

The house snakes of Africa belong to the genus *Boaedon,* family Colubridae. They are harmless mouse- and rat-catchers. An example is *B. lineatum* of eastern Africa, often found in eaves or under mats; it is blackish and usually less than 90 cm (35 inches) long.

house sparrow, also called ENGLISH SPARROW (*Passer domesticus*), one of the world's best-known and most abundant small birds,



House sparrow (*Passer domesticus*)
Eric Hosking

sometimes classified in the family Ploceidae (*q.v.*; order Passeriformes) or separated as Passeridae. It lives in towns and on farms, worldwide, having accompanied Europeans from its original home—most of Eurasia and northern Africa. It was introduced into North America at Brooklyn, N.Y., in 1852 and within a century had spread across the continent. It is a 14-centimetre (5.5-inch) buffy-brown bird with a black bib (male only). House sparrows breed nearly year-round in warm regions. The nest, containing four to nine eggs, is an untidy bundle of straw and feathers—usually quite dirty—placed in house eaves. Both birds of the pair take part in building the nest. Formerly, large sparrow populations were supported by waste grain from the feed of horses, and the number of sparrows in urban areas declined as horses were replaced by automobiles.

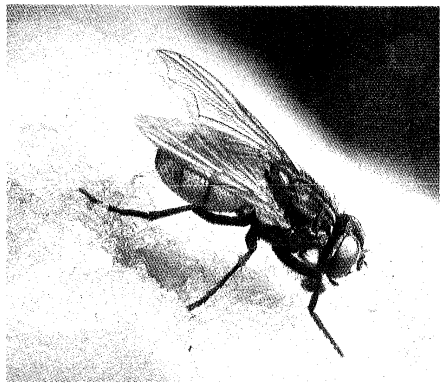
Housebook, Master of the, also called MASTER OF THE HAUSBUCH, or MASTER OF THE AMSTERDAM CABINET, German HAUSBUCHMEISTER, or MEISTER DES HAUSBUCHS (fl. 1450–70), anonymous late Gothic painter and engraver who was one of the outstanding early printmakers. He was formerly referred to as the Master of the Amsterdam Cabinet because the Rijksprentenkabinet, the print room of the Rijksmuseum, in Amsterdam has the largest collection of his line engravings (*q.v.*) and etchings done with a technique close to drypoint (*q.v.*). Today he is usually called the Housebook (*Hausbuch*) Master after a *Hausbuch,* or sketchbook, drawn by him for the Wolfegg family that is still in Schloss Wolfegg, near Aulendorf in the Lake Constance, or Bodensee, region of Germany. The *Hausbuch* drawings and his 91 known prints are primarily whimsical and sometimes satiric observations of his contemporary world, although he also did religious subjects. Nothing is known of his life, but art historians generally agree that he was a German artist who came from either Swabia or the Middle Rhine region. Some scholars have advanced the theory that the Housebook Master and the Master of the Amsterdam Cabinet are two different artists, while others have tried to prove that these anonymous works were really done by the young Matthias Grünewald (*q.v.*).

housecarl, also spelled HUSCARL, Old Norse HÚSKARL ("house man"), Danish and Norwegian HIRD ("household," or "household member"), member of the personal or household troops or bodyguard of Scandinavian kings and chieftains in the Viking and medieval periods. The housecarls achieved a celebrated place in European history as the Danish occupation force in England under Canute the Great in 1015–35.

Canute's 3,000-man force, which remained in England after the invasion army had been sent home, does not represent the typical size of a royal retinue; forces of approximately 90 men were more common. Housecarls were distinguished by great personal loyalty to their employers; in exchange they received booty and maintenance in the employer's household or court. Their lives were regulated by laws that governed their personal behaviour, military chain of command, and civil functions (police work and tax collection, for example). Housecarls disappeared after the rise of military aristocracies and bureaucratized royal courts in the late Middle Ages.

During World War II, the Norwegian Nazi Vidkun Quisling revived the term Hird (plural Hirden) for his political stormtroopers.

housefly (*Musca domestica*), a common insect of the family Muscidae (order Diptera). About 90 percent of all flies occurring in human habitations are houseflies. Once a major nuisance and hazard to public health in cities, houseflies are still a problem wherever decomposing organic waste and garbage are allowed to accumulate. The adult housefly is dull gray with dirty-yellowish areas on the abdomen and longitudinal lines on the thorax. Body size ranges from about 5 to 7 mm (0.2 to 0.3 inch), and the conspicuous compound eyes have approximately 4,000 facets. Because it has sponging or lapping mouthparts, the housefly cannot bite; a near relative, the stable fly, however, does bite. The housefly can walk on vertical window panes or hang upside down on a ceiling probably because of the surface-tension properties of a secretion produced by tiny glandular pads (pulvilli) beneath each claw on the feet. The female deposits more than 100 slender whitish eggs (0.8 to 1 mm long) at a time, producing between about 600



Housefly (*Musca domestica*) on a doughnut
Avril Ramage—© Oxford Scientific Films Ltd.

and 1,000 eggs in her life. These eggs hatch in 12 to 24 hours. After several molts the dirty-whitish maggots (larvae), about 12 mm long, transform into pupae. The adults, when developed, expand a pouch (ptilinum) on the head and break off the end of the puparium to emerge.

Houseflies may carry on their feet millions of microorganisms that, in large enough doses, can cause disease. Garbage, manure, and similar wastes that cannot be made inaccessible to flies can be treated with larvicidal drenches or dusts. Residual insecticidal sprays are effective against flies for several weeks; however, some houseflies have developed resistance to certain insecticides, such as DDT.

houseleek, also called LIVE-FOREVER, any of numerous low-growing succulent plants constituting the genus *Sempervivum,* about 40 species, in the stonecrop family (Crassulaceae), native to Europe, Morocco, and western Asia. The name houseleek refers to the growth of some species on thatched roofs in Europe; "live-forever" indicates their hardiness and durability. Houseleeks usually have thick fleshy leaves arranged in a dense rosette. Small plantlets, or offsets, arise in a cluster around the parent plant. They are useful in garden borders and rock gardens and are attractive in window pots indoors.

The common houseleek, also known as old-man-and-woman or hen-and-chickens (*S. tectorum*), has given rise to a number of cultivated varieties of horticultural interest. Cobweb houseleek (*S. arachnoideum*), with leaftips connected by weblike strands, has also yielded many desirable varieties.

Consult the INDEX *first*

Houseman, John, original name JACQUES HAUSSMANN (b. Sept. 22, 1902, Bucharest, Rom.—d. Oct. 31, 1988, Malibu, Calif., U.S.), American stage, film, radio, and television producer who is perhaps best known for his later career as a character actor.

As a child, Houseman traveled throughout Europe with his British mother and Alsatian father. He was educated in England and immigrated to the United States in 1924. His first major job in the theatre was as director of Virgil Thomson's opera *Four Saints in Three Acts* in 1934. The following year he organized, with Orson Welles, the Negro Theatre Project, a part of the Works Progress Administration's Federal Theatre Project. In 1937 he and Welles formed the Mercury Theatre, which achieved success both on Broadway and on radio. Houseman served as both writer and producer for the company.

In the 1940s Houseman moved to Hollywood, where he produced 19 feature films, including *Letter from an Unknown Woman*

(1948), *They Live by Night* (1949), *The Bad and the Beautiful* (1952), *Julius Caesar* (1953), and *Lust for Life* (1956). He continued to produce and direct plays on Broadway, and in the 1950s he worked as a producer for CBS-TV. He also served as artistic director for, among others, the American Shakespeare Festival, the Professional Theatre Group at the University of California at Los Angeles, the drama division of the Juilliard School, and the Acting Company, a touring repertory group that he cofounded.

In 1973 Houseman portrayed a caustic, imperious law-school professor in *The Paper Chase,* a film directed by his former apprentice James Bridges. His performance earned him an Academy Award, and he became identified with the character, appearing in similar roles in numerous other films and television programs. He published several volumes of memoirs, including *Run Through* (1972), *Front and Center* (1979), and *Final Dress* (1983).

houseplant, plant adapted for growing indoors, commonly a member of a species that flourishes naturally only in warm climates.

A brief treatment of houseplants follows. For full treatment, *see* MACROPAEDIA: Gardening and Horticulture.

Although the practice of growing plants indoors was known in the ancient world, houseplants did not become widely popular until after the 17th century. In 1652 an English authority on agriculture, Sir Hugh Platt, published *The Garden of Eden,* which discussed how plants might be grown indoors. Not long afterward, the many previously unknown species brought back to Europe from the tropics by the voyages of discovery could be found in newly built greenhouses and conservatories.

Two factors contribute to the success of the huge number of species grown today as houseplants. It is essential that houseplants be easy to care for; they must be able to tolerate the fairly low levels of light and humidity found in most homes. Of course, attractiveness also plays an obvious role—houseplants are favoured either because of their foilage, or because of the flowers they produce, or both.

Although specific points vary from species to species, in general a plant's basic requirements will be met by trying to match as closely as possible its native environment. There are five aspects of a plant's environment to which attention should be paid.

Light. All plants need some bright light each day, although it need not be direct. Obviously, plants from shady environments, such as forests or jungles, need less light than plants that grow in the open, as is the case with most flowers. In most cases, artificial light can make up for any lack of sunlight.

Temperature and humidity. Because air in many homes is heated by radiators, it tends to be too dry for many plants, especially in winter. To keep humidity up, it is best to keep the temperature down, preferably between 60° and 70° F (15° and 21° C) during the day, and 5°–10° F (3°–6° C) lower at night.

Soil. A standard mixture of loam, peat moss, and sand is good for most houseplants, although various materials might be substituted to better match a plant's native soil. Soil should be given adequate drainage and contact with the air; for this reason unglazed pots with drainage holes are the preferred containers for houseplants.

Water. The amount of water a plant is given is the most variable element of its care and should be determined by observing the amount it actually uses. Watering must be adjusted to the needs of the plant, the size of its container, the composition of its soil, and the temperature and humidity of the room.

Nutrients. Plants receive the nutrients necessary to healthy growth from soil. But as the nutrients in potted soil become depleted, they should be replenished by adding fertilizers, which can be obtained commercially. In addition, nutrients can be sprayed onto a plant's leaves, a practice that stimulates foliage growth.

Basic care should keep houseplants healthy; if their leaves turn brown it is likely that they are not being cared for correctly. Problems can include too much or too little light or water, improper temperature and humidity conditions, or the presence of some noxious gas. Another common problem with houseplants is that they can become infested with pests, the most common of which are mealybugs, aphids, root lice, and red spiders. Pests can be controlled by washing the plant with various liquids, ranging from alcohol to soapy water, or with commercial insecticides.

Housman, A(lfred) E(dward) (b. March 26, 1859, Fockbury, Worcestershire, Eng.—d. April 30, 1936, Cambridge), English scholar and celebrated poet whose lyrics express a Romantic pessimism in a spare, simple style.

Housman, whose father was a solicitor, was one of seven children. He much preferred his mother; and her death on his 12th birthday was a cruel blow, which is surely one source of the pessimism his poetry expresses. While a student at Oxford, he was further oppressed by his dawning realization of homosexual desires. These came to focus in an intense love for one of his fellow students, an athletic young man who became his friend but who could not reciprocate his love. In turmoil emotionally, Housman failed to pass his final examination at Oxford, although he had been a brilliant scholar.

From 1882 to 1892 he worked as a clerk in the Patent Office in London. In the evenings he studied Latin texts in the British Museum reading room and developed a consummate gift for correcting errors in them, owing to his mastery of the language and his feeling for the way poets choose their words. Articles he wrote for journals caught the attention of scholars and led to his appointment in 1892 as professor of Latin at University College, London.

Apparently convinced that he must live without love, Housman became increasingly reclusive and for solace turned to his notebooks, in which he had begun to write the poems that eventually made up *A Shropshire Lad* (1896). For models he claimed the poems of Heinrich Heine, the songs of William Shakespeare, and the Scottish border ballads. Each provided



A.E. Housman, detail of a drawing by William Rothenstein, 1906; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

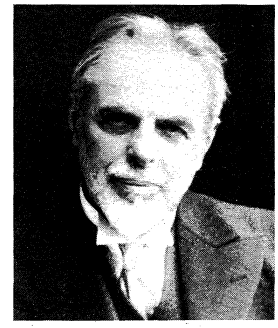
him with a way of expressing emotion clearly and yet keeping it at a certain distance. For the same purpose, he assumed in his lyrics the unlikely role of farm labourer and set them in Shropshire, a county he had not yet visited when he began to write the first poems. The popularity of *A Shropshire Lad* grew slowly but so surely that *Last Poems* (1922) had astonishing success for a book of verse.

Housman regarded himself principally as a Latinist and avoided the literary world. In 1911 he became professor of Latin at Cambridge, teaching there almost up to his death. His major scholarly effort, to which he devoted more than 30 years, was an annotated edition of Manilius (1903–30), whose poetry he did not like but who gave him ample scope for emendation. Some of the asperity and directness that appears in Housman's lyrics also is found in his scholarship, in which he defended common sense with a sarcastic wit that helped to make him widely feared.

A lecture, *The Name and Nature of Poetry* (1933), gives Housman's considered views of the art. His brother Laurence selected the verses for the posthumous volume *More Poems* (1936). Housman's *Letters* appeared in 1971.

BIBLIOGRAPHY. An account of his life and work is contained in A.S.F. Gow, *A.E. Housman* (1936). A later biography is Richard Percival Graves, *A.E. Housman: The Scholar Poet* (1979).

Housman, Laurence (b. July 18, 1865, Bromsgrove, Worcestershire, Eng.—d. Feb. 20, 1959, Glastonbury, Somerset), English artist and writer who reached his widest public with a series of plays about the Victorian era, of which the most successful was *Victoria Regina* (1934). A younger brother of the poet A.E. Housman, he studied art in London.



Laurence Housman

By courtesy of Jonathan Cape Ltd.

Among Housman's earliest works were illustrations for Christina Rossetti's *Goblin Market and Other Poems.* His first writings were fairy tales and poems, which he illustrated himself. His first play, *Bethlehem,* was privately produced by Gordon Craig in 1902 but, like many of his dramatic works, was for some years withheld by censorship from public performance. *Prunella* (1906), a charming fantasy in which Harley Granville-Barker collaborated, escaped this fate. It was not, however, until 1922 that Housman again became prominent, with the publication of the first of three collections entitled *Little Plays of St. Francis.* The Victorian historical piece *Angels and Ministers* had appeared in 1921, and in 1922 *Dethronements. Victoria Regina* was staged in the United States with great success before it was licensed in England in 1937. The note of satire that in varying degrees pervaded much of his writing was dominant in the novel *Trimblerigg* (1924), of which David Lloyd George was the thinly disguised butt.

Houssay, Bernardo Alberto (b. April 10, 1887, Buenos Aires, Arg.—d. Sept. 21, 1971, Buenos Aires), Argentine physiologist, who received (with Carl and Gerty Cori) the 1947 Nobel Prize for Physiology or Medicine for his discovery of the role played by pituitary hormones in regulating the amount of blood sugar (glucose) in animals.

Working with dogs that had been rendered diabetic by excision of the pancreas (1924–37), Houssay found that removal of the adenohypophysis (the anterior, or frontal, lobe of the pituitary body, located beneath the brain)

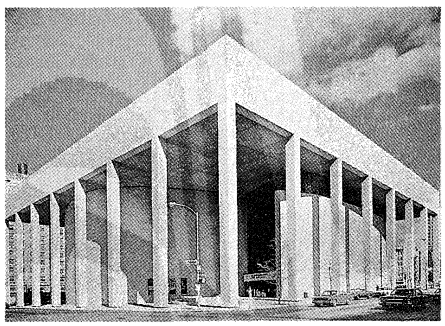
greatly relieved the symptoms of the disease and made the animal unusually sensitive to insulin. He demonstrated that injection of pituitary extracts into normal animals induces diabetes by increasing the amount of sugar in the blood, indicating that the secretions of the gland oppose the action of insulin.

Appointed professor of physiology (1910) and director of the physiological institute (1919) at the University of Buenos Aires, Houssay was one of 150 Argentine educators dismissed from their posts by the 1943 military coup of Gen. Juan Perón. Although he was reinstated in 1945, he was asked to submit his resignation a year later. He founded (1944) and directed (from 1946) the Institute of Biology and Experimental Medicine, Buenos Aires, a leading physiological research centre. His best known book is *Human Physiology* (1951).

Houston, inland port city, seat (1836) of Harris County, southeastern Texas, U.S., linked by the Houston Ship Channel to the Gulf of Mexico and the Intracoastal Waterway at Galveston, 51 mi (82 km) southeast. The state's largest city, its skyscrapers rise from the unrelieved flat Gulf Coastal Plain (alt 41 ft [12 m]). The first settlement in the area, Harrisburg (1826), was destroyed in April 1836 by the Mexican general Santa Anna in pursuit of Sam Houston and the Texas Army. A week later outside the present city at the Battle of San Jacinto, Santa Anna was captured, and Texas was freed.

In August 1836 New York land speculators, the brothers Augustus C. and John K. Allen, bought a site near burned-out Harrisburg and began advertising the place as the future "great interior commercial emporium of Texas." Two months later, John Allen persuaded the first Congress of the Republic of Texas, in session at Columbia, to move to his town, named for the first elected president, Sam Houston. The manoeuvre was later denounced, and the government stayed there only two years (1837–39). Mud-bogged and beset by yellow-fever epidemics, the town grew slowly as a cotton-shipping port; during the Civil War it became a haven for blockade runners. Briefly threatened in 1862 when Federal forces captured Galveston Island (which was soon recaptured by the Confederates), Houston, in 1863, became the headquarters for the Confederacy's Trans-Mississippi Department (Texas, New Mexico, and Arizona). The city developed as a rail centre, with 12 railways by 1891; and, after the Galveston hurricane and flood in 1900, it emerged as the state's leading port. The first dock was built in 1840, and widening and deepening of Buffalo Bayou (now part of the Houston Ship Channel) was begun in 1869. By the early 1980s the port, third largest in the U.S. in tonnage moved, was handling more than 80,000,000 tons of foreign, coastal, and canal shipping annually.

Oil, discovered in the area in 1901, brought considerable industrial development, triggering the city's expansion and prosperity. Houston is now a leading oil and petrochemical centre, the focal point for networks of natural gas pipelines, and an aerospace research and development centre. Immense resources of oil, natural gas, sulfur, lime, salt, and water have created one of the world's greatest concentrations of industries along the ship channel. Southeast near Clear Lake, 22 mi from the city's downtown area, is the Lyndon B. Johnson Space Center (1961), which is the command post for the flights by U.S. astronauts. The area around Houston is also important for rice, cotton, and cattle.



Jesse H. Jones Hall for the Performing Arts, Houston, Texas
By courtesy of the Texas Highway Department

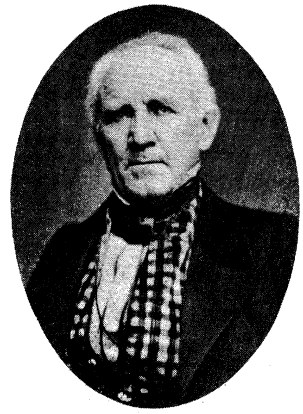
Among the many colleges and universities in the area are Rice University (1912), the University of Houston (1927), Houston Baptist University (1934), Texas Southern University (1947), and the University of St. Thomas (1947). The Texas Medical Center (organized 1945) is an immense complex of hospitals, medical schools (including the Baylor University College of Medicine [1903]), and research institutions. Houston is one of the few U.S. cities having a professional symphony orchestra and resident professional companies in ballet, opera, and theatre. The Houston Civic Center includes the Jesse H. Jones Hall for the Performing Arts (opened in 1966 and the home of the Houston Symphony Orchestra [1913], the Grand Opera Association, and the Ballet Foundation), the National Space Hall of Fame, and the Alley Theater (1968). The city's Astrodomain, a lavish entertainment complex built in the 1960s, includes the Astrodome (a plastic-domed, air-conditioned stadium and the home of the Oilers [football] and Astros [baseball] teams), the Astrohall (a large exhibition centre and the site of livestock shows, rodeos, and the circus), and the Astroworld (a theme amusement park). Hermann Park is the site of the Zoological Gardens, the Museum of Natural Science, and the Burke Baker Planetarium; other notable institutions in Houston include the Museum of Fine Arts and the Contemporary Arts Museum. The Houston Intercontinental Airport was opened in 1969. Inc. 1837. Pop. (1980) city, 1,594,086; metropolitan area (SMSA), 2,905,350.

Houston, Edwin James (b. July 9, 1847, Alexandria, Va., U.S.—d. March 1, 1914, Philadelphia), U.S. electrical engineer who influenced the development of commercial lighting in the United States.

A Philadelphia high school teacher, Houston collaborated with Elihu Thomson in experimenting on induction coils, dynamos, wireless transmission, and the design of an arc lighting system (patented in 1881) that was widely successful and led to further improvements in lighting techniques. The Thomson–Houston Electric Co., organized in 1883 at Lynn, Mass., merged with Thomas Edison's company in 1892 to form the General Electric Company. In 1893 Houston was appointed chief electrician at the World's Columbian Exposition in Chicago, where he implemented George Westinghouse's two-phase alternating-current power system.

Houston, Sam, byname of SAMUEL HOUSTON (b. March 2, 1793, Rockbridge County, Va., U.S.—d. July 26, 1863, Huntsville, Texas), U.S. lawyer and politician who became a leader of the struggle by U.S. emigrants in Mexican territory to win control of Texas (1834–36) and make it part of the United States.

In his youth Houston moved with his family to a farm in rural Tennessee after the death of his father in 1807. He ran away in his mid-teens and lived for nearly three years with the Cherokee Indians in eastern Tennessee, where he took the name Black Raven and learned the native language, skills, and customs. Houston thus developed a rapport with the Indians that was unique for his day. As a consequence, after service in the War of 1812 and an interlude of study and teaching, in 1817 Houston became a U.S. subagent assigned to manage the removal of the Cherokee from Tennessee to a reservation in the Arkansas Territory. He returned to Nashville to practice law and from 1823 to 1827 served as a U.S. congressman. He was elected governor of Tennessee in 1827. After a brief unsuccessful marriage to Eliza Allen in 1829, he resigned his office; he again sought refuge among the Cherokee and was formally adopted into the tribe. He twice went to Washington, D.C., to expose frauds practiced upon the Indians by government agents and in 1832 was sent by Pres. Andrew Jackson to Texas, then a Mexican province, to negotiate Indian treaties for the protection of U.S. border traders.



Sam Houston, photograph by Mathew Brady
By courtesy of the Library of Congress, Washington, D.C.

Houston's arrival in Texas coincided with the heated contest between U.S. settlers and Mexicans for control of the area. He established a home there by 1833, and he quickly emerged as one of the settlers' main leaders. When they rose in rebellion against Mexico in November 1835, he was chosen commander in chief of their army. The revolt suffered reverses during the winter, but on April 21, 1836, Houston and a force of fewer than 800 Texans surprised and defeated 1,600 Mexicans under Gen. Antonio López de Santa Anna at San Jacinto. This triumph secured Texan independence and was followed by Houston's election as president (1836–38; 1841–44) of the Republic of Texas. He was influential in gaining the admission of Texas to the United States in 1845. Houston was elected one of the new state's first two senators, serving as a Union Democrat from 1846 to 1859. His views on the preservation of the union were unpopular with the Texas legislature, however, and on the eve of the Civil War he was not reelected—although he was chosen governor once more in 1859. In this position he tried unsuccessfully to prevent the secession of his state in 1861, and upon his refusal to swear allegiance to the Confederacy, he was declared deposed from office in March.

He spent his last two years quietly at home in Huntsville with Margaret Lea, his wife from 1840 and mother of his eight children. The city of Houston, Texas, was named in his honour. *The Raven: A Biography of Sam Houston* by Marquis James was published in 1953.

Houston Ship Channel, waterway that connects Houston, Texas, with the Gulf of Mexico, passing through the former Buffalo Bayou and Galveston Bay. The channel, which was opened in 1914 and later improved, is 50.5 mi (81.3 km) long, 36 ft (11 m) deep, and has a minimum width of 300 ft (90 m). It requires no locks.

Hout, Jan van (b. Dec. 14, 1542, Leiden, Holland—d. Dec. 12, 1609, Leiden), Human-

ist, translator, historian, and poet, who was the first Dutch Renaissance figure to distinguish himself from his contemporaries in the field of literary theory. He foresaw the line of development that European literature was to take and wrote from the first in the iambic metre.

His "modernity" is also seen in his intense interest in his Germanic past and in his vigorous campaigns against the dry rhetoric and set conventions that characterized the literature of the time.

Most of van Hout's poetry has been lost, and what survives does not rank him with such Dutch Humanist poets as Dirk Coornhert and Henric Laurenszoon Spieghel, but his few surviving prose works show a remarkable individuality of style and enlightenment of spirit. His prose introduction to his now lost translation of the Scottish Humanist George Buchanan's *Franciscanus* (*c.* 1575) is a highly ironic invective against the then corrupt Franciscan order and the Roman Catholic Church. As a historian, van Hout rose above the medieval tradition of mere chronology with his clarity of thought, his contempt for irrelevancies, and his search for objective truth.

Houtman, Cornelis and Frederik de (respectively b. *c.* 1540, Gouda, Neth.—d. Sept. 11, 1599, Atjeh, Sumatra, Dutch East Indies; b. 1571, Gouda, Neth.—d. Oct. 21, 1627, Alkmaar), brothers who navigated and led the first Dutch trading expedition to the East Indies, an area whose trade previously had been a Portuguese monopoly.

Cornelis and Frederick were sent to Lisbon in 1592 as commercial representatives of nine Dutch merchants. The brothers were imprisoned by the Portuguese for attempting to steal secret charts of East Indian sailing routes. After their release in 1595 they returned to Amsterdam, where Cornelis was appointed commander of four merchant ships of the Verre Company, a syndicate founded by the nine merchants to establish trade with the East Indies. The brothers set sail with the fleet on April 2, 1595, and navigated the voyage with the aid of sailing directions written by the Dutch explorer Jan Huyghen van Linschoten. After reaching the East Indies in 1596, Cornelis established trade relations with the rulers of Java, Sumatra, and Bali (all now part of Indonesia); the brothers returned to Amsterdam with a cargo of spices in 1596. On a second voyage (1598–99), they established trade with Madagascar. The brothers returned in 1599 to Sumatra, where Cornelis was killed in a battle against the forces of the Sultan of Acheh.

Frederik, who was imprisoned by the Sultan, studied the Malay language during his confinement and, after his release and return to Amsterdam in 1602, wrote the first Malay dictionary (1603). He later served as governor of Amboina (1605–11) and the Moluccas (1621–23), all now part of Indonesia; in 1619 he discovered Houtman's Abrolhos, shoals on the west coast of Australia.

Hova (people): *see* Merina.

Hovaness, Alan (U.S. composer): *see* Hovhaness, Alan.

Hovd, also spelled CHOVD, also called JIRGALANTA, or DZHIRGALANTU, formerly KHOBDO, or KOBDO, town, administrative headquarters of Hovd *aymag* (province), western Mongolian People's Republic, in the northern foothills of the Mongol Altayn Nuruu (Mongolian Altai Mountains) at an elevation of 4,260 ft (1,300 m). Har Us Nuur (lake) lies to the east and is fed by the Hovd Gol (river).

Founded in 1731 as a trade depot linked commercially with Peking, Hovd is the main trade centre of western Mongolia. Wool, butter, and agricultural products are among the chief items of trade. The town has an agricultural college and agriculture-based industries such as a wool-washing factory, a meat combine, and a food combine. Pop. (1979) 17,600.

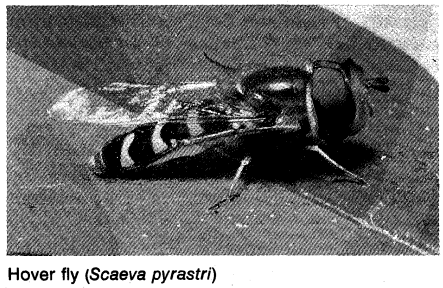
Hove, district (borough), county of East Sussex, England, on the English Channel, adjoining Brighton on the west, from which it is administratively separate. The administrative district set up in 1974 includes Portslade. Hove grew with Brighton as a seaside resort and residential town in the 19th century, with excellent road and rail connections with London to the north. It has an area of 9 sq mi (24 sq km). Pop. (1982 est.) 89,000.

Hoveida, Amīr ʿAbbas: *see* Hoveyda, Amīr ʿAbbas.

hoven (animal disorder): *see* bloat.

Hovenweep National Monument, national monument in southwestern Colorado and southeastern Utah, U.S., 25 mi (40 km) west of Cortez, Colo., established in 1923. It consists of six groups of pre-Columbian Indian ruins: the Square Tower Canyon Cluster and the Cajon Canyon Group in Utah; and the Holly (or Keeley) Canyon Group, the Hackberry Canyon Group, Cutthroat Castle, and Goodman Point in Colorado. Their square, oval, and D-shaped towers are excellent examples of Pueblo Indian defensive architecture of the period 1100–1300 AD. Some of the towers probably served as storage bins; others, on the edges of cliffs, apparently were used as lookout points; still others were built over kivas (underground ceremonial chambers). Hovenweep is a Ute Indian word meaning "deserted valley." Access to the monument, which covers 785 ac (318 ha), is by graded dirt roads.

hover fly, also called FLOWER FLY, or SYRPHID FLY, any member of the insect family Syrphidae (order Diptera), which numbers about 4,000 species. Their various common names refer to the behaviour of hovering around flowers. Hover flies, with their yellow markings, resemble wasps or bees but do not bite or sting. They are distinguished from other flies by a false (spurious) vein that closely parallels the fourth longitudinal wing vein. The species vary from small, elongated, and slender (*e.g., Baccha*) to large (bumblebee size), hairy, and yellow and black (*Criorhina*).



Hover fly (*Scaeva pyrastri*)
William E. Ferguson

The larvae of many hover flies (*e.g., Syrphus americanus, Allograpta obligae*) are predatory on aphids; a larva consumes the body fluids of hundreds of aphids before entering a resting (pupa) stage. Larvae are also important in pollination. Some, such as the narcissus bulb fly (*Merodon* or *Lampetia equestris*) and the lesser bulb fly (*Eumerus tuberculatus*), tunnel in flower bulbs, onions, and flower corms. *Microdon* larvae live in ant and termite nests; *Volucella* larvae, in bumblebee nests; and others, in decomposing vegetation. The rat-tailed maggots (larvae) of the drone fly (*Eristalis tenax*), which live in drains and polluted waters, have a telescopic breathing tube at the rear that gives them their common name.

Hovercraft: *see* air-cushion machine.

Hovey, Richard (b. May 4, 1864, Normal, Ill., U.S.—d. Feb. 24, 1900, New York City), U.S. poet, translator, and dramatist.

After graduating from Dartmouth in 1885, Hovey studied art and theology and in 1887 met Bliss Carman, the poet, with whom he later collaborated. Hovey lectured on aesthetics at the Farmington School of Philosophy and, for the last two years of his life, at Columbia University, where he held a post as professor of English at Barnard College. A self-conscious individual, he tried, in clothing and mannerisms, to be an American Oscar Wilde. His works consistently reflect his faith in an optimistic and vital United States. His books include *Launcelot and Guenevere: A Poem in Dramas* (1891); with Bliss Carman, *Songs from Vagabondia* (1894), *More Songs from Vagabondia* (1890), and *Last Songs from Vagabondia* (1901, posthumous); and such other works as *Seaward* (1893), an elegy on the poet Thomas William Parsons; *Along the Trail* (1898); and *Taliesin, a Masque* (1900). Also published posthumously was *To the End of the Trail* (1908). He translated eight of Maeterlinck's plays into English.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Hoveyda, Amīr ʿAbbas, Hoveyda also spelled HOVEIDA (b. Feb. 18, 1919, Tehrān—d. April 7, 1979, Tehrān), prime minister of Iran under Shah Mohammed Reza Pahlavi from January 1965 to August 1977.

After taking political science degrees at the universities of Brussels and Paris, Hoveyda joined the Iranian Foreign Office and served in Paris (1945–47), Bonn (1947–51), Ankara (1957), and at the United Nations in New York City (1951–57). In 1958 he was appointed to the board of the National Iranian Oil Company. After becoming prime minister he organized the October 1971 festivities at Persepolis commemorating the 2,500th anniversary of the founding of the Persian Empire. As leader of the ruling Iran Novin (New Iran) Party he won a landslide victory at the 1971 general elections. Iran's financial strength enabled Hoveyda to strike advantageous bargains with Western customers for Iranian oil in order to promote Iran's own economic development. But the Shah's gratitude proved limited and on Aug. 7, 1977, Hoveyda was replaced by Jamshid Amouzegar. In November 1978 Hoveyda was detained by the Shah's short-lived military government. At the time of the February 1979 uprising he gave himself up to the new government appointed by Ayatollah Ruhollah Khomeini. Two months later he was sentenced to death by the Islāmic Revolutionary Court and shot the same day.

Hovhaness, Alan, Hovhaness also spelled HOVANESS (b. March 8, 1911, Somerville, Mass., U.S.), U.S. composer of Armenian and Scottish descent, notable for his eclectic choice of material from non-European traditions.

Hovhaness studied piano and composition at the New England Conservatory and later with the noted Czech composer Bohuslav Martinů at Tanglewood, Mass. He taught at the Boston Conservatory (1948–51) and travelled and composed extensively. At age 30 he became interested in Armenian music, an interest that later broadened to include music of the Middle and Far East. He toured Europe and Asia in the early 1960s as conductor and pianist and in India studied with native musicians.

Hovhaness' music draws on many exotic rhythmic, melodic, and instrumental resources, as is indicated by the descriptive titles he favours. His style is often modal and rhythmically intricate, but lyrically expressive, with a de-emphasis on harmony. His *Percussion Sextet* for timpani, two drums, tamtam, marimba, and glockenspiel shows his use of

unusual instrumental groupings, as does his *Symphony No. 16* for strings and Korean percussion (first performed, 1963).

Hovhaness' early work is mostly lost, as he supposedly destroyed about 1,000 pieces in 1940. His compositions since then fall into several categories. His stage works include several chamber operas, including *Blue Flame* (1959) and *Pilate* (1963); the score to the Broadway production of *The Flowering Peach* (1954; lyrics by Clifford Odets); and music for modern dance. Large works for soloists, chorus, and orchestra include the *Magnificat* (1959), *Lady of Light* (1969), and *The Way of Jesus* (1974). His instrumental works range from keyboard and chamber music (*Allegro on a Pakistan Lute Tune,* for piano, 1952; and *Duet* for violin and harpsichord, 1954) to more than two dozen symphonies and many other orchestral compositions.

Hovhannes (Armenian personal name): *see under* John.

Hovhannes IV OTZNETZI: *see* John IV of Odzun.

Hovick, Rose Louise: *see* Lee, Gypsy Rose.

Hovland, Carl I(ver) (b. June 12, 1912, Chicago, Ill., U.S.—d. April 16, 1961, Hamden, Conn.), American psychologist who pioneered in the study of social communication and the modification of attitudes and beliefs.

After receiving his Ph.D. from Yale University in 1936, Hovland became a member of the Yale faculty. His early work was in experimental psychology on problems of conditioned responses (those responses to a stimulus learned through a process of reinforcement) and human learning. Between 1942 and 1945 he worked for the U.S. War Department, studying the effectiveness of training films and information programs, especially audience resistance to persuasive communications and methods of overcoming such resistance. This work formed the basis for *Experiments on Mass Communication* (1949), with Hovland as coauthor.

Returning to Yale after World War II, Hovland served as chairman of the department of psychology (1945–51) and was appointed Sterling professor of psychology (1947). He directed further studies in attitude and communication, particularly on the prestige of the communicator and the order of presentation of arguments as they influence the effectiveness of persuasive communication. The results of these studies were published in *Communication and Persuasion* (1953; reprinted 1961), by Hovland, I.L. Janis, and H.H. Kelley, and in later monographs. This research led Hovland to an analysis of symbolic processes and to work in the field of computer simulation of human thought processes.

Hövsgöl Lake, Hövsgöl also spelled CHÖVSGÖL, Mongolian HÖVSGÖL NUUR, or CHÖVSGÖL NUUR, also called HÜBSÜGÜL DALAY, KHUBSUGUL DALAI, or OZERO KOSOGOL, lake in northern Mongolian People's Republic. With an area of 1,012 square miles (2,620 square km), it is Mongolia's largest freshwater lake, with depths exceeding 800 feet (244 m). It lies near the Soviet border at an elevation of 5,397 feet (1,645 m) at the southern foot of the east Sayan Range and is drained southward by the Egiyn River, which feeds the Selenge River in the Lake Baikal drainage basin. South of the lake lies the Hövsgöl Mountain Range.

Howard FAMILY, a famous English family, of which the duke of Norfolk, premier duke and hereditary earl marshal of England, is head, while the earls of Suffolk, Carlisle, and Effingham and the Lord Howard of Glossop and Lord Stafford represent in the peerage its younger lines. Founded by William Howard, a lawyer summoned to Parliament in 1295, the family acquired the Norfolk title through the marriage of Robert Howard with Margaret, daughter of Thomas Mowbray, 1st Duke of Norfolk. Their son, John, eventually succeeded to most of the Mowbray estates and in 1483 was created duke of Norfolk and hereditary earl marshal. For individual family members *see* Norfolk, earls and dukes of; Nottingham, earls of.

Howard, Bronson (Crocker) (b. Oct. 7, 1842, Detroit, Mich., U.S.—d. Aug. 4, 1908, Avon, N.J.), American journalist, author of successful comedies and dramas about life in the United States and founder-president of the first society for playwrights in the United States.

A newspaper writer in Detroit and New York, Howard had his first success with *Saratoga,* produced in 1870 by Augustin Daly at a time when dramas of American life written by Americans were practically nonexistent; its success encouraged other native playwrights. *The Henrietta* (1887), a satire on business, and *Shenandoah* (1889), which established Charles Frohman as a producer and made a fortune for both producer and author, were also great successes. Howard's other plays include *The Banker's Daughter* (1878), first produced in 1873 as *Lillian's Last Love; Wives* (1879); *Young Mrs. Winthrop* (1882); and *One of Our Girls* (1885). He described his craft in *Autobiography of a Play* (1914).

Howard, Catherine: *see* Catherine Howard.

Howard, Charles: *see* Carlisle, Charles Howard, 3rd Earl of; Nottingham, Charles Howard, 1st Earl of.

Howard, Sir Ebenezer (b. Jan. 29, 1850, London, Eng.—d. May 1, 1928, Welwyn Garden City, Hertfordshire), founder of the English garden-city movement, which influenced city planning throughout the world. Howard derived some of the details of his idea from Edward Gibbon Wakefield's *View of the Art of Colonization* (1849).

In the 1880s Howard wrote *Tomorrow: A Peaceful Path to Social Reform.* Not published until 1898, this work was reissued in 1902 as *Garden Cities of Tomorrow.* Howard was attempting to reverse the trend toward the movement of large numbers of persons from rural areas and small towns to cities, which were becoming more and more overpopulated as a result. He proposed the founding of "garden cities," each a self-sufficient entity—not a dormitory suburb—of 30,000 population, and each ringed by an agricultural belt unavailable to builders. Such cities were intended to provide in heretofore rural districts the economic opportunities and the amenities of large industrial cities; a group of garden cities would among them furnish all the advantages of a metropolis and would blend the pleasures of rural and urban living. Each would be owned by a private corporation, which would make a profit from rents that were to be increased to match the rise in value of land as improved by leaseholders.

Howard had the gift of persuading practical businessmen that his idea was financially sound and socially desirable. During his lifetime two garden cities were founded, both in Hertfordshire: Letchworth (1903) and Welwyn Garden City (1920). Letchworth and Welwyn Garden City served as prototypes of the new towns organized by the British government after World War II. These later towns differed from Howard's model in that a contiguous zone of farmland was not an essential feature. Howard was knighted in 1927.

Howard, Edward (b. Oct. 6, 1813, Hingham, Mass., U.S.—d. March 5, 1904, Roxbury, Mass.), pioneer American watch manufacturer.

Howard was apprenticed to the famous clockmaker Aaron Willard; he showed great mechanical aptitude and a marked preference for smaller timepieces. In 1840 he set up a successful business making clocks in Roxbury.

In 1850 Howard and his friend Aaron Dennison conceived a watchmaking factory that would employ automated equipment and interchangeable parts rather than the individual hand production then common. Despite warnings against the venture, they formed, with their financial backer, Samuel Curtis, The American Horological Company, and by 1853 their first watches were put on the market. In 1857 the company failed and was reorganized under Aaron Dennison; it later became the Waltham Watch Company.

Howard, Henry: *see* Northampton, Henry Howard, Earl of; Surrey, Henry Howard, Earl of.

Howard, John: *see* Norfolk, John Howard, 1st Duke of.

Howard, John (b. Sept. 2, 1726, Hackney, London, Eng.?—d. Jan. 20, 1790, Kherson, Ukraine, Russian Empire [now in Ukrainian S.S.R.]), English philanthropist and reformer in the fields of penology and public health.

On his father's death in 1742, Howard inherited considerable wealth and traveled widely in Europe. He then became high sheriff in Bedfordshire in 1773. As part of his duties,



John Howard, oil painting by Mather Brown; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

he inspected Bedford jail and was appalled by the unsanitary conditions there. He was also shocked to learn that the jailers were not salaried officers but depended on fees from prisoners and that some prisoners had been acquitted by the courts but were kept in prison because they had not paid their fees. In 1774 Howard persuaded the House of Commons to pass two acts that stipulated (1) that discharged persons should be set at liberty in open court and that discharge fees should be abolished and (2) that justices should be required to see to the health of prisoners. Years afterward, however, Howard complained that the acts had not been "strictly obeyed."

Howard continued to travel widely, touring Scotland, Ireland, France, the Netherlands, Germany, and Switzerland, often visiting local prisons. He was largely responsible for a parliamentary statute of 1779 that authorized the building of two penitentiary houses where, by means of solitary confinement, supervised labour, and religious instruction, the reform of prisoners might be attempted. This act, however, like those of 1774, was never effectively enforced.

He spent the last years of his life studying means of preventing plague and limiting the

spread of contagious diseases. Travelling in Russia in 1790 and visiting the principal military hospitals that lay en route, he reached Kherson in the Ukraine. In attending a case of camp fever that was raging there, he contracted the disease and died.

Howard, Leland Ossian (b. June 11, 1857, Rockford, Ill., U.S.—d. May 1, 1950, Bronxville, N.Y.), U.S. entomologist noted for his experiments in the biological control of insects and for other pioneering efforts in applied, or economic, entomology. Howard also gained distinction for his taxonomic work; he described 47 new genera of parasitic Hymenoptera (the order of insects that includes wasps and ants) and more than 20 species of mosquitoes, accomplishing the latter with the help of Harrison G. Dyar and Frederick Knab.

After completing his studies at Cornell University, Ithaca, N.Y., under John Henry Comstock (*q.v.*), one of the leading entomologists of the time, Howard joined the Division of Insects in the U.S. Department of Agriculture and was appointed its head in 1894. He served in that capacity for more than 30 years, during which time he came to be recognized as one of the world's foremost authorities in his field. Besides engaging in experimental work on the control of insect pests, Howard conducted research in the area of medical entomology that resulted in the identification of the common housefly as a major carrier of diseases. He also was a prolific writer, publishing more than 1,000 scientific papers and books. Among his most significant writings were: *The Insect Book* (1901); *The House Fly* (1911); *Mosquitoes of North and Central America and the West Indies,* 4. vol. (1912–17), written in collaboration with H. G. Dyar and F. Knab; and *A History of Applied Entomology* (1930).

Howard, Leslie, original name LESLIE HOWARD STEINER (b. April 3, 1893, London—d. June 1, 1943, at sea), English actor, producer, and film director, whose acting had a quiet, persuasive, and peculiarly English charm.

After working as a bank clerk, Howard served in World War I, where he was able to strengthen an early interest in the stage. Adopting his stage name, he first appeared on stage in 1917. After acting for some years in England, he became popular on Broadway in New York City. After a short return to London in 1926, he enjoyed a long run with Tallulah Bankhead in *Her Cardboard Lover* (1927). Soon afterward, he appeared both in London and New York in John Balderston's *Berkeley Square,* a dramatization from Henry James's incomplete novel *The Sense of the Past.* Other notable successes were *The Petrified Forest* (1935) and *Hamlet* (1936), his own production in which he starred.



Leslie Howard
Pictorial Press

Howard entered films in 1930 when he appeared in *Outward Bound.* He was an incomparable Henry Higgins in the first major George Bernard Shaw film, *Pygmalion.* Other memorable films in which he starred included *Of Human Bondage, The Scarlet Pimpernel, The Petrified Forest, Romeo and Juliet,* and *Gone with the Wind.* He was killed during World War II when the plane that was carrying him from Lisbon to London was shot down.

Articles are alphabetized word by word, not letter by letter

Howard, Oliver O(tis) (b. Nov. 8, 1830, Leeds, Maine, U.S.—d. Oct. 26, 1909, Burlington, Vt.), U.S. Union officer in the American Civil War (1861–65) who headed the Freedmen's Bureau (1865–72) to help rehabilitate former slaves during the period of Reconstruction.

A graduate of the U.S. Military Academy, West Point, N.Y. (1854), Howard resigned his regular army commission at the beginning of the war to become colonel of a Maine volunteer regiment. He was given the rank of major general (1862) after fighting in Virginia at the First Battle of Bull Run, the Peninsular Campaign, the Battle of Fair Oaks (Seven Pines)—in which he lost his right arm—and at Antietam. He also took part in the Battle of Chancellorsville (May) and in the Tennessee and Atlanta campaigns (1863–64). Promoted to command the Army of the Tennessee (July 1864), he marched with Gen. William T. Sherman through Georgia to the sea (November–December) and fought in the Carolinas campaign (early 1865).



Oliver Howard
By courtesy of the Library of Congress, Washington, D.C.

Unusually interested in the welfare of the black people who had been freed from bondage during the war, Howard was appointed by Pres. Andrew Johnson as commissioner of the Bureau of Refugees, Freedmen, and Abandoned Lands (the Freedmen's Bureau). Because he was not a skilled administrator, many abuses appeared in the bureau, much of the staff being poorly trained. Nevertheless, his agency fed millions of the indigent, built hospitals, provided direct medical aid, and negotiated thousands of labour contracts for the former slaves. Most important, it established a multitude of schools and training institutes for blacks; Howard University, Washington, D.C. (est. 1867), was named in recognition of his work in the bureau and as one of the university's founders. Howard served as the university's third president (1869–74), after which he resigned to return to military service.

Howard fought against Indians in the West and served as superintendent at West Point (1880–82). He wrote several books on military history in addition to his autobiography, published in 1907.

Howard, Philip: *see* Arundel, Philip Howard, 1st (or 13th) earl of.

Howard, Sir Robert (b. 1626, England—d. Sept. 3, 1698), English dramatist, remembered chiefly for his dispute with John Dryden on the use of rhymed verse in drama.

Knighted by the royalists in 1644 during the Commonwealth, Howard was imprisoned, but after the Restoration he was elected to Parliament and ultimately became a member of the privy council. His proud and pretentious character provoked frequent attacks.

Of Howard's plays, the best were *The Indian Queen* (first performed 1664), a tragedy written in collaboration with Dryden; and *The Committee* (first performed 1662), a comedy of humours, satirizing the Commonwealth regime, which gained durable popularity from the character of the Irish footman Teague.



Sir Robert Howard, engraving by G. Vertue
By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

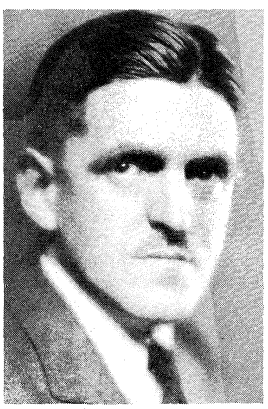
Howard's preface to *Four New Plays* began his dispute with Dryden, who had married Howard's sister, Lady Elizabeth Howard, in 1663. It opposed Dryden's dedicatory epistle to *The Rival Ladies* (1664) that held rhyme was better suited to heroic tragedy than blank verse. Dryden replied in *Of Dramatick Poesie, an Essay* (1668). In the preface to *The Duke of Lerma* Howard replied in a rather more personal tone, but Dryden had the final word in the crushing *Defence of an Essay of Dramatick Poesie* prefaced to *The Indian Emperour* (1667).

Howard, Roy W(ilson) (b. Jan. 1, 1883, Gano, Ohio, U.S.—d. Nov. 20, 1964, New York City), U.S. journalist and editor, co-director of the Scripps-Howard newspaper chain starting from 1925, when the Scripps-Howard name replaced the original designation, Scripps-McRae. Howard directed Scripps-Howard as the surviving partner after the death in 1938 of Robert Scripps. By that time, partly because of the Great Depression, the number of Scripps-Howard newspapers had been reduced from 25 to 20.

Roy Howard was the son of a railroad brakeman who died early, and Roy was obliged to work to help support the family. He got a job as a cub reporter at $8 a week on the *Indianapolis News,* where he worked his way up to full reporter, then moved to the *Indianapolis Star* as a sports editor. His next position was at the *St. Louis Post-Dispatch,* as the telegraph editor. He then moved to the *Cincinnati Post,* which was owned by Edward W. Scripps. Howard became news editor there, and then a correspondent for the Scripps-McRae News Service in 1906. Scripps-McRae purchased the Publishers Press Association, a news agency, and Howard was named to manage the association. When it was consolidated into the United Press (UP) agency in 1907, Howard became its vice president and general manager. The president died the next year and Howard succeeded him. As president of UP, he interviewed leading European political figures. In 1918, reporting from Europe, he broke the news of the World War I Armistice four days early. This caused considerable controversy but Howard was unconcerned, holding that any alert reporter would have done the same thing. He was active in acquiring new papers for Scripps-Howard, and he sought editorial balance for the chain by making it his practice to hire columnists with divergent views.

Howard, Sidney (Coe) (b. June 26, 1891, Oakland, Calif., U.S.—d. Aug. 23, 1939, Tyringham, Mass.), U.S. playwright whose works helped to bring psychological as well as theatrical realism to the American stage.

Howard graduated from the University of California, Berkeley, in 1915 and studied under George Pierce Baker at his Harvard 47 Workshop. In World War I he served with the American ambulance corps and later was a



Sidney Howard

By courtesy of the Library of Congress, Washington, D.C.

captain in the U.S. Air Corps. He was on the editorial staff of the humour magazine *Life* in 1919–22 and in 1923 was a feature writer for Hearst's *International Magazine*. In 1922 he married the actress Clare Eames.

Howard's best known plays are *They Knew What They Wanted* (1924), a mellow story of an aging Italian immigrant in California and his mail-order bride that won the Pulitzer Prize in 1925 and was the basis of Frank Loesser's musical *The Most Happy Fella* (1957); *The Silver Cord* (1926), a devastating portrait of a mother and the effects of her possessiveness on her sons' lives; and *Yellow Jack* (1934, in collaboration with Paul de Kruif), a dramatized documentary of the conquest of yellow fever. Other works include *Lute Song* (1930, with Will Irwin); *The Late Christopher Bean* (1932, an adaptation from a French play by René Fauchois); and *Dodsworth* (1934, adapted from Sinclair Lewis' novel). He also translated and adapted a number of other European dramas, including *Salvation* (1928, with Charles MacArthur).

The Playwrights' Company established an annual memorial award in his name for playwrights of promise.

Howard, Thomas: *see* Arundel, Thomas Howard, 2nd (or 14th) earl of; Norfolk, Thomas Howard, 2nd duke of; Norfolk, Thomas Howard, 3rd duke of; Norfolk, Thomas Howard, 4th duke of; Suffolk, Thomas Howard, 1st earl of.

Howard University, in Washington, D.C., predominantly black university founded in 1867 and named for General Oliver Otis Howard (1830–1909), head of the post-Civil War Freedmen's Bureau, who influenced Congress to appropriate funds for the school.

Although Howard University has always been open to students of any race, colour, or creed, it was founded with a special obligation to provide advanced studies for blacks. Its library, the Moorland Foundation, is the leading research library on U.S. black history. The curriculum includes liberal and fine arts, law, medicine, engineering, religion, human ecology, and architecture, and its School of Medicine is affiliated with Freedmen's Hospital. Although the student body at one time was virtually all black, white students began attending after World War II, especially in the graduate schools.

Many of Howard's graduates have advanced to leadership positions in business, education, social reform, and government. Among the most prominent are U.S. Sen. Edward William Brooke of Massachusetts; Patricia Harris, Secretary of Housing and Urban Development under Pres. Jimmy Carter; sociologist E. Franklin Frazier; and playwright Leroy Jones. Statesman Ralph Bunche, winner of the Nobel Prize for Peace, established the school's political science department and playwright Owen Dodson headed the drama department for 22 years.

Howe, Cape, southeastern point of mainland Australia, at the Victoria–New South Wales border, 300 mi (560 km) southwest of Sydney. It is the southern portal of Disaster Bay, an inlet of the Tasman Sea. Generally low at the shore, the cape rises to the conspicuous landmark of Howe Hill (1,297 ft [395 m]). Sighted in 1770 by the British navigator Capt. James Cook, the cape was named after Richard, Lord Howe, then treasurer of the Royal Navy.

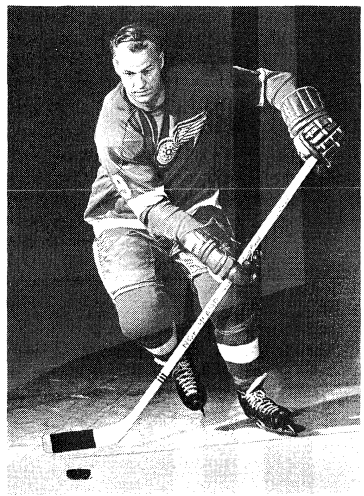
Howe, E(dgar) W(atson) (b. May 3, 1853, Treaty, Ind., U.S.—d. Oct. 3, 1937, Atchison, Kan.), U.S. editor, novelist, and essayist known for his iconoclasm and pessimism.

Howe went to work at seven on his father's homestead near Bethany, Mo. An apprentice printer at 12, he worked at the trade in Missouri, Iowa, Nebraska, and Utah (1867–72). At 19 he was publisher of the *Golden* (Colo.) *Globe* and in 1877 founded the *Atchison* (Kan.) *Daily Globe*, made famous by frequent reprinting of his paragraphs throughout the U.S. His first and most successful novel, *The Story of a Country Town* (1883), was the first realistic novel of Midwestern small-town life. He published and edited *Howe's Monthly* (1911–33) and wrote essays, travel books, and an autobiography, *Plain People* (1929). His journalistic writing was collected in *The Indignations of E.W. Howe* (1933) and other books.

Howe, Elias (b. July 9, 1819, Spencer, Mass., U.S.—d. Oct. 3, 1867, Brooklyn, N.Y.), U.S. inventor whose sewing machine provided an impetus for the revolution of garment manufacture in the factory and in the home.

Interested in machinery since childhood, Howe learned the machinist trade and worked in a cotton machinery factory in Lowell, Mass., and later in Cambridge. During this time it was suggested to him that the man who invented a machine that could sew would earn a fortune. For five years Howe spent all his spare time in the development of a practical sewing machine, and in 1846 he was granted a patent for it. The machine attracted little attention in the U.S. at first, and, when a fortune was not forthcoming, Howe sold the patent rights in England for £250 ($1,250). He moved to England and worked for £5 a week to perfect his machine for use in sewing leather and similar materials. As his financial condition worsened, he managed to send his family back to the U.S.; but when he finally returned destitute, he found his wife dying. Years of disappointment and discouragement followed. He found that, while he had been abroad, sewing machines were being widely manufactured and sold in the U.S. in violation of his patent. After much litigation, his rights were finally established in 1854, and from then until 1867, when his patent expired, he received royalties on all sewing machines produced in the U.S.

Howe, Gordie, byname of GORDON HOWE (b. March 31, 1928, Floral, Sask., Can.), Canadian-born U.S. professional ice hockey player and administrator. He scored the most career goals and total points (goals and assists) in the National Hockey League (NHL) records.



Gordie Howe, 1969

By courtesy of the National Hockey League

Howe played hockey from the age of five; he moved to the United States in 1944 and was put on the Detroit Red Wings negotiating list that same year. He was signed to a contract for Omaha in 1945 and played a season there before joining the Red Wings in 1946. He won the Hart Trophy for the most valuable player of the season several times and was named Canada's Athlete of the Year in 1963. He left the Red Wings in 1971 to play for and become the vice president (president from 1973) of the Houston Aeros in the World Hockey Association (WHA); with two of his sons he played for that team through 1977. He played from 1978 to 1980 with the New England (later the Hartford) Whalers of the WHA, later merged into the NHL. During his career he had 1,071 goals (801 in the NHL) and 1,518 assists and played in 2,421 games. After his retirement as a player, Howe became director of player development for the Whalers and chairman of the board for a marketing company.

Howe, Irving (b. June 11, 1920, New York City), U.S. literary and social critic and educator noted for his probing into the social and political viewpoint in literary criticism.

Howe was educated at the City College of New York and served in the army during World War II. He taught at Brandeis and Stanford universities from 1953 until 1963, when he became a professor of English at the City University of New York at Hunter College. He wrote critical works on Sherwood Anderson (1951), William Faulkner (1962), and Thomas Hardy (1967), and he synthesized his political and literary interests in *Politics and the Novel* (1957) and *A World More Attractive: A View of Modern Literature and Politics* (1963). He edited the works of George Gissing, Edith Wharton, Leon Trotsky, and George Orwell and from 1953 was editor of the periodical *Dissent*. His *World of Our Fathers* (1976) is a sociocultural study of Eastern European Jews who emigrated to the United States between 1880 and 1924; *Celebrations and Attacks* (1979) is a collection of his critical articles; and *A Margin of Hope: An Intellectual Biography* (1982) deals with his involvement with culture and politics.

Howe, James Wong, original name WONG TUNG JIM (b. Aug. 28, 1899, Canton—d. July 12, 1976, Hollywood), one of the greatest cinematographers of the U.S. motion-picture industry.

He started work in 1917 as assistant cameraman to Cecil B. deMille and in 1922 became chief cameraman for Famous Players. He later worked at Metro-Goldwyn-Mayer, Warner Brothers, Columbia, and RKO, then free-lanced after 1948.

Brought by his parents to the United States

at the age of five, he lived in the states of Washington and Oregon until 1916, when he went to southern California. Howe worked on many silent films, exploring all the developments in film, stock, camera mobility, and lighting techniques; then, with the invention of sound, he developed ways to circumvent the restrictions that it imposed on camera movement. He much preferred black and white film, which brought out his dramatic use of light and shade, although his colour work was as exemplary as his black and white; he was at home in a studio or on location, and he was a master of all moods.

In *Transatlantic* (1931) Howe pioneered in using a wide-angle lens, deep focus, and ceilinged sets to replicate shipboard claustrophobia. He was one of the first cameramen to use a hand-held camera. He shot the boxing scenes in *Body and Soul* (1947) while being pushed on roller skates and increased his mobility for *He Ran All the Way* (1951) by shooting from a wheelchair. Howe won Oscars from the Motion Picture Academy of Arts and Sciences for his work on *The Rose Tattoo* 1955) and *Hud* (1963).

Howe, Joseph (b. Dec. 13, 1804, Halifax, Nova Scotia—d. June 1, 1873, Halifax, Nova Scotia, Can.), Canadian statesman and newspaper publisher, premier of Nova Scotia in 1860–63, agitator for responsible, or cabinet, government for Nova Scotia, and opponent of Confederation of the British North American provinces.

In 1827 Howe started a weekly nonpolitical journal, the *Acadian.* The following year he purchased the *Nova Scotian,* which, when later incorporated with the *Morning Chronicle,* became one of the leading newspapers in British North America.

In 1836 Howe was elected member for Halifax in the provincial assembly. He was included in the executive council from 1840 until his resignation in 1843. He campaigned for responsible government for Nova Scotia in his newspaper and criticized the lieutenant governor, Lord Falkland; he helped bring about Falkland's resignation in 1848, and responsible government was finally conceded that year. In 1854 Howe was appointed chief commissioner of railways for Nova Scotia. He became premier of the province in 1860 and opposed federation. He retired from provincial politics in 1863 and took the post of fishery commissioner for Great Britain (1863–66).

After leading the antifederation forces in Nova Scotia and going to Great Britain in 1867 to try to repeal the British North America Act, which created the Dominion of Canada, Howe finally accepted the accomplished fact and was elected to the Canadian Parliament for Hants. He joined the Cabinet of Sir John Macdonald as president of the council and then secretary of state. In May 1873 he was appointed lieutenant governor of Nova Scotia.

Howe, Julia Ward (b. May 27, 1819, New York City—d. Oct. 17, 1910, Newport, R.I., U.S.), U.S. author and lecturer best known for her "Battle Hymn of the Republic." In 1843 she married Samuel Gridley Howe of Boston, reformer and teacher of the blind. The "Battle Hymn," composed to the rhythm of the folksong "John Brown's Body," was first published in *The Atlantic Monthly* in February 1862. Moved by the economic plight of Civil War widows, Howe worked for equal educational, professional, and business opportunities for women. She was the author of travel books, biography, drama, and verse and was a composer of songs for children.



Julia Ward Howe, 1902

By courtesy of the Library of Congress, Washington, D.C.

Howe, Richard Howe, Earl, BARON HOWE OF LANGAR, also called (1758–82) 4TH VISCOUNT HOWE, or (1782–88) VISCOUNT HOWE OF LANGAR (b. March 8, 1726, London—d. Aug. 5, 1799), British admiral who commanded the Channel fleet at the Battle of the First of June (1794) during the French Revolutionary Wars.

Howe entered the navy in 1740, saw much active service, especially in North America, and was rapidly promoted. By the death of his elder brother, on July 6, 1758, he became Viscount Howe—an Irish peerage. In 1762 he was elected member of Parliament for Dartmouth. During 1763 and 1765 he was a member of the Admiralty board and from 1765 to 1770 was treasurer of the navy. In 1770 he was promoted rear admiral and in 1775 vice admiral. In 1776 he was appointed to the command of the North American station, where, in his sympathy for the colonists, he tried conciliation. When France declared war and sent a powerful squadron under the Count d'Estaing, Howe was put on the defensive, but he baffled the French admiral at Sandy Hook and defeated his attempt to take Newport in Rhode Island by a fine combination of caution and calculated daring. On the arrival of Adm. John Byron from England with reinforcements, Howe left the station in September, returning to England.

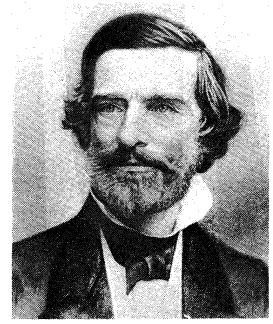
On the change of ministry in March 1782 he was selected to command in the English Channel, and in the autumn of that year he carried out the difficult operation of the final relief of Gibraltar. The French and Spaniards had in all 46 line-of-battle ships to his 33, and his ships were ill-equipped and ill-manned. But Howe handled his ships well, the enemy was awkward and unenterprising, and the operation was brilliantly successful. From Jan. 28 to April 16, 1783, he was first lord of the Admiralty, and again from December 1783 until August 1788, in William Pitt's first ministry.

On the outbreak of the French Revolutionary War in 1793 he was again named to the command of the Channel fleet. In 1794 he won the epoch-making victory of the First of June, a victory not excelled by any of his successors in the war, not even by Horatio Nelson, since they had his example to follow and were served by more highly trained squadrons than his. In 1797 he was called on to pacify the mutineers at Spithead, and he showed great influence with the seamen.

In 1782 he was created Viscount Howe of Langar and in 1788 Baron and Earl Howe.

Howe, Samuel Gridley (b. Nov. 10, 1801, Boston—d. Jan. 9, 1876, Boston), U.S. educator and first director of the Perkins School for the Blind; one of his notable successes was teaching the alphabet to Laura Bridgman (*q.v.*), a student who was blind, deaf, and mute. He attended Harvard Medical School and was admitted to practice but left Boston to take part in the Greek revolution.

He returned to the United States and in 1831 received a proposal to organize a New England asylum for the blind at Boston. Howe set out at once for Europe to investigate the problem. There another revolt (Polish) diverted him. After a brief imprisonment he returned to Boston in July 1832. He began receiving a few blind children at his father's house in Pleasant Street, the beginning of what was to become the Perkins School for the Blind. Howe also interested himself in the condition and treatment of mentally defective children and lobbied strenuously for legislation providing for aid and education for the blind, the deaf, and the mentally ill.



Samuel Gridley Howe

By courtesy of the Perkins School for the Blind, Watertown, Mass.

In 1843 he married Julia Ward, who later wrote the Civil War's "Battle Hymn of the Republic." Both were ardent abolitionists and members of the Free-Soil Party.

Howe, William (b. May 12, 1803, Spencer, Mass., U.S.—d. Sept. 19, 1852, Springfield, Mass.), U.S. inventor who pioneered in the development of truss bridges in the U.S.

An uncle of Elias Howe, the sewing-machine inventor, William Howe farmed until 1838, the year he was engaged to build a bridge for the Boston and Albany Railroad at Warren, Mass. He made major alterations in previous truss designs and in 1840 received two patents for the Howe truss. After he built a bridge over the Connecticut River at Springfield, his truss proved so successful that henceforth he was primarily a bridge builder. His truss, with wooden diagonal members and iron vertical ties, was the most popular bridge design in the U.S. during the last half of the 19th century. In 1842 he obtained a patent for an improvement in the Howe truss, incorporating a curved timber extending from each buttress to the centre of the truss.

Howe, William Howe, 5th Viscount (b. Aug. 10, 1729—d. July 12, 1814, Plymouth, Devonshire, Eng.), commander in chief of the British Army in North America (1776–78) who, despite several military successes, failed to destroy the Continental Army and stem the American Revolution.



5th Viscount Howe, engraving by C. Corbutt, 1777

John R. Freeman & Co. Ltd.

Brother of Adm. Richard Lord Howe, William Howe had been active in North America during the last French and Indian War (1754–63), in which he earned a reputation as one of the army's most brilliant young generals. Sent in 1775 to reinforce Gen. Thomas Gage in the siege of Boston, he led the left wing in three costly but finally successful assaults in the Battle of Bunker Hill.

Succeeding to the supreme command the following year, he transferred his forces southward and captured the strategic port city of New York; his army then occupied the whole area around the city and went into winter quarters. When active operations were resumed in June 1777, Howe moved his troops to the south bank of the Delaware River and won two successive victories over the Americans at the Battle of Brandywine (September) and the Battle of Germantown (October). His next winter was spent in the occupation of Philadelphia. Howe recognized his failure, however, to demolish the modest force of Gen. George Washington, then encamped at nearby Valley Forge; his entire operation had furthermore exposed the troops of Gen. John Burgoyne in upper New York State and led to the disastrous British defeat at Saratoga that fall. Howe therefore resigned his command before the start of operations in 1778, to be succeeded by Gen. Henry Clinton.

Returning to England, he saw no more active service but held a number of important home commands. He succeeded to the viscountcy on the death of his brother in 1799; upon his own death, without issue, the peerage expired.

Howe Caverns, series of underground caves in Schoharie County, east central New York, U.S., 38 mi (61 km) west of Albany. Named for Lester Howe, who is credited with their discovery in 1842, the limestone caves are 160–200 ft (50–60 m) below the surface with grotesque rock formations (stalactites and stalagmites) and underground channels, including the "Styx River," and lakes. In 1929 an electrical system of lighting and communication was installed, and the caves, with an even temperature of 52° F (11° C), are reached by electric elevators. A 1½-mi-long winding passageway, 3–6 ft wide and 10–100 ft high, is the main route for sightseeing. Gondola-style boat rides are available on the ¼-mi-long "mirror perfect" Lake of Venus. The village of Howes Cave is near the entrance, and Secret Caverns, a second group (with underground waterfalls and fossilized marine life), are nearby.

Howel DDA (Welsh), English HYWEL THE GOOD (d. AD 950), chieftain called in the prologues to the Welsh lawbooks "king of all Wales." This epithet was indeed appropriate for Howel, particularly during the last years of his reign.

He became ruler of Seisyllwg (roughly the area of Dyfed and the Towy Valley) jointly with his brother Clydog after the death of their father, Cadell (*c.* 910), but after Clydog's death in 920 he ruled alone. Sovereignty over Dyfed in southwest Wales came to him through his wife, Elen, daughter of Llywarch ap Hyfaidd (d. 904), the last king of its dynasty; he acquired Gwynedd, in northwest Wales, and probably Powis, in northeast Wales, on the death of his cousin Idwal Foel ap Anarawd, in 942. Howel's reign was remarkable for its peacefulness, the result of his consistent policy of subservience to England. Howel's first recorded act is his homage to Edward the Elder in 918. Thereafter, he often attended the English court, and his name is found as a witness to 12 charters of Athelstan and Edred between 928 and 949.

Howel was the only Welsh ruler to issue his own coins. He is remembered chiefly for the codification of Welsh law attributed to him. Although there is no contemporary record of this work, Howel was certainly responsible for a coordination of preexisting law. There are biographies by J.E. Lloyd (1928) and J.G. Edwards (1929).

Howelcke, Johann: *see* Hevelius, Johannes.

Howell, James (b. *c.* 1594, probably in Abernant, Carmarthenshire, Wales—d. 1666, London), Anglo-Welsh writer known for his *Epistolae Ho-Elianae,* 4 vol. (1645–55), early



James Howell, engraving

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

and lively essays in letter form. Though vividly recording contemporary phenomena, they lack historical reliability because of plagiarizing and the addition of fictitious dates—despite the author's position as historiographer royal, a post created for him at the Restoration (1660). He also did translations and wrote dictionaries, imaginative works, and political pamphlets.

Educated at Oxford University, Howell travelled abroad and, after holding minor government posts, became a member of Parliament (1627) for Richmond, Yorkshire. Imprisonment during 1643–51 for either debt or Royalist opinions caused him to follow writing as a profession. The standard edition of his work was edited by Joseph Jacobs, 2 vol. (1890–92).

Howells, William Dean (b. March 1, 1837, Martins Ferry, Ohio, U.S.—d. May 11, 1920, New York City), U.S. novelist and critic, the dean of late 19th-century American letters, the champion of literary realism, and the close friend and adviser of Mark Twain and Henry James.



William Dean Howells, 1913

By courtesy of the Library of Congress, Washington, D.C.

The son of an itinerant printer and newspaper editor, Howells grew up in various Ohio towns and began work early as a typesetter and later as a reporter. Meanwhile, he taught himself languages, becoming well read in German, Spanish, and English classics, and began contributing poems to *The Atlantic Monthly.* His campaign biography of Abraham Lincoln (1860) financed a trip to New England, where he met the great men of the literary establishment, James Russell Lowell, editor of *The Atlantic Monthly,* Oliver Wendell Holmes, Hawthorne, and Emerson. On Lincoln's victory he was rewarded with a consulship at Venice (1861–65), which enabled him to marry. On his return to the U.S. he became assistant editor (1866–71), then editor (1871–81), of *The Atlantic Monthly,* in which he began publishing reviews and articles that interpreted American writers. He was a shrewd judge of his contemporaries. He immediately recognized the worth of Henry James, and he was the first to take Mark Twain seriously as an artist.

Their Wedding Journey (1872) and *A Chance Acquaintance* (1873) were his first realistic novels of uneventful middle-class life. There followed some international novels, contrasting American and European manners. Howells' best work depicts the American scene as it changed from a simple, egalitarian society where luck and pluck were rewarded to one in which social and economic gulfs were becoming unbridgeable, and the individual's fate was ruled by chance. He wrote *A Modern Instance* (1882), the story of the disintegration of a marriage, which is considered his strongest novel. His best known work, *The Rise of Silas Lapham* (1885), deals with a self-made businessman's efforts to fit into Boston society. In 1887 he risked both livelihood and reputation with his plea for clemency for the condemned Haymarket anarchists on the grounds that they had been convicted for their political beliefs. In 1888 he left Boston for New York.

His deeply shaken social faith is reflected in the novels of his New York period, such as the strongly pro-labour *Annie Kilburn* (1888) and *A Hazard of New Fortunes* (1890), generally considered his finest work, which dramatizes the teeming, competitive life of New York, where a representative group of characters try to establish a magazine.

Howells' critical writings of this period welcomed the young Naturalistic novelists Hamlin Garland, Stephen Crane, and Frank Norris and promoted the European authors Turgenev, Ibsen, Zola, Pérez Galdós, Verga, and above all Tolstoy.

Long before his death Howells was out of fashion. Later critics have more fairly evaluated his enormous influence, and readers have rediscovered the style, humour, and honesty of his best works.

Howells, William White (b. Nov. 27, 1908, New York City), U.S. physical anthropologist who specialized in the establishment of population relationships through physical measurement. He is also known for his work in developing anthropological curricula and his popular books in the field, which have been widely translated and are extensively used in the classroom.

Howells received his Ph.D. from Harvard University, where his work with Ernest A. Hooten led him to an interest in morphological studies. He worked on the research staff of the American Museum of Natural History in New York City and then taught at the University of Wisconsin until he was offered a chair of anthropology at Harvard upon Hooten's death in 1954. He subsequently served on the staff of the Peabody Museum of American Ethnography at Harvard.

Howells pioneered the use of quantitative methods in the formulation and solution of morphological problems, particularly his use

of cranial measurements in world population studies. His authoritative "Cranial Variation in Man: A Study by Multivariate Analysis of Patterns of Difference Among Recent Human Populations" compared skull measurements from 17 distinct world populations. He conducted extensive research on the peoples of Oceania.

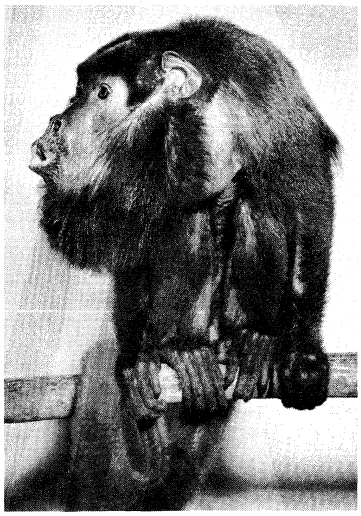
Howick, Charles Grey, Viscount: *see* Grey, Charles Grey, 1st Earl; Grey, Charles Grey, 2nd Earl.

Howick, Henry George Grey, Viscount: *see* Grey, Henry George Grey, 3rd Earl.

Howland Island, coral atoll, unincorporated territory of the United States, in the southwestern Pacific Ocean, 1,650 mi (2,650 km) southwest of Honolulu. The atoll rises to 20 ft (6 m), is 1.5 mi long by 0.5 mi wide, and has a land area of less than 0.6 sq mi (1.6 sq km). Its central basin indicates the existence of a former lagoon.

Sighted in 1842 by American whalers and named for one of the first sailors to sight it, Howland was claimed in 1857, along with nearby Baker Island, by the United States under the Guano Act of 1856. The guano deposits are now exhausted. Colonized from Hawaii in 1935 and placed under the administration of the U.S. Department of the Interior in 1936, the island served as a stop for planes flying between Hawaii and Australia. On July 2, 1937, the noted American aviator Amelia Earhart and her navigator, Fredrick J. Noonan, were lost near Howland after having stopped at Lae, Papua New Guinea. The atoll is occasionally visited by scientists from the Smithsonian Institution (Washington, D.C.) to study bird-migration patterns. There are no permanent inhabitants.

howling monkey, also called HOWLER (*Alouatta*), any of several tropical American monkeys belonging to the family Cebidae, noted for their roaring cries. Five species of howlers



Red howler (*Alouatta seniculus*)
San Diego Zoo

are widely distributed through Central and South America. These are the largest New World monkeys and generally attain lengths of about 40–70 centimetres (16–28 inches) excluding the 50–75-cm tail. Howlers are stoutly built, bearded animals with a hunched appearance and thickly furred, prehensile tails that are naked on the underside of the tip to afford a better grip. The hair is long and thick and, depending on species, is typically black, brown, or red. Howlers are characterized by expansion of the hyoid bone into a large, shell-like organ that communicates with the windpipe and gives resonance to the voice. In connection with the enlarged hyoid, howlers have protruding jaws and high, sloping faces.

Howlers live in groups within territories whose boundaries are mapped out by howling matches with neighbouring clans. Their voices carry over a distance of three to five kilometres (two to three miles) and can be heard in session during the early morning. Howlers are slow-moving monkeys and are in the habit of sitting on the topmost branches, rarely descending to the ground. They feed primarily on leaves. When on the move, they progress in orderly groups usually led by an old male. Births are usually single and occur at any time of year.

Because of their diet, temperament, and other factors, howlers are difficult to maintain in captivity.

Howman, John: *see* Feckenham, John de.

Howrah, also called HABARA, or HAORA, city, administrative headquarters of Howrah district, West Bengal state, northeastern India, just west of the Hooghly River. The city lies within Greater Calcutta. It has major Grand Trunk Road connections and is the terminus of two principal Indian railways. Its river port is lined with shipbuilding and repairing docks. Major industries include the milling of jute, flour, rice, oilseeds, and cotton; sawmilling; iron and steel rolling; and the manufacture of chemicals, glass, hosiery, cigarettes, and batteries. Sibpur, a southern suburb, contains light industry and railway workshops. The botanical garden founded in Sibpur in 1786 contains a banyan tree that stands 88 ft (27 m) high and has a circumference of about 1,250 ft. Constituted a municipality in 1862, Howrah has several colleges.

Howrah district (569 sq mi [1,474 sq km]) is a deltaic alluvial tract intersected by numerous rivers, the most important of which are the Hooghly, Dāmodar, and Rūpnārāyan; the district becomes flooded during the rainy season. Rice, jute, corn (maize), and betel nuts are the principal crops. The Hooghly bank from Bally to Bauria is the most industrialized region. Pop. (1981) city, 744,429; district, 2,966,861.

Howth, Irish BINN ÉADAIR, peninsula, fishing port, and summer resort, Dublin County Borough, Ireland. The promontory is formed of old quartzites and shales (probably of Cambrian age) and is connected to the mainland by a raised beach. It rises to 560 ft (172 m) at Howth Head and has a steep cliffed coast on the south and east. The fishing port and suburban resort of Howth is located on the promontory's north side. The harbour was built in the early 19th century for the steamer service to Holyhead in Wales, but it was superseded by that of the port of Dun Laoghaire, closer to Dublin. In 1914 the harbour was the scene of Irish Volunteers' gunrunning in the yacht "Asgard"—a celebrated incident in the events leading up to Irish independence. Pop. (1981) 9,944.

Hoxha, Enver, Hoxha also spelled HODJA (b. Oct. 16, 1908, Gjirokastër, Alb.—d. April 11, 1985, Tiranë), the first Communist chief of state of Albania, an extreme Stalinist who used summary measures against dissidents.

Hoxha, the son of a Muslim cloth merchant, studied at the French lycée at Korçë and reportedly also at the American Technical School in Tiranë. In 1930 he went on a state scholarship to the University of Montpellier, France, and then from 1934 to 1936 he was a secretary at the Albanian consulate general in Brussels and studied law at the university there. Returning to Albania in 1936, he became a teacher at his old school in Korçë. In 1939, when Italy invaded Albania, he was dismissed for refusing to join the newly formed Albanian Fascist Party and opened a retail tobacco store at Tiranë, which became headquarters for a Communist cell. After Germany and Italy partitioned Yugoslavia in 1941, he helped found the Albanian Communist Party (afterward called the Party of Labour, or Workers' Party), becoming head of its resistance arm in 1943. He was prime minister of Albania from 1944 to 1954 and minister of



Hoxha greeting a member of a Chinese Red Guard delegation to Albania in 1967
China Photo Service—Eastfoto

foreign affairs from 1946 to 1953. From 1954 he served as first secretary of the Party of Labour's Central Committee.

After World War II Albania became a Communist republic under Yugoslav protection. Resenting this tutelage, Hoxha exploited the enmity between Joseph Stalin and Josip Tito to break with Yugoslavia in 1948. A visit by Soviet leader Nikita Khrushchev to Albania in 1959 resulted in a reaffirmation of Albania's allegiance to the Soviet bloc, but after 1960 Albanian–Soviet relations deteriorated, and by December 1961 all contacts had ceased. Meanwhile, ties with Maoist China were strengthened.

For Hoxha, the bond with China was an effective economic aid and a means of irritating Moscow. But the alliance was not to last. On July 7, 1977, Hoxha criticized the "three-worlds" theory invoked by the new Chinese leaders to justify better relations with the United States. The following year China severed all economic and military ties with Albania.

Hoxne Interglacial Stage, major division of Pleistocene deposits and time in Great Britain (the Pleistocene Epoch began about 2,500,000 years ago and ended about 10,000 years ago). The Hoxne Interglacial Stage was named for sediments studied in the region of Hoxne, Suffolk. The Hoxne Interglacial is correlated with the Holstein Interglacial Stage of northern Europe, the Masovian Interglacial Stage of Poland, and the Mindel-Riss Interglacial Stage of Alpine Europe. It is also broadly contemporaneous with the Yarmouth Interglacial Stage of the North American Pleistocene.

Hoy, Norse HAEY, second largest island of the Orkneys group of northeastern Scotland, 14 mi (23 km) long and 6 mi wide, with an area of 53 sq mi (137 sq km). Hoy, 2 mi west of Mainland, from which it is separated by the Sound of Hoy, is a lofty island (its name means "high island") with a spectacularly indented coastline of red sandstone cliffs, which reach heights of more than 1,000 ft (300 m). The Old Man of Hoy, a detached pillar of rock 450 ft high, is a famous landmark. Pop. (1981) 519.

Hoyerswerda, city, Saxony *Land* (state), eastern Germany, on the Schwarze Elster River, in a lignite (brown-coal) mining region, south of Cottbus. First mentioned in 1268 as the seat of a German barony reputedly founded by Count Hoyer of Friedberg, it acquired market rights in 1371. In 1959 the "Socialist New Town" of Hoyerswerda-Neustadt was built to

the northeast of the old city as a residential area for the nearby huge lignite-processing combine of Schwarze Pumpe, which unifies mining, briquetting, coking, gas, and power facilities. There are also glassworks and brickworks within the city limits. Pop. (1989 est.) 69,361.

Hoyle, Edmond (b. 1671/72—d. Aug. 29, 1769, London), English writer, perhaps the first technical writer on card games. His writings on the laws of Whist gave rise to the common phrase "according to Hoyle," signifying full compliance with universally accepted rules and customs.

Hoyle's life before 1741 is unknown, although he is said to have been called to the bar. For the use of the pupils to whom he began teaching Whist that year, he prepared *A Short Treatise on the Game of Whist* (1742), which went through 13 editions in his lifetime. His revised laws of 1760 remained authoritative until 1864, when the Arlington and Portland Whist clubs in London adopted a new code. French and German translations of the *Short Treatise* first appeared in 1764 and 1768, respectively.

The Hoyle codification of the laws and strategy of Backgammon (1743) is still largely in force. He also wrote treatises on Chess (1761) and other games. Familiar with the laws of probability, he appended to one of his books a life table for annuities. He died at the age of 97. He is memorialized in such books as *The New Complete Hoyle*, edited by Richard L. Frey, Albert H. Morehead, and Geoffrey Mott-Smith (1956), comprising the rules, methods of play, and history of more than 600 games of skill and chance, and *According to Hoyle*, edited by Frey (1965; rev. ed. 1970), concerning 300 games.

Hoyle, Sir Fred (b. June 24, 1915, Bingley, Yorkshire, Eng.), British mathematician and astronomer best known as the foremost proponent and defender of the steady-state theory



Fred Hoyle

London Daily Express—Pictorial Parade/EB Inc.

of the universe. This theory holds both that the universe is expanding and that matter is being continuously created to keep the mean density of matter in space constant.

Hoyle was educated at Emmanuel College, Cambridge, and spent six years during World War II with the British Admiralty. In 1945 he returned to Cambridge as a lecturer in mathematics. Three years later, in collaboration with the astronomer Thomas Gold and the mathematician Hermann Bondi, he announced the steady-state theory. Within the framework of Einstein's theory of relativity, Hoyle formulated a mathematical basis for the steady-state theory, making the expansion of the universe and the creation of matter interdependent.

In the late 1950s and early 1960s, controversy about the steady-state theory grew. New observations of distant galaxies and other phenomena, supporting the big-bang theory, weakened the steady-state theory, and it has since fallen out of favour with most cosmologists. Although Hoyle himself was forced to alter some of his conclusions, he tenaciously tried to make his theory consistent with new evidence.

Hoyle was elected to the Royal Society in 1957, soon after joining the staff of the Mt. Wilson and Palomar Mountain Observatories (now the Hale Observatories). In collaboration with William Fowler and others in the United States, he formulated theories about the origins of stars as well as about the origins of elements within stars. In 1966 Hoyle became director of the Institute of Theoretical Astronomy at Cambridge, an institution he was instrumental in founding. He received a knighthood in 1972.

Hoyle is known for his popular science works, including *The Nature of the Universe* (1951), *Frontiers of Astronomy* (1955), *Astronomy and Cosmology* (1975), *Ten Faces of the Universe* (1977), and *Ice* (1981). He is also a noted science-fiction writer of novels, plays, and short stories.

Hoysaḷa DYNASTY, family that ruled from *c.* 1006 to *c.* 1346 in the southern Deccan and, for a time, in the Cauvery Valley. The first kings came from the hills northwest of Dōrasamudra (modern Halebīd), which became their capital *c.* 1060. With their hardy, hill-dwelling, Kanarese-speaking followers, they gradually absorbed Gaṅgavāḍi (Mysore state) and the rich lands beyond the Tungabhadra toward Dhārwār and Raichūr. The imperialistic programs of the Cālukyas of Kalyāṇī helped them, for under the Hoysaḷa rulers Vinayāditya (reigned *c.* 1047–98) and his grandson Viṣṇuvardhana (reigned *c.* 1110–41) they gained wide experience as feudatory generals.

Viṣṇuvardhana won much territory from the tough Kadambas of Hāngal, but his weak son Narasiṃha I lost it. Yet Viṣṇuvardhana's expulsion of the Cōlas from the plateau succeeded. His grandson Ballāla II (reigned 1173–1220) was invited into the plains to help the Cōlas. He agreed because his northern gains in 1189–1211 from the Cālukya dynasty beyond the Malprabha and Krishna rivers proper had diminished under pressure from the Yādava dynasty of Devagiri. He extended his dominions to the north of Mysore and defeated the Yādavas, making the Hoysaḷa dynasty the dominant power in southern India.

Ballāla II's grandson Someśvara (reigned *c.* 1235–54) resided in the principality on the Cauvery given by the Cōlas, and his son Rāmanātha (reigned 1254–95) was allowed to remain there by the Pāṇḍya emperor. On his eviction, however, his attempt to take the plateau kingdom from his brother Narasiṃha III weakened Hoysaḷa resources. Ballāla III (reigned *c.* 1292–1342), who helped the Sultan of Delhi against the Pāṇḍyas, brought about the dynasty's downfall by his futile ambitions. The Vijayanagar dynasty succeeded the Hoysaḷas.

Hoysaḷa architecture and sculpture, especially ornate and intricate, are best seen at Halebīd, Belūr, and Somnāthpur. The family liberally patronized Kanarese and Sanskrit letters.

Hozdar (Pakistan): *see* Khuzdār.

Hozjusz, Stanisław: *see* Hosius, Stanislaus.

Hrabanus Magnentius: *see* Rabanus Maurus.

Hradec Králové, German KÖNIGGRÄTZ, town, capital of Východočeský *kraj* (Eastern Bohemia region), Czechoslovakia, at the confluence of the Orlice and Elbe rivers. The old town stands on a low outcrop of sandstone between the rivers; the new town is on the western bank of the Elbe. Hradec lies at the crossing of old trade routes from the Baltic to the Danube River and from Prague to Kraków, Poland. Its marketplace received town rights in 1225. Fortified in the 14th century, Hradec became associated with Elisabeth of Poland, the queen dowager (Králové means "of the queen"), who founded the Gothic Cathedral of the Holy Ghost there in 1307. At the time, it was the second largest city of Bohemia. It suffered severely in the 17th century during the Thirty Years' War. The Prussians decisively defeated the Austrians in 1866 at the Battle of Königgrätz, which took place between Hradec and the nearby town of Sadova (Sadowa).

Hradec is a rail junction and is noted for the manufacture of musical instruments. Pop. (1983 est.) 97,438.

Hraschina meteorite, object that provided early evidence for the reality of meteorite falls. On May 26, 1751, a fireball exploded over Hraschina in Croatia (now in Yugoslavia), and two pieces of iron fell into a field, the larger weighing more than 70 pounds. Scientific opinion at that time held that stones or metal could not fall from the sky. The two fragments, with eyewitnesses' sworn statements, were preserved, however, by the consistory of the bishop of Zagreb and later by the Austrian emperor. When 40 years later the extraterrestrial origin of meteorites was postulated, the evidence from Hraschina was one of the strongest arguments. The fall (1803) of many stones at L'Aigle, Fr., provided the final convincing proof.

Hrdlička, Aleš (b. March 29, 1869, Humpolec, Bohemia, Austria-Hungary—d. Sept. 5, 1943, Washington, D.C.), American physical anthropologist, most renowned for his studies of Neanderthal man and his theory of the migration of American Indians from Asia.

Though born in Bohemia, Hrdlička came to America with his family at an early age. He studied medicine and practiced briefly until he left for Paris in 1896 to study anthropology with L.P. Manouvrier. He returned to the United States in the same year and became an associate in anthropology in the New York Pathological Institute. In 1899 he took charge of physical anthropology for expeditions sponsored by the American Museum of Natural History. In 1910 he became curator of the physical anthropology collections at the Smithsonian Institution, having been assistant curator for the previous seven years.

It was in his capacity as curator that Hrdlička made his extensive travels, examining many of the sites where *Pithecanthropus* had been found, as well as the sites of various Paleolithic settlements. His pioneering work, however, was done in the study of *Homo neanderthalensis.* In 1927 he published the first of his major theories in an article entitled "The Neanderthal Phase of Man," in which he sought to prove that *Homo sapiens* had developed from *Homo neanderthalensis* and that all human races had a common origin. In a later work, he postulated that mankind could have developed only in the Old World.

In 1927 Hrdlička began organizing expeditions to Alaska and the Bering Strait and developed the theory that native Americans came from Asia across the Bering Strait. Among the numerous honours that he received was the naming of the Hrdlička Museum of Man in Prague after him.

Most of Hrdlička's written work consisted of articles for various scientific publications.

Hrorekr (Varangian prince): *see* Rurik.

Hrosvitha, also spelled ROSWITHA (*c.* 935—1000), regarded as the first German woman poet.

Of noble birth, Hrosvitha spent most of her life as a nun in the Benedictine convent at Gandersheim. In an effort to counteract the pagan morality expressed in classical works, Hrosvitha wrote (*c.* 960) six comedies in Latin, based on Terence, but embodying Christian

themes. Written in a rough, partly rhymed prose, they were meant to provide edification for her sister nuns and were not to be compared to the vain pleasures of more felicitous secular documents. They were also meant for reading rather than performance. The manuscripts of Hrosvitha's plays were rediscovered *c.* 1500 by the German Humanist scholar Conradus Celtis. Hrosvitha's other works include narrative poems based on Christian legends and two verse chronicles: one on the feats of Otto the Great and the other on the history of the convent of Gandersheim from its founding in 856 to the year 919.

Hrozný, Bedřich (Czech), German FRIEDRICH HROZNY (b. May 6, 1879, Lysá nad Labem, Bohemia, Austria-Hungary—d. Dec. 18, 1952, Prague), Czech archaeologist and language scholar who deciphered cuneiform Hittite, opening a major path to the ancient history of the Near East.

After taking part in excavations in northern Palestine (1904), Hrozný became professor at the University of Vienna (1905) and also professor of cuneiform research and ancient Oriental history at Charles University, Prague (1919–52).

Working with inscriptions from the Hittite royal archives discovered at Boğazköy, Tur. (1906), he took the position—first suggested in 1902 by J.A. Knudtzon—that Hittite belonged to the Indo-European family of languages and was related to Iranian, Italic, Celtic, and Slavic. His *Sprache der Hethiter* . . . (1915; "Language of the Hittites . . .") was attacked from many quarters. He substantiated his claim, however, by translating a number of documents, including a Hittite legal code, and publishing *Hethitische Keilschrifttexte aus Boghazköi* . . . (1919; "Hittite Cuneiform Inscriptions from Boğazköy . . ."). In 1925 he led a Czechoslovak expedition to Kültepe, Tur., recovered some 1,000 Old Assyrian tablets nearby, and excavated the ancient city of Kanesh, revealing much about its everyday life. During the remainder of his career, he addressed himself to problems of deciphering.



Hrozný
CTK

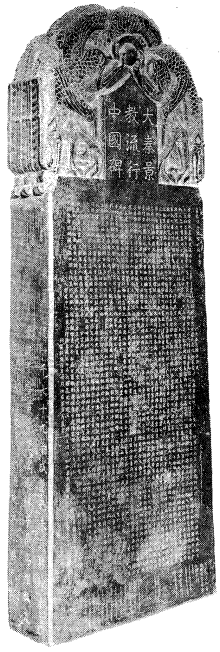
Hrušovský, Ivan (b. Feb. 23, 1927, Bratislava, Czech.), Slovak composer and educator.

Hrušovský studied composition at the Bratislava Conservatory and the Academy of Musical Arts, graduating in 1957. As a theoretition he was concerned with the development of Slovak music since the 19th century, and he wrote a number of articles on the subject. He is best known, however, for his lyrical musical compositions, most of which are firmly rooted in the eastern European musical tradition. His compositions include a piano sonata, a violin sonata, several orchestral works, works for chorus, and two works for electronic tape.

Hrvatska (Yugoslavia): *see* Croatia.

Hsaya San (Burmese leader): *see* San, Saya.

Hsi-an monument, inscribed stone monument that records the early missionary activity of Nestorian Christians in China. It was discovered by Jesuit missionaries in 1625 in the province of Shensi, China. The monument, constructed in 781, bears an inscription written in Chinese and signed in Syriac by 128 Christians, chiefly priests and officials.



Hsi-an monument, constructed in AD 781; in the Musée Guimet, Paris
Giraudon—Art Resource/EB Inc.

According to the inscription, the Chinese emperor T'ai Tsung received the Nestorian Persian monk A-lo-pen in his capital city of Ch'ang-an (modern Sian, or Hsi-an) in 625 and looked with favour upon him and the writings of the "luminous doctrine" (Christianity) he brought with him. By 638 a monastery for this monk and 20 others had been constructed at the expense of the Imperial coffer in the capital city. By 650 it is reported that the Christian mission had expanded sufficiently to be recognized at the diocesan level. Buddhist opposition, however, so affected the fortunes of the Christian enterprise that it was not possible to appoint a Nestorian metropolitan before the reign of Emperor Hsüan-tsung (712–56). The community disappeared after the 10th century.

Hsi Hsia, Pinyin XI XIA, kingdom of the Tibetan-speaking Tangut tribes that was established in the 11th century and flourished through the early 13th century. It was located in what are now the northwestern Chinese provinces of Kansu and Shensi.

Occupying the area along the trade route between Central Asia and the West, the Tangut were content with being a tributary state of the Chinese Sung dynasty (960–1279) until 1038, when a new leader, Li Yüan-hao, assumed the title of emperor as Chao Yüan-hao. Naming his new dynasty after the ancient Chinese state of Hsia, Chao embarked on a campaign to conquer all of China. But in 1044 he abandoned this attempt after the Chinese agreed to pay him an annual tribute.

For the next two centuries the Hsi Hsia, or Western Hsia, as the dynasty became known to distinguish it from its ancient Chinese namesake, maintained an uneasy three-way truce with the Sung and with the Liao dynasty (907–1125), established by the Inner Asian Juchen (or Jurchen) tribes in North China. Modeling their government after that of the Sung, the Hsi Hsia rulers adopted a new writing system for their people. Unlike the Chinese, they were ardent devotees of Buddhism and departed from the Chinese model in making Buddhism the state religion.

The Hsi Hsia dynasty was finally conquered by the Mongol troops of Genghis Khan in 1227.

Hsi-hsia-pang-ma Feng (China): *see* Gosainthan.

Hsi K'ang, Pinyin XI KANG, also called (Wade–Giles romanization) CHI K'ANG (b. AD 223, Yang Province, China—d. 262, Loyang), Chinese Taoist philosopher, alchemist, and poet who was one of the most important members of the free-spirited, heavy drinking Seven Sages of the Bamboo Grove, a coterie of poets and philosophers who scandalized Chinese society by their iconoclastic thoughts and actions.

Of influential parentage, Hsi received a traditional education, married into the Imperial family, and received an appointment as a high official. But he was unconcerned with governmental affairs; his taste ran to chess, dancing, wine, and the lute, in company with six famous friends who gathered in a bamboo grove near his Honan estate.

Hsi's poems and essays, in which he intermingled serious thoughts and humorous descriptions of his own eccentricities, are famous for their Taoist advocacy of transcending morality and institutions to follow nature. He believed that all distinctions between rich and poor, weak and powerful, and right and wrong should be eliminated. To that end, he scandalized Confucians of his day, who believed the upper classes should not engage in manual labour, by becoming an accomplished metalworker and busying himself with alchemical studies. But his iconoclasm, as well as his potentially subversive doctrines, proved his undoing; he offended one of the Imperial princes by his lack of ceremony and was denounced to the Emperor as a seditious influence. He was condemned to death, and it is said that more than 3,000 of his disciples offered to take his place in paying the supreme penalty. But Hsi calmly played his lute as he awaited execution.

Hsi-ning, Pinyin XINING, city in Tsinghai Province (*sheng*), western interior of China. Hsi-ning is the provincial capital and is situated in a fertile mountain basin in the valley of the Huang Shui (river), a tributary of the Huang Ho, about 125 miles (200 km) west of Lan-chou in Kansu Province and 45 miles east of Koko Nor, on what was traditionally the main trade route from northern China into Tibet and the Tsaidam Basin. These routes are now followed by modern highways. Since 1959 Hsi-ning has been connected by rail to the main Chinese system at Lan-chou; this railway extends into the Tsaidam area via Hai-yen near Koko Nor to Golmud.

Hsi-ning has always been a strategic point on the Chinese western frontier. Under the Han dynasty (206 BC–AD 220) a county (*hsien*) there called Lin-ch'iang controlled the local Ch'iang tribesmen. It was again a frontier county under the Sui (581–618) and T'ang (618–907) dynasties; during the 7th and early 8th centuries it was a centre of constant warfare with the T'u-yü-hun and (later) the Tibetan peoples. In 763 it was overrun by the Tibetans and while under Tibetan control was known to the Chinese as Ch'ing-t'ang-ch'eng. Recovered by the Sung dynasty in 1104, it received the name Hsi-ning (meaning "peace in the west") and has been the seat of a prefecture or superior prefecture under that name since that time. With the rise of Tibetan Buddhism (Lamaism), which began in the 7th century AD, Hsi-ning became an important religious centre; Tsinghai's largest

lamasery, a holy place to the Yellow Hat sect of Buddhists, was located at Kunbum, some 12 miles to the southeast.

Hsi-ning became the provincial capital when Tsinghai was established as an independent province in 1928, and it was given municipal status in 1945. Since the late 1950s, when the Liu-chia Gorge Dam and hydroelectric project came into operation in neighbouring Kansu Province, Hsi-ning has been linked by a high-tension grid to both Liu-chia and Lan-chou. It also uses local coal from mines at Ta-t'ung-hsien to the north. A modern woolen mill was installed before 1957. The city also has a leather industry and is a market for salt from the Tsaidam region. During the late 1950s medium-sized iron- and steelworks were built, supplying metal to Lan-chou. Pop. (1985 est.) city centre, 473,000; city, 576,400; city and administratively attached counties, 921,700.

Hsi-po (Chinese ruler): *see* Wen-wang.

Hsi River, Wade–Giles romanization HSI CHIANG, also spelled SI KIANG, Pinyin XI JIANG, English WEST RIVER, longest river of southern China. It flows generally eastward for 1,216 miles (1,957 km) from the Yunnan highlands to the South China Sea and drains—along with the Pei, Tung, and the Pearl rivers—a basin 173,000 square miles (448,000 square km) in extent. It is shorter than the other important Chinese rivers—the Yangtze, the Huang Ho (Yellow River), and the Sungari, but it delivers an enormous quantity of water, and its volume of flow is second only to that of the Yangtze.

The Hsi River itself drains an area of about 127,000 square miles of southern China and northern Vietnam. More than half of the basin is mountainous and lies between 9,900 and 1,650 feet (3,000 and 500 m) above sea level; more than 40 percent of the rest of the basin is occupied by hills between 330 and 1,650 feet high. The lowlands of the delta account for less than 5 percent of the total drainage area. Most of the mountains and hills are composed of limestone, and the river has cut a cavernous valley through them. The riverbed is broken by rapids and gorges, and its walls are often high and steep; the landscape is of the type known as karst, in which the limestone rocks are honeycombed with tunnels and openings, so that much of the drainage runs underground, and deep sinks or swallow holes abound.

The main headstream is generally considered to be the Nan-p'an River, rising in the Yunnan–Kweichow plateau region at an elevation of about 6,900 feet but dropping a total of 5,900 feet in the first 530 miles of its course, which flows in a southeasterly direction through Yunnan Province. It then forms part of the border between Kweichow Province and the Chuang Autonomous Region of Kwangsi for a distance of about 535 miles. Southeast of the town of Ts'e-heng, the river receives the Pei-p'an River and is then known as the Hung-shui River. This section of the river flows for about 400 miles through a narrow valley with high, mountainous banks dropping down about 850 feet. Its bed—between 165 and 1,000 feet wide—is broken by rocky rapids that are less than 3 feet deep and difficult to navigate. For the first 75 miles of its course the Hung-shui continues to form part of the Kweichow–Kwangsi border, flowing in an easterly direction until just before it reaches the town of Chiu-t'ien-o, where it makes a great bend to the south and flows through Kwangsi. At Kungchuan it turns northward and then resumes its easterly direction.

At Shih-lung the river receives the Liu River, its most important left-bank tributary, and is then called the Ch'ien River. This shortest section of the river is no more than 75 miles in length, the river dropping about 50 feet in this distance. The channel grows dramatically, occasionally achieving depths of 280 feet. For almost half its length, the Ch'ien flows through the narrow, rock-strewn Tat'eng Gorge between the cities of Wu-hsüan and Kuei-p'ing, at the end of which it receives its most important right-bank tributary, the Yü River, and is then known as the Hsün River. This section flows for about 120 miles in an easterly direction, dropping a further 55 feet and receiving the Jung River on the right bank at T'eng-hsien and the Kuei River on the left bank at Wuchow (Ts'ang-wu) on the Kwangtung Province border. The widest point of the Hsün is 1,120 feet, at Lungtangsha (gorge), while its maximum depth reaches almost 200 feet.

Below Wuchow, where it enters Kwangtung Province, the river is known as the Hsi River. Its valley consists of a series of winding gorges and wide hollows. The Sanjung and Lingyang gorges narrow to widths of 230 to 260 feet and are about 250 feet deep. Throughout its 130-mile length the Hsi drops only about 30 feet, flowing to the east until it joins with the Pei River at San-shui. It then turns south through the vast Pearl River Delta, also called the Canton Delta, before emptying into the South China Sea west of Macau.

The delta is formed by three main rivers—the Hsi, the Pei, and the Tung. At San-shui, the Hsi and Pei are joined by a short channel and then divide. The larger branch, the Hsi, bends to the south and forms the western border of the delta, while a lesser branch, the Fo-shan Chih-liu, flows eastward into the delta itself. The Tung flows from the east and enters the delta's main channel, the Pearl River (Chu Chiang), which begins just above Canton. Canton lies west of the point where the Tung flows into the main channel; Hong Kong stands to the east and Macau to the west of the entrance to the Pearl River Estuary, which is about 18 miles wide.

Covering an area of about 1,500 square miles in southeastern Kwangtung Province, the delta is a complex network of river branches and channels, divided by islands of alluvial soil and by hills that were once coastal islands. The fertile islands are only slightly above sea level and are protected from the sea by a system of flood dikes.

Forests cover much of the mountainous region of the basin, especially in the north and west, the stretch along the border of Kweichow Province being the most heavily forested. The more important trees are the pine, the fir, the camphor, the tung, and bamboo. In the eastern part of the basin, in the low places of the maritime zone and in the valleys, the vegetation is mostly cultivated and includes rice, peanuts (groundnuts), sugarcane, hemp, tobacco, and fruit.

The river contains an abundance of freshwater fish. The waters of the Pearl River Delta are well utilized as fishponds. Monkeys, bears, and tapir frequent the mountainous regions to the west.

Throughout the mountainous part of its course, the river has but little relationship to the peoples who live in its vicinity. Most settlement occurs in small valleys or in plains between mountains, known as *patse.* The villages are isolated, compact agricultural units. River towns become more frequent in the hilly part of the Kwangsi region, where the river is an artery of commerce; towns include Kungchuan, Ch'ien-chiang, Lai-pin, Kuei-p'ing, T'eng-hsien, and Wuchow.

The Pearl River Delta is one of the most densely populated regions of China. The entire region is intensively cultivated. Rice is the most important crop, but in the cooler, drier climate of the west wheat, corn (maize), sorghum, beans, and potatoes are also grown. An intricate irrigation system includes more than 1,200 miles of flood dikes. The waters are also used as fishponds. The delta's many channels are vital to Canton's international commerce, as well as to trade with the interior.

The river basin is nourished mainly by rainfall, and its water levels and volume vary according to the relative abundance of precipitation. The rate of flow more than doubles in the summer season. Most of the large flow results from the summer monsoon rains, when torrential floods may occur and frequently do cause catastrophic damage. The water is at its lowest during the winter dry period.

Fluctuations in the water level during the year may vary by as much as 80 feet at Wuchow; in the lower course and the delta, variations in the level are less. Especially dangerous are the delta floods that result from a combination of flooding rivers and high tides. In the river basin, there were 29 floods in the 17th century, 26 in the 18th, 36 in the 19th, and 24 in the first half of the 20th century.

The river is important for its use as a transportation artery. The basin contains more than 9,000 miles of water routes, of which more than 6,800 miles are in use. Steamships can sail along more than one-third of the total length of the waterways, while Chinese junks and small craft ply all the navigable waters. Navigation is hampered by low water on many tributaries and by rapids on some sections of the river. In several places, as on the Yü River, river craft are pulled over the rapids with hand-worked windlasses. During low-water periods, transportation ceases on some rivers, including the Tung and the Pei.

The water routes do not form an integrated system. Canton, the largest city in the basin, does not have direct access to either the Hsi or the Pei. The channels that connect the city to the water routes of the basin are winding and mud filled and are navigable only by shallow-draft boats. Because most of the river branches of the delta are shallow, oceangoing vessels cannot reach Canton but must dock at Huang-pu-chiang (Whampoa), 10 miles downstream.

Hsi-tsung (Chinese emperor): *see* T'ien-ch'i.

Hsi wang mu, Pinyin XI WANG MU (Chinese: "Queen Mother of the West"), in Taoist mythology of China, queen of the immortals in charge of female genies (spirits) who dwell in a fairyland called Hsi Hua ("West Flower"). Her popularity has obscured Mu Kung, her counterpart and husband, a prince who watches over males in Tung Hua ("East Flower") paradise. Tradition describes the queen as a former mountain spirit transformed into a beautiful woman from a quasi-human who had a leopard's tail and tiger's teeth. Her fairyland garden was filled with rare flowers, extraordinary birds, and the flat peach (*p'an-t'ao*) of immortality.

A Taoist romance relates that during a visit to Wu-ti, emperor of the Han dynasty, Hsi wang mu gave him the famous peach of immortality. He was anxious to bury the stone, but Hsi wang mu discouraged him saying that Chinese soil was not suitable and, in any case, the tree bloomed only once in 3,000 years.

The Hung-wu emperor, who was the first Ming emperor (1368–98), was presented with a *p'ant'ao* stone discovered in a treasure house of the previous (Yüan) dynasty. Ten engraved ideographs identified the stone as that given to Wu-ti by Hsi wang mu.

Hsi wang mu's birthday is celebrated by the Pa Hsien ("Eight Immortals") with a grand banquet during which Hsi wang mu serves special delicacies: bear paws, monkey lips, and dragon liver. *P'an-t'ao* are offered to the guests as the last course.

Hsi-yu chi (Chinese: "Record of a Journey to the West"), foremost Chinese comic novel, written by the long-anonymous Wu Ch'eng-en (1500–*c.* 1582). Based on the actual 7th-century pilgrimage of the Buddhist monk

Hsüan-tsang (602–664) to India in search of sacred texts, the story was already a part of Chinese folk and literary tradition in the form of colloquial stories, a poetic novelette, and a six-part drama when Wu Ch'eng-en formed it into his long and richly humorous novel.

Composed of 100 chapters, the novel can be divided into three major sections: the first seven chapters dealing with the birth of a monkey from a stone egg and his acquisition of magic powers; five chapters relating the story of Hsüan-tsang, known as Tripitaka, and the origin of his mission to the Western Paradise; and the bulk of the novel, recounting the 81 adventures that befall Tripitaka and his entourage of three animal spirits—the magically gifted Monkey, the slow-witted and clumsy Pigsy, and the fish spirit Sandy—on their journey to India, culminating in their attainment of the sacred scrolls.

In addition to the novel's comedy and adventure, *Hsi-yu chi* has been enjoyed for its biting satire of society and Chinese bureaucracy, and for its allegorical presentation of man's striving and perseverance. An English translation entitled *Monkey* was published in 1942.

Hsia DYNASTY, Pinyin XIA (22nd–19th/18th century BC; traditional dates *c.* 2205–*c.* 1766 BC), early Chinese dynasty, mentioned in legends but of undetermined historicity. According to legend, the founder was Yü, who was credited with having engineered the draining of the waters of a great flood (and who was later identified as a deified lord of the harvest). Yü allegedly made the rulership hereditary in his family, thereby founding the first (legendary) Imperial dynasty in China. Tradition gives the names of successive rulers, ending with Chieh, who is said to have fallen in love with a beautiful but evil woman, who acted cruelly. Outraged, the people, so the story goes, rose in rebellion, led by T'ang, who tradition says founded the Shang (or Yin) dynasty.

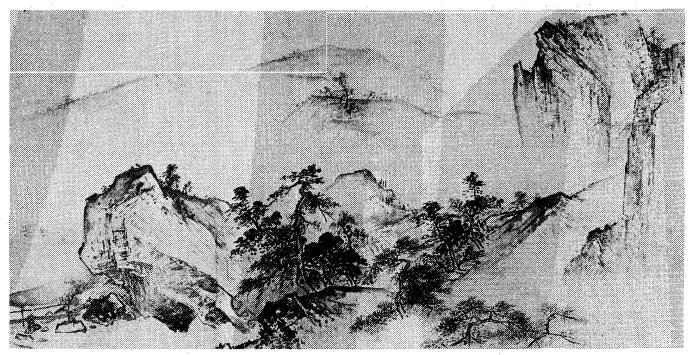
Hsia-kuan, Pinyin XIAGUAN, city in western Yunnan Province (*sheng*), China. Hsia-kuan is a county-level municipality (*shih*) and the administrative centre of Ta-li-pai-tsu Autonomous Prefecture (*tzu-chih-chou*). Hsia-kuan is situated at the southern end of the Erh Hai (lake) in a fertile basin about 10 mi (16 km) southeast of Ta-li. It has traditionally been an important centre on the routes westward from K'un-ming to the Tibetan Autonomous Region and northern Burma; it also has routes leading south into the wild southwest region of Yunnan.

Hsia-kuan was first known to the Chinese in the mid-8th century as Lung-wei-ch'eng; at that time it was a city built by Pi-lo-ko, king of the Nan-chao kingdom located in the area. After the occupation of the area by the Mongols in the late 13th century, it became a customs station and tax office, known variously as Lung-wei-kuan, Ho-wei-kuan, or Hsia-kuan. It grew into an important market town for local produce and was a centre of trade between Chinese merchants and the various minority peoples living in the surrounding mountain districts. Its trade in the 19th century was largely founded on tea produced in the vicinity. It was also a tea market second only to Pu-erh in Yunnan, and tea processing became an important industry in the early years of the 20th century. Its prosperity increased still further with the construction of the Burma Road during the Sino-Japanese War (1937–45), and its commercial role subsequently increased until it became the chief collection and distribution centre in western Yunnan.

The modern city is a collecting centre for cotton, tea, grain, sugar, pears, walnuts, and ham, as well as fish from the Erh Hai; these products were mainly for shipment to K'un-ming. Since 1949 the city has experienced some limited industrial development, including grain milling, oil extraction, and tea curing. It also has some light engineering industries, producing farm tools. Pop. (1953) 26,000; (mid-1970s est.) 10,000–50,000.

Hsia Kuei, Pinyin XIA GUI (fl. 1195–1224), artist, one of China's greatest masters of landscape painting, co-founder with Ma Yüan of the Ma-Hsia school. The album leaf and the hand scroll with a continuous panorama were his predominant forms. His works are typically in ink monochrome, occasionally with a few touches of colour. His style is characterized by short, sharp, angular strokes suggesting rapid execution.

Life. Hsia Kuei's birth and death dates are unknown. According to most Chinese sources, however, he served in the Imperial Academy (Yü hua-yüan) under the emperor Ning Tsung (reigned 1194/95–1224/25), eventually attaining the rank of *tai-chao,* or "painter in attendance," and being awarded the highest honour a court painter could receive, the Golden Belt.



"Pure and Remote View of Streams and Mountains," detail of hand scroll in ink and paper by Hsia Kuei, early 13th century (Southern Sung); in the National Palace Museum, Taipei

By courtesy of the National Palace Museum, Taipei, Taiwan, Republic of China

The earliest source of information on him, however, a collection of painters' biographies compiled in 1298 by Chuang Su and titled *Hua-chi pu-i,* states that he was active in the academy under the reign of the emperor Li Tsung (reigned 1224/25–1264/65). Perhaps his service in the academy overlapped these two reigns and can provisionally be dated around 1200–40.

He was born in or near the city of Hangchow in Chekiang Province, then the capital of China, to which the Imperial Court had been moved in the early 12th century when the north of China was invaded by the Chin (Juchen) Tatars. Because of this move, the latter half of the Sung dynasty is known as the Southern Sung period (1127–1279). During this period, the centre of painting, and the concentration of major artists, was in the Imperial Painting Academy. Accordingly, the leading masters of the 12th and first half of the 13th centuries, with a few exceptions, were the court painters of Hangchow. Most famous among them are Hsia Kuei and his contemporary Ma Yüan, whose school of painting came to be known as the Ma-Hsia school.

No information exists on Hsia Kuei's early artistic training or the identity of his teacher, but most sources agree that he followed the stylistic tradition of an earlier landscapist in the academy, Li T'ang. Li T'ang's career extended from the late 11th century until sometime after 1138, when the court resettled in Hangchow; he had followed it there on its southward exodus and rejoined the academy when peace allowed its resumption of activity, living long enough after that to set the new direction that its painting took in the Southern Sung period. Li T'ang transformed the monumental, imposing landscape type of the 11th century into a new image of nature, seen closer up, less awesome, allowing easier response by the viewer. Where early Sung landscape paintings had been carefully constructed microcosms, complex in design and full of detail, with small figures, buildings, and so forth, scattered throughout the scene, Li T'ang tended to simplify his compositions and limit his materials, achieving thereby a more sharply focussed and immediate effect. He thus, with his followers, created the new mode of landscape sometimes called the lyric style. His ideas were developed and exploited by academy landscapists later in the 12th century, practically all of whom were to some degree his followers.

Hsia Kuei was no exception. The painting that is stylistically earliest among his signed, reliable works—a fanshaped album leaf in the National Palace Museum, Taipei, representing two men in a house in a valley gazing out at a waterfall—follows fairly closely the models of earlier 12th-century academy masters who imitated Li T'ang but brings the scene even closer than they had, further limiting the range of view and focussing interest on the two figures. The drawing is more conventional than in Hsia Kuei's later works, although a few features of style that anticipate these are to be seen.

The favourite form of the Southern Sung academy painters was the album leaf, which sometimes took the round or oblate shape that indicates it was originally mounted on a flat fan but more often was square, or nearly square, in shape. Most of Hsia Kuei's surviving works are album leaves. Two preserved in Japan—a signed landscape in the famous collective album called *Hikkōen* ("Garden Plowed by the Brush") and another, unsigned, in the Tokyo National Museum—along with a signed, fan-shaped leaf in the Boston Museum of Fine Arts representing a sailing boat on a river during a storm, with houses and windswept trees on the shore—are widely accepted as genuine productions of his hand. All are painted on silk, the two in Japan in ink monochrome, the Boston leaf with a few touches of light colour. All follow the same simple but effective scheme: the composition is diagonally divided, upper left to lower right, with the landmass in the lower segment and the upper occupied only by distant hills (in the *Hikkōen* picture, even these are missing). In each, a central group of leafy trees projects into the empty area, and a house is seen below, partly hidden. In both the leaves in Japan, a figure of a farmer returning homeward enters across a bridge in one lower corner; in the Boston leaf, a sailing boat at left serves the same function as a secondary focal point. All are exquisitely calculated, perfectly balanced, conveying with great precision a scene glimpsed through haze, sharply focussed at a few points but obscured at others. In all, the void plays as positive a role as the solid masses.

Hsia Kuei was also a master at composing

the hand scroll, or horizontal scroll, which one viewed by unrolling from one end to the other, rerolling the portion already viewed as one moved. The effect was that of gazing at a continuous panorama, as in an imaginary journey through the scenery of nature. The finest example of that form is his great "Pure and Remote View of Streams and Mountains" in the National Palace Museum, Taipei. Originally signed, it is now missing a final section that bore the signature. A colophon by a later writer, dated 1378, ascribes it to Hsia Kuei. The remaining portion is about 27 feet long. Executed on paper, in rich ink tones ranging from the deepest blacks to subtle, seemingly evanescent, washes of pale gray, it is probably the most brilliant performance in the ink-monochrome technique in the whole of Chinese painting. Strong tonal contrasts are used to give powerful bulk to the rocks by distinguishing their sunlit and shadowed faces. Broad, broken strokes of ink render their rough-textured surfaces. This technique is derived from Li T'ang's "small ax-cut" texture strokes, so called because they suggest a surface hewn with an ax; the broader form, seen in works by Ma Yüan and Hsia Kuei, are called large ax-cut strokes.

These and other features of the drawing agree closely with descriptions of Hsia Kuei's style by Chinese writers. They speak of his use of a "split brush" (*i.e.,* the brush tip divided so as to make two or more strokes at once) in painting tree foliage and of his freehand drawing of architecture, bridges, and so forth, "without employing a ruler." They say that he liked to use a brush with a worn tip, the purpose of this presumably being to avoid the over-refined, "slick" drawing of other Southern Sung academy artists. They speak also of his working with great facility and spontaneity, so that the painting was "finished suddenly, in a strange and mysterious way."

The composition of the "Pure and Remote View" offers dramatic juxtapositions of near and far, solid and void. Distant parts of the picture are painted in dimmer ink, a basic device for achieving a sense of space in Chinese landscape that is known as atmospheric perspective. The whole impression is of a spacious, mist-hung, peaceful terrain, seen toward twilight. The standard characterization of Ma-Hsia landscape as "romantic" seems well justified in this, the supreme surviving work of the school.

Several others of Hsia Kuei's hand scroll compositions survive in original or copy. The "Twelve Views from a Thatched Hut" exists in several versions, of which the best by far, preserving, however, only four of the views, is in the William Rockhill Nelson Gallery of Art in Kansas City, Mo. Another fine composition is preserved in a copy in the Shanghai Museum, which originally bore an inscription and the date 1204. A famous and often-recorded work of Hsia Kuei, his "Ten Thousand Miles of the Yangtze River," now survives only in a copy that is probably of the 16th century, in the National Palace Museum, Taipei.

Hanging scroll compositions based on Hsia Kuei's paintings are less common. The "Landscape: A Fisherman's Abode After the Rain" in the Boston Museum of Fine Arts is ascribed to him and is in his style. A painting of "A Misty Gorge" in the Freer Gallery of Art is in his style and of his period. It reportedly once bore his signature, which was lost in remounting. Several paintings in Japanese collections may be copies of his works; the most famous and often-reproduced is the "Rain Storm" formerly in the Kawasaki Collection, once regarded as a major work of the master but now recognized to be a copy.

Influence and assessment. For a time after his death, Hsia Kuei may have suffered the same low esteem as other Southern Sung academy painters in the eyes of proponents of the new literati, or scholar-amateur, school of painting, for whom professionalism was equated with empty technique and academicism. Chuang Su wrote in 1298 (*Hua-chi pu-i*):

> He painted landscapes and figures, all very vulgar and debased. In the late Sung period, when the way the world had fallen into decline, and people's minds were restless and upset, Hsia Kuei won a name for himself by pursuing excess. But of real substance there is none.

Hsia Wen-yen, in *T'u-hui pao-chien* (1365), wrote of him in more positive terms:

> His works have an exciting (stimulating) quality. His ink tones give the effect of colours; his brush-work is mature and controlled; the ink washes are applied rich and wet, a remarkable achievement. His snow scenes are completely based on those of [the 11th-century landscapist] Fan K'uan. Of all the Academy masters of landscape after Li T'ang, none was his equal.

Tung Ch'i-ch'ang (1555–1636), great artist-critic of the late Ming period, who was generally scornful of the entire professional-academy tradition, exempted Hsia Kuei somewhat from his sweeping condemnation.

> Hsia Kuei followed Li T'ang but added the element of *simplicity* to his style. What he did was like what clay-workers call "reduced modeling." In his conceptions and intent, he is quite devoid of the "shortcuts" of imitativeness. With some forms hidden, some sunk [into mist], he has the "ink-plays" of the two Mi's at his brush-tip.

The last sentence, obscure as it may sound, is especially significant. "Ink-plays" was a term used by the scholar-amateur artists for their unassuming, noncommercial pictures. Two of them who were particularly fond of so designating their paintings were Mi Fei, also known as Mi Fu (1051–1107), and his son Mi Yu-jen (1086–1165), both highly respected by Tung Ch'i-ch'ang and other literati critics for their spontaneity and inspired, intuitive mode of painting. To relate Hsia Kuei to them was to credit him with the same qualities, in which academy artists were generally held to be deficient. While it is difficult to see much clear resemblance between paintings by or after the two Mi's and those of Hsia Kuei, Tung Ch'i-ch'ang's observation is not an empty one: in his use of subtle ink washes to render atmosphere, in his hiding of transitions in mist and reduction of fine-drawn detail, Hsia Kuei does appear to have learned something from Mi Yu-jen. Such affinities set him apart from his co-workers in the academy, including Ma Yüan, whose sleeker and more elegant style, used for carefully constructed, often mannered compositions, seems quite incompatible with the literati painters' ideals.

Ma Yüan's style proved relatively easy to imitate, and hundreds of later painters did so. The style of Hsia Kuei, on the other hand, produced its brilliant effects only in the hands of a master; direct attempts at imitation by lesser painters of later times are on the whole pallid and uninteresting. Nevertheless, his influence was considerable. One painter in the Yüan period (1206–1368), Sun Chün-tse, did creditable pictures in a mixed Ma-Hsia manner, and some artists of the Che school under the Ming dynasty, in the 15th and 16th centuries, played entertaining variations on the style, while robbing it of most of its depth, both pictorial and expressive. Through these Ming epigones and their flatter, more decorative landscapes, the Ma-Hsia school was transplanted in Japan, where it served as the basis for most of the ink-monochrome landscapes of the Muromachi period (1338–1573). Two of the major works of the Japanese painter Sesshū (1420–1506), both hand scrolls, appear to be modelled on paintings by Hsia Kuei. As late as the early 17th century in China, a few painters were still producing landscapes avowedly "in the manner of Hsia Kuei." But the direction that painting took in the Ch'ing dynasty (1644–1911/12) did not allow such tonal subtleties or such concern with space and distance, and Hsia Kuei's style was scarcely reflected in paintings of that period, nor was the artist himself mentioned in its literature. It is only in modern times that he has come to be recognized as one of the leading masters of Chinese landscape painting and one of the great interpreters of nature in world art.

(J.F.C.)

MAJOR WORKS. Some examples of Hsia Kuei's style and work (dating from the 13th century or considered to be faithful copies); "Pure and Remote View of Streams and Mountains" (National Palace Museum, Taipei; other versions and variations of this work may be found in the Asano Collection, Odawara, Japan; the Metropolitan Museum of Art, New York City; and in the Freer Gallery of Art, Washington, D.C.); "Rain Storm" (formerly Kawasaki Collection, Kōbe, Japan); "Twelve Views from a Thatched Hut" (William Rockhill Nelson Gallery of Art, Kansas City, Mo.; a copy is held in the Moore Collection of Yale University Art Gallery, New Haven, Conn.); *Hikkōen*, album, two leaves attributed to Hsia Kuei (Nakamura Collection, Tokyo); "Ten Thousand Miles of the Yangtze River," attributed to Hsia Kuei (National Palace Museum); "Landscape with Two Men Gazing at a Waterfall," fan-shaped painting (National Palace Museum); "River Landscape with a Windswept Tree" (Museum of Fine Arts, Boston); "River View with a Boat at Anchor" (Tokyo National Museum; a copy in the Seikado Foundation, Tokyo).

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Hsia-men (China): *see* Amoy.

Hsiang Chi: *see* Hsiang Yü.

Hsiang-fan, Pinyin XIANGFAN, city in northern Hupeh Province (*sheng*), China. A county-level municipality (*shih*), it is the administrative centre of Hsiang-yang Prefecture (*ti-ch'ü*), which includes counties (*hsien*) in the middle basin of the Han Shui (river). Hsiang-fan is situated just west of the junction of the Han Shui with its northern tributary, the Pei Ho (river). It is the head of navigation for steamers and is a transshipment point for the junk traffic from the Upper Han Shui and its tributaries. It has good highway communications, being at the crossing place of the major route from Honan Province (which runs via Nan-yang to Sha-shih and across the Yangtze River into the southwest) and of the southeast to northwest route via the Han Shui Valley from Wu-han to Lan-chou in Kansu Province. The area from very early times had been a vitally important strategic and commercial centre. The modern municipality was formed in 1950 by combining the two cities of Fan-ch'eng (a commercial centre and river port) on the north bank of the Han Shui, and Hsiang-yang (an administrative, political, and cultural centre) on the south bank.

Hsiang-yang is much the older of these two cities. The county of this name was established by the Han dynasty (206 BC–AD 220) in the 2nd century BC and continued in existence on the same site until the present. It became the site of a commandery in AD 221 and was a key strategic stronghold in the wars of the ensuing period between the rival regimes in North and South China. In the late 12th century it became a superior prefecture (*fu*), retaining this status until 1912. During the 13th century it was the most important fortress on the frontier between the territory occupied by the Mongols in northern China and the South-

ern Sung dynasty (1126–1279); its capture, following a prolonged siege during which the Mongol forces used cannon and explosives, was a turning point in the Mongol conquest of the Central Yangtze Basin and, eventually, of all southern China. Hsiang-yang, although it continued to be an important garrison city and administrative centre, was not a good river port; and Fan-ch'eng, on the opposite bank, grew rapidly in importance during the 19th and 20th centuries, as did Kuang-hua, farther upstream, which was the head of navigation for junk traffic.

The creation of the municipality of Hsiang-fan in 1950 has established its economic importance as the major collecting and commercial centre for the surrounding region, which is rich and densely populated. The city's importance has been increased further by the construction of rail links that join it to Wu-han. A line via Kuang-hua extending up the Han Shui Valley northwest to An-k'ang and then southwest to Ch'ung-ch'ing (Chungking; in Szechwan) was completed in 1978. A north to south line from Lo-yang in Honan to I-tu in Hupeh on the Yangtze and to nearby I-ch'ang has also been built. Hsiang-fan has a thermal generating plant. There is, however, no major industry apart from small-scale processing of agricultural products, oil pressing, the production of textiles, yarn spinning, and glass manufacture. Pop. (mid-1970s est.) 100,000–300,000.

Hsiang-kang: *see* Hong Kong.

Hsiang language, type of Chinese spoken in Hunan Province. There are two major varieties of Hsiang, New Hsiang and Old Hsiang. New Hsiang, spoken primarily around Ch'ang-sha, the capital of Hunan, has been strongly influenced by Mandarin Chinese. Old Hsiang, spoken in other areas of the province, including Shuang-feng, is similar in many respects to the Wu language. Old Hsiang has a greater number of different initial consonants than any other major Chinese language. Hsiang uses five tones to distinguish meaning between words or word elements with the same series of consonants and vowels.

Hsiang River, Wade–Giles romanization HSIANG CHIANG, Pinyin XIANG JIANG, river in Hunan Province, China. With a total length of 500 mi (800 km), the Hsiang is one of the principal tributaries of the Yangtze River. The Hsiang rises in the mountains in Hsiang-an County (*hsien*) in the northern part of the Kwangsi Chuang Autonomous Region and flows northeast into Hunan Province. At Ling-ling it is joined by the Hsiao Shui (river), which drains the Hunan–Kwangsi border mountains and then flows east, being joined by the Lei Shui, flowing from the Kwangtung border, at Heng-yang. The river then turns north, passing Ch'ang-sha, and flows into Tung-t'ing Hu (lake) and thence into the Yangtze. It is joined by the Lu Shui at Chu-chou and by the Lien Shui, its chief western tributary, below Hsiang-t'an.

The Hsiang River is an important waterway and was the chief artery of communications for the province until the completion of the railway in the 1930s. Large vessels can reach Ch'ang-sha from the Yangtze. Small steamboats can reach Hsiang-t'an, and junks can reach Heng-yang. At high water, junks can reach Ling-ling. Above this point small craft can be hauled with difficulty up the upper stream to Hsing-an, in Kwangsi, and thence, by the ancient Ling Ch'ü (Ling Canal), across the watershed to the Kuei Chiang (Kuei River). This waterway provided one of the chief routes between central China and Kwangtung and Kwangsi throughout historical times and is still usable, though now largely superseded by the railway.

Hsiang-t'an, Pinyin XIANGTAN, city in eastern Hunan Province (*sheng*), China. A county-level municipality (*shih*), it is the administrative seat of Hsiang-t'an Prefecture (*ti-ch'ü*), which is divided into two sections by the Chu-chou Municipality (*shih*). Situated at the confluence of the Hsiang Chiang and Lien Shui (rivers), 22 mi (35 km) southwest of Ch'ang-sha, it has good communications by water as far as Heng-yang to the south and Shao-yang to the southwest.

The county was first established in the early 6th century AD as a subordinate county of Ch'ang-sha. Originally some distance south of the present city, it was moved to its present site in 749 and has remained a county under the same name ever since, except for a brief interval in the 13th and 14th centuries when it became an independent prefecture. It was opened to foreign trade in 1905.

With the construction of the northern section of the Han-k'ou–Canton railway in 1918, however, Hsiang-t'an was bypassed, since the rail line went through Chu-chou (formerly a small market town under its jurisdiction) to the east. Hsiang-t'an did not get its own rail link until 1957, when the line westward from Chu-chou to Lou-ti was opened. Subsequently, in 1963, this line was extended to Shao-yang to the southwest and to Hsin-hua to the west. In the 1970s the line was extended westward from Hsin-hua to Kuei-yang (in Kweichow).

The city has continued, however, to be an important river port and is the major market and collecting centre for the rich rice area of the Lien Shui and I-su Ho valleys. Traditionally it was a great centre of the medicinal-herb business, with the ramifications of its trade stretching far into Kweichow, Yunnan, Szechwan, and Kwangtung provinces. In 1937, in the early stages of the Sino-Japanese War (1937–45), it was decided to industrialize Hsiang-t'an and Chu-chou. Orders for a large iron- and steelworks were placed in Germany, but the outbreak of war prevented the project from reaching fruition. Before 1949 the only modern industries were the generation of electricity and the manufacture of electric equipment.

The old city—the commercial centre and port—was located on the west bank of the Hsiang Chiang. Since 1949 a major new industrial city has grown up on the east bank. This includes a large cotton-textile industry and a large electric wire and cable plant as well as the Hsiang-t'an Electrical Equipment Plant, which produces a wide range of products. There is also a large iron and steel complex, built in the late 1950s, which came into production in 1959. Hsiang-t'an remains a commercial centre for the agricultural produce of southern and southwestern Hunan. It is a centre for rice milling and is a major producer of hog bristles. It also has a university. Pop. (1980 UN est.) 574,000 .

Hsiang Yü, Pinyin XIANG YU, original name (Wade–Giles romanization) HSIANG CHI, (b. 232 BC, state of Ch'u, China—d. 202 BC, Anhwei Province), Chinese general and leader of the rebel forces that overthrew the Ch'in dynasty (221–206 BC) and the principal contestant for control of China with Liu Pang, the founder of the Han dynasty (206 BC–AD 220). Hsiang Yü's defeat signalled the end of the old aristocratic order in China.

Hsiang Yü was a member of a prominent family in Ch'u, one of the Chinese states absorbed by the Ch'in dynasty when it united China and abolished the small feudal kingdoms into which the country had been divided. When rebellions erupted against the dynasty, Hsiang Yü joined the Ch'u armies led by his uncle, eventually succeeding him as supreme commander. Hsiang Yü's forces captured the Ch'in capital and executed the last Ch'in emperor.

Hsiang Yü then attempted to restore the earlier ruling system. He gave the title of emperor to a member of the former Imperial family of the state of Ch'u and divided the country among the various insurgent generals, making each a ruler of one of the old royal houses. Hsiang Yü took the old territory of Ch'u and reserved for himself the title of hegemon king.

Soon, however, he had the Emperor executed, thus precipitating a struggle for supremacy with his rival generals, the foremost of whom was Liu Pang, who had been given control of western China. Of peasant origin, Liu was a blunt, crude man but one who knew how to win the hearts of the people. He had gradually eliminated his rivals in the west and consolidated his position. Hsiang Yü, by contrast, epitomized the aristocrat. He was tall and muscular, a poet and an educated man, and a superb military tactician; yet he lacked the personal magnetism to gain and hold the loyalty of the common people. The truce that the two rivals for power concluded was violated almost immediately by Liu Pang, who also repeatedly declined Hsiang Yü's offers to settle their conflict in hand-to-hand combat. In 202 Hsiang Yü's forces were overwhelmed, and he chose suicide rather than capture. His heroism, especially during the final battle, has been glorified in Chinese stories and poetry.

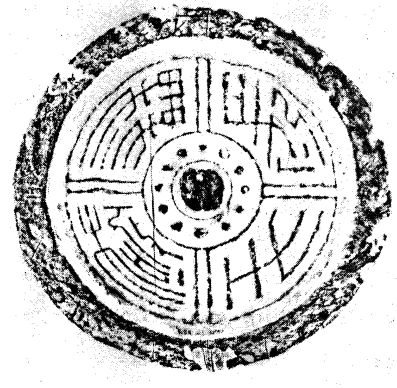
hsiao, Pinyin XIAO (Chinese: "filial piety"), Japanese KŌ, in Confucianism, the attitude of obedience, devotion, and care toward one's parents and elder family members that is the basis of individual moral conduct and social harmony. *Hsiao* consists in putting the needs of parents and family elders over self, spouse, and children, deferring to parents' judgment, and observing toward them the prescribed behavioral proprieties (*li*).

Hsiao was rooted in China's feudal social structure, in which land was held by large clans whose internal life was structured hierarchically and patriarchally. Confucius (551?–479? BC) raised *hsiao* to a moral precept by citing it as the basis of *jen* ("humanity"), the cultivated love of fellow men that was the Confucian moral ideal. He also delineated the importance of *hsiao* for both family harmony and sociopolitical stability and facilitated its practice by reemphasizing the rites and behaviours associated with it.

The concept, rendered *kō,* was adopted in Japan during the 17th century, when Confucianism became the official doctrine of the Tokugawa shogunate.

Hsiao-ch'in (Chinese regent): *see* Tz'u-hsi.

hsiao-chuan, Pinyin XIAOZHUAN (Chinese: "small seal"), in Chinese calligraphy, a standardized and simplified form of the earlier *ta-chuan* script—all lines are of even thickness and curves and circles are relatively predom-



Ink rubbing of a *hsiao-chuan* inscription on a pottery roof tile, 3rd century BC, Ch'in dynasty; in the Field Museum of Natural History, Chicago

By courtesy of the Field Museum of Natural History, Chicago

inant. Its development during the Ch'in dynasty (221–206 BC) is traditionally attributed to Li Ssu (280?–208), a minister of that dynasty. The Ch'in dynasty created the first Chinese empire, under which customs, laws, weights, and measures were standardized. The modification of characters into a standardized script made possible a broader and easier dissemination of learning. Irregularities were dropped, and each character was structurally adjusted to fit within an imaginary square. A passage written in *hsiao-chuan* appears as a balanced and well-spaced series of neat columns and rows of equal squares. Only the tip of a long-haired brush was used.

Hsiao-ta (Chinese classicist): *see* Chang Chih-tung.

Hsiao-wen Ti, Pinyin XIAOWEN DI (posthumous name, or *shih*), personal name (*hsing-ming*) T'O-PA HUNG, or YÜAN HUNG, temple name (*miao-hao*) (WEI) KAO-TSU (d. 499, China), emperor of the Northern Wei dynasty (386–534/535), which dominated much of North China during part of the chaotic 360-year period between the end of the Han dynasty (206 BC–AD 220) and the founding of Sui rule (581–618). Hsiao-wen Sinicized his tribal kinsmen, making the Northern Wei into a Chinese-style dynasty. He also instituted a land-reform program that has persisted in its basic form into modern times.

When Hsiao-wen ascended the throne in 471, the nomadic T'o-pa tribal state he ruled had become so well acculturated to its area of North China that he could take the Chinese surname of Yüan; move the site of the capital to Lo-yang, which had been the location of the capital of the Eastern Han dynasty (AD 25–220); make Chinese the official language of the court; and order the nobles to adopt Chinese dress and family names.

In 485 he instituted a *chün-t'ien* ("equal-field") system of agriculture, in which every peasant family was assigned 140 *mou,* or about 19 acres of land. A small portion was kept permanently by the farmer and his family, but most of the land reverted to the state for redistribution upon death or retirement. To implement his policy, Hsiao-wen divided the population into groups through which the people would supervise one another. Five families formed a *lin,* or "neighbourhood"; five *lin* constituted a *li* ("village"), and five *li* a *tang* ("association"). Each *tang* functioned under a *chang* ("chief").

This system greatly reduced the selling off of land by peasants to large landholders; it thus reformed the policy that had destroyed the Han and provided the fiscal basis for the formation of the Sui and T'ang (618–907) dynasties. In the short run, Hsiao-wen's reforms caused great resentment, and the tribal forces under his command revolted and seized the capital, causing the emperor to die of starvation in the capital. The Northern Wei dynasty survived for another 36 years, at which time it was divided among the leading generals.

Hsiao Yen (Chinese emperor): *see* Wu-ti (464–549).

Hsieh Ho, Pinyin XIE HE (fl. mid-6th century), Chinese figure painter, best remembered as the critic who collated or invented the "Six Principles" (*lui fa*) of Chinese painting, which have often been quoted and cited by painters and critics up to the present time. The "Six Principles" introduce Hsieh Ho's *Ku-hua p'in-lu* ("Classified Record of Painters of Former Times"), which rates 27 painters known to him in three classes of descending merit, each with three subdivisions. The "Six Principles" have inevitably acquired new and even different meanings through the ages, but generally they may be paraphrased as follows: creativity (or "spirit resonance"), structural use of the brush, proper representation of objects, specific coloration of those objects, good composition, and transmitting the old masters by copying. These have become the basic standards of both the painter's training and the critic's judgment.

Hsieh Ling-yün, also called HSIEH K'ANG-LO, Pinyin XIE LINGYUN, or XIE KANGLO (b. 385, Yang-hsia [T'ai-k'ang], China—d. 433, Canton), prominent Chinese writer of the Six Dynasties era, known chiefly as a nature poet.

The scion of an aristocratic house associated with the displaced southern court, Hsieh was an official under the Eastern Chin and Liu-Sung dynasties, but factional intrigues later disrupted his career, leading to his frequent dismissal and eventual execution in exile.

As a devout Buddhist who supported the famed Mount Lu Monastery (in modern Kiangsi province), Hsieh both translated and wrote religious works. His literary reputation, however, derived from his poetry, particularly his evocation of a spiritual presence in the wild southern landscape. His erudite, imagistic verse set the fashion for his age, prompting early critics to prize his *shan-shui,* or "mountain and stream," landscapes above the more pastoral *t'ien-yüan,* or "field and garden," scenes depicted by T'ao Ch'ien, his countryman and contemporary. Indeed, Hsieh's poems outnumber those of other Six Dynasties poets in the *Wen Hsüan* ("Literary Anthology"), the 6th-century canon that defined medieval Chinese literary tastes.

Hsieh Wan-ying (Chinese author): *see* Bing Xin.

hsien, in Chinese Taoism, an immortal who has achieved divinity through devotion to Taoist practices and teachings. Early Taoist sages, including Chuang-tzu, referred perhaps allegorically to immortal beings with magical powers; some followers interpreted these references literally and devoted themselves to discovering the "drug of immortality" and prolonging their lives through breath control, yogalike exercises, and abstention from grains. Adepts in these practices, though appearing to die, were believed to achieve physical immortality and admission to heavenly realms inaccessible to the spirits of mere mortals. The pursuit of this state gave rise to a vast body of Taoist alchemical and other esoteric techniques and lore.

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hsien, the basic unit of local government in China. The word *hsien* may be roughly translated as "county," or "district."

The *hsien* originated during the Ch'un-ch'iu, or Spring and Autumn, period (770–476 BC) of Chinese history. Villages or townships on China's western frontier that had been newly conquered by such expanding Chinese states as Ch'in and Ch'u were placed directly under the authority of the head of the kingdom, in contrast to more settled areas in which the local aristocratic families held governing authority. The first recorded use of the term *hsien* to denote these centrally administered townships dates from 688 to 687 BC. During the Warring States period (475–221 BC), as the heads of Chinese kingdoms became more powerful at the expense of their nobles, the *hsien* became the model for a new type of administrative system based on districts that were all governed by the central power of the kingdom. The kingdom of Ch'in became the first to formally adopt the *hsien* as its basic administrative unit in the 4th century BC. The system was subsequently adopted by the Ch'in and Han dynasties, which unified China. In the hierarchy of territories created by the Western Han dynasty (206 BC–AD 25), several *hsien,* or counties, were grouped into a larger unit called a commandery (*chün*), several of which were in turn grouped into a prefecture (*chou*) that was based in a large city. Each *hsien* was governed by a magistrate appointed by the imperial court, and he was assisted by a locally recruited staff.

In the course of the Sui dynasty's governmental reforms in the late 6th century AD, the commandery was abolished as an administrative unit, but the *hsien* (county) and prefecture were retained, with a prefecture consisting on average of six or seven *hsien.* Under the Yüan and Ming dynasties, still-larger units, called provinces (*sheng*), were created out of a handful of prefectures. This territorial hierarchy has continued, with only a few interruptions, down to the present day in the Chinese system of government.

hsien (ancient Chinese vessel): *see* yen.

Hsien Chu (Chinese emperor): *see* Liu Pei.

Hsien Huang-hou (Chinese regent): *see* Tz'u-hsi.

Hsien-shou (Buddhist monk): *see* Fa-tsang.

Hsien-ti (1563–1620): *see* Wan-li.

Hsien-ti (1678–1735): *see* Yung-cheng.

Hsien-tsung (Chinese emperor): *see* Ming-ti.

Hsien-yang, Pinyin XIANYANG, city, Shensi *sheng* (province), China. Hsien-yang is situated on the north bank of the Wei River about 12 miles (20 km) northwest of Sian, in an area that was the cradle of early Chinese civilization. It is on a vital east-west route through the Wei River valley, with good communications to the Northwest via its tributary, the Ching River.

Its historical importance began with the Ch'in state, which emerged in the 4th century BC as a powerful contender for control of China. In 350 BC this state's ruler, Hsiao Kung, moved his capital to Hsien-yang from Yung. When all China was united under the Ch'in dynasty (221–206 BC), Hsien-yang was expanded to form the capital of the new unified empire. Magnificent public buildings and palaces were erected, and some 120,000 households were moved from their homes elsewhere to populate the capital. The city was burned during disturbances and civil war in 206 BC. In 1974 farmers digging wells near the tomb mound of Shih Huang-ti (the first emperor of the Ch'in dynasty), located east of Hsien-yang, found a collapsed subterranean vault, containing a veritable army of life-size ceramic figures including warriors (each a unique portrait), horses, and wooden chariots.

The Han dynasty (206 BC–AD 220), successor to the Ch'in, moved its capital to Ch'ang-an; and Hsien-yang became a minor county named Wei-ch'eng. With the transfer of power to the Eastern Han capital, Lo-yang, after AD 23, it ceased even to be a county. Under the T'ang dynasty (618–907), when the capital was returned to Ch'ang-an, Hsien-yang again became a suburban county, the first staging post on the road to the west and a garrison post commanding the crossings of the Wei River. It remained a county subordinate to Sian until the establishment of the Chinese republic in 1911, when it became autonomous. The original Hsien-yang was about 6 miles (10 km) east of the modern town on the river almost north of Sian.

In modern times, Hsien-yang has functioned as the market centre for a large and fertile irrigated area in the central Wei River valley, where in the 20th century the irrigation system has been greatly improved. The main products are grains, tobacco, and cotton. Since 1949, Hsien-yang, which was linked by rail to the coast and eastern China in 1935, has increased its commercial importance. It has also developed a large cotton-textile industry. Hsien-yang remains closely linked both com-

mercially and industrially with the growing industrial complex of Hsi-an. Pop. (mid-1970s est.) 50,000–100,000.

Hsin DYNASTY, Pinyin XIN (AD 9–25), short-lived dynasty in China formed by Wang Mang (*q.v.*), who, with his sucessor, Liu Keng-shih, ruled during an interim between the Former Han and Later Han dynastic periods.

Hsin-an River Dam, Wade–Giles romanization HSIN-AN CHIANG SHUI-K'U, Pinyin XIN-'ANJIANG SHUIKU, hydroelectric project at the town of Hsin-an-chiang, Chekiang Province, China. It was constructed between about 1955 and 1965, its completion having apparently been much delayed by the ending of Soviet technical assistance to China. On its completion it was hailed as a triumph of Chinese technology. It consists of a dam 344 ft (105 m) high on the Hsin-an Chiang, a tributary of the Fu-ch'un Chiang (Ch'ien-t'ang Chiang) in northwestern Chekiang, close to Chien-te. It was originally conceived as forming one of a series of hydroelectric stations in Chekiang. By 1980 the project's four 72,500-kilowatt generators were in operation, and five additional generators were planned, bringing the river project to a potential capacity of 652,500 kilowatts. The Hsin-an-chiang and the Huang-t'an-k'ou stations are linked to the power grid serving Hang-chou, Shanghai, Nan-ching (Nanking), and the Yangtze River Delta region.

Hsin Ch'i-chi, Pinyin XIN QIJI (b. 1140, Shantung Province, China—d. 1207, Shang-jao, Kiangsi Province), Chinese poet and master soldier whose *tz'u*, poems written to existing musical patterns, are considered by many critics to be the best of the Southern Sung dynasty (1127–1279).

A soldier by upbringing and a brilliant tactician by the age of 20, Hsin Ch'i-chi was forced to abandon his ambitions to avenge the dishonourable victory of the Juchen over the Sung when the two empires negotiated a peace treaty in 1164. He finally retired in 1194 and built a retreat in beautiful Shang-jao county, where he spent his time reading and creating the *tz'u* that were to bring him lasting fame. His 623 carefully crafted *tz'u* are important for their controlled experimentation with, and expansion of, the existing *tz'u* form, adding to it an emotional depth until that time untapped and afterward widely imitated.

Hsin Chiang (China): *see* Hsin River.

Hsin-chu, *hsien* (county), northwestern Taiwan, occupying an area of 591 sq mi (1,532 sq km). It is bordered by the *hsien*s of T'ao-yüan (north), I-lan (east), and Miao-li (south) and by the Formosa Strait (west). The Hsüeh-shan Shan-mo (mountain range), with an average elevation of 8,200 ft (2,500 m) above sea level, traverses most of the southeastern part and gradually merges with the coastal plains of the northwest. Tea, paddy rice, sweet potatoes, and oranges are grown. Industries include petroleum refining; glass, cement, textile, and fertilizer manufacturing; fruit canning; woodworking; and fish processing. Iron ore, coal, gold, and silver are mined. A major producer of oil and natural gas, Hsin-chu *hsien* has a science-based industrial park, a computer-electronics-engineering complex with Taiwan's first integrated circuit manufacturing plant. Chu-pei has Taiwan's first colour television picture tube factory and a research centre for pearl culture. A wild-animal Safari Park (accessible by motor vehicle) at Kung-tzu-kou, the Ch'ing-ts'ao Hu (Green Grass Lake), and Shih-t'ou Shan (Lion's Head Mountain) are other places of interest. The region was brought under Chinese (Ming) control in the 17th century by Cheng Ch'eng-kung (Koxinga) and was economically developed during the reign (1735–96) of Ch'ien-lung, the 4th emperor of the Manchu (Ch'ing) dynasty. The *hsien* is well served by north–south running railways and roads. Hsin-chu city is the administrative seat. Pop. (1983 est.) 653,744.

Hsin-chu, *shih* (municipality) and seat of Hsin-chu *hsien* (county), northwestern Taiwan, situated southwest of Taipei about 6 mi (10 km) from the island's west coast, on north–south highway and railway lines that parallel the coast. Hsin-chu was first settled and walled in the 18th century; it received its modern name in the 19th century, when a regular administration was first established. It was an important military base during the Japanese occupation (1895–1945), from which period the present form of the city largely derives.

Hsin-chu is the marketing and distribution centre of a prosperous agricultural district, producing rice and tea, on which the 19th-century prosperity of the area was founded; citrus fruits are also grown. The city also has various small-scale industries, producing paper, fertilizers, cement, glass, and some textiles. A large industrial park opened in 1980, based on advanced technology and coordinated with training and research at the city's several technological colleges. Taiwan's most productive petroleum field is nearby. Pop. (1982 est.) 243,218.

Hsin-hai-lien (China): *see* Lien-yün-kang.

Hsin-hsiang, Pinyin XINXIANG, city in northern Honan Province (*sheng*), China. It is a county-level municipality (*shih*) and the administrative centre of Hsin-hsiang Prefecture (*ti-ch'ü*). It has always been a communications centre, located at the head of navigation of the Wei Ho (river), with access to Tientsin, and at the southern end of the route from Hopeh Province that skirts the east of the T'ai-hang Shan (mountains) in Shansi Province and then joins the route along the north of the Huang Ho (Yellow River) to southern Shansi and Shensi provinces.

Founded under the Sui dynasty (AD 581–618), the county gained importance because of its location, where the Yung-chi Canal joined the Wei Ho to the Huang Ho, thus affording a transport route from the Huang Ho Valley to northern Hopeh. When the Grand Canal was constructed farther to the east in the early 15th century, Hsin-hsiang remained a transport centre for southeastern Shansi and northern Honan provinces, standing on a waterway that afforded an easy route to Tientsin and Peking. It also served as a collecting centre for cotton.

A new importance was given to the town with the completion of the railway from Peking to Han-k'ou in 1905. This line gave access to the important coalfield at Chiao-tso to the west of Hsin-hsiang, and in the 1950s it was extended into southeastern Shansi to serve the industrial base at Ch'ang-chih.

In 1949 Hsin-hsiang had only four small factories, but by the mid-1950s it was transformed from a prosperous regional commercial centre and market into a minor industrial centre and the chief city of northern Honan. In addition to cotton-textile production, spinning, and dyeing, its operations include flour milling, brewing, and food processing.

The usefulness of the Wei Ho as a transport route was increased by the construction of the People's Victory Canal (which links the Wei's headwaters with the Huang Ho to allow diversion of water when the level is low) and by the improvement of the lower course as part of the major Hai Ho conservation project. Pop. (1980 UN est.) 429,000.

Hsin River, Wade–Giles HSIN CHIANG, Pinyin XIN JIANG, river, tributary of the Yangtze River system in northeastern Kiangsi province, China, with a length of 194 mi (312 km) and a drainage area of about 6,500 sq mi (16,800 sq km). It rises along the northeastern border of the province and flows southwestward past Shang-jao city, a commercial centre producing paper and processing tea. The river continues generally westward to Ying-t'an where it courses northwestward to empty into P'o-yang Lake, east of Nan-ch'ang. Lower and middle stretches of the river run through an important rice-growing area of China; tea and wheat are grown farther upstream.

hsin-shu (Chinese: "art of the heart and mind"), also called NEI YEH ("inner cultivation"), an early Chinese Taoist system aimed at purifying the practitioner's "vital force" (*ch'i*) and enabling him to attain awareness of true reality as encompassed in the Tao. In *hsin-shu,* the purification of *ch'i* meant cleansing the mind and heart of thoughts and emotions; only when an individual had reached a state beyond conscious desires, fears, and ideas was he able to receive the spiritual power of the Tao. Control of breath seems to have been the main technique for achieving the desired state.

For the *hsin-shu* theorists, spiritual awareness was not an end in itself; their ideal figure was the sage-activist who exerted a powerful and positive influence on the governing of the nation. Health and prolonged life were also said to result from practicing *hsin-shu.* Many non-Taoists, including possibly the Confucian sage Mencius, were influenced by *hsin-shu* theory during the late 4th and early 3rd centuries BC. The two major texts for the doctrine, included in the book known as the *Kuan-tzu,* date from this period.

Hsin-tien, *shih* (town), T'ai-pei *hsien* (county), northern Taiwan, 5 mi (8 km) southeast of Taipei city, in the northernmost portion of Taiwan's western coastal plain. Situated on the right bank of Hsin-tien Ch'i (river), the town is the centre of a region producing tea, rice, and citrus fruits. Woodworking, glassmaking, and the manufacture of small machinery are the major industries; coal is mined nearby. It is linked by railway with Taipei, Taiwan's capital, and is also an important junction on the Taipei–I-lan road. Tourist and recreational facilities have been developed around Hsin-tien, which has one of the three major camping grounds in Taiwan, and there is boating at Pi-t'an (Green lake), about a mile south. The town is the seat of the Academia Historica, an institute containing national archives and other historical documents. Pop. (1982 est.) 171,315.

Hsin-yang, also called (locally) P'ING-CH'IAO, Pinyin XINYANG, or PINGQIAO, city of southern Honan Province (*sheng*), China. It is a county-level municipality (*shih*) and the administrative centre of Hsin-yang Prefecture (*ti-ch'ü*). The city is situated in the very south of the Honan plain, in the basin between the Ta-pieh Shan (mountains) and the Huai Ho (river). It has traditionally been on a cultural divide between the plain and the hilly districts to the south. It was also a natural route centre, standing on the Shih Ho, a tributary of the Huai Ho. The Shih Ho has become passable for relatively large craft since the construction of the Nan-wan Dam, which provides a constant flow of water. To the south, the Ming-wei Pass leads over the Ta-pieh Shan, while to the west two further passes—the Wu-sheng and the Chiu-li—lead into Hupeh Province and the Han Valley.

The area has been settled since early times. Neolithic (New Stone Age) remains have been discovered in several sites, and important finds deriving from the southern culture of Ch'u (722–220 BC) have also been made in the vicinity. During the centuries before unification under the Ch'in dynasty in 221 BC, it was a frontier settlement of Ch'u and an important defensive position. It was also a place of strategic importance from the 4th century AD

to the late 6th century but constantly changed hands and underwent many changes of name. The name Hsin-yang was first given to it in 976, when a Hsin-yang army was stationed there. The present city dates from the late 14th century, when the administration was transferred from an earlier site nearby. Under the Ch'ing dynasty (1644–1911) it was known as San-chou. It reverted to county status and took its present name in 1913.

Always the local centre of a fertile district, the prosperity of Hsin-yang grew after the completion of the Peking–Han-k'ou railway in 1905. As the southernmost rail centre in Honan, with good road and river transport facilities, the city grew into a major collecting point for grain, cotton, and other local agricultural produce. Its importance was augmented by the completion in the early 1960s of extensive irrigation works in the Huai Ho Valley. It has flour mills, mills for hulling and polishing rice, and factories for manufacturing agricultural implements. Pop. (1982) 240,000.

Hsin-ying, *shih* (town) and seat of T'ai-nan *hsien* (county), southwestern Taiwan. Hsin-ying is situated 25 mi (40 km) northeast of T'ai-nan city, in the southern part of Taiwan's western coastal plain. Located on the north bank of the Chi-shui Hsi (river), the town grew in the early 17th century as an agricultural marketing centre. Rice, sugarcane, sweet potatoes, and fruits are grown in the surrounding fertile alluvial plain; fish cultivation in ponds is also important. Industries include textile manufacturing, food canning, and shoemaking. Hsin-ying is connected by the Chung-shan freeway to Taipei in the north and to T'ai-nan in the south; the town is also served by the West Line railway. Pop. (1982 est.) 67,373.

Hsinbyushin (d. 1776, Ava, Upper Burma), third king (1763–76) of the Alaungpaya, or Konbaung, dynasty in Burma; he pursued a policy of expansion at the expense of practically all his neighbours.

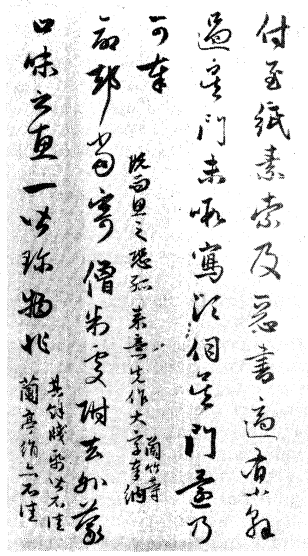
His most important single project was the subjugation of Siam (now Thailand). In 1764 he campaigned eastward, taking Chiengmai and Vientiane before invading the Mae Nam Chao Phraya Valley. When the Siamese capital of Ayutthaya fell in April 1767, he deported thousands of prisoners to Burma. According to the Siamese chronicles, "the King of Hanthawaddy [Bayinnaung] waged war like a monarch, but the King of Ava [Hsinbyushin] like a robber." Burmese control of Siam, however, was very brief; within a short time, the Siamese general Taksin expelled Hsinbyushin's armies. Not content with conquering Siam, Hsinbyushin invaded the Hindu kingdom of Manipur (in present-day Manipur state, India) three times for slaves and plunder. When the King claimed suzerainty over the country in the third invasion, he could then threaten British India.

The greatest threat to Hsinbyushin's power came from China. Burmese aggressiveness in the Shan States, Laos, and Chieng Mai (then the capital of the kingdom of Lan Na) led the Emperor of China to launch four expeditions against Burma in 1765–69. All four were defeated by the Burmese king. In 1769 a treaty was signed that provided for trade and diplomatic missions between the two countries.

In 1773 a revolt broke out in Lower Burma, which Hsinbyushin suppressed. On his death three years later he was succeeded by his son, Singu Min.

Hsing-an (China): *see* An-k'ang.

hsing-shu, Pinyin XINGSHU (Chinese: "running script"), a semicursive Chinese script that developed out of the Han Dynasty *li-shu* (*q.v.*) at the same time that the standard *k'ai-shu* (*q.v.*) was evolving (1st to 3rd century AD). The



Hsing-shu by Chao Meng-fu, Yüan dynasty; in the National Palace Museum, Taipei

By courtesy of the National Palace Museum, Taipei, Taiwan, Republic of China

characters of *hsing-shu* are not abbreviated or connected, but strokes within the characters are often run together. The best known example of early surviving calligraphy, *Lan-ting hsü* ("Essay on the Orchid Pavilion"), written in 353 by Wang Hsi-chih (*q.v.*) but surviving only in a T'ang copy (618–907), is written in this script.

Hsing-t'ai, Pinyin XINGTAI, city in southwestern Hopeh Province (*sheng*), China. It is a county-level municipality (*shih*) and the administrative seat of Hsing-t'ai Prefecture (*ti-ch'ü*). Situated in a fertile plain at the foot of the T'ai-hang Shan (mountains), on the upper course of the Tzu-ya Ho (river), it became a settlement at an early date. There were several Shang dynasty (*c.* 1766–1122 BC) settlements in the area, and the name of Hsing appears on the oracle bones found there. Since 1954 more than 10 such Shang sites have been found in the district, indicating both lengthy occupation and a relatively advanced urban complex.

In the early years of the Chou dynasty (*c.* 1111–255 BC), the site was the capital of the feudal state of Hsing. After Hsing transferred its capital farther east and was subsequently destroyed, Hsing-t'ai became a part of the state of Ch'in and later of Chao, and it was incorporated into the Ch'in empire on the fall of Chao in 228 BC. In the civil war following the defeat of the Ch'in dynasty (206 BC), Hsiang-Yü, one of the chief contenders for the empire, made one of his supporters the king of Ch'ang-shan, with his seat at Hsing-t'ai. During the ensuing Han dynasty (206 BC–AD 220) the area was divided among the surrounding commanderies and feudal kingdoms. In 319 it became the capital of the Later Chao dynasty founded by Shih Lo (319–333), but under his successor, Shih Hu, the capital was moved from Hsing-t'ai to Yen in 335. After the Sui dynasty (581–618) conquered China, the area was given the name of Hsing-chou, which it retained until 1119 when it became Hsin-te Prefecture (*fu*). Under the Ming (1368–1644) and Ch'ing (1644–1911) dynasties it became Shun-te Prefecture. The actual prefectural town has been called Hsing-t'ai since Sung times (960–1126).

Hsing-t'ai is now largely a local market and commercial centre on the main railway line and highway from Peking to Cheng-chou and Han-k'ou, and it collects produce from the agricultural area in the plain to the east. Its importance has in recent times been overshadowed by its rapidly developing neighbours, which have better communications and considerable industry. Pop. (1982) 334,210.

Hsiung Fo-hsi (Chinese playwright): *see* Xiong Foxi.

Hsiung-nu, Pinyin XIONGNU, nomadic pastoral people who at the end of the 3rd century BC formed a great tribal league that was able to dominate much of Central Asia for more than 500 years. China's wars against the Hsiung-nu, who were a constant threat to the country's northern frontier throughout this period, led to the Chinese exploration and conquest of much of Central Asia.

Of the same Mongoloid strain as the Chinese, the Hsiung-nu first appear in Chinese historical records around the 5th century BC, when their repeated invasions prompted the small kingdoms of North China to begin erecting what later became the Great Wall. The Hsiung-nu became a real threat to China after the 3rd century BC, when they formed a far-flung tribal confederation under a ruler known as the *shan-yü,* the rough equivalent of the Chinese emperor's designation as the *t'ien-tzu* ("son of heaven"). Ruling over a territory that extended from western Manchuria (Northeast Provinces) to the Pamirs and covered much of present Siberia and Mongolia, the Hsiung-nu were fierce mounted warriors. Able to muster as many as 300,000 horseback archers on their periodic intrusions into North China, they were more than a match for the much less maneuverable chariots of the Chinese. The completion of the Great Wall along the whole of China's northern frontier during the Ch'in dynasty (221–206 BC) slowed but did not stop the Hsiung-nu; the early Han dynasty rulers attempted to control them by marrying their leaders to Chinese princesses. But Hsiung-nu raids against China continued periodically until the Han emperor Wu Ti (reigned 141/140–87/86 BC) initiated a fiercely aggressive policy against the nomads, sending expeditions into central China to outflank them and to negotiate alliances with their enemies. These expeditions led to the Chinese conquest of the state of Chosŏn in northern Korea and southern Manchuria and the Chinese exploration of present-day Turkistan.

In 51 BC the Hsiung-nu empire split into two bands: an eastern horde, submitting to the Chinese, and a western horde, which was driven into Central Asia. Chinese expeditions against the former group in the 1st century AD again resulted in the temporary extension of Chinese control to much of what now comprises the northwestern provinces of Kansu and Sinkiang. But as the Han dynasty began to weaken, the Chinese began to hire Hsiung-nu generals to patrol China's northern borders, and these semi-Sinicized tribesmen frequently turned on their masters, particularly after the fall of the Han (AD 220) and the establishment of a number of small dynasties.

In AD 304 one of these Hsiung-nu generals, Liu Yüan, who claimed descent from the early Han emperors through a Chinese princess given in marriage to a Hsiung-nu chief, declared himself the first ruler of the Northern Nan dynasty, also known as the Former Chao. In 329, however, the dynasty was overthrown by another Hsiung-nu general, Shih Le, who in 319 had established his own Later Chao dynasty, which was also short-lived.

Hsiung-nu raids continued periodically in the subsequent period, but all references to the tribe disappear after the 5th century. The dominant nomad people in the Mongolian steppe in the 7th century, the T'u-chüeh, identified with the Turks, claimed to be descended from the Hsiung-nu. And a number of Hsiung-nu customs suggest Turkish affinity, which has led some historians to suggest that the western Hsiung-nu may have been the ancestors of the European Turks of later centuries. Others believe that the Hsiung-nu

are the Huns, who invaded the Roman Empire in the 5th century. Though possible, this view cannot be substantiated. The graves of several *shan-yü* (Hsiung-nu chiefs) excavated in the Selenga Valley in the U.S.S.R. have been found to contain remains of Chinese, Iranian, and Greek textiles, indicating a wide trade between the Hsiung-nu and distant peoples.

Hsiung Shih-li, Pinyin XIONG SHILI (b. 1885, Huang-kang, Hupeh, China—d. 1968, Peking), one of the outstanding figures of 20th-century Chinese philosophy. His ontological system is an original synthesis of Buddhist, Confucian, and Western motifs.

Hsiung was an anti-Manchu revolutionary in early youth, but after the age of 30 he devoted himself wholly to philosophy. He first studied metaphysical idealism in the Yogācāra school of Mahāyāna Buddhism. He then turned to Confucian tradition, finding basic insights in the *I Ching* ("Book of Changes") and in the idealistic branch of Neo-Confucianism. From Western thought Hsiung gained an appreciation of analytical method and the idea of evolutionary change. Accepting elements from all these sources, he shaped his own ontological system, which he systematically presented in the eight-volume *Hsin wei-shih lün* ("New Doctrine of Consciousness Only"), published in 1944. From 1925 until his retirement, he was professor of philosophy at Peking University.

Briefly, the system is as follows. The universe (Reality) is one great whole. Its basic nature, which is that of mind, will, and consciousness, is eternal and continuous. It is dynamic, a vast ever-running current of changes, in process of perpetual transformation, producing and reproducing all things. In this current, two factors are at work: (1) an integrating and consolidating tendency called "closing," which gives rise to all becoming of physical things, and (2) a strong, directing, controlling tendency called "opening," which is the operation of mind. No matter how great the variety of physical and mental happenings in the world, they are all one in the "original substance." They are its functionings and manifestations, just as waves of the ocean are one and continuous with the ocean itself. "Original substance" is "original mind." Spirit and matter are simply two aspects of its perpetual operation. "Original mind" is thus common to man, heaven, earth, and all things. Its continuous transitions create what is new, not capriciously but with all the orderliness and causal sequence which science discovers. In spirit it is *jen* (humanity, humaneness, human-heartedness), the inmost ethical nature of reality and all its functions—a concept faithful to basic Confucian tradition.

Hsiung Wu (Chinese general): *see* An Lu-shan.

hsü (Chinese: "emptiness," or "purity"), in Chinese Taoism, a state of being that is characterized by total tranquility and transcendence of self, through which individual consciousness is believed to become one with the Tao; the Tao, or Way, constitutes absolute reality and cannot be defined or understood in human terms except through individual experience of *hsü*.

Contemplative Taoists attain *hsü* by stilling their thought processes and emotions, which they view as corruptions of the Tao. Historically, many schools of Taoism have made use of breath control techniques to quiet the mind; the more elaborate systems of breath control, requiring years of practice, were condemned by some Taoists as being contrary to the Tao, which is beyond human striving.

Hsü, Paul: *see* Hsü Kuang-ch'i.

Hsü-ch'ang, Pinyin XUCHANG, city in central Honan Province (*sheng*), China. It is a county-level municipality (*shih*) and the administrative centre of Hsü-ch'ang Prefecture (*ti-ch'ü*). Situated in the foothills of the Kunlun Mountains northeast of the Fu-niu Shan (range) and on the edge of the North China Plain, Hsü-ch'ang has since early times been a natural route centre—the point where the north–south route on the western edge of the North China Plain is crossed by the main route running northeast to Shang-ch'iu and to Shantung Province and the southwesterly route to Nan-yang and the Yangtze Valley.

The name Hsü goes back to the Western Chou period (1111–771 BC), when the site was given as a fief to the descendants of the legendary deity T'ai Yueh Ta Ti, who lived on Mt. T'ai in Shantung Province. In AD 196, during the Later Han dynasty, when the two capitals, Ch'ang-an (modern Hsi-an) in Shensi and Lo-yang in Honan, were in a state of disorder, the emperor Hsien Ti established his capital at Hsü-ch'ang. Under the Han (206 BC–AD 220) it was a major centre of commerce, with manufacturing controlled by the government.

Hsü-ch'ang held the administrative status of either a prefecture or a commandery under succeeding dynasties. After the Juchen conquest in 1127, it was renamed Hsü-chou and kept this name until 1913, when it became a county seat named Hsü-ch'ang. Its importance was increased by the completion of the Peking–Han-k'ou railway in 1905, as a result of which it became the main collecting centre for agricultural produce from the western plain of Honan. By World War II it was a flourishing commercial city.

The surrounding region produces cotton, good-quality tobacco, sesame, vegetables, and hides, which are mostly sent to Han-k'ou by rail. By the early 1970s the city had various processing and some handicraft industries, including an industry producing felt hats. There is also a well-established ceramic industry, dating back at least to the 11th century, which now produces mostly coarse domestic ware for the local regional market. The region around Hsü-ch'ang is Honan's leading tobacco-growing area. Pop. (1982) 218,960.

Hsü Chih-mo, Pinyin XU ZHIMO, pseudonyms (Wade–Giles romanization) NAN-HU and SHIH-CHE, original name HSÜ YU-SEN (b. 1896, Hsia-shih, Chekiang Province, China—d. Nov. 19, 1931, Tsinan, Shantung Province), free-thinking Chinese poet who strove to loosen Chinese poetry from its traditional forms and to reshape it under the influences of Western poetry and the vernacular Chinese language.

After receiving a classical Chinese education at Peking University, Hsü Chih-mo went to the United States in 1918 to study economics and political science. Finding life there intolerable, he went to England in 1920 to study at Cambridge University, where he became fascinated with English Romantic poetry and decided upon a literary career.

Returning to China in 1922, Hsü Chih-mo began writing poems and essays in the vernacular style. He fell under the influence of the Indian poet Rabindranath Tagore while he was serving as interpreter for him during a lecture tour of China. All the foreign literature to which Hsü Chih-mo had been exposed served to shape his own poetry and establish him as a leader in the modern poetry movement in China. He served as an editor of the literary supplement of the *Ch'en pao* ("Morning Post") and as a professor at various universities. In 1928 he helped organize the Hsin-yüeh shu-tien (Crescent Moon Book Company), which published a literary journal featuring Western literature. He was killed in a plane crash. In addition to four collections of verse, Hsü Chih-mo produced several volumes of translations from many languages.

Hsü-chou (China): *see* Suchow.

Hsü Kuang-ch'i, Pinyin XU GUANGQI, Christian name PAUL HSÜ (b. April 24, 1562, Shanghai—d. Nov. 8, 1633, China), Ming dynasty official, the most influential Chinese convert to Christianity before the 20th century.

Hsü obtained his *chin-shih* degree, the highest level in the civil service examination, and then studied with Matteo Ricci (1552–1610), the noted Italian Jesuit missionary in China. He became the first of his countrymen to translate European books into the Chinese language, translating with Ricci Western books on mathematics, hydraulics, and geography. Their most famous translation was Euclid's *Elements* (*Chi-ho yüan-pen*), which exerted a great influence on Chinese mathematics.

In 1629 Hsü finally obtained high office as a result of a competition held by the government to determine who could predict most precisely the time of a solar eclipse scheduled to occur that year. Of the three competing schools—the Chinese, or Ta-t'ung, the Muslim, and the Western—the Western approach, represented by Hsü, proved to be most accurate, and he was made one of the Emperor's leading ministers.

Hsü convinced the Emperor to use Western troops and firearms against the invading Manchu forces. The Manchus, however, soon acquired Western arms themselves and in 1644 occupied all of China. After Hsü's death, Catholicism never again achieved such influence in China.

Hsü Ta, Pinyin XU DA (b. 1332, Feng-yang, Anhwei Province, China—d. 1385, China), general who helped the founder and first emperor of the Ming dynasty, Hung-wu (reigned 1368–98), to overthrow the Mongol, or Yüan, dynasty (1206–1368).

Hsü joined the future emperor's rebel band in 1353 and became the leading general, engineering the capture of the capital at Peking so perfectly that, so it is said, commerce in its market was not stopped for a single day. After the establishment of the Ming dynasty, Hsü pursued the retreating Mongols across the Gobi Desert and burned their capital, Karakorum, which was founded by Genghis Khan (d. 1227). Hsü continued north across the Yablonovy Mountains into the modern Siberian region of Transbaikalia—farther north than any previous Chinese army had penetrated. By the end of his campaign the Mongol armies were decimated. Emperor Hung-wu had Hsü's image placed in the number one position in the Ming Temple of Men of Merit.

Hsü Wei, Pinyin XU WEI (b. 1521, Shan-yin, Chekiang Province, China—d. 1593), colourful figure in the history of Chinese painting as child prodigy, bureaucrat, apparent madman, and painter. At one point in his life Hsü Wei was sent to jail, but pretended madness and was released; he also was supposedly a drunkard and died in poverty. While he is later ranked among the Che school artists (such as Tai Chin) who perpetuated the by then conservative traditions of the Southern Sung academy style of Ma Yüan and Hsia Kuei, he was by temperament and painting style more like such 17th-century individualists as Shih-t'ao and Chu Ta. His painterly style is broad and often explosive.

Hsüan-hua, Pinyin XUANHUA, city, northwestern Hopeh Province (*sheng*), China. It is a county (*hsien*) seat in Chang-chia-k'ou Prefecture (*ti-ch'ü*). Hsüan-hua is situated some 25 mi (40 km) southeast of Chang-chia-k'ou on the upper course of the Yang Ho (river).

In former times the settlement was in a border district, just inside the Great Wall, between the Inner Mongolian pasturelands and the area of Chinese settlement. Under both the

Han (206 BC–AD 220) and T'ang (618–907) dynasties, it was a strategic frontier prefecture. In 938 it was occupied by the Liao dynasty and for the next four centuries was an important administrative centre for successive dynasties of conquest. With the beginning of the Ming dynasty (1368–1644), it once more became a Chinese frontier post. In 1430 Hsüan-hua became the headquarters of the military command of the northwestern defenses against the Mongols. Under the Ch'ing dynasty (1644–1911) Hsüan-hua remained a large, well-fortified city and a strategic and administrative centre, but the neighbouring city of Changchia-k'ou surpassed it as a commercial centre in the 19th century and totally eclipsed it by the end of the Ch'ing (Manchu) period. Hsüan-hua remained a secondary collecting centre for grain, wool, hides, and vegetable oils, which were marketed largely by rail via Peking, in Tientsin.

In the 20th century Hsüan-hua has developed mainly as an industrial centre. In 1918 the Lung-yen Iron and Steel Company, a joint state–private enterprise, set up an ironworks there based on the production of nearby iron-ore mines. In the early days, coking coal for the plant had to be hauled by rail some 250 mi from sites in Shansi Province. The mines were further developed during the 1950s and '60s, though, and by the early 1970s, coal was being obtained from nearer locations. Hsüan-hua now mainly produces pig iron, which is processed in iron- and steelworks in Peking, T'ai-yüan, and Pao-t'ou. Pop. (mid-1970s est.) 100,000–300,000.

Hsüan Ti, Pinyin XUAN DI, (posthumous name, or *shih*), personal name (Wade–Giles romanization) LIU HSUN, or LIU PING-CHI (d. 49/48 BC, China), eighth emperor (reigned 74–49/48) of the Han dynasty, who ascended the throne when the designated heir apparent behaved indecorously during mourning ceremonies for his father. Hsüan strove to abate the harshness and widespread corruption that had marked the preceding two reigns. Under him the Han dynasty probably attained its greatest prosperity. Even the Hsiung-nu tribes on the northwest frontiers, who had been warring with China for more than two centuries, were persuaded to cease their raids during his reign. He was succeeded by his son Yüan Ti (reigned 49/48–33).

Hsüan-tsang, Pinyin XUANZANG, original name CH'EN I, honorary epithet SAN-TSANG, also called MU-CH'A T'I-P'O, Sanskrit MOKṢADEVA, or YÜAN-TSANG (b. 602, Ch'en-lu, China—d. 664, China), Buddhist monk and Chinese pilgrim to India who translated the sacred scriptures of Buddhism from Sanskrit into Chinese and founded in China the Buddhist Consciousness Only school. His fame rests mainly on the volume and diversity of his translations of the Buddhist *sūtra*s and on the record of his travels in Central Asia and India, which, with its wealth of detailed and precise data, has been of inestimable value to historians and archaeologists.

Born into a family in which there had been scholars for generations, Hsüan-tsang received a classical Confucian education in his youth, but under the influence of an older brother he became interested in the Buddhist scriptures and was soon converted to Buddhism. With his brother he traveled to Ch'ang-an and then to Ssu-ch'uan (modern Szechwan) to escape the political turmoil that gripped China at that time. While in Ssu-ch'uan, Hsüan-tsang began studying Buddhist philosophy but was soon troubled by numerous discrepancies and contradictions in the texts. Not finding any solution from his Chinese masters, he decided to go to India to study at the fountainhead of Buddhism. Being unable to obtain a travel permit, he left Ssu-ch'uan by stealth in 629. On his journey he traveled north of the Takla Makan Desert, passing through such oasis centres as Turfan, Karashar, Kucha, Tashkent, and Samarkand, then beyond the Iron Gates into Bactria, across the Hindu Kush (mountains) into Kapiśa, Gandhāra, and Kashmir in northwest India. From there he sailed down the Ganges River to Mathura, then on to the holy land of Buddhism in the eastern reaches of the Ganges, where he arrived in 633.

In India, Hsüan-tsang visited all the sacred sites connected with the life of the Buddha, and he journeyed along the east and west coasts of the subcontinent. The major portion of his time, however, was spent at the Nālandā monastery, the great Buddhist centre of learning, where he perfected his knowledge of Sanskrit, Buddhist philosophy, and Indian thought. While he was in India, Hsüan-tsang's reputation as a scholar became so great that even the powerful king Harṣa, ruler of north India, wanted to meet and honour him. Thanks largely to that king's patronage, Hsüan-tsang's return trip to China, begun in 643, was greatly facilitated.

Hsüan-tsang returned to Ch'ang-an, the T'ang capital, in 645, after an absence of 16 years. He was accorded a tumultuous welcome at the capital, and a few days later he was received in audience by the Emperor, who was so enthralled by his accounts of foreign lands that he offered the Buddhist monk a ministerial post. Hsüan-tsang, however, preferred to serve his religion, so he respectfully declined the Imperial offer.

Hsüan-tsang spent the remainder of his life translating the Buddhist scriptures, numbering 657 items packed in 520 cases, that he brought back from India. He was able to translate only a small portion of this huge volume, about 73 items in 1,330 chapters, but his translations included some of the most important Mahāyāna scriptures.

Hsüan-tsang's main interest centred on the philosophy of the Yogācāra (Vijñānavāda) school, and he and his disciple K'uei-chi (632–682) were responsible for the formation of the Wei-shih (Consciousness Only school) in China. Its doctrine was set forth in Hsüan-tsang's *Ch'eng-wei-shih lun* ("Treatise on the Establishment of the Doctrine of Consciousness Only"), a translation of the essential Yogācāra writings, and in K'uei-chi's commentary. The main thesis of this school is that the whole world is but a representation of the mind. While Hsüan-tsang and K'uei-chi lived, the school achieved some degree of eminence and popularity, but its subtle philosophy, abstruse terminology, and hair-splitting analysis of the mind and the senses was alien to the Chinese tradition, and with the passing of the two masters the school rapidly declined. Before this happened, however, a Japanese monk named Dōshō arrived in China in 653 to study under Hsüan-tsang, and, after he had completed his study, he returned to Japan to introduce the doctrines of the Ideation Only school in that country. During the 7th and 8th centuries, this school, called Hossō by the Japanese, became the most influential of all the Buddhist schools in Japan.

In addition to his translations, Hsüan-tsang composed the *Ta-T'ang Hsi-yü-chi* ("Records of the Western Regions of the Great T'ang Dynasty"), the great record of the various countries passed through during his journey. Out of veneration for this intrepid and devout Buddhist monk and pilgrim, the T'ang emperor canceled all audiences for three days after Hsüan-tsang's death.

Two studies of Hsüan-tsang are Arthur Waley's *The Real Tripitaka,* pp. 11–130 (1952), a popular biography written in a lively and interesting style, and the more complete biography by René Grousset, *Sur les traces du Bouddha* (1929; *In the Footsteps of the Buddha*), which discusses the life of the Chinese pilgrim against the background of T'ang history and Buddhist philosophy.

Hsüan Tsung, Pinyin XUAN ZONG (temple name), personal name (Wade–Giles romanization) LI LUNG-CHI, posthumous name, or *shih*, MING HUANG, or WU HUANG (b. AD 685, Lo-yang, China—d. 762), sixth emperor of the T'ang dynasty of China, which during his reign (712–756) achieved its greatest prosperity and power.

Hsüan Tsung was the third son of Jui Tsung, who was himself a son of the empress Wu Hou. Hsüan Tsung was born during a period when actual power was entirely in the hands of Wu Hou, although his father was nominal emperor. Enfeoffed as prince of Ch'u in 687, Hsüan Tsung was reenfeoffed as prince of Lin-tz'u in 693 after Empress Wu's usurpation of the throne under her own name in 690. Toward the end of her reign he was appointed to several ceremonial posts at court which gave him influence over the Imperial guards and palace armies.

In the course of the complicated succession struggles that followed the death of the Empress in 705, Hsüan Tsung's father, Jui Tsung, was restored to the throne in 710. As a result of Hsüan Tsung's key role in this coup, he was appointed heir apparent.

In 712 the ineffectual Jui Tsung abdicated in favour of Hsüan Tsung but, at the urging of his ambitious sister (the princess T'ai-p'ing), he remained "Supreme Emperor," a sort of regent with control over appointments to high offices, which were filled with the Princess' supporters.

In 713 Hsüan Tsung won a brief power struggle between himself and the princess T'ai-p'ing; she committed suicide, Hsüan Tsung then assumed full authority as emperor, and his father retired into seclusion.

Hsüan Tsung's reign began well. He carried out a sweeping reform of the bureaucracy, which had become vastly inflated by great numbers of nominal and supernumerary officials, many of whom had been appointed by patronage or by the open purchase of their posts. Under Hsüan, the purchase of office was restricted and the authority of the throne, the efficient functioning of the bureaucracy, and the finances of the state were largely restored. Moreover, the canal system, upon which the capital at Ch'ang-an relied and which had fallen into decay while Empress Wu resided in Lo-yang, was restored to action. Successful campaigns were waged against the Tibetans, the Turks, and the Khitan.

During this early stage of Hsüan Tsung's reign, which lasted until about 721, he successfully maintained a balance of power and influence between the competing factions of the examination-recruited ministers who had served the empress Wu, the members of the Imperial clan, and the palace officials and members of the families of the imperial consorts.

But a period of wide-ranging reforms in administration began in 720, and the whole structure of central government was changed in such a way as to concentrate more and more authority in the hands of the chief ministers. At the same time there was a marked resurgence of the influence of the old aristocracy at court, and the period 721–737 was one of continuous political tension between the aristocrats and the examination-recruited professional bureaucrats. The aristocratic faction managed to increase its influence in the bureaucracy during the implementation of a series of sweeping financial reforms that were initially successful. The population was effectively reregistered, bringing vast numbers of taxpayers onto the rolls and a sharp increase in revenue; the coinage was improved, and the transportation system was reformed so effectively that the Emperor no longer had to move the court between Ch'ang-an and Lo-yang

periodically to avoid famine. The empire's revenues increased, enabling the Emperor to establish along the northern frontiers an ever-growing permanent military establishment (by the end of his reign numbering 600,000 men), without overburdening the population.

The political influence of the aristocracy's financial experts grew even greater in the latter part of Hsüan Tsung's reign, and after 737, Li Lin-fu, chief representative of the aristocratic interest, became virtual dictator and the aristocratic party was firmly entrenched in power. From about 740 onward the Emperor's actual control of affairs began to decline. The reforms, which theretofore had mostly been necessary for greater administrative efficiency, now tended more and more to destroy the balance of political power. The chief ministers formally acquired unprecedented power and prestige as heads of the government. The financial experts, too, devoted more and more of their attention to purely exploitative measures designed to pay for court extravagance and the Emperor's increasingly expensive personal needs.

Moreover, after 737, the vast regional commands established earlier in the reign to control the northern border now began to develop widespread powers in other fields and to acquire territorial authority. By the late 740s some of these generals had grown immensely powerful and began to intervene in court politics. Most important of them was Li Lin-fu's protégé An Lu-shan, who controlled the northeast and had an army of 180,000 troops. The central government had no standing armies under its own command to rival the forces of these military governors.

Meanwhile Hsüan Tsung had withdrawn more and more. Always a great patron of the arts—he had founded Imperial music academies to provide court musicians and had patronized poets, painters, and writers—he now became deeply involved in the study of Taoism, from whose founder the T'ang royal house claimed to be descended.

He also began to suffer from family problems, chiefly because he had fallen under the influence of at least two of his many consorts. The first was Wu Hui-fei, who had great influence from the early 720s until her death in 737; she played a part in the rise of Li Lin-fu and eventually became involved in unsuccessful plots to make her own eldest son heir to the throne in place of one of the Imperial princes. The eventual heir apparent, however, was another prince (the future Su Tsung), who was opposed to Li Lin-fu.

The Emperor also came under the influence of another favourite, the consort Yang Kuei-fei. During the later years of his reign, Hsüan Tsung became completely infatuated with her and heaped honours on members of her family. One of these relatives, her cousin Yang Kuo-chung, rose rapidly to rival even Li Lin-fu in power and, on the latter's death in 752, replaced him as the dominant chief minister.

There had already been some tensions between Yang Kuo-chung and An Lu-shan. With the removal of his patron at court, and the increasing hostility of Yang Kuo-chung, An Lu-shan began building up his provincial power base in readiness for armed confrontation. This began at the end of 755. An Lu-shan's forces swiftly struck into the northeastern provinces, and, by the summer of 756, they were approaching the capital of Ch'ang-an. Hsüan Tsung, accompanied only by a few troops and a small group of relatives and courtiers, fled to take refuge in Szechwan, the power base of the Yang clan. They had reached Ma-wei when the soldiers mutinied, killed Yang Kuo-chung, and forced Hsüan Tsung to have Yang Kuei-fei killed.

Shortly afterward, the heir apparent, who had fled separately to Ling-wu, west of the capital, proclaimed himself emperor. Hsüan Tsung, who heard of this only some time after it had occurred, acquiesced and abdicated formally in his favour. He lived in retirement until his death in 762.

Although Hsüan Tsung's reign ended in political disaster and personal tragedy, it was a period of internal stability, good government, and prosperity, an era of confidence during which real progress was made in every field. The sudden end of this period not only changed the political system completely but it was also a dramatic, traumatic experience for the men of the time. In the next decade the confident pride of Hsüan Tsung's age was replaced by self-questioning, by withdrawal from public affairs, and by a new spirit of social and political criticism.

Hsüan Tsung (Chinese emperor): *see* Tao-kuang.

Hsüan-t'ung (Chinese emperor): *see* P'u-i.

Hsüan-yeh (Chinese emperor): *see* K'ang-hsi.

Hsün-tzu, Pinyin XUN-ZI, also spelled HSÜN-TZE, original name HSÜN K'UANG, honorary name HSÜN CH'ING (b. *c.* 300 BC, Chao Kingdom, China—d. *c.* 230 BC, Lan-ling, Ch'u Kingdom, China), philosopher who was one of the three great Confucian philosophers of the Classical period in China. He elaborated and systematized the work undertaken by Confucius and Mencius, giving a cohesiveness, comprehensiveness, and direction to Confucian thought that was all the more compelling for the rigour with which he set it forth; and the strength he thereby gave to that philosophy has been largely responsible for its continuance as a living tradition for over 2,000 years. Many of his diverse intellectual achievements came to be obscured as later Confucians focused on the misanthropic view attributed to him that human nature is basically ugly or evil, and, beginning about the 12th century AD, his writings fell into a period of disfavour and neglect from which they have only recently reemerged.

His original name was Hsün K'uang, but he is commonly referred to as Hsün-tzu (Master Hsün), *tzu* being an honorary suffix attached to the names of many philosophers. The exact dates of Hsün-tzu's life and career are uncertain. Little is known of his life save that he was a native of the state of Chao (in modern Shansi Province, north central China), that he belonged for some years to the Chi-hsia academy of philosophers maintained in Ch'i by the ruler of that eastern state, and that, later, because of slander, he moved south to the state of Ch'u, where he became magistrate of a small district in 255 BC and later died in retirement.

Hsün-tzu's importance in the development of Confucian philosophy rests on the historical influence of his major work, known today as the *Hsün-tzu.* This book comprises 32 chapters, or essays, and is regarded as being in large part from his own hand, uncorrupted by later emendations or forgeries. The *Hsün-tzu* essays are a milestone in the development of Chinese philosophy. The anecdotal and epigrammatic style that had characterized earlier philosophical literature—*i.e.,* the *Analects, Tao-te Ching, Mencius, Chung-tzu*—no longer sufficed to convey fully and persuasively the complex philosophical disputes of Hsün-tzu's day. Hsün-tzu was the first great Confucian philosopher to express his ideas not merely by means of the sayings and conversations recorded by disciples but also in the form of well-organized essays written by himself. In his book he introduced a more rigorous writing style that emphasized topical development, sustained reasoning, detail, and clarity.

Hsün-tzu's most famous dictum is that "the nature of man is evil; his goodness is only acquired training." What Hsün-tzu preached was thus essentially a philosophy of culture. Human nature at birth, he maintained, consists of instinctual drives which, left to themselves, are selfish, anarchic, and antisocial. Society as a whole, however, exerts a civilizing influence upon the individual, gradually training and molding him until he becomes a disciplined and morally conscious human being. Of prime importance in this process are the *li* (ceremonies and ritual practices, rules of social behaviour, traditional mores) and music (which Hsün-tzu, like Plato, regarded as having a profound moral significance).

Hsün-tzu's view of human nature was, of course, radically opposed to that of Mencius, who had optimistically proclaimed the innate goodness of man. Both thinkers agreed that all men are potentially capable of becoming sages, but for Mencius this meant that every man has it within his power to develop further the shoots of goodness already present at birth, whereas for Hsün-tzu it meant that every man can learn from society how to overcome his initially antisocial impulses. Thus began what became one of the major controversies in Confucian thought.

The difference between Mencius and Hsün-tzu is metaphysical as well as ethical. T'ien (Heaven) for Mencius, though not an anthropomorphic deity, constituted an all-embracing ethical power; therefore it is inevitable that man's nature should be good, since he receives it from Heaven at birth. For Hsün-tzu, on the other hand, T'ien embodied no ethical principle and was simply the name for the functioning activities of the universe (somewhat like our word Nature). These activities he conceived of naturalistically and almost mechanistically. Moral standards, therefore, have no metaphysical justification but are man-made creations.

One may ask how, if man is born "evil" (by which Hsün-tzu really meant uncivilized), it is possible for him to create the higher values of civilization. In the essay "A Discussion of Ritual," Hsün-tzu attempts to answer this question and in the process elaborates the concept central to his entire philosophy. Hsün-tzu asserts that man differs from other creatures in one vital respect: besides his instinctual drives, he also possesses an intelligence which enables him to form cooperative social organizations. Hence the sages, realizing that man cannot well survive in a state of anarchy, used this intelligence to formulate the social distinctions and rules of social behaviour which would check the encroachments of one individual upon another and thereby ensure sufficiency for all. Hsün-tzu thus presents a believable utilitarian explanation for the creation of social institutions.

The *li* constituted the "Way" of Confucianism as interpreted by Hsün-tzu, being the ritualized norms governing the mores, manners, and morals of the people. Originally the behavioral expressions of early supernatural beliefs, the historical *li* were being abandoned by an increasingly agnostic intelligentsia during Hsün-tzu's own era, the Warring States period, a time of great change and instability. Hsün-tzu had a sophisticated appreciation of the manifold advantages in areas such as trade, social mobility, and technology that were accompanying the breakdown of the feudal order during the Warring States period. At the same time, he could see that these societal transformations were also bringing to the Chinese the demise of their ancient socio-religious institutions, and he believed that the ritual practices (*li*) linked with those institutions were too important to be lost during secularization. For him, those ritual practices were important to the society because they were a culturally binding force for a people whose existence depended on cooperative economic efforts, and further, those ritual practices were important to the individual because

they provided an aesthetic and spiritual dimension to the lives of the practitioners. By his fundamental insistence on the necessity of cultural continuity for both the physical and psychological well-being of his fellows, Hsün-tzu placed himself squarely in the ranks of Confucian philosophers and provided an ethical and aesthetic philosophical basis for these ritual practices as their religious foundation was weakening.

The *li* are the basic stuff out of which Hsün-tzu builds the ideal society as described in his book, and the scholar-officials who are to govern that society have as their primary function the preservation and transmission of these ritual practices. Like all early Confucians, Hsün-tzu was opposed to hereditary privilege, advocating literacy and moral worth as the determinants of leadership positions, rather than birth or wealth; and these determinants were to have as their foundation a demonstrated knowledge of the high cultural tradition—the *li*. No less significant politically than socially, the *li* were to be employed by scholars to ensure that everyone was in a place; and officials were to employ the *li* to ensure that there was a place for everyone.

Hsün-tzu's primary concern was with social philosophy and ethics, as evidenced by the content of his essays: 18 of the 32 fall solely within these areas, and the remainder fall partly so; even the technical, linguistically oriented "Rectification of Names" is liberally sprinkled with comments about the adverse social consequences attending the abuse and misuse of language. Among his other famous essays, "A Discussion of Music" became the classic work on the subject in China. Here, too, social issues are under consideration as Hsün-tzu discusses the importance of music as a vehicle for expressing human emotions without generating interpersonal conflict.

Another celebrated essay is "A Discussion of Heaven," in which he attacks superstitious and supernatural beliefs. One the main themes of the work is that unusual natural phenomena (eclipses, etc.) are no less natural for their irregularity—hence are not evil omens—and therefore men should not be concerned at their occurrence. Hsün-tzu's denial of supernaturalism led him into a sophisticated interpretation of popular religious observances and superstitions. These were merely poetic fictions, useful for the common people because they provided an orderly outlet for human emotions, but not to be taken as true by educated men. There Hsün-tzu inaugurated a rationalistic trend in Confucianism which has been congenial to scientific thinking.

Hsün-tzu also made important contributions to psychology, semantics, education, logic, epistemology, and dialectic, yet his primary interest in dialectic was as a tool for exposing the "fallacies" of rival schools; and he bitterly lamented the need for dialectic in the absence of a centralized political authority that could impose ideological unity from above. Hsün-tzu, indeed, was an authoritarian who formed a logical link between Confucianism and the totalitarian Legalists; it is no accident that among his students were two of the most famous Legalists, the theoretician Han Fei-tzu (*c.* 280–233 BC) and the statesman Li Ssu (*c.* 280–208 BC). Both of these men earned the enmity of later Confucian historians, and the opprobrium they have consistently received through the centuries has also negatively affected the evaluation of their teacher. Hsün-tzu's writings were no less the recipient of moral disapproval than his teaching, owing in large measure to the often-quoted essay "Man's Nature Is Evil." Because Mencius believed that human beings were innately disposed toward moral behaviour, Hsün-tzu was perceived, as the author of this essay, to be attacking his illustrious predecessor. The truth is that Hsün-tzu remained Confucian in his firm rejection of the amoral philosophy and compulsive techniques of the Legalists, and in his insistence on Confucian morality as the basis for society.

For several centuries after Hsün-tzu's death, his influence remained greater than that of Mencius. Only with the rise of Neo-Confucianism in the 10th century AD did his influence begin to wane, and not until the 12th century was the triumph of Mencius formalized by the inclusion of the *Mencius* among the Confucian classics and by Mencius' canonization as the second Sage of Confucianism. Hsün-tzu was declared heterodox.

Hsün-tzu's model society was never put into practice, and, like Confucius and Mencius before him, he probably died believing himself to have been a failure. Yet the rationalism, religious skepticism, concern for man in society, historical and cultural sensitivity, and fondness for ancient lore and customs that pervade his writings also pervaded Chinese intellectual life for more than two millennia. No one dealt with these issues more thoroughly than Hsün-tzu, and his passionate defense of the Confucian moral vision contributed substantively to lessening the distance between the philosophical ideal and the historical reality. He has been correctly described as the molder of ancient Confucianism. Traditional China, with its extensive lands and huge population, came to be largely a Confucian state—making Hsün-tzu one of the most influential philosophers the world has ever known.

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hu, Pinyin HU, type of Chinese bronze vessel produced during the Shang (18th–12 century BC) and Chou (1111–255 BC) dynasties. A pear-shaped container for wine or water, the *hu* has a narrow neck blending gracefully into an expanded midsection that is sharply cut to a small ring base. The vessel can be suspended by means of lugs (ear-shaped protuberances) or rings attached to the body.

The *hu,* which may have had a Neolithic (*c.* 3000–1500 BC) pottery predecessor, is found in the bronze art of the Shang dynasty but is especially common in the late Chou (*c.* 600–255 BC), when its ample surface was handsomely decorated. With the increasing popularity and prestige of bronze vessels, inexpensive pottery duplicates were often made of the *hu,* especially in the Han dynasty (206 BC–AD 220).



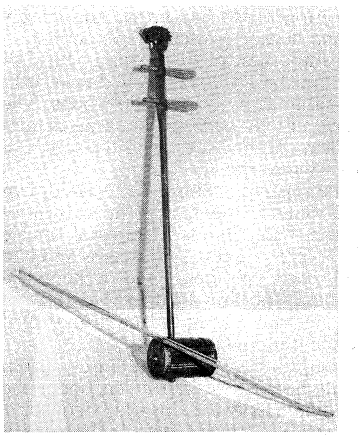
Bronze *hu,* late Chou (*c.* 600–255 BC); in the Ashmolean Museum, Ingram Collection, Oxford

By courtesy of the Ashmolean Museum, Ingram, Collection, Oxford

Hu, Sia, and Heh, Heh also called NEHEH, in Egyptian religion, deified abstractions personifying, respectively, "creative command" or "authoritative utterance," "perception" or "intelligence," and "eternity." They were all essential forces in the creation and continuance of the universe. Hu and Sia served as crew members in the solar barque of the sun god Re. They were represented as bearded men and also served as bearers of the eye of the god Horus. In Memphis they personified the tongue and the heart of the god Ptah, and throughout Egypt they were regarded as two of the divine attributes of every king.

Heh was the personification of infinite space and was portrayed as a squatting man bearing the symbols of long life and happiness.

hu-ch'in, popular vertically held two-stringed fiddle of China, having a muted tone marked by slides and vibratos. It is a spike fiddle, as its narrow cylindrical or hexagonal body is skewered by the tubular neck. The two strings are aligned one on top of the other above the snakeskin belly and are tuned a fifth apart (as c–g). The bow is not removable; its horsehair passes between the strings and its arched wooden handle outside them. It was apparently of Mongol origin and was adopted in China about the 10th century. It is especially prominent today in theatrical music.



Hu-ch'in

By courtesy of Chinese Classical Music Association

The *hu-ch'in* has many variants, generically also called *hu-ch'in.* Notable are the larger, lower pitched *erh-hu* and the four-stringed *hu-hu.* Similar bowed fiddles are also found in Southeast Asia, Korea, and, less prominently, Japan.

Hu-chou (China): *see* Wu-hsing.

Hu Han-min, Pinyin HU HANMIN (b. Dec. 9, 1879, P'an-ya, Kiangsi Province, China—d. May 12, 1936, Canton), Chinese rival with Chiang Kai-shek for control of the Kuomintang (Nationalist) government in the late 1920s.

Educated in Japan, Hu joined the T'ungmeng hui (Alliance Society), the revolutionary organization of the Chinese Nationalist leader Sun Yat-sen, when it was organized in Tokyo in 1905. He soon became one of the party's leading polemicists and one of Sun's chief deputies. After the Republican Revolution of 1911, when Sun became the provisional president of the new republic, Hu was named his chief secretary.

In 1913 Yüan Shih-k'ai, who had succeeded

Sun as president of the new republic, launched a campaign to crush the old adherents of the T'ung-meng hui, and Sun and Hu were forced to flee the country. In an effort to regain power, Sun organized a new revolutionary group, the Kuomintang Party, and again made Hu one of his top lieutenants. By 1923, when Sun entered into an alliance with the Chinese Communist Party and began to receive Soviet military and organizational aid, the Kuomintang controlled the South China area around Canton.

Sun died in March 1925, shortly before the Kuomintang armies launched the Northern Expedition that crushed the warlords of North China and united the country. Hu, one of the major aspirants for leadership of the new government, gained power briefly in 1927 when the Kuomintang split into two factions. He was elected chairman of the government established in Central China by the right-wing, anti-Communist faction but was forced to resign four months later when the left wing purged its Communist members and reunited with the right wing under the leadership of Chiang Kai-shek, the head of the Kuomintang armies.

In September 1928 Hu became president of the Legislative Yüan, one of the five major organs of the government. His opposition to the promulgation of a constitution led to a break with Chiang culminating in Hu's arrest in 1931, an event that touched off a major revolt within the Kuomintang and forced Chiang to release him. Hu died of apoplexy at the age of 56.

Hu-ho-hao-t'e (China): *see* Hohhot.

Hu-lan, Pinyin HULAN, city near Harbin (Ha-erh-pin), in Heilungkiang *sheng* (province), China. Hu-lan was one of the first places in Heilungkiang opened by the Ch'ing dynasty to Chinese colonization, in 1865. It is the centre of a rich agricultural area noted for its grain, flax, and sugar beets. The city has a variety of small industrial enterprises engaged in precision engineering such as tool and instrument manufacture. Many of these enterprises are closely linked with industries in Harbin. There is a large match factory as well as a flax-processing plant that supplies linen thread to the textile industry in Harbin. Hu-lan is virtually a satellite town of Harbin. Pop. (1982) 83,787.

Hu-lun (China): *see* Hailar.

Hu-lun Lake, Wade–Giles romanization HU-LUN HU, Pinyin HULUN HE, Mongol HU-LUN NUR, also called CHALAI NOR, or DALAI NOR, large lake in the Hu-lun-pei-erh Plain, northern Inner Mongolia autonomous region, China. The lake is fed by the K'o-lu-lun River, which flows from the west, and by the Orxon (Wu-erh-hsün) River, which flows from the south.

Hu-lun Lake has varied considerably in area according to variations in the climate. At one time it was part of a large lake that included Pei-erh Lake, a somewhat smaller lake in the south of the Hu-lun-pei-erh Plain, which drains into Hu-lun Lake via the Orxon River. Normally Hu-lun covers an area of about 894 square miles (2,315 square km). It is comparatively shallow and is joined by a seasonal channel to the Hai-la-erh River, which flows into the Argun River. For much of the year, however, it is undrained, and occasionally, when its level is very low, there is a reverse flow of waters from the Hai-la-erh River into the lake. All the rivers of this area are unstable, owing partly to the concentration of rainfall in a short period of the summer and partly to the great annual variations in the weather. Unlike most of the lakes in the Hu-lun-pei-erh region, which are highly saline, both Hu-lun and Pei-erh lakes have fresh water with a very low salt content. Both are well-stocked with fish, which are consumed throughout the region. During the six months of bitter winter cold, most of the fish in Hu-lun Lake migrate up the Orxon River to Pei-erh Lake.

Hu Shih (b. Dec. 17, 1891, Shanghai—d. Feb. 24, 1962, Taiwan), Chinese Nationalist diplomat and scholar, important leader of Chinese thought who helped establish the vernacular as the official written language (1922). He was also an influential propagator of American pragmatic methodology as well as the foremost political liberal in Republican China, advocating building a new country not through political revolution but through mass Chinese education.

Early life and education. Hu Shih's father was a scholar-official from Chi-ch'i county in Anhwei Province. When Hu Shih was three years old, his father died. His mother, though uneducated herself, laid great emphasis on the education of her son, which alone would enable him to pass competitive civil service examinations that led to a career as an official.

Since passing the examinations was the aim of education, the content of the examinations became almost exclusively the content of education. By the time Hu Shih began his schooling, traditional Chinese education had solidified into a rigid orthodoxy, remote from contemporary life and learning. It was based on the Confucian Classics and on a narrow interpretation of them introduced by the reigning Manchu dynasty to justify monarchical rule. Moreover, the emphasis had shifted from the study of the content of the Classics to the study—almost the worship—of their literary form. It became so important that a scholar's



Hu Shih, 1958
By courtesy of the Academia Sinica, Nankang, Taipei

writing conform to the orthodox literary style that, if his ideas could not be adapted to the style, they were often changed. The language itself hampered the development of new ideas, as well as the dissemination of those ideas to the masses. Although some writers had used the vernacular, the respected books were those written in the classical Chinese language. As remote from the living, spoken language as Latin is from English, it was so difficult to learn that it was largely responsible for the very widespread illiteracy in China.

Although the pressure for modernization was forcing educational orthodoxy to compromise with Western learning (and in 1905 was to force the Manchus to abolish the civil service examinations), the compromise was not very great in 1895 when Hu Shih began his schooling at the age of four. Taught in Chi-ch'i by his uncle and cousin, the manifestly gifted child studied the Classics and the old vernacular stories and novels.

In 1904 Hu went to Shanghai for a "modern education." In 1910, having won a scholarship, he went to the United States to study agriculture, and then philosophy, at Cornell University, Ithaca, N.Y. After receiving his B.A. degree in 1914, he became a student of the philosopher John Dewey at Columbia University. Dewey's philosophy discouraged the quest for absolute truths and recommended instead the acceptance as true of what works in any given set of circumstances; man should believe nothing, Dewey maintained, except that which has been subjected to the "test of consequences." This philosophy had a profound influence on Hu Shih. It gave expression and direction to his rational, skeptical, liberal cast of mind and was to him a means of helping his country free itself from blind submission to ancient tradition.

Hu returned to China in 1917, after completion of his doctoral dissertation under Dewey. Despite the high hopes engendered by the Revolution of 1911, which abolished the monarchy and established a Western-style republic, Hu found a China not radically changed from the nation he had left seven years earlier. Only nominally a republic, the country was overrun by warlords (provincial military rulers) fighting for dominance; there had been two attempts to restore the monarchy; the old conservative intellectual bureaucracy was still powerful; China's political and economic sovereignty were still threatened by foreign powers; and the masses were still 90 percent illiterate and still obedient to ancient traditions.

Reforms of language and education. Hu Shih and other intellectuals who had returned from study abroad concluded that for Western-style government to work there must first be a thorough reexamination and total regeneration—after the Western model—of traditional Chinese culture. The centre of this cultural reform movement was Peking National University, the faculty of which Hu joined in 1917. Although some Peking intellectuals were more politically minded than others, in 1917 they all agreed, as Hu explains,

> to keep away from politics for twenty years and to be devoted only to educational, intellectual, and cultural activities, to build a political foundation by way of non-political factors.

Early in 1917, Hu's "Wen-hsüeh kai-liang ch'u-i" ("Tentative Proposal for Literary Reform") was published in *Hsin ch'ing-nien* ("New Youth"), an influential magazine established by Ch'en Tu-hsiu, Hu's colleague at Peking University, who was to become the founder of the Chinese Communist Party. In this article Hu made himself the champion of the *pai-hua* movement. He proposed a new, living literature, liberated from the tyranny of the "dead" language and style, accessible to the people, and flexible enough to express all kinds of new ideas. The poems Hu wrote in 1918, which were published in 1920 as *Ch'ang-shih chi (A Book of Experiments),* were just the beginning of a flood of new literature in the vernacular, resulting in new short-story and essay forms, new drama, and translations of modern European literature. Despite severe attacks from the traditionalists, "vernacular literature," as Hu said, "spread as though it wore seven-league boots." By 1922 the government had proclaimed the vernacular as the national language.

The literary revolution was, however, a single aspect of a broader campaign directed against the deadweight of the traditional values. To reappraise China's cultural heritage, Hu emphasized the need to use the new pragmatic methodology of Dewey. The slogan he propounded in 1919 generated much enthusiasm among intellectuals: "Boldness in suggesting hypotheses coupled with a most solicitous regard for control and verification." Hu's *Chung-kuo che-hsüeh shih ta-kang* (published 1919; *Outline of the History of Chinese Philosophy*), which examined the logic of the ancient philosophers, and his later studies of

the old vernacular literature, which verified authorship and authenticity, demonstrated how the scientific method could be applied in the study of traditional Chinese literature. So effective was Hu's advocacy of pragmatic methodology that it led to the examination and destruction of many of the accepted—and invalid—versions of ancient Chinese history.

Escape from politics was not long-lived. The agreement made by Hu and his colleagues began to disintegrate in 1919 after the May Fourth incident, when patriotic, anti-Japanese sentiment exploded into a student demonstration against the decision of the Versailles Peace Conference to support Japan's claims to Shantung province. The demonstration hastened the inevitable split between the leftist intellectuals, who had been incipient political activists all along, and the liberal intellectuals, who tended to avoid political activism.

The split became overt on July 20, 1919, when Hu challenged the leftists in an article entitled "More Study of Problems, Less Talk of 'Isms'." Deeply convinced of the feasibility of the experimentalist approach, with its reliance on coolness and reflective deliberation, he counseled gradualism and the individual solution of individual problems. In his view, the invocation of such abstract formulas as Marxism and anarchism, in the hope that one specific Western doctrine would solve all of China's problems, was futile; in coping with real issues he felt they would most likely lead to disastrous consequences. By appealing to cool reason at a time when the whole nation was ringing with sentimental battle cries, however, Hu Shih and his fellow liberals were bound to face frustration. Moreover, by urging the acceptance of pragmatism, which dismisses isms as unproven fabrications yet is itself an ism, Hu's position seemed to be untenable and unconvincing.

Because of this position, Hu not only made himself the declared antagonist of the Chinese Communists but also found himself frequently in uneasy relationships with the Nationalists. It was not until war with Japan broke out in 1937 that a modus vivendi was reached between Hu and the Nationalist government. He served as its ambassador to Washington from 1938 to 1942 and in 1945 was appointed chancellor of the government-sponsored Peking National University. After the establishment of the Communist government in 1949, Hu lived in New York City, where in 1957 he served as Nationalist China's representative to the United Nations. In 1958 he went to Taiwan to assume the presidency of the Academia Sinica, China's leading scholarly organization, a position he held until his death in 1962. (C.Li.)

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Hu Yaobang, Wade-Giles romanization HU YAO-PANG (b. November 1915, Liu-yang, Hunan, China—d. April 15, 1989, Peking), general secretary of the Chinese Communist Party from 1981 to 1987.

Born into a poor peasant family, Hu received little formal education. At age 14 he left home to join the Communists, and he became a member of the Communist Party in 1933. A veteran of the Long March (1934–35), he worked closely with the future party leader Deng Xiaoping in the 1930s and served as political commissar under Deng in the 2nd Field Army during the war against Japan. In the late 1940s, he and Deng moved into Szechwan province when their army took over the area from Nationalist forces. In 1952 he followed Deng to Peking, where he became head of the Young Communist League (1952–66).

After the Cultural Revolution was launched in 1966, both Hu and Deng were twice purged and twice rehabilitated. After his second rehabilitation in 1977, Hu became director of the party's organization department and soon afterward was made a member of the Politburo and propaganda chief.

In February 1980 he was appointed general secretary of the Chinese Communist Party and was elected to the Politburo's Standing Committee, the inner circle of the ruling body. In June 1981 he was further elevated to the chairmanship of the party, replacing Mao Zedong's handpicked successor, Hua Guofeng. Hu's elevation, engineered by his mentor Deng (who himself had become the de facto leader of China), marked the Chinese leadership's broader acceptance of pragmatic programs designed to speed up economic growth.

As general secretary of the Communist Party, Hu was responsible for ensuring that the party apparatus carried out the policy directives of China's new leadership. He set about downgrading the party's discredited Maoist ideology and replacing it with a more flexible and pragmatic policy of "seeking truth from facts." In line with the new emphasis on collective leadership in place of the personality cult of Mao Zedong, and to prevent a recurrence of the kind of party domination that Mao had exercised as its chairman, Hu helped abolish that post at a party congress in 1982. He then oversaw the purging of unrepentant Maoists and corrupt or incompetent members from the party and their replacement with younger, better-educated cadres in the mid-1980s. Early in 1987, after several weeks of student demonstrations demanding greater Western-style freedom, Hu was forced to resign for "mistakes on major issues of political policy." He nevertheless remained a member of the Standing Committee of the Politburo.

Hua Guofeng, Wade-Giles romanization HUA KUO-FENG (b. *c.* 1920, probably Shansi province, China), premier of the People's Republic of China from 1976 to 1980 and chairman of the Chinese Communist Party (CCP) from 1976 to 1981.

Nothing is known about Hua's life before the Chinese Civil War (ended 1949), when he was a local party secretary in Hunan province, the home province of Mao Zedong. He was transferred in 1955 to head the party apparatus in Hsiang-t'an city-county in Hunan. Hua became vice governor of the province in 1958 and was a strong supporter of Mao in the Great Leap Forward (1958–59). During the Cultural Revolution (1966–76) he received Mao's endorsement against rebel groups in Hunan, and he was active in setting up that province's revolutionary committee in 1968 and in reestablishing its party committee in 1970. By late 1972 Hua had become the top man in Hunan province. He became a member of the Politburo in August 1973 and moved to Peking, where he was named minister of public security in January 1975.

After the death of Premier Zhou Enlai in January 1976, Hua was named acting premier. In April—allegedly at the instigation of Mao's wife, Jiang Qing, and three of her political allies (the Gang of Four)—Mao chose Hua over his chief political rival, vice premier Deng Xiaoping, as permanent premier, and Deng was purged. Hua became chairman of the CCP after the death of Mao in September 1976. Known as an ideologically flexible leader, Hua had no strong ties either to the Maoist radicals or to Deng and the other pragmatists within the Communist Party. Although his unexpected rise to power had been seen as a compromise between the party factions led, respectively, by the Gang of Four and Deng Xiaoping, Hua ordered the arrest of the Gang of Four just days after Mao's death. The influence of Deng triumphed soon afterward. In 1977 Hua allowed Deng to be rehabilitated and restored to his former position as vice premier. In 1980 Hua resigned the premiership to Zhao Ziyang, a follower of Deng, citing as his reason the CCP's policy against officials holding high posts in both the party and the government. In June 1981 Hua was replaced as party chairman by Hu Yaobang, also a Deng supporter.

Hua-lien, *hsien* (county), east-central Taiwan, with an area of 1,787 square miles (4,629 square km). It is the largest and least densely populated *hsien* in Taiwan. The Chung-yang



Harvesting sugarcane in Hua-lien *hsien,* Taiwan
Barry L. Schuttler—Black Star/EB Inc.

Mountain Range and the Hai-an Mountain Range run north–south and extend over the western and eastern *hsien,* respectively. Between them is the T'ai-tung rift valley; it is filled with alluvial deposits and provides the only flat area for cultivation, where sugarcane, paddy rice, and jute are grown. The Hua-lien and the Wu, the major rivers, provide hydroelectricity for various industries. Iron ore, asbestos, sulfur, copper, and gold are mined, and marble is quarried. The T'ai-lu-ko (Taroko) Gorge is noted for its scenic beauty. Ho-huan mountain pass and Li-yü Lake are places of interest. Hua-lien city, the administrative seat, is the northern terminus of the East Line railway and the eastern terminus of East–West Cross-Island highway. Some 87,000 Ami aborigines inhabit the mountains. Pop. (1988 est.) 355,383.

Hua-lien, *shih* (municipality) and seat of Hua-lien *hsien* (county), eastern Taiwan, the largest settlement and principal harbour on the island's east coast. Hua-lien is situated on a major fault line at the northern end of the T'ai-tung rift valley, which separates the main Chung-yang Mountain Range of the interior from the rugged and steep coastal ranges between Hua-lien and the smaller port of T'ai-tung. A narrow-gauge railway follows this valley, which is about 4 miles (6 km) wide, and the bustling port is joined to the western parts of the island by a remarkable mountain highway. Located in a highly volcanic region, the city is severely affected by seismic disturbances; it was almost destroyed by a major earthquake in 1951.

Although the settlement at Hua-lien was founded in the late 19th century, it was not until 1910, during the Japanese occupation (1895–1945), that a local administration was set up. Numbers of Japanese farmers settled in the area, which produces rice, sugarcane, jute, and camphor. The Japanese initially planned to establish a major port and city on the site, but they found that conditions were poor because of heavy seas, frequent typhoons, and generally poor communications. In the 1970s the port underwent major improvements, as fishing harbours were upgraded to accept cargo ships. It is now one of Taiwan's major international ports. Pop. (1982 est.) 103,625.

Hua-pei P'ing-yüan (Wade–Giles romanization), Pinyin HUABEI PINGYUAN (China): *see* North China Plain.

Hua-yen (Buddhism): *see* Kegon.

huaca, also spelled WAK'A (Quechua: "sacredness," or "holiness"), ancient Inca and modern Quechua and Aymara religious concept variously used to refer to sacred ritual, the state of being after death, or any sacred object. The conquistador Pedro de Cieza de León believed that it meant burial place. *Huaca* also means spirits that either inhabit or actually are physical phenomena, such as waterfalls, mountains, or man-made shrines. The shrines, found throughout the Inca territory from Ecuador to Chile, may be as simple as stones piled in a field (*apachitas*) or as complex as stepped pyramids that were once topped with canopies and carved images.

Huaca Prieta, also called CHICAMA, pre-Columbian site of the Late Preceramic Period (*c.* 3500–1800 BC) in northern Peru, which is located in the present-day department of La Liberdad at the mouth of the Chicama River. Archaeological excavations have revealed subterranean pit dwellings. The inhabitants of these dwellings did not cultivate maize (corn) or make pottery but grew squash, chilies, and cotton; caught fish; and wove baskets and coarse cloth. By the radiocarbon method this culture has been dated to about 2500 BC.

Huai-an, Pinyin HUAI'AN, city and river port in northern Kiangsu Province (*sheng*), China. It is a county (*hsien*) seat in Huai-yin Prefecture (*ti-ch'ü*), located some 9 mi (15 km) south of its administrative centre at Ch'ing-chiang. Huai-an is a water transport focus, being situated where the Grand Canal (Ta Yün-ho) crosses the Su-pei-kuan-kai-tsung Ch'ü (canal), and is also on the highway between Suchow in northwest Kiangsu and Yang-chou in southern Kiangsu.

In former times Huai-an was a city of considerable importance. Until the 12th century the Huai Ho (river) flowed to the sea some miles to the north, and the city was served by the section of the Grand Canal between the Huai Ho and the Yangtze River. A county (*hsien*) had been established there in the 2nd century BC; in the early 4th century it became the administrative seat of a commandery (district controlled by a commander) and was walled. In 593, under the Sui dynasty (581–618), it received the name Ch'u Prefecture (*chou*), by which it was known until the 12th century. With the completion of the New Pien Canal in 607, it became a city of major economic importance as a canal port on the route by which grain was sent from the Yangtze to the capital cities of Sian (Hsi-an [Ch'ang-an]) in Shensi Province and Lo-yang (Honan Province), as a collecting centre for tax grain from the rich rice-growing lands of the Huai Ho plain, as a centre of the salt industry in coastal Kiangsu, and as a major seaport, the shipping of which was mostly engaged in the northern coastal traffic to Korea and Japan. During the 7th to the 9th centuries it had a considerable foreign merchant community, including many Koreans. When this area fell to the Chin (Juchen) in the early 12th century, its role was changed to that of a major strategic centre in the frontier confrontation between the Sung dynasty (960–1127) and the Chin regime. At this time it first received the name Huai-an (meaning "the Huai pacified").

With the revival of the grain transport system under the Yüan (Mongol; 1206–1368) and subsequently under the Ming (1368–1644), Huai-an became a transport centre of immense importance, the site of vast granaries, and a centre of the transport administration. Although a change of course of the Huang Ho in 1194 had blocked the mouth of the Huai Ho, robbing Huai-an of its role as a seaport, the town grew rapidly. In 1560 both the old city and the newer settlement, which had grown up since the 14th century, were surrounded by strong fortifications. Throughout the Ming (1368–1644) and Ch'ing (1644–1911/12) periods it remained a superior prefecture (*fu*) named Huai-an; but its importance declined after the mid-19th century, when the Grand Canal gradually fell into decay. Huai-an, however, retained a provincial role as a transport centre and as a collecting centre for agricultural produce, above all, of rice from the Huai Ho Valley. In 1912 it ceased to be a superior prefecture, and has since been a county seat—at first under its ancient name Shan-yang and, since 1914, as Huai-an.

Since 1949 it has revived considerably, due to the completion of the Su-pei-kuan-kai-tsung Ch'ü (which once again gives medium-sized shipping direct access to the sea) and to the restoration of the northern sections of the Grand Canal system. Pop. (mid-1970s est.) 10,000–50,000.

Huai-nan, Pinyin HUAINAN, industrial city, north central Anhwei Province (*sheng*), China. A prefecture-level municipality (*shih*) since 1949, it includes an area stretching west some 25 mi (40 km) along the south bank of the Huai Ho to include the mines at Pa-kung-shan.

Until the 20th century Huai-nan was a minor town called T'ien-chia-an, under the jurisdiction of Shou-hsien, some 30 mi to the west. Its development began with the discovery of coal deposits early in the 20th century, but exploitation of the mines did not begin in earnest until the 1930s. Their development was further advanced under the Japanese occupation (1937–45). After 1949 new coal deposits were discovered, and by the 1970s Huai-nan was the centre of one of China's most important coalfields, with several mechanized deep pits. The city has a major thermal generating plant, which supplies electricity to part of northern Anhwei.

During the 1950s, chemical and photochemical industries were established, as well as an iron and steel industry. Huai-nan also has an unusually large number of plants and a diverse range of heavy industry, including engineering and machine-building plants. Standing at the centre of a fertile agricultural region, it has benefitted from irrigation projects established by the Huai River Conservancy Authority. There are also food-processing and tobacco-processing plants. It has railway connections with Ho-fei to the south and with Hsü-chou (in Kiangsu) to the north. Pop. (1983 est.) 1,036,000.

Huai-nan-tzu, Pinyin HUAINANZI, original name (Wade–Giles romanization) LIU AN, English MASTER HUAI-NAN (d. 122 BC), Chinese nobleman and scholar. He was one of the few prominent Taoist philosophers active during the 700-year period between the peak of Taoist thought in the 4th century BC and its resurgence in the 3rd and 4th centuries AD.

Huai-nan-tzu was a grandson of the founder of the Han dynasty and a cousin of the reigning Emperor, and he attracted many talented people to the court. After being implicated in a plot against the throne, he committed suicide. His most important work is the classic *Huai-nan-tzu* (*q.v.*).

Huai-nan-tzu (Chinese: "Master Huai Nan"), important Chinese classic written in the 2nd century BC under the patronage of the nobleman Huai-nan-tzu (Liu An). It is a compilation of 21 loosely connected chapters on metaphysics, cosmology, matters of state, and conduct. Although it contains little that is not included in two earlier Taoist classics, the *Tao-te Ching* and *Chuang-tzu* (*qq.v.*), cosmogony in it becomes more elaborate and more definite. In cosmological evolution, Tao (Way) originated from vacuity, and vacuity produced the universe, which in turn produced the material forces. The material forces of heaven and earth combined to form yin and yang, which in their turn give rise to the myriad things. In its broad outline this cosmogony has been retained as orthodox doctrine not only by Taoist philosophers but also by later Confucianists. In its discussion of the spirit, the *Huai-nan-tzu* introduces such ideas as immortality on Earth and the physical techniques, such as breathing, used to achieve it, thus paving the way for the later confusion of Taoist philosophy with Taoist popular religion. In addition, by approaching metaphysics and cosmology in an essentially rational spirit, the text prepared for the emergence of rationalistic Neo-Taoism.

Huai-ning (China): *see* An-ch'ing.

Huai River, Wade–Giles romanization HUAI HO, Pinyin HUAI HE, conventional HWAI HO, river in North China draining the North China Plain between the Huang Ho (Yellow River) and the Yangtze River (Ch'ang Chiang). The river has a length of 660 mi (1,100 km) and drains an area of 67,000 sq mi (174,000 sq km). It is fed by numerous tributary streams rising in the Fu-niu Shan, the T'ung-pai Shan, and the Ta-pieh Shan (mountains), which, with their extensions into Anhwei Province north of the Yangtze, form its southern watershed. The Huai Ho flows eastward to discharge into the Hung-tse Hu (lake) in Kiangsu Province. In ancient times this lake was much smaller than at present, and the Huai Ho discharged from it into the sea roughly on the line of the modern Kuan Ho, south of Lien-yün-kang. Its mouth was, however, blocked by silt and the water from the Hung-tse Hu drained away through the string of lakes in eastern Kiangsu into the Yangtze near Yang-chou. In the north a series of tributaries flow northwest to southeast from a very low watershed almost on the southern dikes of the Huang Ho. The Huang Ho has from time to time flowed through the north of the Huai drainage basin and has discharged into the Huai or even, on occasion, first into the Huai and then into the Yangtze. The drainage of this flat and featureless plain has been a perennial problem, particularly since the 1850s, when the Huang Ho, which had previously discharged into the sea at Hai-chou Wan (bay), again coursed north of the Shantung Peninsula. As a result, much of the drainage into its lower course was diverted into the Huai Ho, leading to continual flooding.

Many plans were made for controlling the drainage of the Huai Basin in the late 1800s and early 1900s. In the 1930s part of the system was dredged, and an artificial channel protected by flood barrages was cut from the Hung-tse Hu to the sea. During the Sino-Japanese War, however, the Chinese Army, in an attempt to block the Japanese southward advance through the North China Plain, blew up the dikes of the Huang Ho near Cheng-chou in 1938, flooding a large area in Honan Province.

Extensive work to control the Huai Ho was

carried out after World War II. The dikes were repaired, and the Huang Ho returned to its old course through northern Shantung. In 1951 work began on a comprehensive water-conservancy project for the Huai Basin. The outlet canal from the Hung-tse Lake to the sea, known as the Su-pei Canal (*q.v.*), was reconstructed, and an alternative outlet to the sea by way of the old Yun-yen Canal, discharging into Hai-chou Bay at Lien-yün-kang, was also completed. At the same time the repair and improvement of the Grand Canal (*q.v.*) also improved drainage of Hung-tse Lake to the south. In the early 1950s the headwaters of the Huai and its western tributaries in the Fu-niu and T'ung-pai mountain ranges were controlled by the construction of a number of large retention dams. In 1957 a second stage of flood control began on the southern tributaries. After 1958 the area south of the Huai was incorporated into a large coordinated irrigation system.

In the late 1960s government attention shifted to work on the New Pien Canal north of the Huai, although development in the south still continued. By the early 1970s the northern tributaries had been joined to the New Pien Canal, which provided more effective flood control in the northern Huai plain. In the early 1980s the Huai River was navigable by small ships above Huai-nan, while the Su-pei Canal provided a navigable outlet to the sea. River traffic from the Huai could also join the Grand Canal, providing a water transport route north to the Huang Ho and south to the Yangtze River.

Huai-yin (China): *see* Ch'ing-chiang.

Huainanzi (Taoist philosopher): *see* Huai-nan-tzu.

huaiño (folk dance): *see* huayño.

Huallaga River, Spanish RÍO HUALLAGA, river in central and northern Peru, rising in the Andes mountains just south of Cerro de Pasco, and descending north-northeastward past Huánuco and Tingo María. The Huallaga carves a valley between the Cordillera Central and the Cordillera Azul and emerges into the Amazon Basin to join the Marañón River downstream from Lagunas. Although the length of the Huallaga is estimated to be 700 miles (1,100 km), only the lower 30 miles (48 km) to Laguna are navigable by large vessels.

Huambo, formerly NOVA LISBOA, English NEW LISBON, city, west-central Angola. Located south of the Kwanza River on the Bié (central) Plateau at an elevation of 5,581 feet (1,701 m), it has a temperate climate. The town was founded in 1912 by Portuguese settlers and workers on the Benguela Railway, which was then under construction. It was first called Huambo but was renamed Nova Lisboa in 1928 to emphasize colonial ties, since it was originally intended as the capital of Portuguese Angola. Following Angola's attainment of independence in 1975, the city's original name was restored. Basically a transportation centre with one of the largest rail repair shops in Africa, it is also engaged in considerable commercial and shipping activity through its rich agricultural environs. Huambo was severely damaged during the civil war that accompanied and followed independence. The important Benguela Railway, which runs from Lobito on the Atlantic coast eastward through central Angola to Zaire, passes through Huambo. The railway's operation has been repeatedly disrupted by forces of the National Union for the Total Independence of Angola (UNITA), a guerrilla movement that continued to fight the post-independence central government and for whom the area around Huambo became the primary base of operation.

Coffee, wheat, and corn (maize) are grown in the area around Huambo, and there is significant cattle raising. Some iron mining was begun there in the 1950s but had to be suspended in the mid-1980s because of civil strife in the area. Near the city of Huambo there are fish-breeding reservoirs. Pop. (1974 est.) 65,000.

Huancavelica, department (formed 1822) of central Peru, occupying an area of 8,139 square miles (21,079 square km) in a rugged, mountainous region of the Andes. Its high-level surface about 15,000 feet (4,600 m) above sea level is surmounted by clusters of high mountains and cut by deep canyons, chief of which is the Mantaro. During the colonial period, mercury was essential in extracting the silver from native ore, and the department was famous for its mercury mine at Santa Bárbara, some 2,000 feet (600 m) above the department's capital city, Huancavelica. With the decline of silver mining in the 19th century, the mining of mercury in the area also decreased. The department's principal agricultural products include wheat, barley, corn (maize), and potatoes. Huancavelica is a source of wool for local use and of meat for Lima, to which it is connected by rail and an all-weather highway. Pop. (1987 est.) 371,400.

Huancavelica, city, capital of Huancavelica province and department, central Peru. It is located about 140 miles (225 km) southeast of Lima, in the inter-Andean Huancavelica River valley at an elevation of 12,060 feet (3,676 m). Huancavelica was established as a mining settlement in 1563 after the local discovery of mercury, which was essential in extracting the silver from the native ores. Founded as Villa Rica de Oropesa ("Rich Town of Oropesa") in 1572 on the orders of the viceroy, Francisco de Toledo, it was almost immediately called Huancavelica—a Spanish corruption of the indigenous Quechua name for the site, meaning "stone idol"—and was officially declared a city with its present name in 1581. The city remained an important mercury-mining centre until the mid-19th century; small-scale extraction of other metallic ores in the area (including gold, silver, copper, and lead) continued into the late 20th century. Most inhabitants of the province are Quechua-speaking Indians who practice a sedentary subsistence agriculture, cultivating potatoes and barley. Leather and alpaca products are traded in local markets. Exemplary Spanish colonial art of the late 16th to 18th century is particularly noteworthy in the altars of the city's many old churches. A narrow-gauge railway running south from Huancayo makes Huancavelica the terminus of a 404-mile (650-kilometre) intermontane rail line from Callao (the port of Lima). Pop. (1987 est.) 24,000.

Huancayo, capital of Huancayo province and Junín department, located in the central highlands of Peru. Lying at 10,659 feet (3,249 m) above sea level in a fertile basin drained by the Mantaro River, it is in a long-inhabited agricultural area. The settlement at Huancayo (from the Quechua Indian word meaning "clan of the Huancas," a powerful Indian people) was given the status of a city in 1823. The major commercial centre of the central Andes, Huancayo is connected to Lima and other Andean cities by railroad and highway. Indians and mestizos from the surrounding villages flock to the city's large and colourful Sunday market. The seat of an archbishopric, Huancayo contains a cathedral and many picturesque religious buildings. The city's dynamism is best revealed in its large, modern buildings near the main plaza. It is the location of Universidad Nacional del Centro del Peru (1962) and is a tourist centre. Pop. (1987 est.) 195,000.

Huang Ch'ao, Pinyin HUANG CHAO (d. 884, China), Chinese rebel leader whose uprising so weakened the T'ang dynasty (618–907) that it collapsed a few years after the rebellion ended.

Although well-educated, Huang Ch'ao failed to pass his civil service examinations and turned to salt smuggling, defying the government-granted salt-manufacturing monopoly. In 875 he collected a group of several thousand followers and joined the numerous rebellions then sweeping the country. His forces pushed into the south and in 879 occupied the rich trade city of Canton. Huang then swept back north, capturing the capital at Ch'ang-an in 881. He proclaimed himself the first emperor of the Ta Ch'i dynasty, but he was unable to organize the food supply to the capital. In 883 the government, aided by an alliance with a group of nomadic Turkish tribes, the Sha-t'o, drove him from the capital. The following year Huang was captured and executed, but T'ang control over the country had been destroyed by the 10-year revolt, and the dynasty rapidly crumbled. Chu Wen, the man who finally usurped the T'ang throne, was one of Huang's former generals.

Huang Di (Chinese mythology): *see* Huang Ti.

Huang Gongwang: *see* Huang Kung-wang.

Huang Hai (East Asia): *see* Yellow Sea.

Huang Ho, also spelled HWANG HO, Pinyin HUANG HE, English YELLOW RIVER, great river of China and the second longest, flowing 3,395 miles (5,464 km) from the Plateau of Tibet eastward in a winding course to the Po Hai (Gulf of Chihli) in the Yellow Sea.

A brief treatment of the Huang Ho follows. For full treatment, *see* MACROPAEDIA: Asia.

The Huang Ho passes through the provinces of Tsinghai and Kansu, the autonomous regions of Ningsia and Inner Mongolia, and then into the provinces of Shensi, Shansi, Honan, and Shantung as a shifting, turbulent, muddy stream that often overflows its banks and sends floodwaters across the North China Plain. The chief cities of the region are Lan-chou, Pao-t'ou, Sian, T'ai-yüan, Loyang, Cheng-chou, K'ai-feng, and Tsinan. The Huang Ho drains an area of 288,000 square miles (745,000 square km).

The river system is divided into two distinct parts: the mountainous upper basin and the plains section, the latter of which is subdivided into middle and lower basins. In the upper basin the Huang Ho flows eastward, cutting deep valleys into thick layers of loess deposits and carrying away tremendous quantities of silt. The middle section consists of a great northern loop through the Ordos Desert and then a southward course across the Loess Plateau. The two longest tributaries—the Wei River of Shensi Province and the Fen River of Shansi Province—join the Huang Ho in the middle basin. Downstream the lower basin becomes fan-shaped as it broadens out across the North China Plain, China's rice granary, which is broken only by the low Shantung Hills.

In the past 4,000 years several radical changes have occurred in the Huang Ho's course; at different times the river has entered the Yellow Sea at points as far apart as 500 miles (800 km). The mean annual discharge of the Huang Ho is 52,900 cubic feet per second (1,500 cubic m/sec), but large yearly and seasonal variations in discharge occur. The water supply of the system is dependent on the rains brought by the monsoon winds from July to October, as well as on the flow from melting mountain snow. The Huang Ho is the world's muddiest river, carrying more than 2 pounds of silt per cubic foot of water (78 grams per litre); floodwaters may contain up to 44 pounds of silt per cubic foot of water (70 percent by volume). Development plans for the river call for the construction of new dams and

reservoirs, the exploitation of its hydroelectric potential (estimated at 30,000,000 kilowatts), and the extension of the navigable length of the river and its tributaries.

Huang Hsing, Pinyin HUANG XING (b. Oct., 28, 1874, Chang-sha, Hunan province, China—d. Oct. 31, 1916, Shanghai), revolutionary who helped organize the Chinese uprising of 1911 that overthrew the Ch'ing dynasty and ended 2,000 years of Imperial rule in China.

He founded the Hua hsing hui (Society for the Revival of China), a revolutionary group dedicated to the overthrow of the Ch'ing government. After several abortive attempts at revolution, Huang was forced to flee to Japan. In 1905 the revolutionary leader Sun Yat-sen organized the T'ung-meng hui (Alliance Society) as a union of all Chinese revolutionary groups, and Huang was made Sun's second in command.

Six years later Huang and his followers, aided by sympathizers among the Imperial troops, attempted a military attack on the South China city of Canton. Because of lack of coordination among the various units participating in the action, the Canton Uprising, one of the most celebrated events in Chinese revolutionary history, failed. On Oct. 10, 1911, a group of revolutionary army officers in the central Chinese city of Wu-ch'ang began a revolt that soon spread to all parts of South China. With Sun Yat-sen in Europe, Huang was the most important leader on the scene, and he hurried to Wu-han to take charge of the revolutionary forces. In his heroic defense of the central Chinese city of Han-yang, he held off the Ch'ing forces for more than three weeks, giving the revolutionaries time to organize in other parts of the country. On Dec. 2, 1911, the revolutionaries captured Nanking, South China, and made it their capital.

On December 14, delegates to the provisional revolutionary government elected Huang generalissimo of the new republic. He declined the appointment, however, and Sun Yat-sen was made provisional president upon his return two weeks later. In March, Sun resigned in favour of the former Manchu military commander Yüan Shih-k'ai, and the capital was moved to Peking. Although Huang was offered the premiership and the title general of the army, he refused. Instead, he disbanded his troops and set to work converting the T'ung-meng hui into a parliamentary political party. By 1913 it had become clear that Yüan was not interested in cooperating with the parliament or obeying the new constitution, and Huang joined with Sun in organizing a new revolution. Yüan's armies, however, soon crushed the forces of the so-called second revolution, and Huang was forced to flee to Japan. In 1916, after the death of Yüan, Huang returned to China.

Huang Kung-wang, Pinyin HUANG GONG-WANG (b. 1269, Ch'ang-shu, Kiangsu province, China—d. 1354), oldest of the group of Chinese painters later known as the Four Masters of the Yüan dynasty (1206–1368), often cited by later painters and critics as especially meritorious for his rectitude (even though he briefly served in a junior capacity in the Mongol administration) and for his intense association with nature.

Huang Kung-wang spent most of his later years in retirement in the Fu-ch'un Mountains, which he recorded in a long handscroll produced over a three-year period (1347–50), now in the National Palace Museum, Taipei, Taiwan. He is known also for his accomplishments in literary arts, and thus is listed among the paragons of the "literati painting" (*wen-jen-hua*) ideal. His style of and attitude toward painting stand at a pivotal midpoint between such ancient masters as Chü-jan in the Five Dynasties period and Shen Chou, Tung Ch'i-ch'ang, the Four Wangs, and others of the Ming and Ch'ing dynasties.

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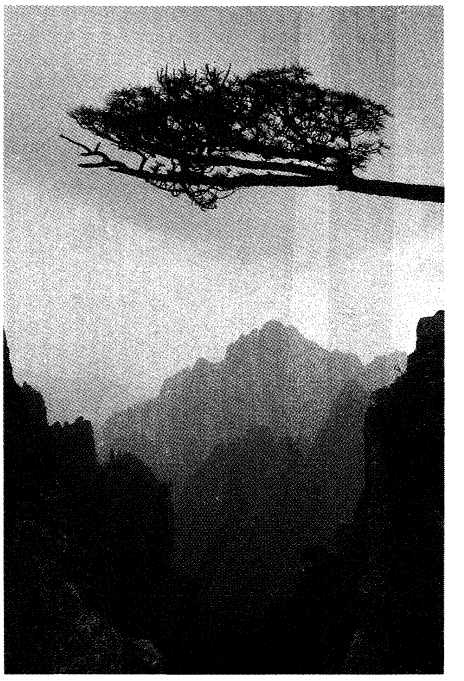
Huang Li-chou (Chinese scholar): *see* Huang Tsung-hsi.

Huang Mountains, Chinese (Wade–Giles and Pinyin) HUANG SHAN, complex mountain system in southern Anhwei province, China. Some 160 miles (250 km) in length, the range has a generally southwest to northeast axis, extending from the area east of P'o-yang Lake to the eastern point of the province near Kuang-te. Its general elevation is about 3,300 feet (1,000 m), but individual peaks reach higher altitudes; Kuang-ming Ting is 5,610 feet (1,710 m) high, Mount Huang is 4,600 feet (1,402 m), and Nan-yün Chien is 4,465 feet (1,361 m). A secondary range, somewhat lower in elevation, known as the Chiu-hua Mountains, runs parallel to the main range to the north along the southern bank of the Yangtze River. The general structure of the area derives from folding during the Jurassic period.

The range takes its name from its most famous peak, Mount Huang, which is renowned for its magnificent scenery. Known in ancient times as Mount I, Mount Huang received its present name in AD 747. It was the retreat of the Ch'an (Zen) Buddhist master Chih-man, who founded a temple that later became famous as the Hsiang-fu Monastery. From that time onward it became a famous place for sight-seeing, with its great stands of pines, its mountain streams and waterfalls, and its many strangely shaped rocks, caves, grottoes, and hot springs.

The Huang Mountains form the watershed between the Yangtze River and the Hsin-an River, tributary of the Fu-ch'un (Ch'ien-t'ang) River. The principal route crosses the range to the west of the peak of Mount Huang itself, running from T'ai-p'ing in the north to She-hsien in the south.

Much of the area remains heavily forested with fir and pine, and lumbering is an important local industry, as is the production of tung oil, lacquer, and similar products. The major product of the area is, however, tea.



Pine branch overhanging peaks in the Huang Mountains, Anhwei province, China
John Wang—Shostal Assoc.



"Dwelling in the Fu-ch'un Mountains," detail of a handscroll by Huang Kung-wang, 1347–50; in the National Palace Museum, Taipei, Taiwan
By courtesy of the National Palace Museum, Taipei, Taiwan

Huang-po (Buddhism): *see* Ōbaku.

Huang-shih, Pinyin HUANGSHI, city in southeastern Hupeh *sheng* (province), China. Situated on the south bank of the Yangtze River about 80 miles (130 km) southeast of Wu-han, the nucleus of the present city was a small market town called Shih-tan-yao or Shih-hui-yao; Huang-shih was the name of the landing on the Yangtze serving the town. When the nearby Ta-yeh iron mines began to be exploited at the end of the 19th century, a railway line was constructed linking the mining town of Ta-yeh to the river at Shih-tan-yao (Huang-shih), whence the ore was shipped by river to the Han-yang Ironworks. When the ironworks went out of production in the 1920s, much of this iron ore was shipped instead to the Yawata Iron and Steel Works in Japan. Huang-shih was also the seat of a large cement-manufacturing industry, as well as a centre for coal mining. During World War II, however, most of the area's industrial equipment was either evacuated to the southwest or destroyed, as also were the port installations. After the beginning of Communist rule in 1949, Huang-shih and Ta-yeh were combined in 1950 to form a single municipality. The ports were repaired, and the coal mines and cement works were restored and enlarged. In addition, Huang-shih has itself become an iron- and steel-producing centre, specializing in the manufacture of high-grade steel. Huang-shih is connected by railway with Wu-han. Pop. (1988 est.) 430,000.

Huang-ti, Pinyin HUANGDI (Chinese: "Yellow Emperor"), in full (Wade–Giles romanization) SHEN YEN HUANG-TI, third of ancient China's mythological emperors, a culture hero and patron saint of Taoism.

Huang-ti is reputed to have been born about

2704 BC and to have begun his rule as emperor in 2697. His legendary reign is credited with the introduction of wooden houses, carts, boats, the bow and arrow, and writing. Huang-ti himself is credited with defeating "barbarians" in a great battle somewhere in what is now Shansi—the victory winning him the leadership of tribes throughout the Huang Ho (Yellow River) plain. Some traditions also credit him with the introduction of governmental institutions and the use of coined money. Huang-ti's wife was reputed to have



Huang-ti, illustration from *Li-tai ku-jen hsiang-tsan* (1498 edition); in the collection of the University of Hong Kong

By courtesy of the University of Hong Kong

discovered sericulture (silk production) and to have taught women how to breed silkworms and weave fabrics of silk.

Huang-ti is held up in some ancient sources as a paragon of wisdom whose reign was a golden age. He is said to have dreamed of an ideal kingdom whose tranquil inhabitants lived in harmonious accord with the natural law and possessed virtues remarkably like those espoused by early Taoism. On waking from his dream, Huang-ti sought to inculcate these virtues in his own kingdom, to ensure order and prosperity among the inhabitants. Upon his death he was said to have become an immortal.

Huang T'ing-chien, Pinyin HUANG TINGJIAN (b. 1045, Kiangsi province, China—d. 1105), Chinese painter and calligrapher, one of the Four Masters of the Sung dynasty.

Huang T'ing-chien was a student of Su Shih and his school of "literati" painting. The two are frequently mentioned together not only for their similar approach to art but for the similar political misfortunes each experienced. They are frequently grouped with Mi Fei and Ts'ai Hsiang as the Four Great Sung Calligraphers. Huang was a more scholarly and introverted person than Su Shih, and, at the same time, his approach to creativity was more mystical. His wild cursive script, deriving from the 8th-century T'ang priest Huai-su, is notable.

Huang Tsun-hsien, Pinyin HUANG ZUNXIAN (b. 1848, Chia-ying, now Mei-hsien, Kwangtung province, China—d. March 28, 1905, Chia-ying), Chinese poet and government official who instituted both literary and social reforms.

In his career as a diplomat, Huang Tsun-hsien traveled to Japan, the United States, and England, expanding his outlook and accumulating new material for his poetry and prose works; but the new style that made his poetry popular originated in his hometown of Chia-ying. There he observed the speech of the common people, reproducing it in his verse. Even more importantly, he borrowed from the styles and rhythms of the local folk songs, incorporating these new patterns in his poetry. Huang Tsun-hsien's use of vernacular Chinese and the folk-ballad style was a major breakthrough in Chinese verse. The poet was also a social reformer, instituting changes in the local government when he served as judicial commissioner of Hunan province in 1897.

Huang Tsung-hsi, Pinyin HUANG ZONGXI, also called HUANG LI-CHOU (b. Sept. 24, 1610, Yü-yao, Chekiang province, China—d. Aug. 12, 1695, Yü-yao), one of the foremost Chinese scholars and reformers in the early Ch'ing period whose major contribution was a critique of the excessive authoritarianism of the Chinese political system. Study of his works was revived by Chinese reformers around the beginning of the 20th century.

The son of a prominent scholar-reformer of the Ming dynasty, Huang refused to serve the subsequent Ch'ing dynasty. He fought with the last Ming resisters in South China and after their defeat retired to a life of scholarly pursuit. Although his range of interests included mathematics, geography, calendrical science, literature, and philosophy, he is best known as a historian and founder of the eastern Chekiang school, which attempted to develop objective rather than personal and moral standards for historical study. The school also insisted on the study of recent history as opposed to the traditional Chinese belief that value lay solely in ancient studies.

Huang's first major work, the *Ming-i tai-fang lu* (1662; "A Plan for the Prince"), was a critique of despotism in Chinese history. He proposed that the office of prime minister, which had been in existence in ancient times, be revived as a way for the emperor to share his power with his high officials. He suggested reforms of the Imperial court and of education, civil-service examination, military, and taxation systems. He also recommended reforms of the legal code that would have made the law the impersonal embodiment of justice rather than the arbitrary dictates of despotic regimes. His *Ming-ju hsüeh-an* (1676; "Survey of Ming Confucianists") is considered to be the first systematic history of Chinese philosophy. His *Sung Yüan hsüeh-an* (1846, posthumous; "Survey of Sung and Yüan Confucianists"), although unfinished, attempts the same kind of systematic study of Chinese thought for the Sung (960–1279) and Yüan (1206–1368) periods.

Huang-t'u Kao-yüan (Wade–Giles), Pinyin HUANGTU GAOYUAN (China): *see* Loess Plateau.

Huang Xing (Chinese revolutionary): *see* Huang Hsing.

Huang Zongxi (Chinese scholar): *see* Huang Tsung-hsi.

Huang Zunxian (Chinese poet): *see* Huang Tsun-hsien.

Huánuco, *departamento* (formed 1869) of central Peru, crossed by the northward-flowing Marañón, Huallaga, and Pachitea rivers. The department's area of 13,088 square miles (33,897 square km) contains snowcapped Andean peaks in the west and tropical rain forests of the Amazon basin in the east. Settlement is concentrated in the mountains and valleys, particularly in the rapidly developing agricultural areas around Huánuco (*q.v.*), the departmental capital, and Tingo María. The improvement and extension of trans-Andean highways has brought economic improvement to these long-isolated settlements and to the German colony at Pozuzo. Pop. (1989 est.) 596,000.

Huánuco, city, capital of Huánuco *departamento,* central Peru. It is located on the bank of the Huallaga River in a cool, dry intermontane basin. In 1539 the Spaniard Gómez Alvarado founded the town of León de Los Caballeros de Huánuco ("Lion of the Gentlemen of Huánuco") on the site of the Inca settlement now known as Huánuco Viejo ("Old Huánuco"). The town was later moved 35 miles (56 km) to its present site to escape hostile Indians. Huánuco rose to prominence during the colonial era as a centre of missionary activity, and its citizens were early agitators for independence from Spain.

Present-day Huánuco is a trade centre for the surrounding agricultural region, which produces sugarcane, cotton, coffee, cacao, and fruit. Cotton gins and sugar mills are located nearby. The pleasant climate, the colonial churches (San Cristóbal and San Francisco), and the city's proximity to pre-Columbian ruins at Kotosh make it a popular tourist resort. The "Hermilio Valdizán" National University was established there in 1964. Airlines and highways link Huánuco to Lima and to cities in the east. A section of the Trans-Amazon Highway, from Huánuco to Aguaytia, was opened in the late 1970s. Pop. (1990 est.) 86,-300.

Huaraz, also spelled HUARÁS, city, capital of Huaraz province, central Peru, on the Quilca River at its junction with the Santa River. It lies at 10,011 feet (3,052 m) above sea level in the scenic Callejón de Huaylas, against a backdrop of the snowcapped peaks of the Cordillera Blanca. Founded upon remains of a pre-Columbian civilization, it is inhabited by highland Indians, noted for their colourful dress. In 1823 the liberator Simón Bolívar proclaimed it the Muy Generosa Ciudad de Huaraz ("Very Generous City of Huaraz") in recognition of the aid given his troops during the struggle for independence from Spain.

Huaraz is an agricultural centre handling primarily wheat, corn (maize), and potatoes. Silver, cinnabar, and coal are mined nearby. There is some industrial activity (weaving, brewing), and the city is linked to Lima (216 miles [348 km] south) by road.

In 1941 much of Huaraz was buried by an avalanche, and in May 1970 a devastating earthquake virtually leveled the entire city, killing about 10,000 residents. Reconstruction was carried out with national and international assistance. Pop. (1990 est.) 65,600.

Huari, also spelled WARI, archaeological site located in the central highland region of present-day Peru that gives its name to an Andean civilization of the central and northern



Painted clay vessel depicting a priest being carried by servants, Huari civilization, *c.* AD 600–1000; in a private collection

Ferdinand Anton

highlands of the Middle Horizon Period (*c.* AD 600–1000). Huari is closely linked in its art style to the monuments of the great site of Tiahuanaco, located on Lake Titicaca in northwestern Bolivia. Huari was probably the centre of a militaristic empire that dominated much of the Peruvian highlands and coast during the earlier part of the Middle Horizon Period. Its influences are seen especially in the Late Nazca (Ica) culture of the southern coast and at Pachacamac on the central coast. The most distinctive decorative motif on Huari pottery is the Doorway God, a stylized, anthropomorphic figure often represented in front view with a rectangular face and rayed headdress. This motif is also found at Tiahuanaco. Huari architecture features large enclosures constructed of stone masonry. Monumental temple sculpture is naturalistic and depicts both male and female figures with elaborate hair styles. Turquoise miniatures ranging in size from ½ inch to 4 inches (1 to 10 centimetres) have also been found. Huari skill in metalwork is illustrated by gold masks and a copper statue of an anthropomorphic feline. The well-to-do were buried in stone tombs. The Huari site was first settled in the Huarpe phase, which dates to the Early Intermediate Period (*c.* 200 BC–AD 600); but the expansion of the site to its impressive urban dimensions corresponds with the Tiahuanaco-influenced Huari phase proper of the Middle Horizon Period, the time at which the leaders of Huari embarked on a course of imperial expansion.

Huarpe, extinct Indian people of South America who inhabited an area bounded on the west by the Andes and on the east by the Pampas, in the present-day province of Mendoza, Argentina. They engaged in hunting and gathering to supplement their marginal agriculture. Huarpe settlements were usually found along rivers and lakes or in places where irrigation was possible. Each settlement was headed by a chieftain. The family consisted of a man and one or more wives. They worshipped a god, Hunuc Huar, who lived in the mountains, as well as the Sun, the Moon, the morning star, and the hills. The population was never very large. Deportation to Chile as industrial labourers contributed to their extinction in the early 18th century.

Huascar, in full INTI CUSI HUALLPA HUÁSCAR (Sun of Joy) (d. 1532, Cajamarca, Peru), Inca chieftain, legitimate heir to the Inca Empire,



Huascar, manuscript illumination by an unknown artist from the chronicle *Historia* by Antonio de Herrera, 1601; in the Biblioteca Nacional, Madrid

By courtesy of the Biblioteca Nacional, Madrid

who lost his inheritance and his life in rivalry with his younger half brother Atahuallpa, who in turn was defeated and executed by the Spanish conquerors under Francisco Pizarro.

Huascar succeeded his father in 1525 but was given only part of the empire (Cuzco), while about one-fifth of it (Quito) was left to Atahuallpa. Although at first Atahuallpa agreed to the division, he soon began to tire of the limits upon his power and started an armed rebellion. Huascar led his troops north to subdue the threat to his supremacy, but Atahuallpa was consistently victorious. Huascar fled Cuzco with the remnants of his army but was apprehended and compelled to watch the murder of his family, friends, and supporters. He was then ordered to be taken to Atahuallpa's residence at Cajamarca. This was the state of affairs when Francisco Pizarro arrived in 1532. After the Spaniard succeeded in his great conquest, Atahuallpa feared that Pizarro might return Huascar to power. Consequently, he ordered his brother's assassination.

Huascarán, also called NEVADO HUASCARÁN, mountain peak of the Andes of west central Peru. The snowcapped peak rises to 22,205 ft (6,768 m) above sea level in the Cordillera Blanca, east of the Peruvian town of Yungay, Ancash department. It is the highest mountain in Peru and is a favourite of mountaineers and tourists. In 1962 a thaw caused a portion of the sheer north summit to break off, resulting in an avalanche that destroyed several villages and killed about 3,500 persons. In 1970 a severe earthquake caused another avalanche that buried 10 villages and most of Yungay; about 20,000 people were killed in one of the worst natural disasters of the 20th century.

Huastec, Mayan Indians of Veracruz and San Luís Potosí in eastern central Mexico. The Huastec are independent both culturally and geographically from other Mayan peoples. They are farmers, corn (maize) being the staple crop. Coffee and henequen are also grown, as well as a variety of fruits and vegetables. Poultry, pigs, donkeys, horses, and cattle are also kept. Settlements of several houses are usual; the houses are round, of poles or bamboo, with thatched roofs. Weaving of henequen fibre into mats, bags, ropes, hats, and the like is common. Pottery is made, and needlepoint embroidery has taken the place of textile weaving for the most part. Men wear factory-made clothing, and women may wear shapeless homemade dresses or white blouses, dark, short, knee-length skirts, and sashes, all of factory-woven cloth. More traditional clothing is worn for fiestas and special occasions.

Ritual kinship is practiced; godparents are chosen at baptism, confirmation, and marriage. Children of godparents are considered siblings and not eligible for marriage. Religion is Roman Catholic with few pagan elements; saints' days are celebrated monthly.

Huave, also spelled HUAVI, or WABI, Meso-American Indian peasants of the Pacific coast of the Isthmus of Tehuantepec. The exact relationship of the Huave language to other Meso-American languages is a matter of scholarly dispute. Fishing and agriculture are the main subsistence activities, but the Huave also depend on markets in nearby towns to meet their needs for staple foods and manufactured goods. Patrilocal family units occupy thatched-roof huts that make up compact villages. All male members of the community enter the *escalafón,* a system of civil and religious office holding.

Huaylas, Callejón de, valley on the upper Santa River in Ancash department, west central Peru. Overlooking the valley to the northwest is the snowless Cordillera Negra, with peaks rising to 17,000 ft (5,200 m), and to the east is the spectacular, snowcapped Cordillera Blanca, containing many of Peru's highest mountains.

A mountain setting, cool climate, and picturesque villages make the Callejón de Huaylas a major tourist area. Most of the valley's inhabitants are subsistence farmers who cultivate potatoes and barley at higher elevations and corn (maize) and alfalfa at lower altitudes. There are silver, lead, and copper mines. Settlements include the cities of Huaraz, Yungay, and Caras. Two roads and a railroad cross the Cordillera Negra to the Pacific Ocean, and Caras is linked by air to Lima.

The Callejón de Huaylas bore the brunt of a devastating earthquake and resulting landslides in 1970. Numerous towns were destroyed, and tens of thousands of people perished. Reconstruction efforts began in the early 1970s.

huayño, also spelled HUAIÑO, HUAYNO, or WAYNO, couple dance of the Quechua and Aymara Indians and of many mestizos (people of Spanish–Indian descent) of Peru, Bolivia, and Ecuador. It antedates the Spanish conquest and was possibly an Inca funeral dance; today it is purely festive. A circle of dancing couples surrounds the musicians, whose instruments may be flutes, drums, harps, and guitars. The music is in $\frac{2}{4}$ time. The melodies are rhythmic and pentatonic, *i.e.,* built on a scale of five notes, as D–E–G–A–B–D. Couples perform various figures but do not touch; individuals may carry bright woven bands or, among mestizos, handkerchiefs, or a couple may each grasp ends of a handkerchief.

Hubay, Jenö (b. Sept. 15, 1858, Budapest—d. March 12, 1937, Budapest), Hungarian violinist, teacher, and composer, noted especially for his teaching.

He studied as a child with his father, a professor of violin at the Budapest Conservatory, and gave his first concert at the age of 11. After studying with Joseph Joachim in Berlin from 1871 to 1876 he went to Paris, where he impressed Henry Vieuxtemps, who later became a close friend. He succeeded Vieuxtemps as professor at the Brussels Conservatory in 1882, but returned to Budapest to take up his father's old position in 1886. He was director of the Conservatory from 1919 to 1934. Among his students were Franz von Vecsey, Joseph Szigeti, Emil Telmányi, and Eddy Brown. He performed in most European countries; his playing had a rich, romantic quality. His numerous works include operas (some in Hungarian) and orchestral works as well as concertos and other works for the violin.

Hubbard, Cal, byname of ROBERT CALVIN HUBBARD (b. Oct. 31, 1900, Keytesville, Mo., U.S.—d. Oct. 17, 1977, St. Petersburg, Fla.), professional American League baseball umpire and collegiate and professional U.S. football player who is the only person elected to both the Baseball Hall of Fame (1976) and the collegiate and professional football halls of fame (1962, 1963).

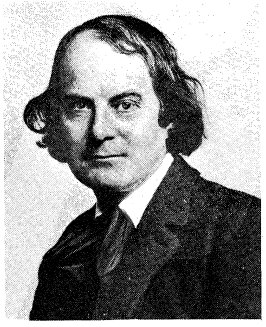
Hubbard was an admirer of coach Bo McMillin and played football for him at Centenary College (Shreveport, La.) and Geneva College (Beaver Falls, Pa.); he was named All-American at tackle (1926–27). McMillin called him the best football player, collegiate or professional, he had ever seen. From 1927 until 1936 Hubbard played in the National Football League (NFL) with the New York Giants, the Green Bay Packers, and the Pittsburgh Pirates (later the Steelers). He was named to the NFL All-Time team in 1969.

Hubbard umpired in baseball minor leagues from 1925 through 1935. In 1936 he moved up to the American League and retired from the field in 1951 after being struck in the eye by a shotgun pellet in a hunting accident. Thereafter he was supervisor of American League umpires until 1968. He also served on the Official Playing Rules Committee (1959–69).

Hubbard, Elbert (Green) (b. June 19, 1856, Bloomington, Ill., U.S.—d. May 7, 1915, at sea off Ireland), U.S. editor, publisher, and author of the moralistic essay "A Message to Garcia."

A free-lance newspaperman and head of sales

and advertising for a manufacturing company, Hubbard retired in 1892 and founded his Roycroft Press in 1893 at East Aurora, N.Y., on the model of William Morris' com-



Elbert Hubbard

By courtesy of the Library of Congress, Washington, D.C.

munal Kelmscott Press, which he had visited in England. Beginning in 1895 he issued monthly the famous "Little Journey" booklets. These were pleasant biographical essays on famous persons, in which fact was interwoven with comment and satire. Hubbard also began publishing *The Philistine,* an avant-garde magazine, which he ultimately wrote single-handedly. In an 1899 number of *The Philistine,* "A Message to Garcia" appeared, in which the importance of perseverance was drawn as a moral from a Spanish-American War incident. In 1908 Hubbard began to edit and publish a second monthly, *The Fra.* His printing establishment in time expanded to include furniture and leather shops, a smithy, and an art school, as had the operations of William Morris. Hubbard died in the sinking of the *Lusitania.*

Hubbard's writings contain a bizarre mixture of radicalism and conservatism. He apotheosized work and efficiency in a vigorous, epigrammatic style. Valuable collections of his writings are *Little Journeys,* 14 vol. (1915), and *Selected Writings,* 14 vol. (1923). His *Scrap Book* (1923) and *Note Book* (1927) were published posthumously.

Hubbard, Robert Calvin (baseball umpire): *see* Hubbard, Cal.

Hubbell, Carl (Owen), byname HUB, KING CARL, or THE MEAL TICKET (b. June 22, 1903, Carthage, Mo., U.S.—d. Nov. 21, 1988, Scottsdale, Ariz.), American professional baseball (left-handed) pitcher, who popularized the screwball pitch. In this pitch, the ball, which is thrown with the same arm motion as a fastball, has reverse spin against the natural curve and when thrown by a left-hander breaks sharply away and down from right-handed batters.

Two of Hubbell's elder brothers were professional baseball pitchers, and they and his father trained him. From high school Hubbell went to the minor leagues (1923–25) and in 1925 joined the American League Detroit Tigers, who did not allow screwball pitches and sold his contract to the National League New York Giants in 1928.

With the Giants, Hubbell led the league in games won (1933 [23], 1936 [26], 1937 [22]) and won 20 games or more in 1934 and 1935. In 1933 he pitched 46 consecutive runless innings, and he won 24 consecutive games (1936–37). In the 1934 All-Star game, Hubbell struck out in succession Babe Ruth, Lou Gehrig, Jimmie Foxx, Al Simmons, and Joe Cronin. In his 16-year career he had 253 wins, 154 losses, and an earned run average of 2.97; in World Series competition, he won four games and lost two. Following his retirement as a player in 1943, Hubbell first directed the Giants' farm system and then became a scout. He was elected to the Baseball Hall of Fame in 1947.

Hubbert, Marion King (b. Oct. 5, 1903, San Saba, Texas, U.S.—d. Oct. 11, 1989, Bethesda, Md.), American geophysicist and geologist known for his theory of the migration of fluids in subsurface rock strata. He became an authority on the migration and entrapment of petroleum and the social implications of world mineral-resource exploitation.

Hubbert was educated at Weatherford College in Texas and at the University of Chicago. He was made an instructor of geophysics at Columbia University (1931–40), a research geophysicist for the Shell Oil Company (1943–64), and a professor at Stanford University (1964–68) in California. He was based thereafter at Johns Hopkins University, Baltimore. His books include *Theory of Ground-Water Motion* (1940) and *Energy Resources* (1962).

Hubble, Edwin Powell (b. Nov. 20, 1889, Marshfield, Mo., U.S.—d. Sept. 28, 1953, San Marino, Calif.), American astronomer who is considered the founder of extragalactic astronomy and who provided the first evidence of the expansion of the universe.

Hubble's interest in astronomy flowered at the University of Chicago, where he was inspired by the astronomer George E. Hale. At Chicago Hubble earned both an undergraduate degree in mathematics and astronomy (1910) and a reputation as a fine boxer. Upon graduation, however, Hubble turned away from both astronomy and athletics, preferring to study law as a Rhodes Scholar at the University of Oxford (B.A., 1912). He joined the Kentucky bar in 1913 but dissolved his practice soon after, finding himself bored with law. A man of many talents, he finally chose to focus them on astronomy, returning to the University of Chicago and its Yerkes Observatory in Wisconsin. After earning a Ph.D. in astronomy (1917) and serving in World War I, Hubble settled down to work at the Mount Wilson Observatory and began to make discoveries concerning extragalactic phenomena.

While at Mount Wilson, Hubble discovered (1922–24) that not all nebulae in the sky are part of the Milky Way Galaxy, the vast star system to which the Sun belongs. He found that certain nebulae contain stars called Cepheid variables, for which a correlation was already known to exist between periodicity and absolute magnitude. Using the further relationship among distance, apparent magnitude, and absolute magnitude, Hubble determined that these Cepheids are several hundred thousand light-years away and thus outside the Milky Way system and that the nebulae in which they are located are actually galaxies distinct from the Milky Way. This discovery, announced in 1924, forced astronomers to revise their ideas about the Cosmos.

Soon after discovering the existence of these external galaxies, Hubble undertook the task of classifying them according to their shapes (1926) and exploring their stellar contents and brightness patterns. In studying the galaxies Hubble made his second remarkable discovery—namely, that these galaxies are apparently receding from ours and that the further away they are, the faster they are receding (1927). The implications of this discovery were immense. The universe, long considered static, was expanding; and, even more remarkably, as Hubble discovered in 1929, the universe was expanding in such a way that the ratio of the speed of the galaxies to their distance is a constant now called Hubble's constant.

Although Hubble was correct that the universe was expanding, his calculation of the value of the constant was incorrect, implying that the Milky Way system was larger than all other galaxies and that the entire universe was younger than the surmised age of the Earth. Subsequent astronomers, however, revised Hubble's result and rescued his theory, creating a picture of a Cosmos that has been expanding at a constant rate for 10 billion to 20 billion years.

For his achievements in astronomy, Hubble received many honours and awards. Among his publications were *Red Shifts in the Spectra of Nebulae* (1934) and *The Hubble Atlas of Galaxies* (published posthumously, 1961, and edited by Allan Sandage). Hubble remained an active observer of galaxies until his death.

Hubble's constant, in cosmology, constant of proportionality in the relation between the velocities of remote galaxies and their distances. It expresses the rate at which the universe is expanding. It is denoted by the symbol H and named in honour of Edwin Hubble, the American astronomer who attempted in 1929 to measure its value. With redshifts of distant galaxies measured by Vesto Slipher, also of the United States, and with his own distance estimates of these galaxies, Hubble established the cosmological velocity–distance law:

$$\text{velocity} = H \times \text{distance}.$$

According to this law, known as the Hubble law, the greater the distance of a galaxy, the faster it recedes. Derived from theoretical considerations and confirmed by observations, most astronomers believe the velocity–distance law has made secure the concept of an expanding universe. Hubble's original value for H was 150 km (93 miles) per second per 1,000,000 light-years. Modern estimates, using more precise distance measurements, place the value of H at between 15 and 30 km (9.3 and 18.6 miles) per second per 1,000,000 light-years. The reciprocal of Hubble's constant lies between 10 billion and 20 billion years, and this cosmic time scale serves as an approximate measure of the age of the universe.

Hubel, David Hunter (b. Feb. 27, 1926, Windsor, Ont., Can.), Canadian-born American neurobiologist, corecipient with Torsten Nils Wiesel and Roger Wolcott Sperry (*qq.v.*) of the 1981 Nobel Prize for Physiology or Medicine. All three scientists were honoured for their investigations of brain function, Hubel and Wiesel in particular for their collaborative discoveries concerning information processing in the visual system. One of their outstanding achievements was the analysis of the flow of nerve impulses from the retina to the sensory and motor centres of the brain.

Hubel attended McGill University in Montreal, receiving a bachelor's degree in 1947 and a doctorate in medicine in 1951. He held positions at the Montreal Neurological Institute, at the Johns Hopkins Medical School (where his association with Wiesel began), and at the Walter Reed Army Institute of Research in Washington, D.C., before joining the faculty of the Harvard Medical School, along with Wiesel, in 1959. In 1965 he became professor of physiology and, in 1968, the George Packer Berry professor of neurobiology. He became a U.S. citizen in 1953.

Huber, Eugen (b. July 13, 1849, Stammheim, Switz.—d. April 23, 1923, Bern), Swiss jurist and author of the Swiss civil code of 1912.

In 1880 Huber became a professor of Swiss civil and federal law and legal history at Basel, and later (1888) he became a professor of German civil and state law at Halle. In 1892 he was commissioned to develop a Swiss civil code. He completed it in 1904, and it finally came into force in January 1912. From 1903 to 1911 he served as a member of the Swiss Nationalrat. As a federal legal counsel, he also represented Switzerland at The Hague Permanent Court of Arbitration.

From 1892 to 1923 he occupied a professorial chair at Berne in civil law. Among his published writings, his *System und Geschichte des schweizerischen Privatrechtes,* 4 vol. (1886–93; "History of Swiss Civil Law"), a compre-

hensive study of the various cantonal legal systems, and *Die Bedeutung der Gewere im deutschen Sachenrecht* (1894; "The Importance of Lawful Possession in German Legal Cases") are considered landmarks of legal research.

Huber, Robert (b. Feb. 20, 1937, Munich, Ger.), German biochemist who, along with Johann Deisenhofer and Hartmut Michel, received the Nobel Prize for Chemistry in 1988 for their determination of the structure of a protein complex that is essential to photosynthesis in bacteria.

Huber received his doctorate from the Munich Technical University. In 1972 he joined the staff of the Max Planck Institute for Biochemistry at Martinsried, Ger., where he conducted his award-winning research with Deisenhofer and Michel. He alternately worked there and at the Munich Technical University.

Huber was an internationally recognized expert in the use of X-ray diffraction to determine the atomic structure of complex molecules such as proteins. Once a protein has been reduced to a pure crystalline form, its atomic structure can be deduced by analyzing the manner in which the crystal's atoms scatter a beam of X rays. Huber and his colleagues used this technique to determine the structure of a protein complex (called a photosynthetic reaction centre) that is essential to photosynthesis in certain bacteria. By 1985 the three scientists had succeeded in describing the complete atomic structure of the protein. Although bacterial photosynthesis is somewhat simpler than that carried on by plants, the scientists' work significantly increased the understanding of the mechanisms of photosynthesis in general.

Articles are alphabetized word by word, not letter by letter

Huber, Wolf (b. *c.* 1485, Feldkirch?, Tirol [Austria]—d. 1553, Passau, Bishopric of Passau [Germany]), Austrian painter, draftsman, and printmaker who was one of the principal artists associated with the Danube school of landscape painting.

After 1509 Huber's career was centred in Passau, Germany, where he was court painter to the prince-bishop. Among his important paintings was the altarpiece of St. Anne for the Church of St. Nikolaus in his native Feldkirch in Vorarlberg, Austria (1515–21; panels divided between St. Nikolaus and the Kunsthistorisches Museum, Vienna). Some of Huber's most expressive and poetic works are his landscapes, especially drawings he made of the Danube River valley on a trip (*c.* 1529) from Passau to Vienna.

Hubert WALTER (d. July 13, 1205, Teynham, Kent, Eng.), archbishop of Canterbury, papal legate, justiciar of King Richard I of England, and chancellor of King John of England. Hubert was an administrator whose position in church and state was unmatched until the time of Cardinal Wolsey in the 16th century.

Employed in the household of King Henry II of England by 1182, he became bishop of Salisbury in October 1189. The following year he traveled with Richard and Archbishop Baldwin of Canterbury on the Third Crusade, in which his distinguished services included negotiating on Richard's behalf with the Muslim leader Saladin and directing the return of English forces.

Returning to England in April 1193 after visiting Richard in captivity at Dürnstein, Austria, he was elected archbishop of Canterbury on May 30. On becoming justiciar in the following December, he controlled England's highest ecclesiastical and secular offices. In 1193 he raised Richard's ransom and suppressed an attempt by Prince John to seize control of England. After Richard's return in March 1194 and departure for Normandy in the following May, Hubert became the effective governor of England for the rest of Richard's reign and was particularly prominent because of the king's prolonged absences. In March 1195 Pope Celestine III appointed him papal legate.

Hubert was mainly responsible for one of England's most remarkable periods of administrative development. Among his key accomplishments were: the first attempt to tax revenue and chattels for secular purposes, in the levy of 25 percent for Richard's ransom; the first general assize of weights and measures (1196); the reassessment of taxation on land (1198); and the modification of feudal military service. Maintaining order ruthlessly, he ordered the execution of William Fitz Osbert, the leader of a protest against the assessment of London taxes. Richard had Hubert's conduct investigated in 1196. After offering to resign, he continued his justiciarship until July 1198, when illness and remonstrations from Pope Innocent III led him to quit.

King John, Richard's successor, appointed him chancellor on May 27, 1199, a post in which Hubert exercised great political influence. He was instrumental in securing the throne for John and in one of his last acts (1205) advised the king against a campaign in France, which was at general war with England.

Hubmaier, Balthasar (b. 1485, Friedberg, near Augsburg, Bavaria [Germany]—d. March 10, 1528, Vienna [Austria]), early German Reformation figure and one of the foremost leaders of the Anabaptists, who advocated adult baptism.

Named doctor of theology after studies at the German universities at Freiburg and Ingolstadt, Hubmaier was appointed cathedral preacher at Regensburg in 1516. In 1521 he arrived in Switzerland, where he soon became a leader of the fledgling Anabaptists, generally viewed as the most prominent movement of the radical Protestant Reformation. Persecuted even by the liberal Zwinglians for his beliefs, he was arrested in 1525 at Zürich, where he made an enforced recantation. Subsequently, however, he resumed his Anabaptist proselytizing, first in Augsburg and later in Nikolsburg, Moravia (in modern Czechoslovakia). Especially influential through his writings, he represented the more moderate strain of the movement, in contrast to the millenarian anarchism of Thomas Müntzer and Hans Hut, radical leaders who tried to aid the coming of the millennium, the 1,000-year reign of Christ and his elect. Constantly hunted by imperial authorities, Hubmaier was ultimately captured and burned at the stake as a heretic at Vienna.

hübnerite, also spelled HUEBNERITE, manganese-rich variety of the mineral wolframite (*q.v.*).

hubris, also spelled HYBRIS, in classical Greek ethical and religious thought, overweening presumption suggesting impious disregard of the limits governing men's actions in an orderly universe. It is the sin to which the great and gifted are most susceptible, and in Greek tragedy it is usually the basic flaw of the tragic hero. Perhaps the simplest example occurs in the *Persians* of Aeschylus, in which the arrogance of Xerxes in building a bridge of ships across the Hellespont flaunts nature by turning sea into land. He is punished by the crushing defeat of the Persians at Salamis. In most other Greek tragedies the hero's hubris is more subtle, and sometimes he appears wholly blameless, although his unbroken spirit under his tragic ordeal is suggestive of the overconfidence that the gods find offensive.

Hübsch Martin: *see* Schongauer, Martin.

Hübsügül Dalay (Mongolia): *see* Hövsgöl Nuur.

Huc, Evariste Régis (b. June 1, 1813, Caylus, Fr.—d. March 26, 1860, Paris), French missionary of the Vincentian (Lazarist) order whose account of his journey through China and Tibet provides a vivid picture of China on the verge of modern times.

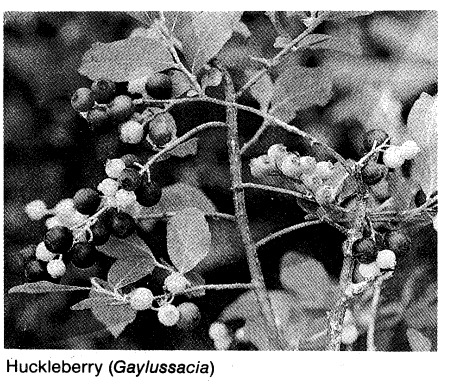
Sent by his order to Macau (1839), he lived in South China, Peking, and Hei-shui, 300 miles (480 km) north of Peking. In 1844, with another Vincentian, Joseph Gabet, and a Tibetan convert to Christianity, Father Huc set out from Dolon Nor (now To-lun), about 150 miles (240 km) north of Peking, and reached Lhasa, Tibet, in January 1846. Though the missionaries were well received by the Tibetans, the Chinese imperial commissioners succeeded in having them expelled. They reached Canton, Kwangtung province, China, in September 1846. Huc returned to Europe in 1852 and left the Vincentians the following year. His widely read account, *Souvenirs d'un voyage dans la Tartarie, le Thibet et la Chine pendant les années 1844, 1845, et 1846* (1850), was frequently reprinted.

Hucbald (b. *c.* 840, Tournai?, Fr.—d. 930, Saint-Amand, near Tournai), medieval French musical theorist, scholar, and humanist, a pupil of his uncle, the scholar Milo of Saint-Amand; mention of him is found at Nevers, Saint-Amand, Saint-Omer, and Reims.

Hucbald was an abbot and apparently spent his life teaching. His treatise *De harmonica institutione* describes the gamut (the series of recognized musical notes) and the eight modes. He also wrote poems, metrical prayers, and hymns.

Hucbald was long believed to be the author of other theoretical works now attributed to an unidentified writer known as Pseudo-Hucbald, who lived somewhat later. Some scholars speculate that his works may in fact have several authors. These theoretical works are of great importance. The *Musica enchiriadis* and *Scholia enchiriadis* give the earliest written description of music in several voices: parallel organum, in which a plainchant melody is sung in parallel fourths or parallel fifths. *De alia musica* deals with a notational system called daseian notation. Although it never became generally accepted, it was an early attempt to show exact pitch in musical notation; it used symbols showing 18 specific pitches and placed the words to be sung in a set of horizontal lines, thus showing the contour of the melody.

huckleberry, small, fruit-bearing, branching shrub of the genus *Gaylussacia* (family Ericaceae), resembling in habit the English bilberry (*Vaccinium*), to which it is closely allied. The huckleberry bears fleshy fruit with 10 nutlike seeds, differing in this respect from the blueberry. The common huckleberry of



Huckleberry (*Gaylussacia*)
H. Morton—Shostal/EB Inc.

the northern United States is *G. baccata,* also called black, or high-bush, huckleberry. *G. brachycera* and *G. dumosa* are known, respectively, as box and dwarf, or bush, huckleberry. The florists', or evergreen, huckleberry is actually a blueberry. The cultivation of huckleberries is essentially the same as for blueberries, requiring acidic and moist but well-drained soil. The red huckleberry of the southern United States is commonly called the southern cranberry.

Hudaida (Yemen [Ṣan'ā']): *see* Ḥudaydah, al-.

Ḥudaybiyah, Pact of al-, compromise reached between Muḥammad and Meccan leaders (628), in which Mecca gave political and religious recognition to the growing community of Muslims in Medina. Muḥammad had been approaching Mecca with about 1,400 followers in order to perform the *'umrah* (pilgrimage) as directed in a dream. The Meccans, however, humiliated by their inability to besiege Medina (March 627), would not allow Muḥammad entry into their city. Instead, a Meccan delegation met the Muslims at their stopping place, al-Ḥudaybiyah, about 9 miles (14.5 km) outside Mecca, to negotiate a treaty, thus acknowledging the equality of the Muslims as bargaining partners. A 10-year truce was declared. Muḥammad then agreed to abandon his *'umrah,* on the condition that he be allowed to enter Mecca the following year, at which time the city would be emptied for three days to allow the Muslims to perform their rites. Provision was also made for the return of any Meccan who might flee to Medina without permission from his guardian (though a similar provision for Muslims going to Mecca was not stipulated). Finally, the various tribes could ally themselves with either the Meccans or the Muslims, as they wished.

Ḥudaydah, al-, also spelled HODEIDA, or HUDAIDA, city, western Yemen (Ṣan'ā'). It is situated on the Tihāmah coastal plain that borders the Red Sea. It is the nation's chief port and the only one with modern facilities. Al-Ḥudaydah, first mentioned in Islāmic chronicles in 1454/55, became important in the 1520s when the Yemeni Tihāmah was taken by the Ottomans. In succeeding centuries the city displaced Mocha (al-Mukhā) as the country's chief port. Under Ottoman suzerainty until 1918, al-Ḥudaydah was the landing site for successive Ottoman attempts to wrest full control of the then Imamate of Yemen from its traditional rulers (first Ottoman occupation, commencing 1849; second occupation, 1872–1918). During the Italo-Ottoman War of 1911–12 the city was shelled by Italian warships lying offshore. After World War I the victorious British handed over al-Ḥudaydah and the Yemeni Tihāmah to the Idrīsī rulers of Asir, to the north, but the area was retaken by Yemen in 1925. A Yemeni-fomented revolt in Asir (by then part of Saudi Arabia) in 1934 led to Saudi occupation of al-Ḥudaydah. The Treaty of aṭ-Ṭā'if of that year returned the city and the Yemeni Tihāmah to Yemen; the latter, in turn, recognized Saudi Arabia's possession of Asir. The city was seat of a semiautonomous administration under one of the Yemeni imam's (leader's) sons until proclamation of the republic and the subsequent civil war (1962–70).

Al-Ḥudaydah's picturesque old city, surrounded by a thick wall, is typical of larger Yemeni towns, with its elaborately decorated multistory dwellings. With its outer quarters, traditional al-Ḥudaydah stretches along the Red Sea coast for about a mile. By the 1970s many modern buildings had also been constructed.

A radical change in the city's economic life took place after 1961, when the Soviet Union completed construction of the deepwater port at Aḥmadī, several miles north. This port, with modern facilities for ships drawing up to 26 feet (8 m) of water, is built in the lagoon of al-Kathīb Bay and is protected from winds by a hook-shaped spit that culminates in Cape al-Kathīb. The old port at the city site was an open roadstead; ships had to unload their cargoes into small dhows and lighters. Whereas the new port can handle several 10,000-ton ships at once, the capacity of the old port was estimated at only 100–150 tons per day. Grain silos were constructed in the new port for the secure storage of grain supplies for the population. Another factor in the city's development was the opening (also in 1961) of an all-weather improved road from there to Ṣan'ā', the nation's capital. This road was built by Chinese engineers. Another new road, to the inland city of Ta'izz, was built by the Soviets and the West Germans.

The port handles most of the imports coming through Yemeni ports, exclusive of petroleum, as well as the majority of exports. Imports include raw and processed foodstuffs, machinery and metal goods, and consumer goods. Principal exports are coffee, cotton, kat (a mild narcotic used widely in the Middle East and East Africa), and hides and skins. Aside from the city's port activity and its importance as a local trade centre, there is little economic activity. A small cotton-ginning plant and soft-drink plants are in operation. An airfield is north of the city; service is maintained to Ṣan'ā', Ta'izz, and Aden, capital of Yemen (Aden). Pop. (1986) 155,110.

Hudde, Johan van Waveren (b. April 23, 1628, Amsterdam—d. April 15, 1704, Amsterdam), Dutch mathematician and statesman who promoted Cartesian geometry and philosophy in Holland and contributed to the theory of equations.

Born of a patrician family, Hudde served for some 30 years as burgomaster of Amsterdam. In his *De reductione aequationum* (1713; "Concerning Reduction of Equations"), he was the first to take literal coefficients in algebra as indifferently positive or negative. Two of his discoveries, dating from 1657 to 1658, are known as Hudde's rules and point clearly toward algorithms (a special process for solving certain types of problems) of calculus. Hudde also anticipated the power-series expansion (1656) for $\ln(1+x)$ and the use of space coordinates (1657). In 1672 he directed the flooding of parts of Holland to block the advancing French army during the War of 1672–78. He corresponded with the Dutch mathematician and physicist Christiaan Huygens on problems of canal maintenance, probability, and life expectancy. Although Hudde's manuscripts were never published, Gottfried Leibniz of Germany reported that they contained many excellent results.



Hudde, detail of an engraving by J. Houbraken after a drawing by H. Pothoven after a painting, 1672

By courtesy of Gemeentelijke Archiefdienst van Amsterdam, Topografische Atlas, collectie Dreesmann

Huddersfield, locality, Kirklees district (borough), metropolitan area of West Yorkshire, England. Huddersfield is situated in the Colne River valley, 15 miles (24 km) southwest of Leeds, and grew in the 18th century from a large village, one of several that had a domestic weaving industry, and benefited from construction of the Calder and Marsden canals. The locality's traditional textile industry, together with coal and water supplies, stimulated ancillary dyestuff, chemical, and heavy-engineering industries. The choral and madrigal societies of Huddersfield are nationally known, as are its football teams. Pop. (1981 prelim.) 123,888.

Huddinge, city, *län* (county) of Stockholm, east-central Sweden, just south of Stockholm. When founded as a suburb of the capital in 1923, Huddinge had an area of 0.5 square mile (1.4 square km) and a population of 511. In 1947 the residential communities of Fullersta, Hörningsnäs, Stuvsta, Snättringe, and Segeltorp merged with Huddinge. The city's present area is about 50 square miles (130 square km). Wooded and rolling, it has a modern town hall (1946–49) and residences for many Stockholm commuters. Hosiery knitting and the manufacture of metal products and concrete are leading industries. Pop. (1988 est.) mun., 71,910.

Hūdid DYNASTY, Muslim Arab dynasty that ruled Saragossa, Spain, in the 11th century AD during the politically confused period of the party kingdoms (*ṭā'ifahs*). The murder of the Tujībid king Mundhir II, in 1039, enabled one of his allies, Sulaymān ibn Muḥammad ibn Hūd, known as al-Musta'īn, to seize the Tujībid capital of Saragossa and establish a new dynasty. Al-Musta'īn, who had been a prominent military figure of the Upper, or Northern, Frontier and governor of Lérida, took control of a kingdom that covered a considerable portion of the northeastern Iberian Peninsula. After his death, in 1046, his five sons struggled for the throne; and Aḥmad I al-Muqtadir (reigned 1046–81) emerged as the new king.

Al-Muqtadir made a name for himself among the party kings with the recapture of Barbastro (1065), which had been seized from the Muslims a year earlier by the Norman Robert Crespin. He maintained a distinguished court with such notables as the theologian Abū al-Walīd al-Bājī and the poet Ibn 'Ammār, and he built the Aljafería Palace, parts of which survive.

Although al-Muqtadir was at times tributary to Christian princes, he managed to expand his kingdom with the capture of Tortosa (1061) and Denia (1075–76), leaving it to his son Yūsuf al-Mu'tamin (reigned 1081–85), who was more a scholar than a political figure. The reign of Aḥmad II al-Musta'īn (1085–1110) was marked by constant wars against the Christians. He was dealt a severe defeat at Alcoraz in 1096, during the Christian march on Huesca; Saragossa itself was attacked, but the appearance of an army sent by the Almoravids (a North African Islāmic dynasty) forced the Christians into retreat.

After 1090–91, the Almoravids began to dissolve the various *mulūk aṭ-ṭawā'if* (party kings), but, needing a buffer between themselves and the Christians, they allowed Saragossa to remain a kingdom. Al-Musta'īn, however, died in January 1110 fighting the Christians at Valtierra. The Almoravids seized the city in June of that year, forcing his successor, 'Imād ad-Dawlah, to flee for Rueda de Jalón, where he died in 1130.

'Imād's son Aḥmad III al-Mustanṣir was able to make arrangements with Alfonso VII of Castile and Leon to exchange Rueda for some territory in the province of Toledo. In the general revolt against the Almoravids in 1144, he assembled an army of Muslim supporters from the whole peninsula and proceeded to

capture Córdoba, Jaén, Granada, Murcia, and Valencia. Their successes ended in a battle near Chinchilla in February 1146, in which the Muslim forces were defeated by the Christians. Al-Mustanṣir was killed, and the Hūdid line came to an end.

Hudson, George (b. March 1800, York, Yorkshire, Eng.—d. Dec. 14, 1871, London), English financier, known as the "railway king," whose enterprise made York a major railway and commercial hub.

Having risen from an apprenticeship in the drapery business to partnership in the firm,



George Hudson, detail of a portrait
The Mansell Collection

he began his railroad activities in 1827 by investing a £30,000 bequest in North Midland Railway shares. Hudson helped obtain passage of an act of Parliament to raise capital for the York and North Midland Railway, of which he subsequently became chairman.

Also active politically, he served as deputy lieutenant for Durham and three times as lord mayor of York. By 1844 he controlled more than 1,000 miles of railway and the following year won election as a Conservative member of Parliament for Sunderland. With railway speculation at its height, Hudson became involved in fraud concerning the Eastern Counties Railway and upon exposure lost influence and fortune at a single stroke. The rest of his life was spent mainly in litigation and efforts to operate financially outside of England.

Consult the INDEX *first*

Hudson, Henry (b. *c.* 1565, England—d. after June 22, 1611, in or near Hudson Bay?), English navigator and explorer who, sailing three times for the English (1607, 1608, 1610–11) and once for the Dutch (1609), tried to discover a short route from Europe to Asia through the Arctic Ocean, in both the Old World and the New. A river, a strait, and a bay in North America are named for him.

Of Hudson's early life, nothing is known. Several Hudsons were associated with his sponsors, the Muscovy Company of London, a generation before his own time. A 1585 voyage by the English navigator John Davis, who sailed to the Arctic to make the first attempt to find a Northwest Passage from Europe to Asia, was planned in the home of a Thomas Hudson in Limehouse, now in the docks area of London's East End. Henry Hudson may have been present on that occasion and consequently developed a lifelong interest in Arctic exploration. It is certain that he was well informed about Arctic geography and that his competence as a navigator was such that two wealthy companies chose him to conduct hazardous explorations.

The search for the Northeast Passage. In the spring of 1607, sailing for the Muscovy Company, Hudson, his son John, and 10 companions set forth "for to discover a Passage by the North Pole to Japan and China." Believing that he would find an ice-free sea around the North Pole, Hudson struck out northward. On reaching the edge of the polar ice pack, he followed it east until he reached the Svalbard (Spitsbergen) archipelago. From there he extended explorations made earlier by the 16th-century Dutch navigator Willem Barents, who had also sought a Northeast Passage to Asia.

A year later, the Muscovy Company again sent Hudson to seek a Northeast Passage, this time between Svalbard and the islands of Novaya Zemlya, which lie to the east of the Barents Sea. Finding his way again blocked by ice fields, he returned to England.

Shortly after his return, Hudson was lured to Amsterdam to undertake a third northeast voyage under contract to the Dutch East India Company. While there, he heard reports of two possible channels to the Pacific across North America. One of these, said to be in about latitude 62° N, was described in the logbooks of a voyage made in 1602 by an English explorer, Capt. George Weymouth. The other, said to be in the vicinity of about latitude 40° N, was newly reported from Virginia by the English soldier, explorer, and colonist Capt. John Smith. Although his interest in a Northwest Passage had been aroused, Hudson agreed to return directly to Holland if his northeast voyage should prove unsuccessful.

Hudson sailed from Holland in the "Half Moon" on April 6, 1609. When head winds and storms forced him to abandon his northeast voyage, he ignored his agreement and proposed to the crew that they should instead seek the Northwest Passage. Given their choice between returning home or continuing, the crew elected to follow up Smith's suggestion and seek the Northwest Passage around 40° N. While cruising along the Atlantic seaboard, Hudson put into the majestic river that was discovered by the Florentine navigator Giovanni da Verrazano in 1524 but that was thenceforth to be known as the Hudson. After ascending it for about 150 miles (240 kilometres) to the vicinity of what is now Albany, N.Y., Hudson concluded that the river did not lead to the Pacific.

On his way to Holland, Hudson docked at Dartmouth, Eng. The English government then ordered him and the English members of his crew to desist from further explorations for other nations. His log and papers were sent to Holland, where his discoveries were soon made known.

Hudson now made ready a voyage to America to follow up Weymouth's suggestion. Weymouth had described an inlet (now Hudson Strait) where a "furious overfall" of water rushed out with every ebb tide. This phenomenon suggested that a great body of water lay beyond the strait. Hudson was confident that it was the Pacific Ocean. The British East India Company contributed £300 toward his voyage, and the Muscovy Company presumably furnished a like amount; Hudson's private sponsors included 5 noblemen and 13 merchants.

The voyage to Hudson Bay. Sailing from London on April 17, 1610, in the 55-ton vessel "Discovery," Hudson stopped briefly in Iceland, then proceeded to the "furious overfall." Passing through it and entering Hudson Bay, he then followed the east coast southward, rather than striking boldly westward. Finding himself in James Bay at the southernmost extremity of Hudson Bay and with no outlet to the Pacific to be found, Hudson cruised aimlessly until winter overtook him.

In the close confinement of an Arctic winter, quarrels arose. Hudson angered one of his crew, Henry Green, by first giving him a gray gown and then, when Green displeased him, taking it back and giving it to another. Some of his crew suspected that Hudson was secretly hoarding food for his favourites, and tempers flared when Hudson ordered the crew's own sea chests searched for extra victuals. Robert Juet, the mate, had been demoted, and he conspired with Green and others to mutiny. Once the homeward voyage had begun, the mutineers seized Hudson, his son, and seven others, casting them adrift in Hudson Bay in a small open boat on June 22, 1611. Although the "Discovery" sailed home to England, neither of the ringleaders returned with her, having been killed, together with several others, in a fight with Eskimos. No more was ever heard of Hudson and his small party, although in 1631 to 1632 another explorer found the ruins of a shelter, possibly erected by the castaways.

As a commander, Hudson was more headstrong than courageous. He violated his agreement with the Dutch and failed to suppress the 1611 mutiny. He played favourites and let morale suffer. In James Bay he appeared irresolute.

Yet Hudson undertook four dangerous voyages, brought his crew through an Arctic winter, and preserved his vessels amid the dangers of ice and unknown shores. He was a competent navigator who materially extended the explorations of Verrazano, Davis, and Barents. His contribution to geographical knowledge was great, while his discoveries formed the basis for the Dutch colonization of the Hudson River and for English claims to much of Canada. (Jo.E.C.)

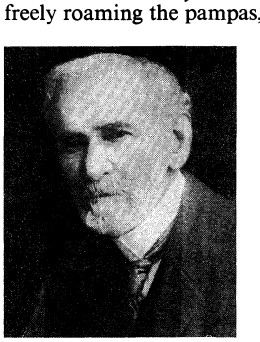
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Hudson, Thomas (b. 1701, Devon, Eng.—d. Jan. 26, 1779, Twickenham, Middlesex, Eng.), English portrait painter, who forms an important link in the apostolic succession of English portrait painters and was praised by contemporaries for his ability to catch a likeness.

Hudson was a pupil of Jonathan Richardson, whose daughter he married, and the young Joshua Reynolds was bound apprentice to him in October 1740. Hudson began to receive notice in the early 1730s, and by 1742 he was one of the most successful of the portrait painters working in London; he painted members of the royal family and "abundance of Persons of Quality." A large number of his portraits were engraved. He probably retired from active practice before 1760.

Hudson, W(illiam) H(enry) (b. Aug. 4, 1841, near Buenos Aires—d. Aug. 18, 1922, London), British author, naturalist, and ornithologist, best known for his exotic romances, especially *Green Mansions.*

Hudson's parents were originally New Englanders who took up sheep farming in Argentina. He spent his childhood—lovingly recalled in *Far Away and Long Ago* (1918)—freely roaming the pampas, studying the plant



W.H. Hudson
Elliott and Fry

and animal life, and observing both natural and human dramas on what was then a lawless frontier. After an illness at 15 permanently

affected his health, he became introspective and studious; his reading of Darwin's *Origin of Species*, which confirmed his own observations of nature, had a particularly strong impact. After his parents' death, he led a wandering life. Little is known of this period or of his early years in England, where he settled in 1869 (and was naturalized in 1900). Poverty and ill-health may have occasioned his marriage in 1876 to a woman much older than himself. He and his wife lived precariously on the proceeds of two boardinghouses, until she inherited a house in the Bayswater section of London, where Hudson spent the rest of his life.

His early books, romances with a South American setting, are weak in characterization but imbued with a brooding sense of nature's power. Although Hudson's reputation now rests chiefly on these novels, when published they attracted little attention. The first, *The Purple Land that England Lost*, 2 vol. (1885), was followed by several long short stories, collected in 1902 as *El Ombú*. His last romance, *Green Mansions* (1904), is the strange love story of Rima, a mysterious creature of the forest, half bird and half human. Rima, the best known of Hudson's characters, is the subject of the statue by Jacob Epstein in the bird sanctuary erected in Hudson's memory in Hyde Park, London, in 1925.

The romances secured Hudson the friendship of many English men of letters, among them Joseph Conrad, Ford Madox Ford, Edward Garnett, and George Gissing. His books on ornithological studies (*Argentine Ornithology*, 1888–89; *British Birds*, 1895; etc.) brought recognition from the statesman Sir Edward Grey, who procured him a state pension in 1901. He finally achieved fame with his books on the English countryside—*Afoot in England* (1909), *A Shepherd's Life* (1910), *Dead Man's Plack* (1920), *A Traveller in Little Things* (1921), and *A Hind in Richmond Park* (1922). By their detailed, imaginative descriptions, conveying the sensations of one who accepted nature in all its aspects, these works did much to foster the "back-to-nature" movement of the 1920s and 1930s but were subsequently little read.

Hudson Bay, inland sea indenting east central Canada. With an area of 316,000 sq mi (819,000 sq km), it is bounded by the Canadian Northwest Territories (north and west), Manitoba and Ontario (south), and Quebec (east). It is connected with the Atlantic Ocean via the Hudson Strait (northeast) and with the Arctic Ocean via the Foxe Channel (north).

The bay is named after Henry Hudson, who, in 1610, on board the aptly named "Discovery," was seeking a Northwest Passage to Asia. The east coast of Hudson Bay proper was mapped two years later; the south coast was traced in 1631; and the explorer Luke Foxe lent his name to Foxe Channel in the same year. The west coast was not mapped until the early 1820s, and the first investigations in depth of the area were made by Canadians during 1929–31. Air reconnaissance superseded naval researches in the second half of the century.

Physical characteristics. Hudson Bay has a shallow and quite smooth floor, averaging 330 ft (100 m) in depth, with a maximum around 900 ft. The coast, situated in a region of permanently frozen earth layers, or permafrost, is a marsh-ridden lowland fed by lake waters and turbulent rivers. In the east and northeast the shores are high and sheer, but elsewhere they are low. Coniferous woods border the southerly James Bay, the shallowest part, but most of the shore is covered with dwarf birch, willow, aspen, and bushes, growing among moss, lichen, and grass.

The eastern coast is bordered, at a distance of some 200 mi, with a set of islands and has cliffs formed of geologically ancient Precambrian (over 570,000,000 years old) crystalline and sedimentary rocks. The only other islands are a small cluster at the bay exit. Bottom deposits are derived from the earth rather than from the shells of minute organisms, as in the case of the ooze of some of the coastal islands.

Hudson Bay has a severe continental climate. January temperatures average −20° F (−29° C), while July temperatures are only 47° F (8.3° C). Annual averages are 9.3° F (−12.6° C), but extremes range from −60° F (−51° C) in the winter to 80° F (26.7° C) in the summer. Spring is mild and cloudy, whereas summer is clear, though the bay itself is often coated with fog. Autumn starts cool, with frequent fogs, clearing later; early winter is very cold, clear, and calm, but this pattern is interrupted, after December, by strong winds and snowstorms. The thaw sets in in late April.

Hudson Bay is filled by the numerous peripheral rivers and also by currents from Foxe Basin in the north, creating a counterclockwise general movement. Outflow occurs along the eastern Hudson Strait coast, rounding Chidley Cape (the northernmost tip of the Quebec–Newfoundland border), and passing into the Labrador Current. Flow is highest in July.

Hudson Bay has much ice, mostly local, though there is some influx of pack ice from Foxe Basin. Southern and central areas have solid, floating ice fields only during February and March. Salinity increases with depth: below 80 feet it is 31 parts per thousand ($^0/_{00}$); the layer above registers $23^0/_{00}$; and the upper six feet registers only $2^0/_{00}$ when the current is strong and ice is melting. Water temperatures can be as low as 29° F (−1.8° C) at depth in August, although surface temperatures may reach 49° F (9.4 C) in September. Currents in the bay respond to the fierce tidal flow off the Labrador coast.

Biological characteristics. Hudson Bay contains a great quantity of dissolved nutrient salts, since unicellular algae, especially microscopic types, grow fast in the well-heated and illuminated upper layers. Small, shrimp-like crustaceans occupy the open waters and form a food source for mollusks, sea urchins, starfish, and worms, together with many other invertebrates living on the bottom.

Fish include numerous polar plaice, cod, halibut, salmon migrating to the lakes and rivers to spawn, and also freshwater species. Ringed, bearded, and Greenland seals inhabit the areas around openings in the ice. Walrus, dolphins, and killer whales live in the northern sector, and the polar bears come down from the north to hunt seals on the ice. About 200 species of birds gather on the coasts and islands; they include ducks, gulls, eiders, loons, snow geese, swans, sandpipers, snow owls, and crows. There are also such herbivorous mammals as caribou, musk oxen, and rodents, as well as fur-bearing animals.

Human exploitation. Fishing, and hunting for sea mammals or furs, are the main local occupations. Indians inhabit the southern region between Eskimo Point (about halfway along the west coast) to Fort-George (on the eastern coast of James Bay, the embayment thrusting inland from the southeast corner of Hudson Bay); Eskimos live in the north. Population density is very low. For conservation purposes, the Canadian government has designated the whole Hudson Bay Basin a "mare clausum" (closed sea).

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Hudson Canyon, large submarine canyon incised into the Atlantic continental slope and outer shelf off New York Harbor, U.S. A shallow shelf channel, Hudson Channel, trends south-southeastward from the mouth of Hudson River to the head of the canyon on the outer shelf, where the water is 300 ft (90 m) deep at 20 mi (30 km) offshore. The canyon proper is approximately 58 mi long, passing into a fan valley at the base of the continental slope at a depth of about 7,000 ft. Where best expressed topographically, the canyon's V-shaped walls have a height of 4,000 ft. Hudson Fan Valley, incised into the continental rise below the mouth of Hudson Canyon, has much less relief, although the 1800-ft-high walls about 90 mi down the fan are abnormally high for most fan valleys. The fan valley, at least 230 mi long, probably serves to distribute the sediment supplied from the shelf by Hudson Canyon over the Hudson Fan.

Hudson River, river entirely within New York state, U.S., originating in several small postglacial lakes in the Adirondack Mountains near Mt. Marcy (5,344 ft [1,629 m]), the highest point in the state. Lake Tear of the Clouds is regarded as the source of its main headstream, the Opalescent River. The Hudson is about 315 mi (507 km) in length and follows a winding course for its first 108 mi, flowing generally southeast to Corinth in Saratoga County and then northeast to Hudson Falls. From there it flows (without significant gradient) almost directly south for 200 mi to the Battery at the head of Upper New York Bay (at New York City). It drains an area of 13,370 sq mi (34,628 sq km). Its lower course, about 150 mi, occupies a drowned valley; extending seaward from its mouth for about 200 mi is a deep submarine canyon. Tides are felt as far north as the federal dam at Troy where the mean tidal range is 4.7 ft (1.4 m). The river varies in width from 3 mi at Haverstraw Bay (between Westchester and Rockland counties), to ¾ mi at its mouth. Together with the Mohawk River (*q.v.*), its major tributary, it forms one of the nation's most important waterways.

The Florentine navigator Giovanni da Verrazano sailed a short distance upstream in 1524, but the river rightly bears the name of Henry Hudson, who explored it in 1609. Dutch settlement of the Hudson Valley began in 1629, and the region's serene beauty (near Tarrytown) formed a background for the stories of Washington Irving and inspired the Hudson River School of landscape painting and architecture. A strategic waterway during the Revolution, the Hudson was the scene of numerous battles including the decisive American victory at Saratoga and the naval battle of Tappan Zee. Benedict Arnold, military commander of forts in the Tappan Zee area, escaped to a British ship anchored near the village of Garrison. Washington made his headquarters at Newburgh in 1782 and later disbanded the continental armies from there. The Palisades (*q.v.*) extend along its west bank from south New York into New Jersey. The river is overlooked at West Point by the U.S. Military Academy and at Hyde Park by the Roosevelt home.

The opening of three canals during the 19th century (the Erie, the Delaware and Hudson, and the Champlain) linked the river with the Great Lakes and with the Delaware and lower St. Lawrence valleys (*see* New York State Barge Canal). The river was thus a key factor in the growth of the Midwest as well as that of New York City. Practical steam navigation was begun by Robert Fulton in 1807, and the river quickly became a major commercial route. The main towns along its lower course owed their early prosperity to the whaling trade and, later during the 19th century, as home ports for interocean fleets.

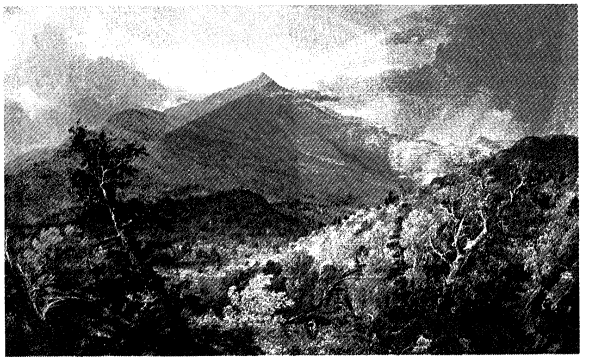
Navigational improvements began in 1797, and in 1892 the Hudson was declared a federal government waterway. Controlling depth is 27

feet (8 m) at Albany and 14 feet (4.3 m) from Albany north to the Mohawk. The river is open and navigable year-round for ocean ships to Albany and for eight months for tugboat–barge traffic to the Great Lakes (via the canalized Mohawk and the New York State Barge Canal). River-borne tonnage includes sand, gravel, crushed rock, petroleum, coal, and lignite. Passenger traffic has been replaced by parallel rail and highway facilities. Numerous bridges cross the river, including the Castleton-on-Hudson (built in 1959), the Rip Van Winkle (1935), the Newburgh–Beacon (1963), the Bear Mountain (1924), the Tappan Zee (1956), and the George Washington (1931). Vehicular and railway tunnels connect New York City to northern New Jersey, where the river forms the state boundary for 17 miles (27 km).

Pollution of the river by industrial waste and raw sewage has been a continuing problem. Conservation groups have made attempts to preserve the river's ecological values, and pure-waters programs have been inaugurated by the state and local governments. The Hudson River Valley Commission was created in 1966 to encourage the preservation and development of the valley's historical, recreational, and natural resources.

Where the same name may denote a person, place, or thing, the articles will be found in that order

Hudson River school, large group of American landscape painters of several generations who worked between about 1825 and 1870. The name, applied retrospectively, refers to a similarity of intent rather than to a geographic location, though many of the older members of the group drew inspiration from the picturesque Catskill region north of New York City, through which the Hudson River flows. An outgrowth of the Romantic movement, the Hudson River school was the first native school of painting in the United States; it was strongly nationalistic both in its proud celebration of the natural beauty of the American landscape and in the desire of its artists to become independent of European schools of painting.



"Shroon Mountain, Adirondacks," oil painting by Thomas Cole, 1838, a painter of the Hudson River school; in the Cleveland Museum of Art

By courtesy of the Cleveland Museum of Art, Ohio, the Hinman B. Hurlbut Collection

The early leaders of the Hudson River school were Thomas Doughty, Asher Durand, and Thomas Cole, all of whom worked in the open and painted reverential, carefully observed pictures of untouched wilderness in the Hudson River valley and nearby locations in New England. Although these painters and most of the others who followed their example studied in Europe at some point, all had first achieved a measure of success at home and had established the common theme of the remoteness and splendour of the American interior. Doughty concentrated on serene, lyrical, contemplative scenes of the valley itself. Durand, also lyrical, was more intimate and particularly made use of delicate lighting in woodland scenes. Cole, the most romantic of the early group, favoured the stormy and monumental aspects of nature. Other painters who concentrated on depicting the landscape of the northeastern United States were Alvan Fisher, Henry Inman, and Samuel F.B. Morse and, later, John Kensett, John Casilear, Worthington Whittredge, and Jasper F. Cropsey. Frederic Edwin Church is considered a member of the Hudson River school, although the exotically dramatic landscapes he painted frequently had little to do with typical American vistas. The more individual landscape painter George Inness also began as a Hudson River painter.

For some painters whose theme was untouched landscape, the northeast was less alluring than the more primitive and dramatic landscapes of the west. John Banvard and Henry Lewis painted huge panoramas of empty stretches of the Mississippi River. Among the first artists to explore the Far West were the enormously successful Thomas Moran and Albert Bierstadt, who painted grandiose scenes of the Rocky Mountains, the Grand Canyon, and Yosemite Valley. The Hudson River school remained the dominant school of American landscape painting throughout most of the 19th century.

Hudson Strait, arm of the Atlantic Ocean between Baffin Island (Northwest Territories) and northern Quebec, Canada, linking Hudson Bay and Foxe Basin with the Labrador Sea. It is about 500 miles (800 km) long and 40–150 miles (65–240 km) wide and has a maximum depth of 3,090 feet (942 m). Salisbury and Nottingham islands are at its entrance from the Foxe Channel (northwest) and Hudson Bay (southwest), and Resolution and Edgell islands are at its eastern entrance from the Labrador Sea.

The Hudson Strait is navigable only during late summer and early autumn, but icebreakers make the passage most of the year. It was partly explored in 1578 by Sir Martin Frobisher, the English navigator. After it was fully navigated by the English explorer Henry Hudson in 1610, it became a main route for the ships of the Hudson's Bay Company.

Hudsonian orogeny, Precambrian thermal event on the Canadian Shield that took place 1.7 billion years ago (± 1.5 million years). Rocks that produce dates in this time span are those in the Churchill Province, a large arcuate belt that includes most of Canada west of Hudson Bay, the exposed Precambrian rocks in northern Canada, the Arctic Islands and Baffin Land, most of northern Greenland, and part of Labrador; the Bear Province in the northwestern tip of the shield; and a broad area in the western United States. The Mazatzal orogeny in Arizona, the Black orogeny in South Dakota, and the Penokean orogeny in the southern part of the Lake Superior region may represent the Hudsonian event in the United States. Precambrian rocks in the Southern Province, which extends south-southwest of Lake Superior into the mid-continental United States, also are dated in the Hudsonian time span.

Hudson's Bay Company, corporation that occupies a prominent place in both the economic and the political history of Canada. It was incorporated in England on May 2, 1670, to seek a northwest passage to the Pacific, to occupy the lands adjacent to Hudson Bay, and to carry on any commerce with those lands that might prove profitable. It still exists as a commercial company active in real estate, merchandising, and natural resources, with headquarters in Toronto.

The territories originally granted to the Hudson's Bay Company became known as Rupert's Land (after Prince Rupert of the Palatinate, who was a cousin of King Charles II of England and the first governor of the company). The boundaries of Rupert's Land were never clearly defined, but the area was commonly understood to extend from Labrador to the Rocky Mountains and from the headwaters of the Red River to Chesterfield Inlet on Hudson Bay.

The Hudson's Bay Company engaged in the fur trade during its first two centuries of existence. In the 1670s and '80s the company established a number of posts on the shores of James and Hudson bays. Most of these posts were captured by the French and were in French hands between 1686 and 1713, when they were restored to the company by the Treaty of Utrecht. After the British conquest of Canada (1759–60), increasing competition led the company to build fur-trading posts inland, starting with Cumberland House, in 1774.

By 1783 many of the Hudson's Bay Company's competitors formed the North West Company (*q.v.*), and for nearly 40 years the two organizations engaged in bitter rivalry. Armed clashes in the early 19th century (*see* Seven Oaks Massacre) ended only when the British government brought about a union of the two companies in 1821 under the name and charter of the Hudson's Bay Company.

At this time the company was given an exclusive license to trade for 21 years (revived for the same term in 1838) in Rupert's Land, in the Northwest Territories beyond Rupert's Land, and on the Pacific slope. The company took over the fur trade of the Oregon Country (present Oregon, Washington, Idaho, British Columbia, and parts of Montana and Wyoming). Increasing American immigration, starting in 1834 and continuing into the next decade, diminished the company's influence in the southern part of the Oregon Country; and in 1846 the Oregon Country was divided between the United States and Great Britain. The Hudson's Bay Company continued to control the British part of the old Oregon Country until 1858.

In 1859 the company's monopoly was not renewed, and increasingly independent traders entered the fur trade. In 1870 the company's remaining territories, which comprised virtually all of present-day Canada except for the Maritime Provinces and part of Ontario and Quebec, were sold to the Canadian government in exchange for £300,000, blocks of territory around its posts, and title to one-twentieth of the lands in the "fertile belt," or habitable portion of western Canada, with mineral rights on all these lands. The company was governed solely from England until 1931, when a Canadian committee was given exclusive authority in Canada but was held responsible to the governor and committee in England.

In the 20th century the Hudson's Bay Com-

pany remained one of the largest fur-collecting and marketing agencies in the world but turned increasingly to retail merchandising. In the 1970s it supplemented its chain of long-established trading and fur-collecting stores in northern Canada with large chains of department and discount stores throughout Canada. The company also engaged in petroleum and natural-gas ventures, remained involved in real estate, and branched out into financial services. In 1979 the Hudson's Bay Company was bought by companies owned by the family of the late Roy Herbert Thomson, 1st Baron Thomson. The consequent heavy debt load forced Hudson's Bay into financial straits in the 1980s, and it sold off its northern Canadian stores and certain other ventures. It remained one of the chief business firms of Canada and continued to own many department stores in Canada.

ḥudūd, al- (Arabic: "the boundaries"), singular AL-ḤADD, in the Druze religion, five cosmic principles that are emanations from God, the One. Al-Ḥākim, the 11th-century Fāṭimid caliph of Egypt deified by the Druzes, stands at the centre of the universe as the embodiment of the One. Ḥamzah ibn ʿAlī, a contemporary of al-Ḥākim, systematized the Druze religion and presented himself as the direct human link to the One; he then established a hierarchy of universal principles, or *al-ḥudūd,* that would span the distance between the One and the mass of Druze believers.

Each principle had a human counterpart from among al-Ḥākim's contemporaries. Ḥamzah himself became the first principle, or *ḥadd,* Universal Intelligence (al-ʿAql); al-ʿAql generated the Universal Soul (an-Nafs), embodied in Ismāʿīl ibn Muḥammad at-Tamīmī. The Word (al-Kalimah) emanates from an-Nafs and is manifest in the person of Muḥammad ibn Wahb al-Qurashī. The fourth successive principle is the Preceder (as-Sābiq, or Right Wing [al-Janāḥ al-Ayman]), embodied in Salāmah ibn ʿAbd al-Wahhāb as-Sāmirrī; and the fifth is the Succeeder (at-Tālī, or Left Wing [al-Janāḥ al-Aysar]), personified by al-Muqtanā Bahāʾ ad-Dīn. Each of these principles, the true *ḥudūd,* also had false counterparts, in turn embodied by various contemporaries of al-Ḥākim. The tension between the two sets of *ḥudūd* represented the conflict of good and evil in the world, to be resolved by al-Ḥākim's eventual support of the true *ḥudūd.* *See also* Ḥākim, al-.

Hue, city, central Vietnam. Lying on a plain backed by foothills of the Annamite Chain (French: Chaîne Annamitique; Vietnamese: Truong Son) and lying 5 miles (8 km) from the South China Sea coast, Hue is traversed by the broad, shallow Huong River (Hue River, or Perfume River). At the city's heart, on the river's left bank, is the early 19th-century Chinese-style Vietnamese imperial citadel, Dai Noi, from which the Nguyen dynasty ruled Vietnam for several centuries. The citadel's 7-mile (11-kilometre) walled circumference enclosed priceless artifacts of Vietnamese civilization. During colonial times the French quarter was on the right bank. The commercial section of the city is located to the east of the imperial capital.

First cited *c.* 200 BC, when it was the seat of the Chinese military authority in the kingdom of Nam Viet (Chinese: Nan Yüeh), Hue passed *c.* AD 200 to the Chams. It was captured repeatedly by the Chinese and in 1306 was ceded to Dai Viet (Vietnam). After 1635 Hue was the seat of the Nguyen family, which controlled central and southern Vietnam. In 1802 Prince Nguyen Anh, assisted by the French, became Emperor Gia Long of a revived Nguyen dynasty, which included Tonkin (northern Vietnam) and had its capital at Hue. The last of his line, Bao Dai, officially emperor of Vietnam from 1925 to 1945, functioned as a figurehead under the French protectorate, which had existed from 1883. Under Japanese occupation from 1940 to 1945, Hue became the seat of a provisional administrative committee of non-Communist Vietnamese in April 1947. On July 1, 1949, however, the newly declared state of Vietnam chose Saigon as its capital, and Hue lost its historic function.

Since the end of World War II Hue has experienced several upheavals. Suffering early damage during the First Indochina War (1946–54), it experienced severe civil disturbances in 1963 and again in 1965. During the 1968 Viet Cong Tet offensive of the Vietnam War, the city sustained very severe damage. Many of the former royal buildings, museums, libraries, and Buddhist shrines, including the Temple of Heaven, were damaged. The city has since been rebuilt.

Situated in the path of the northeast winter monsoon (September to April), the city has heavy rainfall, from 104 to 116 inches (2,600 to 2,900 mm) annually. Summers are hot and quite dry, June being the hottest month.

During the French occupation Hue was linked to Saigon (now Ho Chi Minh City) by road and railway; it also has an airport at Phu Bai, 15 miles (24 km) to the southeast. The Imperial College for Administration at Hue, long oriented toward the Chinese classics, was westernized in 1920 by the French. In 1957 the University of Hue was founded with faculties in medicine, science, law, education, and letters; it was reorganized in 1976. The early 17th-century Thien Mu pagoda and the tombs of the Nguyen kings are near Hue. Pop. (1979) 165,865.

hue and cry, early English legal practice of pursuing a criminal with cries and sounds of alarm. It was the duty of any person wronged or discovering a felony to raise the hue and cry, and his neighbours were bound to come and assist him in the pursuit and apprehension of the offender. All those joining in the pursuit were justified in arresting the person pursued, even if it turned out that he was innocent. If the criminal bore apparent evidence of guilt on his person and if he resisted capture, he could be killed on the spot; if he submitted to capture, his fate was decided by due process. The various statutes relating to hue and cry were finally repealed in the early part of the 19th century.

Hueffer, Ford Hermann: *see* Ford, Ford Madox.

Huehuetenango, city, west-central Guatemala, lying at an elevation of 6,200 feet (1,890 m) above sea level on the southern slopes of the Altos Cuchumatanes, which are the highest mountains in the country. The name Huehuetenango means "Place of the Ancients," and near the city are ruins of an ancient Indian centre called Zaculeu. Huehuetenango is one of the larger commercial centres for the Maya Indian settlements that dot west-central Guatemala. The principal items that are traded on the traditional market days are pottery, leather goods, and woolen textiles. Huehuetenango is also a mining centre for lead, copper, and silver. Farmers in the surrounding area mainly grow subsistence crops of wheat, corn (maize), beans, and potatoes. The city is close to the main Pan-American Highway, 170 miles (275 km) from Guatemala City. Pop. (1981) 12,422.

Huelva, capital of Huelva province, in the autonomous community (region) of Andalusia, southwestern Spain. The city lies on the western shore of a peninsula formed by the estuaries of the Odiel and Tinto rivers, which empty into the Gulf of Cádiz of the Atlantic near the Portuguese frontier. It was originally a Carthaginian trading station and afterward a Roman colony (Onuba), whose restored aqueduct now supplies the city with water. Occupied by the Moors, Huelva was recaptured for the Christians in 1257 by Alfonso X the Wise of Castile. The colossal statue of Christopher Columbus, 112 feet (34 m) high, was erected there in 1892 to commemorate the fourth centenary of his voyage, which began and ended in the nearby village of Palos de la Frontera. Columbus resided in the neighbouring Franciscan monastery of La Rábida (now a summer university) after his original plans for the voyage had been rejected by King John II of Portugal in 1484.

When the famous nearby Riotinto copper mines were given greater commercial impetus after 1873, the city grew rapidly in size and wealth. A major ore-shipping port, Huelva also is the headquarters of the sardine, tuna, and bonito fisheries, and it trades in grain, grapes, olives, and cork. Industrial railways link the ore deposits with the port. Pop. (1982 est.) 131,073.

Huelva, province, in the autonomous community (region) of Andalusia, southwestern Spain. It is bordered by the Guadiana River and Portugal (west) and by the Guadalquivir River and Sevilla province (east) and has an area of 3,894 square miles (10,085 square km). The province's mountainous northern portion (Sierra de Aracena) gives way in the south to the flat, fertile La Campiña, or lowland, which stretches to the Atlantic. The Odiel and the Tinto, the main rivers of the province, join to form the *ría* (inlet) at the provincial capital, Huelva city.

Dry farming (cereals) predominates, but cultivation of cotton, olives, and fruit trees is also important. The local mineral deposits have been exploited since ancient times, and the Riotinto copper mines are world famous. The tuna-fishing industry supports many preserving and salting factories. Tourism along the sunny Costa de la Luz ("Coast of Light") greatly increased after 1960. Important cities in the province include the capital, Huelva (*q.v.*), and Ayamonte, Lepe, and Moguer, the birthplace of the Nobel Prize-winning poet Juan Ramón Jiménez. Pop. (1986 est.) 437,-812.

Huerta, Adolfo de la (b. 1881, Hermosillo, Mex.—d. July 9, 1955, Mexico City), politician who served as interim president of Mexico in 1920.

Huerta worked in a variety of jobs in his native state of Sonora before becoming an agitator against the government of President Porfirio Díaz in 1908. He participated in the Mexican Revolution and served as governor of Sonora from 1917 to 1920. Along with his fellow Sonorans Alvaro Obregón and Plutarco Elías Calles, he helped overthrow President Venustiano Carranza in May 1920, and he served as interim president of Mexico from June through November of that year.

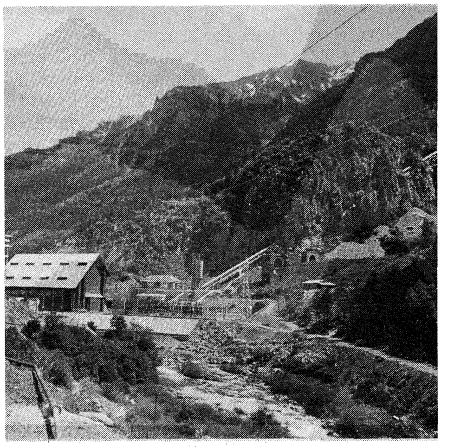
Huerta served as minister of finance under Obregón from 1920 to 1923 and tried in that post to reestablish Mexico's finances on a sound basis. When Obregón supported Calles as the government's presidential candidate in the 1924 elections, Huerta organized an armed rebellion that was suppressed by the government after a few months. Huerta then went into exile, living in Los Angeles from 1924 to 1935 and giving singing lessons to support himself. He returned to Mexico in 1935 after charges against him were dismissed by President Lázaro Cardenas and was made inspector general of consuls.

Huerta, Victoriano (b. Dec. 23, 1854, Colotlán, Mex.—d. Jan. 13, 1916, El Paso, Texas, U.S.), dictatorial president of Mexico (Feb. 18, 1913–July 15, 1914), whose regime united disparate revolutionary forces in common opposition to him.

Though an admirer of former dictator Por-

firio Díaz, Huerta served liberal Pres. Francisco Madero until February 1913, when he joined a military revolt in Mexico City. He assumed the presidency, dissolved the legislature, and suppressed all opposition. Confronted with revolution at home (led by Venustiano Carranza, Álvaro Obregón, Pancho Villa, and Emiliano Zapata) and hostility in the United States (Pres. Woodrow Wilson refused him recognition, seized Veracruz, and permitted arms to reach the anti-government forces), Huerta resigned and fled to Spain. He went to the United States in 1915, was arrested on charges of fomenting rebellion in Mexico, and died in custody at Fort Bliss.

Huesca, province, in the autonomous community (region) of Aragon, northeastern Spain, bordered east by Lérida, south and west by Zaragoza and Navarra, and north by France, with an area of 6,051 sq mi (15,671 sq km). It includes the highest point in the Pyrenees, Pico de Aneto (11,168 ft [3,404 m]). Above 8,000 ft there is Alpine vegetation, giving



Hydroelectric power plant, near Jaca, in Huesca province, Spain
G. Mairani

way at lower elevations to fir and pine, important in Spanish timber production, then to beech, chestnut, and oak. This isolated, sparsely settled Sobrarbe region provides summer pasturage for the livestock raised extensively in the province. The Ordesa National Park, near Monte Perdido (11,007 ft [3,355 m]), has magnificent mountain scenery and woodland. The sierras and valleys of the Pyrenean foothills lead into the irrigated fertile southern plains of the Cinca, Flumen, and Ebro valleys, where an agricultural economy predominates, producing olives, sugar beets, grain, and vegetables. The provincial capital, Huesca (*q.v.*) city, has limited industry. The cities of Monzón and Sabiñánigo have chemical and metallurgical plants. Hydropower for the Barcelona grid, mainly from the Cinca river system, is significant. The energy resources of the province were enlarged by the discovery in 1979 of natural gas at Sabiñánigo. Pop. (1982 est.) 199,211.

Huesca, city, capital of Huesca province, in the autonomous community (region) of Aragon, northeastern Spain, northeast of Zaragoza, in the region known as Hoya de Huesca, dominated by the Sierra de Guara to the north and watered by the Río Flumen. The city originated as Ileosca, capital of the Vescitan, an ancient Iberian tribe; as Osca (Urbs Victrix), it was the site of an important Roman mint. It later fell to the Visigoths and Moors and was recaptured by Peter I of Aragon in 1096. It served as capital of Aragon until 1118. A university, founded there in 1354 by Peter IV, was closed in the 19th century.

Notable buildings include the church of San Pedro el Viejo, begun *c.* 1134 and completed in the 13th century, and the burial place of the kings Ramiro II and Alfonso I the Battler of Aragon; the town hall, in the former convent of St. Francis (pre-13th century); Huesca cathedral, begun in the 13th century on the site of a pagan temple and of a later mosque, was completed in 1515; and the episcopal palace, built in the Mudéjar (Christian-Islāmic) style. The College of (Colegio de) Santiago, founded in 1534, houses the provincial archives and museum of fine arts. The Royal Palace (Palacio Real), ancient residence of the kings of Aragon and former fortress of the Moorish *walis* (rulers), was reconstructed in 1845 to hold the university and later given to the Institute of Intermediate Education. The church of San Miguel was founded in 1110 by Alfonso I; near it is the only tower still standing of the 99 that formed the city's defense works, some of whose walls also remain.

There is little industry apart from local handicrafts and the manufacture of agricultural machinery. Pop. (1982 est.) 42,554.

Huesca, Code of, most important law code of medieval Aragon, written by Bishop Vidal de Canellas under the Aragonese king James I, promulgated in 1247 and taking its name from the city of Huesca in northeastern Spain. The main purpose of the code was to collect and arrange the franchises or laws known as *fueros* and to delineate the territorial boundaries of Aragon. Originally written in Latin, it filled eight books; as it was translated into the dialect of Aragon, it was expanded, finally totalling 12 volumes. The code served as a civil and criminal legal source until the 15th century.

Huet, Pierre-Daniel, Huet also French spelled HUETIUS (b. Feb. 8, 1630, Caen, Fr.—d. Jan. 26, 1721, Paris), French scholar, antiquary, scientist, and bishop; his incisive skepticism, particularly as embodied in his cogent attacks on Descartes, greatly influenced contemporary philosophers.

After studying mathematics with the Jesuits, in 1652 Huet visited the court of Queen



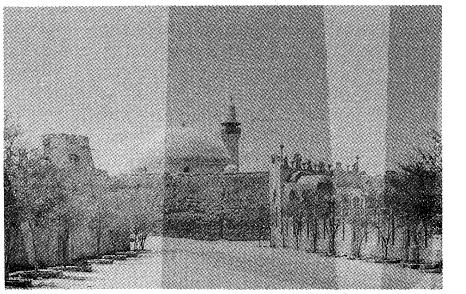
Huet, oil painting by J.-G.-E. Naigeon; in the Musée de Versailles
Cliche Musees Nationaux, Paris

Christina of Sweden. His discovery in the Swedish royal library of some fragments of a commentary on St. Matthew by the Greek theologian Origen (*c.* AD 185–*c.* 254) led to an edition of Origen in 1668.

From 1670, Huet assisted the French bishop Jacques Bossuet, tutor to the dauphin Louis, son of Louis XIV. He took holy orders in 1676 and served as bishop of Avranches for 10 years (1689–99) before retiring to the abbey of Fontenay, near Caen.

In addition to scientific work in the fields of astronomy, anatomy, and mathematics, Huet wrote a number of philosophical works that asserted the fallibility of human reason, among which were the influential polemics *Censura Philosophiae Cartesianae* (1689; "Criticisms of the Philosophy of Descartes") and *Nouveaux memoires pour servir a l'histoire* (1692; "New Memoirs in the Service of History"). In these works he attempted to refute such Cartesian first principles as "Cogito ergo sum" ("I think, therefore I am") and the "clear and distinct" test for the truth of an idea. These refutations were made in the service of Huet's belief that truth is known ultimately only through faith rather than by reason, a philosophy known as fideism.

Hufūf, al-, also spelled HOFUF, town and former capital of ash-Sharqīyah *minṭaqah* (province), ash-Sharqīyah region, Saudi Arabia, in



Mosque of Ibrāhīm Pasha, al-Hufūf, Saudi Arabia
Diane Rawson—Photo Researchers

the large al-Hasa oasis and on the railroad from Riyadh to ad-Dammām. The headquarters of the Ottoman administration from 1871, when the Ottoman Empire seized eastern Arabia, it was recaptured in 1913 by the Wahhābīs, a Muslim fundamentalist group, under Ibn Sa'ūd. The town remained under their control thereafter, becoming part of the Kingdom of Saudi Arabia, formed in 1932. Its role as regional capital was lost to ad-Dammām in the early 1950s.

Now an agricultural market centre (its Thursday Market is notable), al-Hufūf has rice- and date-processing, cement-making, and weaving industries and the royal horse-breeding stables. Agricultural and veterinary faculties of King Faysal University are located near al-Hufūf. It is the site of the early 19th-century domed mosque of Ibrāhīm Pasha. To the west is al-Ghawār, one of the world's largest oil fields. Pop. (1974) 101,271.

Hugdietrich (literature): *see* Heldenbuch, Das; Wolfdietrich.

Hügel, Friedrich von (philosopher): *see* von Hügel, Friedrich.

Hugenberg, Alfred (b. June 19, 1865, Hannover, Hanover—d. March 12, 1951, Kükenbruch, W.Ger.), German industrialist and political leader who, as head of a huge newspaper and film empire and prominent member of the conservative German National Peoples' Party, exercised a profound influence on German public opinion during the Weimar Republic period (1918–33) and materially contributed to Hitler's rise to power.

A businessman and cofounder of the nationalist Pan-German League, Hugenberg entered the Prussian finance ministry in 1903. From 1909 to 1918 he served as chairman of the board of directors of the huge Krupp industrial concern. From 1916 he built up enterprises that during the Weimar period came to encompass, among others, a significant share of Germany's newspapers, a wire service, and the UFA film company. An ambitious monarchist, Hugenberg joined the German National Peoples' Party in 1919 and became leader of its right wing, entering the Reichstag in 1920. As Germany's most powerful figure in the propaganda field, he launched vituperative campaigns against Communism and Social Democracy as well as the Versailles Treaty system and Germany's role in it. Hugenberg opposed the Locarno Treaty (1925), which

settled the western borders of Germany and hastened French withdrawal. As leader of his party from 1928, he campaigned alongside the Nazis against the Young Plan of reparations. His uncompromising attitude led many of the Nationalists' more moderate elements to leave the party. Hoping to exploit Nazi successes at the polls for his own political ambitions, Hugenberg in 1931 formed the Harzburg Front, an alliance between nationalist, conservative elements and Hitler, to attempt to topple the Brüning government. He proved unable to manipulate the Nazis for his own ends, but the large contributions from German industry that flowed, after the Harzburg agreement, into Hitler's party treasury aided Nazi growth substantially. Entering Hitler's Cabinet on Jan. 30, 1933, as minister of economy and food, Hugenberg still hoped to control the Nazis—an illusion soon shattered. He resigned on June 26, 1933, and his party was dissolved. Although Hugenberg remained a member of the Reichstag until 1945, he had no further political influence.

Huggins, Charles B(renton) (b. Sept. 22, 1901, Halifax, Nova Scotia, Can.), Canadian-born U.S. surgeon and medical researcher whose investigations demonstrated the relationship between hormones and certain types of cancer. For his discoveries Huggins received (with Michael E. De Bakey) the 1963 Albert Lasker Award for Clinical Research and (with Peyton Rous) the Nobel Prize for Physiology or Medicine in 1966.

Huggins was educated at Acadia University and at Harvard, where he received his M.D. in 1924. He went to the University of Michigan for further training in surgery (1924–27) and then joined the faculty of the University of Chicago, where he served as director of the university's Ben May Laboratory for Cancer Research from 1951 to 1969.

Huggins, Godfrey (Martin): *see* Malvern, Godfrey (Martin) Huggins, 1st Viscount.

Huggins, Sir William (b. Feb. 7, 1824, Stoke Newington, London—d. May 12, 1910, London), English astronomer who was one of the first to use the spectroscope; with it he revolutionized the observation of celestial bodies.

In 1863 Huggins showed that stars are composed of elements that occur on the Sun and Earth. In examining a nova in 1866, he observed bright hydrogen lines and correctly deduced the emission of a shell of hydrogen gas at a temperature higher than that of the star's surface. In 1868 Huggins showed that comets emit the light of luminescent carbon gas, and in the same year he tried to measure the radial velocities of stars by the Doppler shift of their spectral lines. He and Henry Draper, working separately, were the first to photograph the spectrum of a comet (Comet 1881 III), on June 24, 1881. He was knighted in 1897.

Hugh III, French HUGUES (d. 1284), king of Cyprus and Jerusalem who founded the house of Antioch-Lusignan that ruled Cyprus until 1489.

Succeeding his cousin Hugh II as king of Cyprus in 1267, he obtained the disputed crown of the dwindling crusader kingdom of Jerusalem two years later. The efforts of his rival, Charles I of Anjou, king of Sicily, who also claimed his rights to be a king of Jerusalem, and the resistance of his subjects prevented him from effectively establishing his authority in the Holy Land.

Hugh CAPET, French HUGUES CAPET (b. *c.* 938—d. Oct. 14, 996, Paris), first of a direct line of 14 Capetian kings of France; his control over vast estates in the regions of Paris and Orléans assured his election to the throne in 987 by the assembly of Frankish magnates.

Inheriting the title duke of the Franks from his father, Hugh the Great, in 956, Hugh Capet unsuccessfully tried to control Aquitaine in 970. From 978 to 986 he was allied with the German emperors Otto II and Otto III, and with Adalbero, archbishop of Reims, in political intrigues against the Carolingian king Lothair. By 985 Hugh was actually the ruler in all but title; and, after the brief reign of Lothair's son, Louis V (986–987), he was elected king in May 987. Adalbero was able to convince the Frankish magnates that the crown was elective rather than hereditary and that Charles of Lorraine, the only legitimate Carolingian contender, was unfit to rule. Hugh was crowned at Noyon on July 5, 987. Scholars are generally agreed that Hugh's election was not a revolutionary action. His grandfather Robert I, his great-uncle Eudes, and his uncle Rudolf (Raoul) had all earlier been non-Carolingian kings.

Hugh's reign was marked by the unavailing efforts of Charles of Lorraine (imprisoned 991) to assert himself and by continual conflict between Eudes I, count of Blois, and Fulk Nerra of Anjou, whom Hugh later supported. In 993 Eudes was aided by the Bishop of Laon in an unsuccessful conspiracy to deliver Hugh and his son Robert over to Otto III. That no one was punished for the incident indicated the weakness of the new Capetian dynasty. Hugh's crown was probably preserved by the inability of his enemies to coordinate their activities against him. He assured the succession to his son, Robert II, by having him crowned on Christmas day, 987.

Hugh OF CLUNY, SAINT, French SAINT HUGUES DE CLUNY, original name HUGUES DE SEMUR (b. 1024, Semur-en-Brionnais, Burgundy—d. April 29, 1109, Cluny, Fr.; canonized 1120; feast day April 29), French abbot of the Benedictine monastery of Cluny (1049–1109), under whose direction medieval monasticism reached its apogee and Cluny won recognition as the spiritual centre of Western Christianity. He was also noted for his role in developing the liturgy of the Latin rite.

Hugh de Semur took monastic vows at the age of 14 and, in 1049, succeeded Odilo (later St. Odilo) as abbot. Under Hugh's rule, nearly 2,000 monasteries associated with Cluny were founded in Italy, England, and Spain; in 1055 he founded the first Cluniac convent, at Marcigny. While encouraging the development of Cluniac monasticism elsewhere, he also expanded the parent house at Cluny; at his death, there were 300 monks.

Hugh had a personal reputation for wisdom, sanctity, and persuasiveness, evident in his diplomatic missions to Hungary and Germany on behalf of the church. Before being elected abbot, he had served as the abbey's ambassador to the Holy Roman emperor Henry III. Later, during the reign of the subsequent emperor, Henry IV, Hugh acted as an adviser to Pope Gregory VII in the investiture controversy, a struggle for power in which the Emperor attempted to transcend papal authority.

Hugh OF LINCOLN, LITTLE SAINT (b. 1245, Lincoln, Lincolnshire, Eng.—d. Aug. 27, 1255, Lincoln; feast day August 27), legendary English child martyr who was supposedly murdered by members of the local Jewish community for ritual purposes. There was little basis in fact for the story, but the cult that grew up around Hugh was a typical expression of the anti-Semitism that flourished in medieval times.

The victim of an anonymous murder, Hugh, a 9-year-old boy, was found dead in a well. His friends came forth with the accusation that a Jew named Koppin had imprisoned the child for more than a month, torturing and finally crucifying him. According to rumour, the body had been thrown into the well because the earth had refused to receive it. More than 90 Jews were subsequently arrested and charged with practicing ritual murder. Koppin, who allegedly confessed, was executed along with 18 others.

Miracles began to be attributed to Hugh as soon as the body was discovered; the story, although lacking any evidence, grew both in detail and in popularity over the years and, like others of its kind, reinforced the nearly universal sentiment of anti-Semitism and provided additional fuel for anti-Jewish acts. The legend of Hugh's martyrdom was a popular subject in medieval literature, notably in Chaucer's *Prioress's Tale.*

Hugh OF LINCOLN, SAINT (b. *c.* 1140, Avalon, Fr.—d. Nov. 16, 1200, London; canonized 1220; Anglican feast day November 16), French-born bishop of Lincoln who became the first Carthusian monk to be canonized.

On his mother's death when he was eight, Hugh and his father, Lord William of Avalon, joined the canons regular at Villard-Bonnot, Fr. After his father's death, Hugh joined (*c.* 1165) the monks at the Carthusian motherhouse of La Grande Chartreuse, near Grenoble, Fr. He was ordained priest and later became procurator of the house (*c.* 1170). In 1179/80 King Henry II of England appointed him as the first prior of the Carthusian house at Witham, in Essex, a royal foundation. Henry's interest in Hugh's work secured his election to the see of Lincoln in 1186. Both as prior and as bishop, Hugh consistently defended the church's liberties, gaining a remarkable degree of respect from the English monarchy. When in France (1200) to promote peace between King John of England and King Philip Augustus of France, Hugh revisited La Grande Chartreuse. On his return he fell ill, died, and was buried in Lincoln Cathedral (November 24). Among the many biographies of Hugh are those by H. Thurston (1898), R.M. Woolley (1927), and Joseph Clayton (1931).

Hugh OF SAINT-VICTOR, also called HUGO OF SAINT-VICTOR (b. 1096—d. Feb. 11, 1141, Paris), eminent scholastic theologian who began the tradition of mysticism that made the school of Saint-Victor, Paris, famous throughout the 12th century.

Of noble birth, Hugh joined the Augustinian canons at the monastery of Hamersleben, near Halberstadt (now in Germany). He went to Paris (*c.* 1115) with his uncle, Archdeacon Reinhard of Halberstadt, and settled at Saint-Victor Abbey. From 1133 until his death, the school of Saint-Victor flourished under Hugh's guidance.

His mystical treatises were strongly influenced by Bishop St. Augustine of Hippo, whose practical teachings on contemplative life Hugh blended with the theoretical writings of Pseudo-Dionysius the Areopagite. Hugh's somewhat innovative style of exegesis made an important contribution to the development of natural theology: he based his arguments for God's existence on external and internal experience and added a teleological proof originating from the facts of experience. His chief work on dogmatic theology was *De sacramentis Christianae fidei* ("The Sacraments of the Christian Faith"), which anticipated some of the works of St. Thomas Aquinas.

Unlike some of his contemporaries, Hugh upheld secular learning by promoting knowledge as an introduction to contemplative life: "Learn everything," he said, "and you will see afterward that nothing is useless." A prolific writer, Hugh wrote the *Didascalicon*, a remarkably comprehensive early encyclopaedia, as well as commentaries on the Scriptures and on the *Celestial Hierarchy* of Pseudo-Dionysius. The edition of Hugh's work by the canons of Saint-Victor (1648) was reprinted in J.-P. Migne's *Patrologiae Cursus Completus (Series Latina)*, 1844–64. J.P. Kleinz's *The*

Theory of Knowledge of Hugh of Saint Victor appeared in 1944.

Hugh THE FAT: *see* Chester, Hugh of Avranches, 1st earl of.

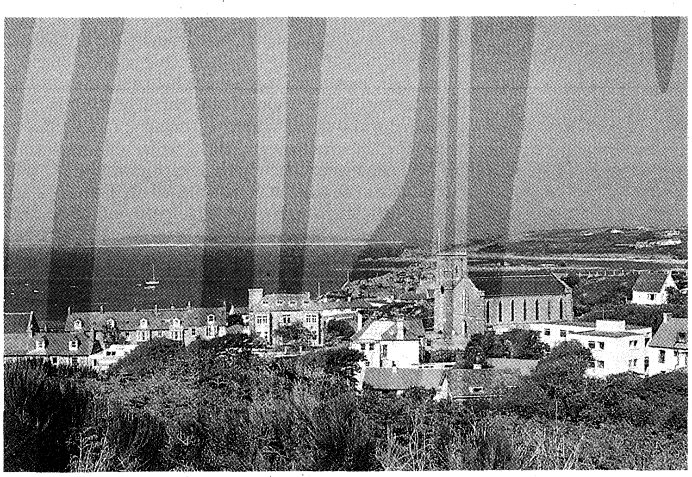
Hugh THE GREAT, also called HUGH THE WHITE, French HUGUES LE GRAND, OR HUGUES LE BLANC (d. June 16/17, 956), duke of the Franks, count of Paris, and progenitor of the Capetian kings of France. He was the most powerful man in the kingdom of France (West Francia) during the reign of Louis IV d'Outremer and the early years of King Lothair.

Son of a king (Robert I), father of another (Hugh Capet), and brother-in-law of three more (Rudolf of France, Athelstan of England, and Otto of Germany), Hugh possessed such vast territories that he could easily have assumed the crown on the death of Rudolf in 936. Preferring to work from behind the throne, he instead suggested the accession of Louis IV, son of the deposed Charles III the Simple. Louis proved no puppet, however, and his reign saw an almost constant struggle between King and Duke in which all the great magnates of France, Otto I of Germany, and the dukes of Lorraine were at one time or another involved. In 945 Louis fell into Hugh's hands and was incarcerated for a year before pressure from abroad and public opinion at home brought his release. Excommunicated by French and German councils and by the Pope, Hugh finally submitted to Louis in 951.

On the death of the King three years later, Hugh again turned down the opportunity to become king, plumping instead for Louis's young son, Lothair; but for his last two years Hugh was effectively the ruler of France.

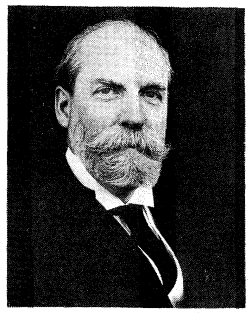
Hugh THE WOLF: *see* Chester, Hugh of Avranches, 1st earl of.

Hugh Town, village and capital of the Isles of Scilly, England. Located on a sandy peninsula on the southwestern side of St. Mary's Island, the village has a harbour and a roadstead where large vessels can lie at anchor. Hugh Town gave shelter to Prince Charles (later Charles II) until his escape to Jersey in 1646. The economy is centred on fishing and tourism. Star Castle, built in 1593 by Francis Godolphin, who leased the islands from Queen Elizabeth I in 1571, is now a hotel.



Hugh Town on St. Mary's, Isles of Scilly
A.F. Kersting

Hughes, Charles Evans (b. April 11, 1862, Glens Falls, N.Y., U.S.—d. Aug. 27, 1948, Osterville, Mass.), jurist and statesman who served as an associate justice of the U.S. Supreme Court (1910–16), U.S. secretary of state (1921–25), and 11th chief justice of the United States (1930–41). As chief justice he led the Supreme Court through the great controversy arising over Pres. Franklin D. Roosevelt's New Deal social legislation.



Charles Evans Hughes, 1916
By courtesy of the Library of Congress, Washington, D.C.

A member of a major New York City law firm, Hughes gained prominence in 1905 as counsel to New York state legislative committees investigating abuses in the gas and electric power industries and the life insurance business. In 1906, with the aid of Pres. Theodore Roosevelt, he defeated the flamboyant newspaper publisher William Randolph Hearst for governor of New York. Reelected in 1908, he resigned to accept an appointment to the Supreme Court by Pres. William Howard Taft.

In 1916 Hughes resigned from the Supreme Court upon receiving the Republican presidential nomination, as well as the endorsement of a Republican splinter group called the Progressive (or Bull Moose) Party. He was narrowly defeated (277 electoral votes to 254) by Woodrow Wilson, who had the decisive advantage of the popular belief that he had kept the nation out of war in Europe. Five months later the United States entered World War I. As secretary of state in the early postwar years, Hughes negotiated a separate peace treaty with Germany after the Senate had failed to ratify the Treaty of Versailles. He supported attempts to secure the entry of the U.S. into the League of Nations, and he planned and then served as chairman of the Washington (D.C.) Disarmament Conference of 1921–22. He returned to private law practice at the end of Pres. Calvin Coolidge's first term.

Appointed chief justice by Pres. Herbert Hoover, Hughes was confirmed despite liberal opposition in the Senate. In many cases involving problems raised by the Great Depression of the 1930s, Hughes generally favoured the exercise of federal power. On Feb. 18, 1935, he delivered three opinions upholding the right of the government to forbid payment of public and private debts in gold. In *Schechter Poultry Corporation* v. *United States* (1935), however, he spoke for the court in invalidating the National Industrial Recovery Act, one of the principal New Deal statutes.

In 1937 President Roosevelt proposed to "pack" the Supreme Court by appointing a new (and presumably liberal) justice to offset each sitting justice over the age of 70 who refused to retire. In a letter to the Senate Judiciary Committee Hughes attacked the plan, and on April 12, 1937, he delivered the opinion in *National Labor Relations Board* v. *Jones & Laughlin Steel Corporation,* 301 U.S. 1, sustaining the right of collective bargaining under the National Labor Relations Act of 1935 (Wagner Act). A few weeks later the court upheld various provisions of the Social Security Act. It was widely believed that these pro-New Deal decisions contributed to the defeat of the court-packing bill in Congress.

Hughes retired in 1941 at the age of 79. He wrote *Foreign Relations* (1924), *The Pathway of Peace* (1925), *The Supreme Court of the United States* (1928), and *Pan-American Peace Plans* (1929). Biographies were written by Merlo J. Pusey, *Charles Evans Hughes,* 2 vol. (1951), and Dexter Perkins, *Charles Evans Hughes and American Democratic Statesmanship* (1956).

Hughes, David (Edward) (b. May 16, 1831, London—d. Jan. 22, 1900, London), Anglo-American inventor of the carbon microphone, which was important to the development of telephony. His family emigrated to the United States when he was seven years old. In 1850 he became professor of music at St. Joseph's College, Bardstown, Ky. Five years later he took out a U.S. patent for a type-printing telegraph instrument; its success was immediate, and in 1857 Hughes took it to Europe, where it came into widespread use and in some places continued in use until the 1930s. Hughes's microphone, invented in 1878, was the forerunner of the various carbon microphones now in use.



David Hughes, engraving by Delzers after a photograph
By courtesy of the International Telecommunications Union

Hughes, Howard (Robard) (b. Dec. 24, 1905, Houston, Texas, U.S.—d. April 5, 1976, in an airplane over southern Texas), U.S. manufacturer, aviator, and motion-picture producer much publicized for his aversion to publicity as well as for the uses to which he put his vast wealth.

He studied at the California Institute of Technology, Pasadena, and later at the Rice Institute of Technology, Houston. Orphaned at 17, he quit school and took control of his father's Hughes Tool Company, Houston. In 1926 he moved to Hollywood, where he produced *Hell's Angels* (1930) and *Scarface* (1932) and introduced Jean Harlow and Paul Muni to the screen. Later *The Outlaw* (1941) introduced Jane Russell.

In 1948 he bought a controlling interest in RKO Pictures Corporation, sold the shares in 1953, bought the whole company in 1954, selling it again in 1955. He remained chairman of the board until 1957.

In the field of aviation he founded the Hughes Aircraft Company, Culver City, Calif., using the profits to finance the Howard Hughes Medical Institute. On Sept. 12, 1935, in an airplane of his own design, he established the world's landplane speed record of 352.46 miles (567.23 kilometres) per hour. On Jan. 19, 1937, in the same craft, he averaged 332 miles per hour in lowering the transcontinental flight-time record to 7 hours 28 minutes. Flying a Lockheed 14, he circled the Earth in a record 91 hours 14 minutes in July 1938. From 1942 he worked on the design of an eight-engine, wooden flying boat intended to carry 750 passengers. In 1947 he piloted this machine on its only flight—one mile.

Never an extrovert, Hughes went into complete seclusion in 1950. As the holder of 78 percent of the stock of Trans World Airlines, he refused to appear in court to answer antitrust charges and thus lost control of the organization by default. In 1966 he sold his TWA shares for more than $500,000,000. His penchant for privacy and seclusion aroused unusual interest in his whereabouts and often entangled him in controversy. This culminated in 1971 in a scandal over what were purported to be his memoirs, which were bought for book and magazine publication at sums totalling $1,000,000. The manuscript, and letters concerning it supposedly written by Hughes, were subsequently found to be fraudulent and forged.

In his final years he abruptly moved his residence from one place to another (Bahamas, Nicaragua, Canada, England, Las Vegas, Mexico), arriving at each new destination unnoticed, taking elaborate precautions to ensure absolute privacy in a luxury hotel, and rarely being seen by anyone except a few male aides. Often working for days without sleep in a black-curtained room, he became emaciated and deranged from the effects of a meagre diet and an excess of drugs. He died on a flight from Acapulco, Mex., to Houston, Texas, U.S., to seek medical treatment.

After his death there arose considerable legal debate over the disposition of his estate. Several "wills" appeared, including one found in the offices of the Mormon church in Salt Lake City, but all were eventually declared to be forgeries.

Hughes, John (b. June 24, 1797, Annaloghan, County Tyrone, Ire.—d. Jan. 3, 1864, New York City), first Roman Catholic archbishop of New York, who became one of the foremost American Roman Catholic prelates of his time. Hughes immigrated in 1816 to the United States, studied at Mount St. Mary's College, Emmitsburg, Md., and was ordained priest in 1826. After serving several parishes in Philadelphia, where he founded the *Catholic Herald* newspaper, he was consecrated (1838) coadjutor to Bishop John Dubois of New York. He succeeded Dubois in 1842. In 1850 he became archbishop of New York.



John Hughes
By courtesy of Fordham University, New York

Hughes' arguments for state support of parochial schools led to the creation of the U.S. parochial school system. He publicly defended Catholicism against the anti-Catholic Know-Nothing movement and fought the radical Irish press established in New York by political exiles. During the Civil War (1861–65), he helped end the critical draft riots in the city (1863) and visited Europe as Pres. Abraham Lincoln's personal agent in a successful effort to counteract pro-Southern feeling in France, Rome, and Ireland. He founded St. John's College (now Fordham University) and was a leader in the establishment of St. Joseph's Provincial Seminary, Troy, N.Y., and the North American College in Rome. John R.G. Hassard's *Life of the Most Reverend John Hughes* appeared in 1866.

Hughes, John Ceiriog, pseudonym CEIRIOG, or SYR MEURIG GRYNSWTH (b. Sept. 25, 1832, Llanarmon Dyffryn Ceiriog, Denbighshire, Wales—d. April 23, 1887, Caersws, Montgomeryshire), poet and folk musicologist who wrote outstanding Welsh-language lyrics.

After working successively as a grocer's helper, a clerk in Manchester, and a railway official in Wales, Hughes began winning poetry prizes in the 1850s and thereafter published several volumes of verse, the first being *Oriau'r Hwyr* (1860; "Evening Hours"). Many of his lighthearted lyrics (totalling about 600) were adapted to old Welsh tunes; others were set to original music by various composers. He investigated the history of old Welsh airs and of the harpists with whom the tunes were identified. Of his projected four-volume compendium of Welsh airs, one volume, *Canto Ganeuon* (1863; "A Hundred Poems"), appeared. He also wrote many satirical prose letters, collected in *Gohebiaethau Syr Meurig Grynswth* (1948; "Correspondence of Syr Meurig Grynswth").

Hughes, (James Mercer) Langston (b. Feb. 1, 1902, Joplin, Mo., U.S.—d. May 22, 1967, New York City), black poet and



Langston Hughes, photograph by Jack Delano, 1942
By courtesy of the Library of Congress, Washington, D.C.

writer who became, through numerous translations, one of the foremost interpreters to the world of the black experience in the United States. Hughes's parents separated soon after his birth, and young Hughes was raised by his mother and grandmother. After his grandmother's death, he and his mother moved to half a dozen cities before reaching Cleveland, where they settled. His poem "The Negro Speaks of Rivers," written the summer after his graduation from high school in Cleveland, was published in *Crisis* (1921) and brought him considerable attention.

After attending Columbia University (1921–22), he explored Harlem, forming a permanent attachment to what he called the "great dark city." He worked as a steward on a freighter bound for Africa. Back from seafaring and sojourning in Europe, he won an *Opportunity* magazine poetry prize in 1925. He received the Witter Bynner Undergraduate Poetry Award in 1926.

While working as a busboy in a hotel in Washington, D.C., Hughes put three of his own poems beside the plate of Vachel Lindsay in the dining room. The next day, newspapers around the country reported that Lindsay had discovered a Negro busboy poet. A scholarship to Lincoln University in Pennsylvania followed, and before Hughes received his degree in 1929, his first two books had been published.

The Weary Blues (1926) was warmly received. *Fine Clothes to the Jew* (1927) was criticized harshly for its title and for its frankness, but Hughes himself felt it represented a step forward. A few months after graduation *Not Without Laughter* (1930), his first prose work, had a cordial reception. In the '30s his poetry became preoccupied with political militancy; he travelled widely in the Soviet Union, Haiti, and Japan and served as a newspaper correspondent (1937) in the Spanish Civil War. He published a collection of short stories, *The Ways of White Folks* (1934), and *The Big Sea* (1940), his autobiography up to the age of 28.

Hughes wrote *A Pictorial History of the Negro in America* (1956), and the anthologies *The Poetry of the Negro* (1949) and *The Book of Negro Folklore* (1958; with Arna Bontemps). He also wrote numerous works for the stage, including the lyrics for *Street Scene,* an opera with music by Kurt Weill. A posthumous book of poems, *The Panther and the Lash* (1967), reflected the black anger and militancy of the 1960s. Hughes translated the poetry of Federico García Lorca and Gabriela Mistral. He was also widely known for his comic character Jesse B. Semple, familiarly called Simple, who appeared in Hughes's columns in the *Chicago Defender* and the New York *Post* and later in book form and on the stage.

Hughes, Richard (Arthur Warren) (b. April 19, 1900, Weybridge, Surrey, Eng.—d. April 28, 1976, near Harlech, Gwynedd, Wales), British writer whose novel *A High Wind in Jamaica* (1929; filmed 1965; original title *The Innocent Voyage*) is a minor classic of 20th-century English literature.

Hughes was educated at Charterhouse School, near Godalming, Surrey, and at Oriel College, Oxford, from which he graduated in 1922, the same year in which his one-act play *The Sister's Tragedy* was produced in London. In 1924 his radio play *Danger,* believed to be the first radio play, was broadcast by the British Broadcasting Corporation. *Gipsy-Night, and Other Poems* (1922) was followed four years later by a collection of verses, *Confessio Juvenis,* and short stories, *A Moment of Time.* He travelled widely in the United States and the Caribbean, contributed to literary journals, and in the early 1930s was vice chairman of the Welsh National Theatre. After *A High Wind in Jamaica* came *In Hazard,* an allegorical novel of the sea (1938). During World War II he worked for the Admiralty. His *Fox in the Attic* (1961) was the first part of a projected trilogy, *The Human Predicament,* dealing with upper-class English and Germans between World Wars I and II; the second volume, *The Wooden Shepherdess,* was published in 1973, but the third volume was left incomplete at his death. His books for children include *The Spider's Palace* (1931) and *Gertrude's Child* (1966).

Hughes, Sir Samuel (b. Jan. 8, 1853, Darlington, Canada West—d. Aug. 24, 1921, Lindsay, Ont., Can.), Canadian politician, soldier, educator, journalist, and statesman. He was minister of militia and defense (1911–16) and was responsible for moving Canadian troops to Europe at the beginning of World War I (1914–18).

Hughes was a teacher and a member of the

voluntary militia. In 1885–97 he was proprietor and editor of the *Warder,* a newspaper in Lindsay. After one unsuccessful attempt, Hughes was elected to the Canadian House of Commons for North Victoria in 1892, in which he sat until 1921, except during the South African War (1899–1902).

In 1897 he was promoted to lieutenant colonel in command of the 45th Regiment. During the South African War he organized lines of communication in South Africa. He returned to Canada in 1900 and was made a full colonel in 1902.

Hughes became minister of militia and defense in 1911, and, with the outbreak of war in 1914, he proceeded to organize, train, and equip the Canadian Expeditionary Force for service in Europe. He was knighted in 1915. Hughes resigned from office in 1916 after a disagreement with the prime minister, Sir Robert Laird Borden.

Hughes, Ted, byname of EDWARD J. HUGHES (b. Aug. 16, 1930, Mytholmroyd, Yorkshire, Eng.), English poet whose most characteristic work is without sentimentality, emphasizing the cunning and savagery of animal life in harsh, sometimes disjunctive lines.

The dialect of Hughes's native West Riding area of Yorkshire set the tone of his verse. At Pembroke College, Cambridge, he found folklore and anthropology of particular interest, a concern that was reflected in a number of his poems. In 1956 he married the American poet Sylvia Plath. The couple made a visit to the United States in 1957, the year that his first volume of verse, *The Hawk in the Rain,* was published. Other works soon followed. *Selected Poems,* with Thom Gunn (a poet whose work is frequently associated with Hughes's as marking a new turn in English verse), was published in 1962.

Hughes stopped writing poetry almost completely for nearly three years following Plath's suicide in 1963 (the couple had separated earlier), but thereafter he published prolifically, often in collaboration with photographers and illustrators, as in *Under the North Star* (1981). He wrote many volumes for children, including *Remains of Elmet* (1979), in which he recalled the world of his childhood. From 1965 he was coeditor of the magazine *Modern Poetry in Translation* in London. In 1984 he was appointed Britain's poet laureate.

Hughes, Thomas (b. Oct. 20, 1822, Uffington, Berkshire, Eng.—d. March 22, 1896, Brighton, Sussex), British jurist, reformer, and novelist best known for *Tom Brown's School Days.*

Hughes was educated at Rugby School from 1834 to 1842. His love for the great Rugby headmaster Thomas Arnold and for games and boyish high spirits are admirably captured in *Tom Brown's School Days* (1857). The book's success—it ran into nearly 50 editions by 1890—did much to create an enduring image of the public-school product and to popularize the doctrine of "muscular Christianity."

From 1842 to 1845 Hughes was at Oriel College, Oxford, and *Tom Brown at Oxford* (1861), a less-successful sequel, gives a picture of life there at that time. He then studied law and was called to the bar in 1848. His admiration for the religious reformer Frederick Denison Maurice led him to join the Christian Socialists and, in 1854, to become a founder member of the Working Men's College, of which he was principal from 1872 to 1883. His simple, earnest approach to religion and his robust patriotism show plainly in his tracts *A Layman's Faith* (1868) and *The Manliness of Christ* (1879). A Liberal member of Parliament from 1865 to 1874, he became queen's counsel in 1869 and a county court judge in 1882. In 1870 he visited the United States, and in 1879 he made an unsuccessful and financially draining attempt to found a cooperative settlement in Rugby, Tenn.

Hughes, William Morris (b. Sept. 25, 1862, London, Eng.—d. Oct. 28, 1952, Sydney, Australia), prime minister of Australia from 1915 to 1923 and a mainstay of national politics for 50 years.

Hughes emigrated to Queensland in 1884. After working for the unionization of maritime workers in Sydney, he was elected to the New South Wales legislature in 1894 as a Labor Party member. He entered the first federal Parliament in 1901 and served as attorney general in the three ministries of Andrew Fisher between 1908 and 1915. He helped establish a national system of defense (1909) and judicial arbitration in labour disputes.



William Morris Hughes
By courtesy of the Australian Information Service

Hughes succeeded Fisher as prime minister in 1915, during World War I, and emerged as a charismatic wartime leader. When the electorate and the Labor Party rejected his conscription proposal of 1916, he helped form the Nationalist Party, remaining prime minister as the head of that party. At the Paris Peace Conference of 1919, he gained Australian control over German New Guinea and successfully opposed a racial equality clause sponsored by Japan for inclusion in the League of Nations covenant. Following a rebuff in the elections of 1922 by Earle Page's Country Party, he slipped from the centre of power.

Hughes contributed to Stanley Bruce's defeat in 1929 and served in the Cabinet (1934–41) under the United Australian Party administrations of Joseph Lyons and Sir Robert Menzies. When the Labor Party came back into power in 1941, Hughes sat on the Advisory War Council (1941–44) and maintained his seat in Parliament until his death. His memoirs were published in *Crusts and Crusades* (1947) and *Policies and Potentates* (1950).

Hughes Medical Institute, in full HOWARD HUGHES MEDICAL INSTITUTE, American philanthropic foundation, established in 1953 by the aviator and industrialist Howard Hughes. From its offices in Bethesda, Md., the organization subsidizes biomedical research at hospitals and universities throughout the United States, chiefly in the fields of genetics, immunology, cell biology, structural biology, and the neurosciences. It also provides educational funding. Although it was originally created by Hughes as a tax shelter, the institute is now one of the world's largest and most powerful charities.

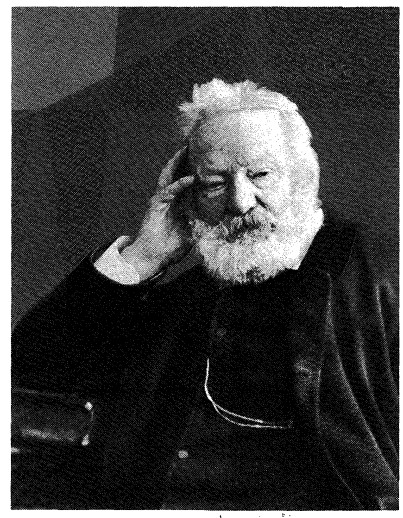
Hūgli (India): *see* Hooghly River.

Hugo, Victor(-Marie) (b. Feb. 26, 1802, Besançon, Fr.—d. May 22, 1885, Paris), poet, dramatist, and novelist, the most important of the French Romantic writers and, in later life, a politician and noted political writer. His most famous novels were *Notre-Dame de Paris* (1831; *The Hunchback of Notre-Dame*) and *Les Misérables* (1862).

Early years (1802–30). Victor was the third son of Joseph-Léopold-Sigisbert Hugo, a major and, later, general in Napoleon's army. The paternal family consisted of farmers and artisans; the maternal, seamen and lawyers. Victor claimed that he came of "a stock both Breton and Lorrain," but it was Paris, where he went to live with his mother when he was two years of age, that he called the birthplace of his soul.

Hugo's childhood was coloured by his father's constant traveling with the imperial army and by the disagreements that soon alienated his parents from one another. It was a chaotic time for Victor, continually uprooted from Paris to set out for Elba or Naples or Madrid, yet always returning to Paris, usually with his mother alone. Such an existence at least fed his mind on contemporary history, if it did not provide a settled upbringing. Nevertheless, his intellectual education did achieve a solid basis, especially in Latin literature.

From 1816, at least, Hugo had conceived ambitions other than the law, in which he was matriculating. He was already filling notebooks with verses that he would later refer to as "nonsense I perpetrated before my birth": translations—particularly from Virgil—two tragedies, a play, elegies. Encouraged by his mother and excited by the dazzling example of François-René de Chateaubriand, the author, diplomatist, and statesman, Hugo founded a review, the *Conservateur Littéraire* (1819–21), in which his own articles on the poets Alphonse de Lamartine and André de Chénier stand out. His mother died in 1821, and a year later Victor married a childhood friend, Adèle Foucher. In that same year he published his first book of poems, *Odes et poésies diverses,* which earned him a pension from Louis XVIII, and a year later he published his first novel, *Han d'Islande,* which in 1825 appeared in an English translation as *Hans of Iceland,* with illustrations by the caricaturist George Cruikshank. Charles Nodier, a journalist and himself author of novels of fantasy, was enthusiastic about the novel and drew Hugo into the group of friends, all devotees of Romanticism, who met regularly at the Bibliothèque de L'Arsenal, where he was curator. Hugo continued to frequent this literary circle, called the Cénacle, though he sometimes professed indifference to the theoretical distinctions it debated. Hugo emerged as a true Romantic, however, with the publication in 1827 of his verse drama *Cromwell* and a once-famous preface. Though immensely long and almost impossible to stage, the drama was written in verse of great force and originality.



Hugo, photograph by Nadar (Gaspard-Félix Tournachon)
Archives Photographiques

Success (1830–51). The defense of freedom and the cult of an idealized Napoleon in such poems as the ode "À la Colonne" and "Lui" brought Hugo into touch with the liberal

group of writers on the newspaper *Le Globe,* and his move toward liberalism was strengthened by Charles X's restrictions on the liberty of the press as well as by the censor's prohibiting the stage performance of his play *Marion de Lorme* (1829), the story of a courtesan purified by love. He immediately retorted with *Hernani,* the first performance of which, on Feb. 25, 1830, gained victory for the young Romantics over the traditional Classicists in a literary battle. The actual impact of the play owed less to the plot than to the sound and beat of the verse, softened only in the elegiac passages spoken by Hernani and Doña Sol. The triumph of *Hernani* was due to the student audience, for it was an homage from a youth to youth.

Hugo had derived his early renown from his plays; he gained wider fame in 1831 with his historical novel *The Hunchback of Notre-Dame,* an evocation of medieval life under the reign of Louis XI. The novel condemned a society that, in the persons of Frollo the archdeacon and Phoebus the soldier, heaped misery on the hunchback Quasimodo and the gypsy Esmeralda. The theme touched the public consciousness more deeply than had that of his previous novel, *Le Dernier Jour d'un condamné* (1829), the story of a condemned man's last day, in which Hugo launched a humanitarian protest against the death penalty. He later renewed this theme in *Claude Gueux* (1834). While *Notre-Dame* was being written, Louis-Philippe, a constitutional king, had been brought to power by the students and the liberal bourgeois in the three days of the July Revolution. Hugo composed a poem in their honour, *Dicté aprés juillet 1830;* it was a forerunner of much political verse.

Four books of poems came from Hugo in the period of the July Monarchy: *Les Feuilles d'automne* (1831), intimate and personal in inspiration; *Les Chants du crépuscule* (1835), overtly political; *Les Voix intérieures* (1837), both personal and philosophical; *Les Rayons et les ombres* (1840), in which the poet, renewing these different themes, indulged his gift for colour and picturesque detail.

So intense was Hugo's creative activity during these years that, having at last achieved a production of *Marion de Lorme* in 1831, he continued to pour out plays. There were two motives for this: first, he needed a platform for his political and social ideas, and, second, he wished to write parts for a young and beautiful actress, Juliette Drouet, with whom he had begun a liaison in 1833. Juliette had little talent and soon renounced the stage in order to devote herself exclusively to him, becoming the discreet and faithful companion she was to remain until her death in 1883.

Hugo's literary achievement was recognized in 1841 by his election, after three unsuccessful attempts, to the Académie Française and by his nomination in 1845 to the Chamber of Peers. From this time he almost ceased to publish, partly because of the demands of society and political life but also as a result of personal loss: his daughter Léopoldine, recently married, was accidentally drowned with her husband in September 1843. He was travelling with Juliette Drouet when it happened and learned the news from a paper. His intense grief found some mitigation in poems that later appeared in *Les Contemplations,* a volume that he divided into "Autrefois" and "Aujourd'hui," the moment of his daughter's death being the mark between yesterday and today. He found relief above all in working on a new novel, which became *Les Misérables,* published in 1862 after work on it had been set aside for a time and then resumed. Other distractions were a liaison with the wife of an artist, Léonie Biard, herself a writer, and, because of his close friendship with Louis-Philippe and his daughter-in-law, the Duchess of Orléans, an assiduous attendance at court festivities. It seemed as if he wished to forget his personal sorrows and the menace of social unrest, but in fact his writings both in verse and in prose reflect his troubled mind, and it was in his grief that his genius matured.

Exile (1851–70). When in December 1851 a coup d'etat took place, which eventually resulted in the Second Empire under Napoleon III, Hugo made one attempt at resistance and then fled to Brussels. His exile was to last until the return of liberty and the reconstitution of the republic on Sept. 4, 1870. Enforced at the beginning, exile later became a voluntary gesture and, after the amnesty of 1859, an act of pride. He remained in Brussels for a year until, foreseeing expulsion, he took refuge on British territory. He first established himself on Jersey, where he remained from 1852 to 1855. When he was expelled from there he moved to the neighbouring island of Guernsey. During this exile of nearly 20 years he produced the most extensive part of all his writings and the most original. It was accomplished in virtual solitude—his only companion, except for his family and the ever-faithful Juliette, was the restless sea. *Les Châtiments* ranks among the most powerful satirical poems in the French language. All Hugo's future verse profited from this release of his imagination: the tone of this collection of poems is sometimes lyrical, sometimes epic, sometimes moving, but most often virulent. The inspiration behind *Les Châtiments,* with its undertone of national and personal frustration, was borne out by a feeling sustained and developed in all his subsequent work, however flawed by the repetition and blemishes that were its inevitable accompaniment.

Despite the satisfaction he derived from his political poetry, Hugo wearied of its limitations and, turning back to the unpublished poems of 1840–50, set to work on a volume of "pure poetry," *Les Contemplations* (1856). The apocalyptic approach to reality dominated the poet's inspiration; it was the source of those epic or metaphysical poems for which there has been growing admiration among modern readers: *La Fin de Satan* and *Dieu*—poems of vast scope, the first a tapestry of resplendent visions, the second tense with urgent debate, both of them confrontations of the problem of evil. Written between 1854 and 1860, they were not published until after his death because his publisher preferred the little epics based on history and legend, the "Petites Épopées" of *La Légende des siècles* (1859). These, which for Hugo himself formed a single poem with the metaphysical epics, are the summit of his art; they display all his spiritual power without sacrificing his exuberant capacity to tell a story. Hugo's personal mythology of the human struggle between good and evil lies behind each of the legends: Eve's motherhood is exalted in "Le Sacre de la femme"; mankind liberating itself from all religions in order to attain divine truth is the theme of "Le Satyre"; and "Plein Ciel" proclaims, through utopian prediction of men's conquest of the air, the poet's conviction of indefinite progress toward the final unity of science with moral awareness. Hugo was a prophet of the modern world at a moment when his century was foundering in religious disbelief.

Yet he was prudent enough not to overtax his readers' comprehension. After the publication of three long books of poetry, he turned to prose and took up his abandoned novel, *Les Misérables.* Its extraordinary success with readers of every type when it was published in 1862 brought him instant popularity in his own country, and its speedy translation into many languages won him fame abroad. Set in the swarming Parisian underworld, it has the plot of a detective story but is the epic of the people of Paris as well.

Last years (1870–85). The defeat of France in the Franco-German War and the proclamation of the Third Republic brought Hugo, faithful to his vow, back to Paris. He agreed to play his part in public affairs as a deputy in the National Assembly (1871) but resigned the following month. Though he still fought for his old ideals, he no longer possessed the same energies. The trials of recent years had aged him, and there were more to come: in 1863 a daughter had eloped to America, and nine years later she returned to France insane; in 1868 he had lost his wife, Adèle, a profound sadness to him; in 1871 one son died and in 1873, another. Increasingly detached from life around him, the poet of *L'Année terrible,* in which he recounted the siege of Paris during the "terrible year" of 1870, had become a national hero. He went on with his task, his gaze fixed on the horizons closing in. In March 1871, outraged by the terms of the peace treaty after the siege, insurrectionists seized power in Paris and established a council called the Commune, which was not suppressed until the end of May. The episode of the commune, which met with Hugo's disapproval, found him once more at Brussels, and he was again expelled for giving shelter to the defeated rebels. After a temporary refuge in Luxembourg he returned to Paris, where he was elected senator. During 1872–73 he was in Guernsey for the writing of *Quatrevingt-treize* and the preparation of his remaining works for publication. In 1878 he was stricken by cerebral congestion, but he lived on for some years in the Avenue d'Eylau, renamed Avenue Victor-Hugo on his 80th birthday. Two years after the death of Juliette, his faithful companion, he died, was given a national funeral, lay in state under the Arc de Triomphe, and was buried in the Panthéon.

Reputation. Hugo's enormous output is unique in French literature; it is said that he used to write each morning 100 lines of verse or 20 pages of prose. "The most powerful mind of the Romantic movement," as he was described in 1830, laureate and peer of France in 1845, he went on to assume the role of an outlawed sage who, with the easy consciousness of authority, put down his insights and prophetic visions in prose and verse, becoming at last the genial grandfather of popular literary portraiture and the national poet who gave his name to a street in every town in France.

This instinctive recognition of Hugo as a great poet at the time of his death was followed by a period of critical neglect. A few of his poems were remembered, and *Les Misérables* continued to be widely read; his poetic art was prized by the few, and the generosity of his ideas and the warmth of their expression still moved the public mind. What the novelist François Mauriac has called "the heroism of banality" made him a poet of the common man, because he knew how to write with simplicity and power of common joys and sorrows. There was another side to this people's poet—what Paul Claudel called his "panic contemplation" of the universe, the numinous fear that penetrates his sombre poems *La Fin de Satan* and *Dieu.* He knew, as the poet Charles Baudelaire wrote of him, how to evoke the ambience of mystery. His knowledge of the resources of French verse and his technical virtuosity in metre and rhyme, moreover, rescued French poetry from the sterility of the 18th century.

André Gide, when asked whom he considered the greatest French poet, replied "Victor Hugo, alas," explaining that if it was a regrettable fact at least it was fact. The time has come to replace this ambiguous verdict by that of another poet, Léon-Paul Fargue: "Victor Hugo, un poète d'avenir," which might be translated as "a poet who has time on his side." Poet of the real and the surreal, Hugo must be accepted whole. (J.-B.Ba./Ed.)

MAJOR WORKS. *Poetry. Odes et poésies diverses* (1822); *Nouvelles Odes* (1824); *Odes et ballades* (1826, enlarged 1828 to include earlier poems and collections); *Les Orientales* (1829); *Les Feuilles d'automne* (1831); *Les Chants du crépuscule* (1835); *Les Voix intérieures* (1837); *Les Rayons et les ombres* (1840); *Les Châtiments* (1853); *Les Contemplations* (1856); *La Légende des siècles* (3 series: 1859, 1877, 1883); *Les Chansons des rues et des bois* (1865); *L'Année terrible* (1872); *L'Art d'être grand-père* (1877); *Les Quatre Vents de l'esprit* (1881). Posthumously published poems and collections include the unfinished *La Fin de Satan* (1886, written 1854–60) and *Dieu* (1891, written 1855); *Toute la lyre* (1888, 2 series; 1893, 1 series); *Les Années funestes, 1852–1870* (1898).

Novels. Han d'Islande (1823); *Bug-Jargal* (1826); *Le Dernier Jour d'un condamné* (1829); *Notre-Dame de Paris* (1831); *Claude Gueux* (1834); *Les Misérables* (1862); *Les Travailleurs de la mer* (1866); *L'Homme qui rit* (1869); *Quatrevingt-treize* (1874).

Drama (poetic). *Cromwell* (1827); *Marion de Lorme* (written 1829); *Hernani* (1830); *Le Roi s'amuse* (1832); *Ruy Blas* (1838); *Les Burgraves* (1843). (Prose): *Amy Robsart* (1828, from Sir Walter Scott's novel *Kenilworth* of 1821); *Lucrèce Borgia* (1833); *Marie Tudor* (1833); *Angelo, tyran de Padoue* (1835); *Théâtre en liberté* (posthumously 1886, collects plays written 1854 onward).

Prose (critical). The preface to *Cromwell* (1827); *Littérature et philosophie mêlées* (1834); *William Shakespeare* (1864). (Political): *Napoléon le petit* (1852); *Histoire d'un crime* (1877, written 1852); *Actes et paroles,* 4 series: 1, *Avant l'exil,* 1841–51; 2, *Pendant l'exil,* 1852–70; 3 and 4, *Depuis l'exil,* 1870–85 (collection of articles, essays, etc., from papers and periodicals). (Descriptive): *Le Rhin* (1842); *Alpes et Pyrenées* (posthumously 1890); *La France et la Belgique* (posthumously 1894). The posthumous *Choses vues,* 2 vol. (1887–99), contains descriptive pieces, notes, and observations.

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Huguenot, any of the Protestants in France who developed during the 16th-century Protestant Reformation and who suffered severe persecution for their faith for many years. The origin of the name is uncertain, but it was evidently applied to the French Protestants from about the middle of the 16th century.

After the Reformation began in Germany (1517), Luther's writings circulated widely in Europe, and the reform movement began in France. The French Protestants soon experienced persecution, however, and the first French martyr was burned at the stake in 1523. In October 1534 Catholic opinion was alarmed and shocked when placards virulently attacking the mass were found in the streets and in the royal palace. Many Protestants, including John Calvin, were forced to flee.

Nevertheless, Protestantism continued to spread in France and soon had supporters among the nobility. Persecution continued and individual executions began to give way to massacres. Under King Henry II the prisons were filled with Huguenots.

In 1559 the scattered Huguenot congregations met in a synod in Paris and drew up a confession of faith. They were greatly influenced by the ideas of John Calvin, and thus French Protestants became a Reformed rather than a Lutheran church.

In 1562 the Wars of Religion began in France and continued intermittently until 1598. A famous incident of this period was the Massacre of St. Bartholomew's Day, which began in Paris on Aug. 23, 1572, and spread throughout France. Nearly all the leading Huguenots in Paris were slain, and thousands were killed in the rest of the country. War was resumed after the massacre and continued, with short-lived intermissions, throughout the reign of the unpopular Henry III, who succeeded Charles IX in 1574. After the assassination of Henry III in 1589, his successor, Henry IV, a Protestant, could pacify the kingdom only by becoming a Catholic (July 1593). In 1598 Henry promulgated the Edict of Nantes, which granted the Huguenots their religious and political freedom.

But civil wars occurred again in the 1620s under King Louis XIII. Eventually the Huguenots were defeated, and the Peace of Alais was signed on June 28, 1629, whereby the Huguenots were allowed to retain their freedom of conscience but lost all their military advantages. No longer a political entity, the Huguenots became loyal subjects of the king. Their remaining rights under the Edict of Nantes were confirmed by a royal declaration in 1643 on behalf of the infant king, Louis XIV.

The French Catholic clergy, however, could not accept the Huguenots and worked to deprive them of their rights. General harassment and the forcible conversion of thousands of Protestants took place for many years. Finally, on Oct. 18, 1685, Louis XIV pronounced the revocation of the Edict of Nantes. As a result, over the next several years, France lost more than 250,000 of its Protestant citizens. They fled primarily to England, Prussia, Holland, or America.

In the first part of the 18th century, the Huguenots seemed to be finally eliminated. In 1715, Louis XIV announced that he had ended all exercise of the Protestant religion in France. That same year, however, an assembly of Protestants held a conference at Nîmes devoted to restoring the Protestant Church. Although much reduced in number, Protestantism persisted in France.

Persecution of the Huguenots was revived from 1745 to 1754, but French public opinion began to turn against the persecutions. In spite of fierce opposition by the Roman Catholic clergy, an edict in 1787 restored in part the civil rights of the Huguenots. In 1789, during the French Revolution, the National Assembly affirmed the liberty of religion and granted Protestants admission to all offices and professions. *See also* Reformed Church of France.

Hugues (French personal name): *see under* Hugh.

Huguet, Jaime (b. *c.* 1415—d. 1492), influential Spanish painter, the last important master of Catalan Gothic painting, established in Barcelona in 1448, where many of his best surviving works are to be seen. With the aid of assistants he produced many large, composite altarpieces. His style, reflecting French, Italian, and Flemish influences, is distinguished by a combination of highly individualized heads and a purely decorative treatment of costume and background ornamented with patterned and embossed gold.

Huho Haote (China): *see* Hohhot.

Hui, also spelled HWEI, or HUI-HUI, also called T'UNG-KAN, Burmese PATHAY, Russian DUNGAN, Chinese Muslims, intermingled with the Han Chinese throughout China but concentrated chiefly in northwest China, with fewer numbers along the Burma–China frontier. The term T'ung-kan is said to derive from a Central Asian Turkic word meaning convert.

The Hui are descended from Chinese converted to Islām and from their intermarriage with Turkic Islāmic tribes of northwest China who settled in Kansu, parts of Shensi, and former Ningsia provinces, chiefly in the 14th and 15th centuries. Islāmization resulted largely from the adoption of Chinese children by Turkic people.

In the late 1970s the Hui, of which there were about 6,400,000, were concentrated in the city of Ku-ch'eng in Hopeh Province, in the cities of Wu-lu-mu-ch'i, Ha-mi, T'u-lu-fan, and Ma-na-ssu in Sinkiang Uighur Autonomous Region, in cities and towns of eastern Kansu, and in parts of northeastern Tsinghai. Their appearance, language, and other cultural characteristics are distinctly Chinese. In Kansu there were about 2,000,000 Hui, organized into two autonomous prefectures and three autonomous counties. Their traditional mode of life was irrigation farming and merchandising.

Some Chinese Muslims, called Dungan, numbering about 52,000 at the 1979 census, have settled in the Soviet Union in the villages and towns of the Dzhambul *oblast* (region) of the Kazakh Soviet Socialist Republic and the Uzbek and Kirgiz S.S.R.'s.

Hui-chou (Anhwei Province, China): *see* She-hsien.

Hui-chou, Pinyin HUIZHOU, city in Kwangtung Province (*sheng*), China. Hui-chou is a county-level municipality (*shih*) and is the administrative headquarters of the Hui-yang Prefecture (*ti-ch'ü*), which embraces most of the drainage area of the Tung Chiang (river). The city stands on the Tung Chiang about 45 mi (70 km) northeast of Hong Kong and 75 mi east of Canton. It has always been a strategic and communication centre, commanding the eastern approaches to Canton. Hui-chou is a regional agricultural market and commercial centre; it is the collecting centre for a rich agricultural district producing large quantities of fruit and sugarcane. It has a number of sugar refineries and rice hulling plants. Hui-chou has good river and highway communications and is also quite near the railway that runs from Canton to Kowloon in Hong Kong. To the northeast of Hui-chou is a large hydroelectric installation on the T'ao Chiang, which is linked by a power grid to Canton. Pop. (1958 est.) 73,000; (mid-1970s est.) 50,000–100,000.

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hui-kuan, Pinyin HUIGUAN, series of guildhalls established by regional organizations (*t'ung-hsiang hui*) in different areas of China during the Ch'ing dynasty (1644–1911/12) as places where merchants and officials from the same locale could obtain food, shelter, and assistance while away from home.

The *hui-kuan* were originated at Peking by the provincial guild of the southern Chinese province of Kwangtung. Eventually, they were constructed in all the major urban centres of the country. In the national and provincial capitals, the *hui-kuan* were often used by examination candidates coming to the city to compete in the civil service tests necessary for admission to the government bureaucracy.

The *hui-kuan* were instrumental in building a feeling of solidarity among the members of a province or a certain region and played an important function in the growth of trade and commerce throughout the Ch'ing dynasty.

Hui-neng, Pinyin HUINENG (b. 638, southwest Kwangtung Province, China—d. 713, Kwangtung), the sixth great patriarch of Zen (Ch'an in Chinese) Buddhism and founder of the Southern school, which became the dominant school of Zen, both in China and in Japan.

As a young and illiterate peddler of firewood, Hui-neng heard the *Chin-kang ching* ("Diamond Sutra") and traveled 500 miles to the area in North China where the fifth Ch'an patriarch, Hung-jen (601–674), was expounding this text. According to legend, in a dramatic poetry contest in 661 the senior monk, Shen-hsiu (605?–706), wrote, "The mind is the stand of a bright mirror. . . . / Do not allow it to become dusty," but Hui-neng wrote, "Buddha-nature is forever clear and pure, / Where is there any dust?" Thereupon the fifth patriarch transmitted the law to Hui-neng.

Hui-neng returned to South China, reaching Canton in 676. He was ordained priest and for the next 37 years propagated the law. In a sermon that has been recorded as the *Liu-Tsu t'an-ch'ing* ("Platform Scripture of the Sixth Patriarch"), he declared that all people possess the buddha-nature and that one's nature is originally pure. Instead of reading scriptures, building temples, making offerings, reciting the name of the Buddha, and praying for rebirth in paradise, one should simply seek to discover one's own nature, in which all buddhas and Buddhist doctrines are immanent. The way to discover one's own nature is through calm and wisdom, which will be attained when one is freed from deliberate thought and from attachment to things. The traditional method of sitting in meditation is useless, for tranquillity is not motionlessness but is the state of having an unperturbed inner nature and an absence of erroneous thought. If one sees one's own nature, enlightenment will follow—suddenly, without external help.

In pronouncing this radical doctrine of sudden enlightenment, Hui-neng rejected all traditional Buddhist concepts, works, and practices and created a wide schism between his Southern school and the Northern school led by Shen-hsiu, who had advocated gradual enlightenment.

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Hui Shih, Pinyin HUI SHI (b. 380 BC, Sung, in modern Honan, China), Chinese philosopher, an outstanding representative of the early Chinese school of thought known as the Dialecticians.

As a result of their preoccupation with pure logic, the Dialecticians have always been separated from the mainstream of Chinese philosophy, which was primarily concerned with the relationship between names and actuality. It is not surprising then that Hui Shih's writings, which at one time supposedly numbered more than could fill a cart, have been lost and that he is known only for his "Ten Paradoxes," which are quoted in the famous Taoist work *Chuang-tzu.* These paradoxes have attracted much interest in modern times because of their similarity to concurrent developments in Western philosophy, especially the famous paradoxes of the Greek philosopher Zeno of Elea (*c.* 495–*c.* 430).

Generally speaking, Hui Shih's doctrine, which bears some resemblance to Taoist thought, is based on a theory of relativity growing out of an atomistic view of space and time. His first paradox is "the greatest has nothing within itself and is called the great unit, the smallest has nothing within itself and is called the small unit." The *Chuang-tzu,* in what many have felt to be a not injudicious appraisal of Hui Shih as a thinker, says that his "doctrines were contradictory and his sayings missed the truth."

In spite of criticism, Hui apparently had a great following in his day and traveled throughout China with his disciples, advising kings and ministers. He became a minister of the state of Liang and wrote a new code of law that found favour with both the ruler and the people of the state. According to tradition, he was so successful in his public service that King Hui of Liang (ruled 371–320 BC) once offered the state to him.

Hui Tsung, Pinyin HUI ZONG, also called SUNG HUI-TSUNG (b. 1082—d. 1135), eighth and penultimate emperor (reigned 1100–25) of the Northern Sung dynasty, best-remembered as both a patron of the arts and a painter and calligrapher.

Hui Tsung sought escape from affairs of state in the pleasures of arts and letters. He urged painters in his academy of painting to depict objects that were "true to colour and form," inviting an extreme literalness of representation; and his own paintings of birds and flowers were detailed, accurately coloured, and perfectly composed. He is also known as a calligrapher who excelled in an elegantly mannered style known as "slender gold." Hui Tsung sponsored the compilation of a major catalog of artists' biographies and paintings known to his court from the 3rd century to his time, known as the *Hsüan-ho hua p'u* ("Catalog of Paintings of the Hsüan-ho Emperor").



"The Five Coloured Parakeet," hand scroll in colour on silk by Emperor Hui Tsung; in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston, Maria Antoinette Evans Fund

Politically, Hui Tsung's reign was fatal to the Northern Sung dynasty. He promoted Taoism at the court and sought comfort and amusement in the arts, in amorous affairs, and in the construction of an extravagant new palace garden. He busied himself with requisitioning colourful stones, rare plants, and exotic pets for this garden while leaving the administration of the state to others. Political disputes between conservatives and reformers went unresolved while the emperor's favourite eunuchs gained unprecedented power in the government.

Threatened by the expanding Liao Empire in the north, Hui Tsung formed an alliance with the Juchen tribes of Manchuria (now the Northeast Provinces). The resulting victory over the Liao was wholly illusory, since it was the Juchen who turned out to be the real menace. In mounting crisis, Hui Tsung abdicated in 1125 in favour of his son, Ch'in Tsung, who reigned for less than two years. In 1127 the invading Juchen ended the Northern Sung dynasty and sacked the Sung capital (K'ai-feng). Both Hui Tsung and his son were captured and lived in exile in Manchuria under miserable conditions until their deaths.

Hui-yüan, Pinyin HUIYUAN (b. AD 334, Yen-men, Shansi, China—d. 416, Lu-shan, Hupeh), celebrated early Chinese Buddhist priest who formed a devotional society of monks and lay worshipers of the Buddha Amitābha. The society inspired the establishment in later centuries (6th–7th) of the Ch'ing-t'u (Pure Land) cult, which is today the most popular form of Buddhism in East Asia. On his advice, the ruler of the Eastern Chin dynasty (317–419) exempted Buddhist monks from having to bow before the emperor, on the grounds that they were far removed from ordinary mortals.

As a child, Hui-yüan is said to have been a student of Taoism and Confucianism, becoming a convert to Buddhism only after meeting the famous Buddhist monk Tao-an. In his teachings, Hui-yüan attempted to utilize native Chinese philosophy, especially Taoist thought, to explain some of the more esoteric Buddhist concepts. The result was a philosophy that emphasized salvation through faith; if one merely uttered the name of the Buddha Amitābha in loving adoration, after death one's spirit was offered a heavenly abode in the Western Paradise. These ideas, which eventually challenged Taoism as the major religious inspiration of the Chinese peasantry, spread throughout China in the century following Hui-yüan's death, partially because of the great prestige associated with his name.

Hui Zong: *see* Hui Tsung.

Huichol and Cora, neighbouring Middle American Indian peoples living in the states of Jalisco and Nayarit in western Mexico. Numbering together about 30,000 in the late 20th century, they inhabit a mountainous region that is cool and dry. The Huichol and Cora languages are about as closely related as Spanish and Italian and are next most closely related to Nahua, the language of the Nahua peoples of central Mexico and the language of the Aztecs. The Huichol and Cora, however, are perhaps culturally closer (as well as linguistically related) to the Uto-Aztecan Indians of northwestern Mexico.

The people are farmers, planting corn (maize), beans, squash, and cucumbers in steep hillside plots. Burning is used to clear undergrowth, plows and planting sticks being the chief cultivating implements. Most families keep a cow for milk and cheese, and sheep are sometimes kept for wool; however, very little meat is eaten. Other barnyard animals are also kept, and hunting, fishing, and gathering of wild foods augments farming. Neither the Huichol nor the Cora commonly live in villages but, rather, have households in the



Huichol Indian making an arrow
By courtesy of the American Museum of Natural History, New York

countryside clustered in loose groups of one to 12; these are called rancherias. Community centres consist of a church or Huichol temple, public buildings, sometimes schools or jails, and houses that are kept by some families to live in when they are at the centre. The rancherias may be quite isolated from such community centres.

Simple pottery is still made, particularly among the Cora. Weaving on the native backstrap loom is still done. The principal articles made are sashes, carrying bags, and wool blankets. Other crafts include cord making and embroidery. Dress is traditional or semitraditional: men wear muslin shirts and pants, sandals, and hats but may add embroidered sashes and shoulder bags and assorted jewelry; women wear long muslin skirts, long-sleeved blouses, sandals, and a cape (*quechquemitl*) over the head or the shoulders.

Ritual kinship is an important social institution among the Huichol and Cora. Resembling that practiced elsewhere in Middle America, it involves the choice of godparents at important points in the life of a child or in the lives of his parents. Both the Huichol and Cora are nominally Roman Catholic and practice some Catholic rituals. Patron saints are often identified with native gods, however, and native pagan religious ceremonies play a central role among both groups. Both also use peyote in certain rites.

Huidobro (Fernández), Vicente García (b. Jan. 10, 1893, Santiago, Chile—d. Jan. 2, 1948, Santiago), Chilean poet, self-proclaimed father of the short-lived avant-garde movement known as Creacionismo (*q.v.*; Creationism). Huidobro was a prominent figure in the post-World War I literary vanguard in Paris and Madrid as well as at home in Chile, and he did much to introduce his countrymen to contemporary European, especially French, innovations in poetic form and imagery.

In 1916, after publishing several collections of poetry in Chile and achieving recognition and notoriety for such literary manifestos as *Non serviam* (1914; "I Will Not Serve"), in which he rejected the entire poetic past, Huidobro went to Paris. There he collaborated with the avant-garde French poets Guillaume Apollinaire and Pierre Reverdy on the influential literary review *Nord-Sud* ("North-South"). During this period Creationism was invented, whether by him or Reverdy is moot; certainly Huidobro was its most vociferous exponent. In *Poemas árticos* (1918; "Arctic Poems") and *Saisons choisies* (1921; "Chosen Seasons"), the latter in French, he exemplified his Creationist theories with incongruous juxtapositions of striking images and random, seemingly irrational, sequences of words and letters of the alphabet.

Huidobro went to Madrid in 1918, where he was enthusiastically received in avant-garde literary circles and where in 1921 he was one of the founders of Ultraísmo (*q.v.*; Ultraism), the Spanish offshoot of Creationism. Traveling frequently between Europe and Chile, he was largely responsible for creating the climate of literary experimentation, based on French models, that prevailed in post-World War I Chile. He accomplished this as much through his well-publicized exploits (such as his semiserious candidacy for the presidency of Chile), as through his frequent magazine articles and poetry.

Continuing to write in the Creationist idiom in such novels as *Sátiro o el poder de las palabras* (1939; "Satyr or the Power of Words"), Huidobro also remained a prolific poet in that style long after the movement itself had collapsed. Huidobro's vogue faded for a time, but his work exerted a strong influence on later Latin-American poets.

huiguan (Chinese guildhalls): *see* hui-kuan.

Huila, department, southwestern Colombia, occupying the Andean Cordilleras (mountains) Oriental and Central, which are separated by the upper Magdalena River Valley. Created in 1905, it covers an area of 7,680 square miles (19,890 square km) and is named for the snowcapped mountain Nevado del Huila (17,844 feet [5,439 m]), which dominates much of the landscape. Since the colonial period, this part of the Upper Magdalena Valley has been primarily a livestock-raising area; with the improvement of irrigation, however, agriculture (especially cotton) has become increasingly important.

The San Agustín archaeological zone, with its giant stone figures, lies in the southernmost part of the department. The department capital of Neiva (*q.v.*) is the southern terminus of a railroad to Bogotá, Girardot, and Ibagué. A highway runs through the river valley and branches in the south to Popayán in Cauca department (west) and to Florencia in Caquetá department (east). Pop. (1985) 647,756.

Huineng (Buddhist leader): *see* Hui-neng.

Huiracocha (Inca god): *see* Viracocha.

huisquil (plant): *see* chayote.

Huitoto (people): *see* Witoto.

Huitrinian Stage, major division of Cretaceous rocks and time in Chile and Argentina (the Cretaceous Period began about 136,000,000 years ago and lasted about 71,000,000 years). Rocks of the Huitrinian Stage underlie those of the Diamantian and overlie rocks of the Mendocian Stage.

The Huitrinian consists of between 60 and 150 m (200 and 500 feet) of nonmarine sandstones, shales, gypsum and salt beds, and dolomites; marine rocks do occur, however, in the Patagonian region of Argentina. In the Andes the Huitrinian is represented by thick volcanic rocks with thin, interbedded marine beds.

Huitzilopochtli, also spelled UITZILOPOCHTLI (from Nahuatl *huitzilin,* "hummingbird," and *opochtli,* "left"), Aztec sun and war god. Because the Aztecs believed dead warriors were reincarnated as hummingbirds and because the south was considered the left side of the world, Huitzilopochtli's name, therefore, meant the "resuscitated warrior of the south." His other names included Xiuhpilli ("Turquoise Prince") and Totec ("Our Lord"). His nahual, or animal disguise, was the eagle.

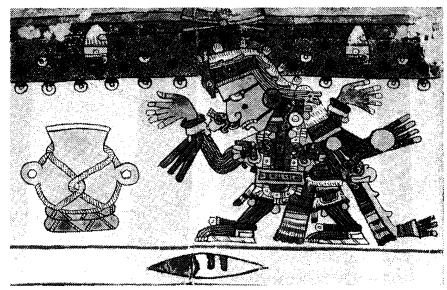
Traditionally, Huitzilopochtli was thought to have been born on the Coatepec Mountain, near the city of Tula. His mother, Coatlicue, an earth goddess, conceived him after having kept in her bosom a ball of hummingbird feathers (*i.e.,* the soul of a warrior) that fell from the sky. His brothers, the Centzon Huitznáua ("Four Hundred Southerners"), stars of the southern sky, and his sister Coyolxauhqui, a moon goddess, decided to kill him, but he exterminated them with his weapon, the *xiuhcóatl* ("turquoise snake").

Other myths presented Huitzilopochtli as the divine leader of the tribe during the long migration that brought the Aztecs from Aztlan, their traditional home, to the Valley of Mexico. His image, in the form of a hummingbird, was carried upon the shoulders of the priests, and at night his voice was heard giving orders. Thus, according to Huitzilopochtli's command, Tenochtitlán, the Aztec capital, was founded in AD 1325 on a small, rocky island in the lake of the Valley of Mexico. The god's first shrine was built on a spot where priests found an eagle poised upon a rock and devouring a snake. Successive Aztec rulers enlarged the shrine until the year Eight Reed (1487), when an impressive temple was dedicated by the emperor Ahuitzotl.

Representations of Huitzilopochtli usually showed him as a hummingbird or as a warrior with armour and helmet made of hummingbird feathers. His legs, arms, and the lower part of his face were painted blue; the upper half of his face was black. He wore an elaborate feathered headdress and brandished a round shield and a turquoise snake.

The 15th month of the ceremonial year, Panquetzaliztli ("Feast of the Flags of Precious Feathers"), was dedicated to Huitzilopochtli and to his lieutenant Paynal ("He Who Hastens," so named because the priest who impersonated him ran while leading a procession around the city). During the month, warriors and *auianime* ("courtesans") danced night after night on the plaza in front of the god's temple. War prisoners or slaves were bathed in a sacred spring at Huitzilopochco (modern Churubusco, near Mexico City) and were then sacrificed either during Paynal's procession or after it on the sacrificial stone of the temple. The priests also burned a huge bark-paper serpent symbolizing the god's primary weapon. Finally, an image of Huitzilopochtli, made of ground maize (corn), was ceremonially killed with an arrow and divided between the priests and the novices; the young men who ate "Huitzilopochtli's body" were obliged to serve him for one year.

The Aztecs also believed that the sun god needed daily nourishment (*tlaxcaltiliztli*)—that is, human blood and hearts—and that they, as "people of the sun," were required to provide the sun god with his victims. The sacrificial hearts were offered to the sun *quauhtlehuanitl* ("eagle who rises") and burned in the *quauhxicalli* ("the eagle's vase"). Warriors who died in battle or on the sacrificial stone were called *quauhteca* ("the eagle's people"). It was believed that after their death the warriors first formed part of the sun's brilliant retinue; then, after four years, they went to live forever in the bodies of hummingbirds.



Huitzilopochtli supporting the southern quarter of the heavens, illustration in the Codex Borgia, 14th–16th century; in the Vatican Library
By courtesy of the Biblioteca Apostolica Vaticana

Huitzilopochtli's high priest, the Quetzalcóatl Totec Tlamacazqui (Feathered Serpent, Priest of Our Lord), was, with the god Tlaloc's high priest, one of the two heads of the Aztec clergy.

Huiyuan (Buddhist philosopher): *see* Hui-yüan.

Huizhou (Kwangtung Province, China): *see* Hui-chou.

Huizinga, Johan (b. Dec. 7, 1872, Groningen, Neth.—d. Feb. 1, 1945, De Steeg), Dutch historian internationally recognized for his *Herfsttij der middeleeuwen* (1919; *The Waning of the Middle Ages,* 1924).

Huizinga was educated at the universities of Groningen and Leipzig. After teaching history in Haarlem and lecturing in Indian literature at Amsterdam, he was professor of history first at Groningen (1905–15) and then at Leiden until 1942, when he was held as a hostage by the Nazis. He remained under open arrest until his death.

His first works dealt with Indian literature and cultures, but he established his reputation with *The Waning of the Middle Ages,* which examines life and thought in France and Holland of the 14th and 15th centuries. Its lively and well-modulated style makes the work literature as well as history, as is also true of *Erasmus* (1924; Eng. trans., 1924), a sympathetic study of a central intellectual figure of the 16th century. Huizinga's other chief works are *In de schaduwen van Morgen* (1935; *In the Shadow of Tomorrow,* 1936), "a diagnosis of the spiritual distemper of our time," and *Homo Ludens* (1938; Eng. trans., 1949), a study of the play element in culture.

Hukbalahap Rebellion, also called HUK REBELLION (1946–54), a Communist-led peasant uprising in central Luzon, Philippines. The name of the movement is a Tagalog acronym for Hukbo ng Bayan Laban sa Hapon meaning "People's Anti-Japanese Army." The Huks came close to victory in 1950 but were subsequently defeated by a combination of advanced U.S. weaponry supplied to the Philippine government and administrative reforms under the charismatic Philippine president Ramon Magsaysay.

The central Luzon plain is a rich agricultural area where a large peasant population worked as tenant farmers on vast estates. The visible contrast between the wealthy few and the poverty-stricken masses was responsible for periodic peasant revolts during the Spanish period of Philippine history. During the 1930s central Luzon became a focus for Communist and Socialist organizational activities.

World War II brought matters to a head. Unlike many other Southeast Asians, the Filipinos offered strong resistance against the Japanese. After the fall of Bataan to the Japanese (April 1942), organized guerrilla bands carried on the fight for the remainder of the occupation period. The Hukbalahap organization proved highly successful as a guerrilla group and killed thousands of Japanese troops. The Huks regarded wealthy Filipinos who collaborated with the Japanese as fair targets for assassination, and by the end of the war they had seized most of the large estates in central Luzon. They established a regional government, collected taxes, and administered their own laws.

The returning U.S. Army was suspicious of the Huks because of their Communist leadership. Tension between the Huks and the Philippine government immediately arose over the issue of surrender of arms. The Huks had gathered an estimated 500,000 rifles and were reluctant to turn them over to a government they regarded as oligarchic.

Philippine independence from the United States was scheduled for July 4, 1946. An election was held in April for positions in the new government. The Hukbalahap participated, and the Huk leader Luis Taruc won a seat in Congress but—along with some other Huk candidates—was unseated by the victorious Liberal Party. The Huks then retreated to the jungle and began their long rebellion. Immediately after independence, Philippine president Manuel Roxas announced his "mailed fist" policy toward the Huks. The morale of government troops was low, however, and their indiscriminate retaliations against villagers only strengthened Huk appeal. During the next four years, the Manila government steadily slipped in prestige while Huk strength increased. By 1950 the guerrillas were approaching Manila, and the Communist leadership decided the time was ripe for a seizure of power.

The Huks suffered a crucial setback when government agents raided their secret headquarters in Manila. The entire Huk political leadership was arrested in a single night. At the same time, Huk strength was dealt another blow when U.S. president Harry Truman, alarmed at the worldwide expansion of Communist power, authorized large shipments of military supplies to the Manila government.

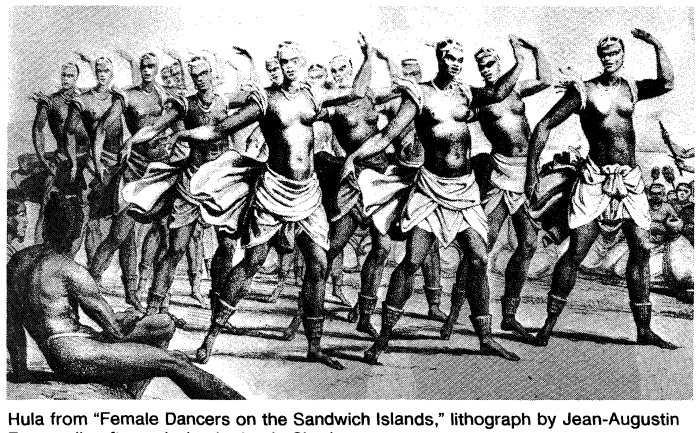
Another factor in the Huk defeat was the rise to power of the popular Ramon Magsaysay. His election as president in 1953 signalled a swing of popular support back to the Manila government. In 1954 Taruc emerged from the jungle to surrender, and the Hukbalahap Rebellion, for all practical purposes, came to an end.

The Huk movement and its leadership persisted, however, operating primarily from a stronghold in Pampanga province (Luzon Island). With the failure of subsequent Philippine administrations to implement the long-promised land reforms, the Huks—although split into factions and, in some areas, merged with new insurgent groups—continued into the 1970s as an active anti-government organization.

hula, sensuous, mimetic Hawaiian dance, performed sitting or standing, with undulating gestures to instruments and chant. Originally the hula was a religious dance performed by trained dancers before king or people to promote fecundity, to honour the gods, or to praise the chiefs. Wristlets and anklets of whale teeth or bone and necklaces and fillets of leis (interwoven flowers) were common ornaments. The women wore short skirts (*pa'us*) and the men tapa loincloths (*malos*).

In 1820 New England missionaries compelled the native women to replace their hula skirts with long dresses (*holokus*). The resulting loss of sensuality in the dance was balanced in the music by expansion, under the influence of hymns, of the two- or three-note scale of the Hawaiian chant (*mele*). Further modification of the hula came when Portuguese sailors introduced the *machada,* the small guitar from which the ukelele developed.

Contemporary hulas primarily tell a story or describe a place through sinuous movements of the limbs and hips. Costumes may be skirts of raffia, fresh-cut ti leaves, or bright cellophane; and instruments, besides the ukelele and steel guitar, include the calabash, seed-filled gourds, split bamboo sticks, stones used as castanets, and *pahu* drums.



Hula from "Female Dancers on the Sandwich Islands," lithograph by Jean-Augustin Franquelin after a design by Louis Choris

By courtesy of the Bernice P. Bishop Museum, Honolulu, Hawaii

Ḥula, ʿEmeq, English HULA VALLEY, valley in upper Galilee, northeast Israel, occupying most of the course of the Jordan River north of the Sea of Galilee. It is bounded by Tel Dan and the settlement of Maʿyan Barukh (north), the Golan Heights (east), by the Hills of Naphtali (west), and on the south it slopes gradually down to the Sea of Galilee. It is approximately 16 mi (25 km) long, 4 mi wide, and covers an area of about 68 sq mi (177 sq km).

Because of the low natural gradient of the Jordan, the valley has been a swampy site throughout recorded history, being first mentioned as a rice-growing area in *c.* 3rd-century rabbinic literature. The former Lake Ḥula had an area of about 5½ sq mi, and surrounding swamps covered almost 12 sq mi. These areas were considerably enlarged during the annual winter rains. Down to modern times, the Ḥula was a malarial area, inhabited only by a few primitive Arab villagers. The pioneering settlement of Yesud ha-Maʿala (founded 1883) was the first effort at modern colonization. The valley was otherwise left desolate until the 1930s; papyrus and water lilies flourished, and the swamps were inhabited by water buffalo, wild boar, and many species of migratory birds.

In 1934 the southern portion of the valley was bought from its Syrian-Arab owners by the Palestine Land Development Company, and later more land was acquired and numerous communal settlements (kibbutzim) founded. In 1951 the project of draining the Ḥula began, and by 1958 the lake and swamps had disappeared, except for a small section retained as a nature reserve. More than 25 mi of drainage and irrigation canals were built; the basalt dike at the north end of the Sea of Galilee was blasted away to provide a better channel for the Jordan, canalized through most of the valley. The work was hindered by armed attacks from adjoining Syria.

The total land area reclaimed or greatly improved, more than 22 sq mi, provides some of Israel's richest farmland. It has been planted with grains, fodder crops, fruits (especially apples), peanuts (groundnuts), cotton, vegetables, and bulbs for export. About one-fourth of Israel's fishponds are in the valley, and beef cattle are important. At the northwest of the

drained area, the planned city of Qiryat Shemona (*q.v.*) has been established to serve as the urban and industrial centre for the region.

Hülegü, also spelled HULAGU (b. *c.* 1217—d. Feb. 8, 1265, Jazīreh-ye-Shāhī, Il-Khanid Iran), Mongol ruler in Iran who founded the Il-Khan dynasty and, as part of a Mongol program of subduing the Islāmic world, seized and sacked Baghdad, the religious and cultural capital of Islām. Some historians consider that he did more than anyone else to destroy medieval Iranian culture.

Hülegü, a grandson of Genghis Khan, was appointed by his brother Mangu Khan, the fourth great khan of the Mongols, to extend Mongol power in Islāmic areas. Hülegü destroyed the fortress of the Assassins (a militant Islāmic sect) in 1256 at Alāmut in north central Iran. He then defeated the Caliph's army and captured and executed al-Musta'ṣim, the last of the 'Abbāsid caliphs, and in 1258 he seized and largely destroyed Baghdad. He captured Syria but was decisively defeated by an Egyptian army in 1260. He then returned to Iran, settling in the province of Azerbaijan.

Hull, city, seat of Outaouais region, southwestern Quebec province, Canada, on the north bank of the Ottawa River, opposite Ottawa, Ont. Originating in the early 19th century as a lumbering settlement named for Hull, Yorkshire, Eng., the city grew to become the chief business and administrative centre for southwestern Quebec and the industrial centre for metropolitan Ottawa. Abundant timber resources and hydroelectric power from Chaudière Falls support large pulp, paper, and match factories; other industries include printing, meat-packing, and the manufacture of cement, textiles, steel, clothing, and furniture. Hull is the seat of a Roman Catholic diocese. Inc. 1875. Pop. (1981) 56,225.

Hull (England): *see* Kingston upon Hull.

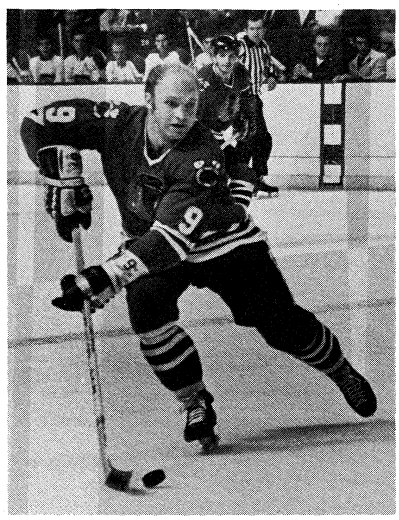
Hull, Albert Wallace (b. April 19, 1880, Southington, Conn., U.S.—d. Jan. 22, 1966, Schenectady, N.Y.), U.S. physicist who independently discovered the powder method of X-ray analysis of crystals, which permits the study of crystalline materials in a finely divided microcrystalline, or powder, state. He also invented a number of electron tubes that have found wide application as components in electronic circuits.

After he received his Ph.D. from Yale University (1909) and had taught for a few years, Hull began work as a research physicist for General Electric Company (1914) and served (1928–50) as assistant director of its research laboratory in Schenectady.

Hull devised the powder method in 1917, unaware that this technique had been discovered the previous year by Peter Debye and Paul Scherrer; he was the first to determine the crystal structure of iron and most of the other common metals. After completing his crystallographic work, he returned to research in electronics with great success. His inventions included the thyratron, a gas-filled tube used to control high-power circuits, and the magnetron, an oscillator used to generate microwaves.

Hull, Bobby, byname of ROBERT MARVIN HULL, JR. (b. Jan. 3, 1939, Point Anne, Ont., Can.), Canadian professional ice hockey player for the National Hockey League (NHL) Chicago Black Hawks (1957–72). His swinging slap shot made him one of hockey's dominant scorers in his time.

At the age of 12 Hull was playing organized hockey on a team with his father. He was put on the Black Hawk's negotiating list, and thereafter he played amateur hockey with financial support for his education by the club. He dropped out of St. Catherines (Ont.) Collegiate School to join the Black Hawks in 1957, at first playing centre but later forward.



Bobby Hull, 1969
Canada Wide—Pictorial Parade

In the 1959–60 season he led the NHL in scoring with 39 goals. In the 1961–62 season he matched Maurice Richard's 1944–45 season 50-goal record. In 1965–66 he established a new record with 54 goals, 43 assists, and 97 points. He had great skating speed to go with his bullet-like shot. He won the Art Ross Trophy for highest scorer (1960, 1962, and 1966), the Hart Trophy for most valuable player (1965 and 1966), and the Lady Byng Trophy for ability combined with sportsmanship (1965). Hull played with the Winnipeg Jets of the World Hockey Association (WHA) from 1972 to 1979 and with the NHL Hartford Whalers (1980–81) and then retired. In the 1974–75 season, he scored 77 goals. In the NHL he had 50 or more goals in five seasons and four such seasons in the WHA. In his career he scored 609 NHL goals, 555 assists, and 1,164 points; in the WHA, 303 goals, 335 assists, and 638 points. Both during his playing days and later, he raised cattle in Canada.

Hull, Clark L(eonard) (b. May 24, 1884, Akron, N.Y., U.S.—d. May 10, 1952, New Haven, Conn.), U.S. psychologist known for his experimental studies on learning and for his attempt to give mathematical expression to psychological theory. He applied a deductive method of reasoning similar to that used in geometry, proposing that a series of postulates about psychology could be developed, from which logical conclusions could be deduced and tested. If a test failed, the postulate could be revised, and if the test then succeeded, the findings would be added to the body of psychological science.

As a student at the University of Michigan at Ann Arbor, Hull became interested in psychology, receiving his Ph.D. from the University of Wisconsin, Madison, in 1918. He then joined the faculty at Wisconsin and worked on the prediction and measurement of aptitude, which led to his first major publication, *Aptitude Testing* (1928). He became interested in hypnosis, conducting experiments in the field after joining the Institute of Human Relations at Yale University in 1929. The results of his rigorous scientific studies formed the basis of *Hypnosis and Suggestibility* (1933).

During his early years at Yale, Hull began to formulate his global theory of behaviour, which he based on scientific, logical, and mathematical principles drawn from a variety of sources. He found a rationale in Darwinian natural selection, took certain ideas on conditioning from the Russian physiologist Ivan Pavlov, and agreed with Sigmund Freud on the fundamental role of motivation in behaviour. He also borrowed from U.S. psychologists, including John B. Watson, who emphasized the objective study of behaviour, and Edward L. Thorndike, who asserted the importance of reinforcement in learning.

The reinforcement theory of learning formed the basis for most of Hull's work. The theory explains behaviour in terms of stimulus and response, which become associated with each other in the learning process. The tendency for an association to be made is strengthened when reinforcement is given, that is, when the response reduces a physiological or psychological need. When a need such as hunger is less strong, as when an animal in a laboratory test is satiated, the reinforcement (for example, food) has less effect and the animal performs less well on learning tasks. On the other hand, Hull hypothesized that animals would learn more quickly the stronger the physiological need or drive and the more immediate the reward or reinforcement; this he later confirmed by experiment. Complex behaviour could be explained by a series of such simple response mechanisms, according to Hull. His learning theories were first presented in *Mathematico-Deductive Theory of Rote Learning* (1940), a collaboration with several co-workers, in which he expressed his findings through mathematics and formal logic. Hull believed that psychology had its own quantitative laws that could be stated in mathematical equations. He further developed these ideas in *Principles of Behavior* (1943), which suggested that the stimulus–response connection depends on both the kind and the amount of reinforcement. His lasting legacy to psychology is thought to be his approach to the study of behaviour, rather than the specifics of his theories.

Hull, Cordell (b. Oct. 2, 1871, Overton County, Tenn., U.S.—d. July 23, 1955, Bethesda, Md.), U.S. secretary of state (1933–44) whose initiation of the reciprocal trade program to lower tariffs set in motion the mechanism for expanded world trade in the 20th century; in 1945 he received the Nobel Peace Prize for his part in organizing the United Nations.



Cordell Hull, 1933
By courtesy of the National Archives, Washington, D.C.

As a young Tennessee attorney, Hull early identified with the Democratic Party. He served in the U.S. House of Representatives for 22 years (1907–21, 1923–31) and in the Senate (1931–33). Appointed secretary of state by Pres. Franklin D. Roosevelt at the beginning of the New Deal, he called for a reversal of high tariff barriers that had increasingly stultified U.S. foreign trade since the 19th century. He first won presidential support and public acclaim for such proposals at the inter-American Montevideo Conference (December 1933). He next succeeded in getting Congress to pass the Reciprocal Trade Agreements Act (March 1934), which set the pattern for tariff reduction on a most-favoured-nation basis and was a forerunner to the international General Agreement on Tariffs and Trade (GATT), begun in 1948.

Throughout the 1930s Hull did much to improve U.S. relations with Latin America by implementing what came to be known as the Good Neighbor Policy. At the Montevideo Conference his self-effacing behaviour and acceptance of the principle of nonintervention in the internal affairs of other nations began to counteract the distrust built up through decades of Yankee imperialism in Latin America. He also attended the Pan-American Conference at Buenos Aires (1936) and a special foreign ministers' conference at Havana (1940). Because of the favourable climate of opinion that he had largely created, Hull successfully sponsored a united front of American republics against aggression during World War II.

In East Asia, he rejected a proposed "Japanese Monroe Doctrine" that would have given that country a free hand in China (1934). When Japan served notice later that year that it would not renew the naval-limitation treaties (due to expire in 1936), Hull announced a policy of maintenance of U.S. interests in the Pacific, continuing friendship with China, and military preparedness.

With the outbreak of World War II, Hull and Roosevelt felt that efforts to maintain neutrality would only encourage aggression by the Axis powers; they therefore decided to aid the Allies. In the crucial negotiations with Japan in the autumn of 1941, Hull stood firm for the rights of China, urging Japan to abandon its military conquests on the mainland.

When the United States entered the war, Hull and his State Department colleagues began planning an international postwar peace-keeping body. At the Moscow Conference of Foreign Ministers (1943)—despite his frail health and advancing age—he obtained a four-nation pledge to continue wartime cooperation in a postwar world organization aimed at maintaining peace and security. For this work, President Roosevelt described Hull as "father of the United Nations," and universal recognition of his key role came with the Nobel Prize. He resigned after the 1944 presidential election, and wrote his *Memoirs of Cordell Hull* (1950).

Consult the INDEX *first*

Hull, Isaac (b. March 9, 1773, Huntington, Conn.—d. Feb. 13, 1843, Philadelphia), U.S. naval commodore noted for the victory of his ship the "Constitution" over the British frigate "Guerrière" in the War of 1812. The victory united the country behind the war effort and destroyed the legend of British naval invincibility.

Already master of a ship at age 19, Hull was commissioned a lieutenant aboard the "Constitution" in 1798. He distinguished himself in the undeclared naval war with France at that time and in the Tripolitan War (1801–05) and was promoted to captain in 1806 and became commander of the "Constitution" four years later.

Encountering a British squadron in July 1812 off Egg Harbor, N.J., Hull escaped through consummate seamanship after three days and nights in one of the most remarkable chases in naval history. Sailing eastward of Boston, the "Constitution" met the "Guerrière" on August 19. After considerable manoeuvring, under fire from the British ship, the American man-of-war delivered its first broadside, within pistol shot. In fewer than 30 minutes of close and violent action, the "Guerrière" was demasted and rendered a total wreck. The helpless hulk was burned, and Hull returned to the mainland a hero. He was recognized as one of the navy's ablest commanders, and his ship became known as "Old Ironsides."

Relieved of his command at his own request, Hull commanded harbour defenses at New York City and at three navy yards. He was



Isaac Hull, detail from a pencil sketch by L. Pellegrin, 1841
By courtesy of the U.S. Navy

one of the first three members of the Board of Naval Commissioners and commanded the U.S. squadron in the Pacific (1824–27) and the Mediterranean (1839–41). A biography, by Bruce Grant, is *Isaac Hull: Captain of Old Ironsides* (1947).

Hull, William (b. June 24, 1753, Derby, Conn.—d. Nov. 29, 1825, Newton, Mass., U.S.), U.S. soldier, civil governor of Michigan Territory (including present Michigan, Wisconsin, and part of Minnesota) who was the subject of a celebrated court martial.

A graduate of Yale College, Hull joined the American army during the Revolutionary War, serving in campaigns in Connecticut, New York, and New Jersey. Both before and after the war he practiced law, and in 1805 Pres. Thomas Jefferson named him governor of Michigan Territory. In 1812, at the outset of the war with Great Britain, he accepted a commission as brigadier general, in command of an army intended to defend Michigan and attack Canada. His invasion of Canada was clumsy and poorly planned; he retreated to Detroit and eventually, on Aug. 16, 1812, without a fight, surrendered his army and forts to the British.

A court matrial later convicted him of cowardice and neglect of duty and sentenced him to death. Pres. James Madison approved the findings but remitted the sentence. Hull's surrender was a severe blow to American morale during the remaining two years of war.

Hull House, one of the first social settlements in North America (*see* social settlement). It was founded in Chicago in 1889, when Jane Addams (*q.v.*) and Ellen Gates Starr rented an old abandoned residence at 800 South Halsted Street that had been built by Charles G. Hull in 1856. Twelve large buildings were added from year to year until Hull House covered half a city block and included a nearby playground and a large camp in the country.

Addams, after college, travelled extensively in Europe, studying the traditions, history, and lives of people in many countries, always seeking a way of life in which she could put her theories and convictions about human and social welfare into action. After visiting Toynbee Hall, a pioneer settlement founded by Canon S.A. Barnett in London's impoverished East End, and finding there a group of university undergraduate residents sharing companionship and intelligent interests and working for social reform, she and Starr decided to establish such a settlement in a comparable district in Chicago.

After raising enough funds to rent part of the Hull Mansion, Addams and Starr set out to aid the needy immigrants in the Halsted Street area. Hull House opened as a kindergarten, but soon expanded to include a day nursery and an infancy care centre. Eventually its educational facilities provided secondary and college-level extension classes as well as evening classes on civil rights and civic duties. Through increased donations more buildings were purchased, and Hull House became a complex, containing a gymnasium, social and cooperative clubs, shops, housing for children, and playgrounds.

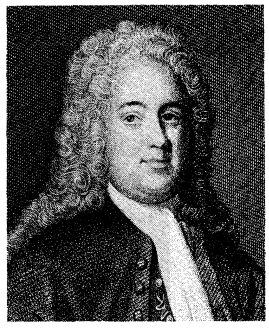
Many volunteers, who held professions in law, the arts, education, social work, and business, became residents of Hull House. These men and women provided education, art, music, recreation, and companionship for the young and the old. Addams, Starr, and other Hull House associates were instrumental in the enactment of state child labour laws and in the establishment of juvenile courts and juvenile protection agencies. In addition, they assisted in the development of local trade union organizations, social welfare programs, and adult education classes. They also contributed to the woman suffrage and the international peace movements.

The publication of *The Hull-House Maps and Papers* (1895), 12 books by Jane Addams, including *Twenty Years at Hull House* (1906), and works by such distinguished residents as Alice Hamilton, Florence Kelley, Julia Lathrop, and Jessie F. Binford, brought widespread attention to the settlement. Eventually, Hull House attracted visitors from all over the world, including leaders in government, science, education, labour, and social welfare, and consequently received international recognition.

In January 1961 plans to clear the area for a University of Illinois campus were announced by the city of Chicago. Legal protests by a community group organized to preserve Hull House and the neighbourhood were unsuccessful. In 1963 the trustees of Hull House sold its properties and adopted plans for decentralized operations in other parts of the city. The original Hull mansion and the adjoining dining hall were spared demolition and became museums.

Hüller, Johann Adam (German composer): *see* Hiller, Johann Adam.

Hulls, Jonathan (b. 1699, Campden, Gloucestershire, Eng.—d. 1758, London), British inventor, possibly the first person ever to devise detailed plans for a steam-propelled ship. In 1736 Hulls obtained a patent for a machine to carry "ships and vessels out of and into any harbour, port, or river against wind and tide or in a calm." This steam tugboat was illustrated in a pamphlet published in 1737.



Hulls, engraving
By courtesy of the Science Museum, London

Its stern paddle wheel was to be driven by a Newcomen atmospheric engine. To obtain continuous rotation of the paddle wheel, Hulls proposed the use of ratchet wheels driven by ropes from the piston. Neither the patent nor the pamphlet, however, led to a practical trial of Hulls's scheme.

Hulme, T(homas) E(rnest) (b. Sept. 16, 1883, Endon, Staffordshire, Eng.—killed in action Sept. 28, 1917, France), English aesthetician, literary critic, and poet, one of the founders of the Imagist movement and a major 20th-century literary influence. He posited the view that humanism, prevalent since the Renaissance, was coming to an end. His hatred of romantic optimism, his view of man as limited and absurd, his theology, which emphasized the doctrine of original sin, and his advocacy of a "hard, dry" kind of art and poetry foreshadowed the disillusionment of many writers of the 1920s.

Hulme was educated at Newcastle-under-Lyme grammar school and went to St. John's College, Cambridge but was expelled for rowdyism in 1904. Thereafter he lived mainly in London, translating the works of Henri Bergson and Albert Sorel and, with Ezra Pound, F.S. Flint, and Hilda Doolittle (H.D.), instigating the Imagist movement. Five of his poems were published in *New Age* (January 1912) and reprinted at the end of Pound's *Ripostes*. Before his death while fighting in World War I, Hulme defended militarism against the pacifism of Bertrand Russell.

Hulme published little in his lifetime, but his work and ideas sprang into fame in 1924, when his friend Herbert Read assembled some of his notes and fragmentary essays under the title *Speculations*. Additional compilations were edited by Read (*Notes on Language and Style*, 1929) and by Sam Hynes (*Further Speculations*, 1955). Many of his noted contemporaries hailed him as a great thinker. A.R. Jones's *The Life and Opinions of T.E. Hulme* (1960) is a critical biography.

Hulst, Hendrik Christoffel van de (b. Nov. 19, 1918, Utrecht, Neth.), Dutch astronomer who predicted theoretically the 21-centimetre radio waves produced by interstellar hydrogen atoms. His calculations later proved valuable in mapping the Milky Way Galaxy and were the basis for radio astronomy during its early development.

In 1944, while still a student, van de Hulst made theoretical studies of hydrogen atoms in space. The magnetic fields of the proton and electron in the hydrogen atom can align in either the same or opposite directions. Once every 10,000,000 years or so a hydrogen atom will realign itself and, van de Hulst calculated, emit a radio wave with a 21-centimetre wavelength.

Van de Hulst was appointed a lecturer in astronomy at the University of Leiden, Neth., in 1948 and four years later was made a professor. In addition to his work in radio astronomy, he made valuable contributions to the understanding of light scattering by small particles, the solar corona, and interstellar clouds.

Ḥulwān, also spelled HELWAN, or HILWAN, ancient settlement, now a southern suburb of Cairo, al-Qāhirah (Cairo) *muḥāfaẓah* (governorate), Lower Egypt, near the right bank of the Nile. After Egypt gained independence in 1952, it grew into an industrial suburb linked to Cairo by highway and electric railway.

The discovery of microliths (tiny flint tools) of the Upper Paleolithic and the excavation of a 1st–2nd-dynasty cemetery (*c.* 3100–*c.* 2686 BC) indicate that Ḥulwān was a centre of prehistoric and pharaonic settlement. Although not continuously occupied, its position on a bluff 100–190 ft (30–58 m) above the Nile low-water line rendered it safe from the annual summer flooding. It was known from early times for its mineral springs. According to Arabic sources ʿAbd al-ʿAzīz ibn Marwān, governor of Egypt, chose Ḥulwān for a settlement when the floods of AD 690 forced him to evacuate al-Fusṭāṭ (Old Cairo). It later declined, and with the advent of the Mamlūks the desert encroached upon it and filled up its medicinal springs. During the reign of Khedive (viceroy) ʿAbbās I (1849–54), the sulphurous springs were uncovered and used again. In 1869 baths were built at the spring, and remains of Umayyad-period (AD 661–750) baths were uncovered. The present baths date from 1892; after 1900 the centre flourished as a spa.

Industrial development began after the overthrow of the Egyptian monarchy in 1952. Beginning with a small iron and steel mill in 1958, rolling mills were added; further expansion was completed by the early 1980s to allow production of 1,500,000 tons per year. Aluminum, cement, fertilizer, and automotive assembly plants have been established in an industrial park at the base of the Jabal (hills) al-Muqaṭṭam, and the Egyptian defense industry has a plant complex there. Other industries include flour milling, food processing, and textile printing and dyeing. In the late 1970s the heavy industries began to convert to natural gas, supplied from the Abū al-Gharādīq gas fields in the Western Desert, through a distribution centre at Dahshūr. The second Suez–Mediterranean oil pipeline passes just south of the city. The former summer residence of King Farouk I, the national observatory (1904), with a 74-in. reflecting telescope, and Ḥulwān University (1976) are in the city. The meteorological station (1904) was one of the first in Egypt. Pop. (1983 est.) 227,600.

hum (landform): *see* pepino hill.

Humacao, town and municipality, eastern Puerto Rico, in the Sierra de Cayey foothills on the Río Humacao. Founded in 1793 as a town, it received the royal title *villa* in 1881. The modern town has light industry, including textiles, plastic products, and castor-oil extracting. It lies 5 mi (8 km) from its port, Playa de Humacao. Humacao is the terminus of one branch of the island's railway network, which links it to the port. The town has a regional college of the University of Puerto Rico.

The municipality, with an area of 45 sq mi (117 sq km), has six urban or partly urban and seven rural barrios (wards). It produces coffee, sugarcane, rice, and tobacco. Pop. (1980) town, 19,147; (1984 est.) mun., 52,400.

human behaviour, subject of research of modern psychology, comprising the expressed and potential capacity for activity in the physical, mental, and social spheres of human life.

A brief treatment of the development of human behaviour follows. For full treatment, *see* MACROPAEDIA: Behaviour, The Development of Human.

While the study of the development of human behaviour is sometimes restricted to the so-called formative years from birth through adolescence, it more properly treats behaviour as developing over the full course of the life cycle. Just as the human body undergoes change continuously from infancy through childhood, adolescence, adulthood, and old age, so human behaviour never reaches a fixed level of development. Behavioral development, in fact, is closely tied to bodily development, and the generally recognized states in the two coincide to a large degree. Various approaches to the study of human behaviour in the late 20th century may be distinguished by their relative emphasis on internal bodily or genetic (called endogenous) determinants of behaviour and external, environmental (or exogenous) influences. The prevailing approach posits the combined influence of "nature" and "nurture," whereby individuals are genetically predisposed toward certain behaviours that are to varying degrees subject to shaping by external factors.

The theories of Swiss psychologist Jean Piaget (1896–1980), which concern the period from birth through adolescence, provide a useful framework for discussion of mental development in conjunction with physical maturation. Piaget's sensorimotor stage of intelligence covers the first two years of life and traces the developmental elaborations of originally reflexive behaviours. Although the cerebral cortex of the brain is not fully functional in the newborn, the lower brain provides a set of behavioral reflexes at birth. While the newborn seems to be fairly capable visually, visual attention develops over the early months of infancy as more disparate stimuli are classified. Auditory development is very similar. Motor development in the child proceeds according to maturational changes in the neuromuscular systems. Infants cry from the time of birth and by the end of two months begin to make cooing and babbling sounds of excitement, which gradually become part of meaningful speech.

While the infant does not exhibit specific emotional responses at birth, he develops a differentiated attachment to his mother and by seven months of age begins to display signs of anxiety at the presence of strangers. The separation anxiety the infant experiences when his mother leaves is alleviated by his acquisition of the concept of object permanence, which enables an 18-month-old to anticipate his mother's return.

A child's development during preschool and early school years, termed the preoperational stage by Piaget, can be described in terms of cognition, motivation, and moral sensibility and takes place primarily in the setting of the child's interactions with his family. Cognition can be understood as the child's formulation of a set of intellectual units and a set of intellectual processes that can be used for purposes of problem solving and goal attainment. Schemata, which are abstract internal, mental representations of specific events, are the earliest units that the child is capable of formulating. Images are mental reconstructions from schemata that preserve temporal and spatial details. The child progresses to the use of symbols, which indicate a higher level of abstraction in the arbitrary naming of things and qualities, and to concepts, or the abstraction and classification of common attributes from a wide array of symbols and concepts. The child's dawning understanding of rules implies his ability to perceive relations among or between the dimensions of concepts.

Cognitive processes in the child are either undirected or directed, the former referring to the free thinking of dreams and reverie and the latter referring to the explicit problem-solving activities of perception, memory, and hypothesis formation. Perceiving entails the extraction of information from one's sensory environment and depends on the child's increasing powers of selection, organization, and interpretation. With the acquisition of language, beginning during the second year, the child's increasingly differentiated perceptions are labeled and utilized in expanding interactions with adults. As he increases his vocabulary, the child also develops the capacity to communicate in sentences, moving from simple two-word utterances to complex, grammatically correct sentences he has never heard before. Memory involves both the storage and retrieval of information for both recognition and recall purposes. Solving problems requires perceiving and remembering, as well as the developing of new concepts and rules through hypothesis generation and deductive thinking.

Although the individual child is ultimately known by his own actions, there are certain basic motivational characteristics that pertain to almost all children. One such characteristic is the desire to reduce feelings of aloneness or danger that can lead to anxiety. An even stronger motivation is the child's need for the love, protection, and care given to him by the adults around him, particularly his mother. Satisfaction of these basic motivations are the foundation for the child's growing interest in

the world around him and for his eventual desire to participate in the activities of that world, notably through the vehicle of play.

The child's moral sensibility develops rapidly during the middle childhood years. The American psychologist Lawrence Kohlberg describes movement across three moral levels, characterized by orientations toward (or against) punishment, approval, and, finally, individual conscience. Parents have a major effect on the developing child's moral sensibility during his first six years.

Adolescence begins with the advent of puberty, or maturation of the child's reproductive system. Many physical changes take place at this time, including a final growth spurt in height and weight (which occurs in girls some two years before boys). In this formal operational stage, according to Piaget, thinking becomes orderly and logical, and the individual learns to manipulate abstract ideas. The psychological issues of adolescence include independence, sexual identity, and vocational definition. The peer group is especially important, providing the adolescent with a place for self-expression, self-evaluation, approval, and self-definition.

Researchers have become increasingly interested in the patterns of change that characterize adult behaviour. What was once seen as a static period of maturity preceding eventual decline is now viewed as a period of development in its own right, during which the self-image comes under evaluation in terms of the individual's perceived adherence to principles, achievement of goals, and contributions to society. Similarly, behaviour in old age, while intimately allied to bodily changes, is coloured by the sense of integrity or wholeness, or the lack thereof, with regard to the earlier developmental stages. *See also* developmental psychology; physiological psychology.

human body, the physical substance of the human organism, composed of living cells and extracellular materials and organized into tissues, organs, and systems.

A brief treatment of the human body follows. For a depiction of the gross anatomy of the human male and female, *see* the colour Trans-Vision in the PROPAEDIA: Part Four, Section 421.

Human anatomy and physiology are treated in many different articles in the MACROPAEDIA. For detailed coverage of the body's biochemical constituents, *see* Biochemical Components of Organisms. For information on the structure and function of the cells that comprise the body, *see* Cells. For a general description of the tissues, organs, and systems of the body, *see* Tissues and Fluids; Organs and Organ Systems. For detailed discussions of specific tissues, organs, and systems, *see* Blood; Circulation and Circulatory Systems; Digestion and Digestive Systems; Endrocrine Systems; Excretion and Excretory Systems; Integumentary Systems; Muscles and Muscle Systems; Nerves and Nervous Systems; Reproduction and Reproductive Systems; Respiration and Respiratory Systems; Sensory Reception; Supportive and Connective Tissues. For a description of how the body develops, from conception through old age, *see* Growth and Development.

The MICROPAEDIA includes many entries on the body's major structures. For example, *see* abdominal cavity; adrenal gland; aorta; bone; brain; ear; eye; heart; kidney; large intestine; lung; nose; ovary; pancreas; pituitary gland; small intestine; spinal cord; spleen; stomach; testis; thymus; thyroid gland; tooth; uterus; vertebral column.

For a description of the place of the human body in the circle of learning and a complete list of both MACROPAEDIA and MICROPAEDIA articles on the subject, *see* PROPAEDIA: Part Four, Section 421.

Human beings are, of course, animals—more particularly, members of the order Mammalia in the subphylum Vertebrata of the phylum Chordata. Like all chordates, the human animal has a bilaterally symmetrical body that is characterized at some point during its development by a dorsal supporting rod (the notochord), gill slits in the region of the pharynx, and a hollow dorsal nerve cord. Of these features, the first two are present only during the embryonic stage in the human; the notochord is replaced by the vertebral column, and the pharyngeal gill slits are lost completely. The dorsal nerve cord is the spinal cord in human beings; it remains throughout life.

Characteristic of the vertebrate form, the human body has an internal skeleton that includes a backbone of vertebrae. Typical of mammalian structure, the human body shows such characteristics as hair, mammary glands, and highly developed sense organs.

Beyond these similarities, however, lie some profound differences. Among the mammals, only human beings have a predominately two-legged (bipedal) posture, a fact that has greatly modified the general mammalian body plan. (Even the kangaroo, which hops on two legs when moving rapidly, walks on four legs and uses its tail as a "third leg" when standing.) Moreover, the human brain, particularly that part called the neocortex, is far and away the most highly developed in the animal kingdom. As intelligent as are many other mammals—such as chimpanzees and dolphins—none have achieved the intellectual status of the human species.

Chemical composition of the body. Chemically, the human body consists mainly of water and of organic compounds, *i.e.,* lipids, proteins, carbohydrates, and nucleic acids. Water is found in the extracellular fluids of the body (the blood plasma, the lymph, and the interstitial fluid) and within the cells themselves. It serves as a solvent without which the chemistry of life could not take place. The human body is about 60 percent water by weight.

Lipids—chiefly fats, phospholipids, and steroids—are major structural components of the human body. Fats provide an energy reserve for the body, and fat pads also serve as insulation and shock absorbers. Phospholipids and the steroid compound cholesterol are major components of the membrane that surrounds each cell.

Proteins also serve as a major structural component of the body. Like lipids, proteins are an important constituent of the cell membrane. In addition, such extracellular materials as hair and nails are composed of protein. So also is collagen, the fibrous, elastic material that makes up much of the body's skin, bones, tendons, and ligaments. Proteins also perform numerous functional roles in the body. Particularly important are those cellular proteins called enzymes, which catalyze the chemical reactions necessary for life.

Carbohydrates are present in the human body largely as fuels, either as simple sugars circulating through the bloodstream or as glycogen, a storage compound found in the liver and the muscles. Small amounts of carbohydrates also occur in cell membranes, but, in contrast to plants and many invertebrate animals, humans have little structural carbohydrate in their bodies.

Nucleic acids make up the genetic materials of the body. Deoxyribonucleic acid (DNA) carries the body's hereditary master code, the instructions according to which each cell operates. It is DNA, passed from parents to offspring, that dictates the inherited characteristics of each human being. Ribonucleic acid (RNA), of which there are several types, helps carry out the instructions encoded in the DNA.

Along with water and organic compounds, the body's constituents include various inorganic minerals. Chief among these are calcium, phosphorus, sodium, magnesium, and iron. Calcium and phosphorus, combined as calcium-phosphate crystals, form a large part of the body's bones. Calcium is also present as ions in the blood and interstitial fluid, as is sodium. Ions of phosphorus, potassium, and magnesium, on the other hand, are abundant within the intercellular fluid. All of these ions play vital roles in the body's metabolic processes. Iron is present mainly as part of hemoglobin, the oxygen-carrying pigment of the red blood cells. Other mineral constituents of the body, found in minute but necessary concentrations, include cobalt, copper, iodine, manganese, and zinc.

Organization of the body. The cell is the basic living unit of the human body—indeed, of all organisms. The human body consists of more than 75,000,000,000,000 cells, each capable of growth, metabolism, response to stimuli, and, with some exceptions, reproduction. Although there are some 200 different types of cells in the body, these can be grouped into four basic classes. These four basic cell types, together with their extracellular materials, form the fundamental tissues of the human body: (1) epithelial tissues, which cover the body's surface and line the internal organs, body cavities, and passageways; (2) muscle tissues, which are capable of contraction and form the body's musculature; (3) nerve tissues, which conduct electrical impulses and make up the nervous system; and (4) connective tissues, which are composed of widely spaced cells and large amounts of intercellular matrix and which bind together various body structures. (Bone and blood are considered specialized connective tissues, in which the intercellular matrix is, respectively, hard and liquid.)

The next level of organization in the body is that of the organ. An organ is a group of tissues that constitutes a distinct structural and functional unit. Thus, the heart is an organ composed of all four tissues, whose function is to pump blood throughout the body. Of course, the heart does not function in isolation; it is part of a system composed of blood and blood vessels as well. The highest level of body organization, then, is that of the organ system.

The body includes nine major organ systems, each composed of various organs and tissues that work together as a functional unit. The chief constituents and prime functions of each system are summarized below. (1) The integumentary system, composed of the skin and associated structures, protects the body from invasion by harmful microorganisms and chemicals; it also prevents water loss from the body. (2) The musculoskeletal system (also referred to separately as the muscle system and the skeletal system), composed of the skeletal muscles and bones, moves the body and protectively houses its internal organs. (3) The respiratory system, composed of the breathing passages, lungs, and muscles of respiration, obtains from the air the oxygen necessary for cellular metabolism; it also returns to the air the carbon dioxide that forms as a waste product of such metabolism. (4) The circulatory system, composed of the heart, blood, and blood vessels, circulates a transport fluid throughout the body, providing the cells with a steady supply of oxygen and nutrients and carrying away such waste products as carbon dioxide and toxic nitrogen compounds. (5) The digestive system, composed of the mouth, esophagus, stomach, and intestines, breaks down food into usable substances (nutrients), which are then absorbed by the blood or lymph; this system also eliminates the unusable portion of the food as fecal matter. (6) The excretory system, composed of the kidneys, ureters, urinary bladder, and urethra, removes toxic nitrogen compounds and other

wastes from the blood. (7) The nervous system, composed of the sensory organs, brain, spinal cord, and nerves, transmits, integrates, and analyzes sensory information and carries impulses to effect the appropriate muscular or glandular responses. (8) The endocrine system, composed of the hormone-secreting glands and tissues, provides a chemical communications network for coordinating various body processes. (9) The reproductive system, composed of the male or female sex organs, enables reproduction and thereby ensures the continuation of the species.

Basic form and development. In general structure, the human body follows a plan that can be described as a cylinder enclosing two tubes and a rod. This body plan is most clearly evident in the embryo; by birth, the plan is apparent only in the trunk region—*i.e.*, in the thorax and abdomen.

The body wall forms the cylinder. The two tubes are the ventrally located alimentary canal (*i.e.*, the digestive tract) and the dorsally located neural tube (*i.e.*, the spinal cord). Between the tubes lies the rod—the notochord in the embryo, which becomes the vertebral column prior to birth.

Within the embryo, the essential body parts are: (1) the outer enclosing epidermal membrane (in the embryo called ectoderm); (2) the dorsal neural tube; (3) the supporting notochord; (4) the ventral alimentary tube, which becomes the lining of the stomach and intestine (in the embryo called entoderm); (5) the intermediate mass (in the embryo called mesoderm); and (6) a rather fluid tissue that fills the interspaces, derived from the mesoderm and in the embryo called mesenchyme. Everything in the body derives from one of these six embryonic parts.

The mesoderm constitutes a considerable pad of tissue on each side of the embryo, extending all the way from the most dorsal to the most ventral part of the body wall. It is hollow, for a cleftlike space appears in it on each side. These are the right and left body cavities. In the dorsal part of the body they are temporary; in the ventral part they are permanent, forming the two pleural cavities, which house the lungs; the peritoneal cavity, which contains the abdominal organs; and the pericardial cavity, which encloses the heart. The dorsal mesoderm becomes separated from the ventral mesoderm and divides itself into serial parts like a row of blocks, 31 on each side. These mesodermal segments grow dorsalward, ventralward, centralward (around the notochord), and outward toward the ectodermal membrane. They form bones, muscles, and the deeper, leathery part of the skin. Dorsally they form bony arches protecting the spinal cord, and ventrally the ribs protecting the alimentary canal and heart. Thus they form the body wall and the limbs—much the weightier part of the body. They give the segmental character to the body wall in neck and trunk, and, following their lead, the spinal cord becomes correspondingly segmented. The ventral mesoderm is not so extensive; it remains near the alimentary tube and is never divided into segments. It becomes the continuous muscle layer of the stomach and intestine, and it forms the lining of the body cavities, the smooth, shining, slippery pleura and peritoneum. The mesenchyme forms blood and lymph vessels, the heart, and the loose cells of connective tissues.

The neural tube itself is formed from the ectoderm at a very early stage. At first it dips in along the dorsal mid-line as a trough. Then the trough closes dorsally, and it becomes a tube separate from the epidermis. Anteriorly it extends above the open end of the cylinder and is enlarged to form the brain. It is not in immediate contact with the epidermis, for the dorsal mesoderm grows up around it and around the roots of the cranial nerves as a covering, separating the brain from the epidermis. Posteriorly the neural tube terminates in the adult opposite the first lumbar vertebra.

If the cylindrical body wall is followed headward, it is found to terminate ventrally as the tongue, dorsally in the skull around the brain, ears, and eyes. There is a considerable interval between eyes and tongue. This is occupied partly by a deep depression of the epidermis between them, which dips in to join the alimentary tube (lining of the mouth). Posteriorly the ventral body wall joins the dorsal at the tailbone (coccyx), thus terminating the body cavities.

Headward, the alimentary tube extends up in front of the notochord and projects above the upper part of the body wall (tongue) and in front of and below the brain to join the epidermal depression. From the epidermal depression are formed the teeth and most of the mouth lining; from the upper end of the alimentary canal are formed the pharynx, larynx, trachea, and lungs. The alimentary canal at its tail end splits longitudinally into two tubes—an anterior and a posterior. The anterior tube becomes the bladder, urethra, and, in the female, the lining of the vagina, where it joins a depression of the ectoderm. The posterior (dorsal) tube becomes the rectum and ends just in front of the coccyx by joining another ectodermal depression (the anus).

The notochord terminates headward in a blunt mass under the middle of the brain. The notochord and mesodermal segments extend to the tip of the coccyx.

Changes incident to old age. The human body undergoes various changes as a result of aging. Because of the lengthening life expectancy, an increasing proportion of the population falls into the group past middle life. The imprints of time on human bodies do not, however, come at the same age in every individual; some persons are as capable at age 75 as others at age 55.

The skin is one of the most accurate registers of the years. The soft, smooth velvet of infancy becomes gradually the hard, wrinkled, seared parchment of old age. The head hair grays and falls out, though other hairs flourish and increase. Wounds take longer to heal; some replacements take five times as long at 60 as at 10 years of age. Sensory fibres in spinal nerves become fewer in number; the ganglion cells become pigmented and some of them die. In the auditory apparatus some nerve cells and fibres are lost, and the ability to hear high notes diminishes. In the eye the lens loses its elasticity. The brain is somewhat smaller after the age of 40 and shrinks markedly after age 75, especially in the frontal and occipital lobes. This shrinkage is not, however, correlated with declines in mental capacity. Intellectual declines in the elderly are the consequence of underlying disease conditions, such as Alzheimer's disease (*q.v.*) or cerebrovascular disease.

The bones become lighter and more brittle; they are friable and indentable, and destruction overtakes new formation. They give up some of their calcium, which increases in arteries and cartilage, in ligaments, and in the tendinous attachment of muscles. In joints the cartilage covering the ends of bone becomes thinner and sometimes disappears in spots, so bone meets bone directly and the old joints creak and burn. Muscular strength decreases but with marked individual variablity.

Elastic tissue, like old rubber, loses its elasticity. This is the one tissue in the body that never rests. In the skin it makes cuts gape open, in the arteries it resists the ever-present blood pressure, and in the connective tissues it restores the resting position after every movement. It is therefore apt to wear out early—in some families at age 45; in others it may last until the age of 90. In the lungs the air sacs (alveoli) get bigger because the elastic tissue in their walls degenerates, and the lungs increase in size (emphysema of old age). Elastic tissue is at its best at 25 years of age. When lost in old age, it is not repaired.

The arteries become fibrous and sclerosed. Because of decreasing elasticity, they tend to become rigid tubes. Fatty spots, which appear in their lining even in youth, are always present in old age. Lymphoid tissue undergoes a general shrinkage after middle age. In glands the parenchyma shrinks and the protoplasm seems to become more sluggish.

Repairs of parts are made more slowly if at all and sometimes are made by tissue different from the original (metaplasia). Pigment appears in increasing amounts in the skin, the heart muscle, liver, kidney, and nerve ganglia and in the cells of the central nervous system. Cells have less energy for division. Young tissues change and adapt themselves to changing conditions much more readily than do old fully differentiated tissues, and, thus, the elderly lose a factor of safety.

In vitro experiments indicate that the body's cells are programmed to undergo a finite number of divisions, after which time they lose their reproductive capacity. Thus, the potential longevity of the human body—about 100 years—seems to be encoded within the very cells of the body.

Change incident to environmental factors. Although the basic form of the human body was established in man's anthropoid ancestors, evolutionary adaptations to different environments are apparent among various human populations. For example, physical adaptations in human beings are seen in response to extreme cold, humid heat, desert conditions, and high altitudes.

Cold adaptation is of three types, adaptation to extreme cold, to moderate cold, and to night cold. Extreme cold favours short, round persons with short arms and legs, flat faces with fat pads over the sinuses, narrow noses, and a heavier than average layer of body fat. These adaptations provide minimum surface area in relation to body mass for minimum heat loss, minimum heat loss in the extremities (which allows manual dexterity during exposure to cold and guards against frostbite), and protection of the lungs and base of the brain against cold air in the nasal passages. Moderate cold favours the tall, stockily built individual with moderate body fat and narrow nose, for similar reasons. Night cold—often part of a desert environment, where inhabitants must be able to withstand hot, dry daytime conditions as well as cold at night—favours increased metabolic activity to warm the body during sleep.

Heat adaptation is of two types, adaptation to humid heat and to dry heat (desert conditions). In hot climates the problem is not in maintaining body heat but in dissipating it. Ordinarily the body rids itself of excess heat by sweating. In conditions of humid heat, however, the humidity of the surrounding air prevents the evaporation of perspiration to some extent, and overheating may result. Hence, the heat-adapted person in humid climates is characteristically tall and thin, so that he has maximum surface area for heat radiation. He has little body fat; often a wide nose, since warming of the air in the nasal passages is not desirable; and, usually, dark skin, which shields him from harmful solar radiation and may serve to lower his sweating threshold. The desert-adapted person can sweat freely but must deal with the water loss involved; hence, he is usually thin but is not tall. This adaptation minimizes both water needs and water loss. Skin pigmentation is moderate since extreme pigmentation is good protection from the sun but allows absorption of heat, which must be lost by sweating. Adaptation to night cold is also common in desert-adapted populations.

High altitudes demand a degree of cold adaptation plus adaptation for low air pressure and the consequent low oxygen. This adaptation is accomplished by an increase in lung tissue generally.

Despite the fact that the general shape and size of the body and its parts are determined by heredity, the body can undergo some modifications in response to present conditions. Thus, a person who moves from a home at sea level to one at mountain altitudes will experience an increase in the number of red blood cells; this increase helps compensate for the lower oxygen levels of his new environment. Similarly, a light-skinned individual who moves to a hot tropical region will develop increased pigmentation in his skin. In such situations, the resultant form is seldom perfect for the new conditions, but it is adapted to present needs well enough to maintain life with the least waste of energy.

human ecology, man's collective interaction with his environment. Influenced by the work of biologists on the interaction of organisms within their environments, social scientists undertook to study human groups in a similar way. Thus, ecology in the social sciences is the study of the ways in which the social structure adapts to the quality of natural resources and to the existence of other human groups. When this study is limited to the development and variation of cultural properties, it is called cultural ecology.

Human ecology views the biological, environmental, demographic, and technical conditions of the life of any people as an interrelated series of determinants of form and function in human cultures and social systems. It recognizes that group behaviour is dependent upon resources and associated skills and upon a body of emotionally charged beliefs; these together give rise to a system of social structures.

human-factors engineering, also called ERGONOMICS, HUMAN ENGINEERING, and ENGINEERING PSYCHOLOGY, science dealing with the application of information on physical and psychological characteristics to the design of devices and systems for human use. Its data and principles apply to activities of the home, the workplace, and recreation.

A brief treatment of human-factors engineering follows. For full treatment, *see* MACROPAEDIA: Industrial Engineering and Production Management.

Human-factors engineering as an interdisciplinary profession is concerned with human performance, behaviour, and training in man–machine systems; the design and development of man–machine systems; and systems-related biological or medical research. Man is regarded as an element in a system, represented by a man–machine model. The most basic model, the man–machine unit, consists of an individual operator working with a single machine or device (for example, using a telephone, driving a car, or operating a computer terminal). The operator processes information provided by the machine and takes the appropriate action. Human-factors engineering deals in large part with improving the practicality, efficiency, and safety of the man–machine model through careful selection and design of machine displays and controls, attention to the layout and design of workplaces and to details of the work environment, and design for maintainability.

The human-factors engineer makes use of scientific method to design effective man–machine systems and then uses trial and error to test a system's comfort and efficacy and to solve its problems and weaknesses. The design of a space suit for astronauts, for example, requires rigorous attention to details of facility, flexibility, protection, and physical comfort and through trial and error can be modified to its simplest and most-acceptable form.

human growth hormone: *see* growth hormone.

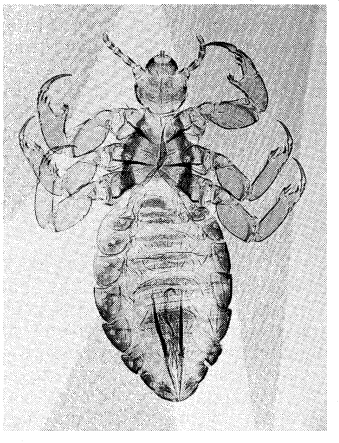
human leukocyte antigen (HLA), also called HISTOCOMPATIBILITY ANTIGEN, any of numerous antigens (substances that cause the production of antibodies) that form the human major histocompatability complex (MHC). These antigens are significant factors in the initiation and regulation of the immune system; they play an important part in the rejection of foreign tissues and organs and thus are crucial factors in determining the success of a transplant. Because the HLA complex is genetically determined, siblings have one chance in four for a complete match of their HLA systems, and HLA matching is closest between siblings.

The HLA complex (first discovered on leukocytes [white blood cells] whence the name) comprises a varied assortment of protein molecules found on every nucleated cell of the body. It is located on a region of chromosome 6. The discovery of HLAs demonstrated that, like blood type, each individual has a tissue type; HLA tissue typing, however, is much more complex than blood typing, involving more than 80 different marker substances in various combinations. Individual antigens of the HLA complex also play an important role as genetic markers. Research indicates that individuals with certain diseases—including ankylosing spondylitis, juvenile (or type 1) diabetes, myasthenia gravis, and rheumatoid arthritis—are likely to have characteristic HLA markers.

HLA typing is also used for paternity testing and for anthropological studies.

human louse, also called BODY LOUSE (*Pediculus humanus*), one of the most common sucking lice (*see* sucking louse), found wherever man exists. There are two subspecies of the common human louse: *Pediculus humanus capitis,* the head louse, and *P. humanus humanus,* the body louse, or cootie. The body louse is an important carrier of epidemic typhus; other louse-borne human diseases are trench fever and relapsing fever.

Smaller and tougher than the body louse, the head louse attaches itself to the hair or scalp by means of claws on its legs. Young lice are sometimes called red backs because of their blood-red colour after feeding; they are called black backs or gray backs after digestion has taken place. Head lice are sensitive to heat and cold; they pass from host to host by direct contact. The easiest way to get rid of them is to keep the hair and scalp clean and to use a fine-tooth comb frequently. In earlier times, when hygiene was not commonly practiced, heads were shaved and wigs worn in an effort to get rid of head lice.



Male human louse (*Pediculus humanus;* magnified about 15½ ×)
William E. Ferguson

The body louse is larger than the head louse and ranges in colour from white to brown. It lives in the seams of clothes but is not dependent upon clothing. The species is prolific; the female lays her eggs, which hatch in about a week, in underclothes. The body louse is transferred by direct contact. It is sensitive to heat and cannot survive hot temperatures; therefore, ordinary laundry procedures will kill it.

human migration, the permanent change of residence by an individual or group; it excludes such movements as nomadism, migrant labour, commuting, and tourism, all of which are transitory in nature.

A brief treatment of human migration follows. For full treatment, *see* MACROPAEDIA: Population.

There are five major types of human migration: primitive, forced, chain, mass, and free. Escape factors were the probable motivation for primitive migration, which is the oldest type. Rather than succumb to hostile neighbours or insurmountable natural forces, ancient peoples chose to leave familiar territory. Important primitive migrations occurred during the potato famine of 1845 and 1846, when German and Irish farmers avoided starvation by abandoning their homes and blighted crops for more hospitable areas. Modern primitive migration is usually undertaken by an individual or family.

Forced, or involuntary, migration refers to the deportation of a group by a government or any such powerful agency. Examples of this type of migration include slavery and the mandatory settlement of Australia between 1788 and 1867 by 150,000 British convicts. Induced migration such as the base-to-base transfers of the military is a milder form of forced migration.

Chain migration is the result of a strong attraction to an area, often exerted by letters from pioneers to friends and relatives back home. These letters, coupled with visits, communicate the advantage of the newly settled area and entice other families to participate in the migration. Although personal communication remains an essential promotional factor, the contribution of newspapers, television, and official agencies has become an additional factor in chain migration.

Word-of-mouth communication figured prominently in the large mass migrations that began in the 19th century. Major intercontinental migrations since 1820 (each accounted for the displacement of 15,000–20,000 people) were the European migrations to South America and to Asiatic Russia. The intracontinental Chinese migration to Southeast Asia has continued for centuries. The largest of mass movements, the Great Atlantic migration, which brought millions of people to America, began as a free migration. Free migrations are initiated by people who are neither pushed from their home nor strongly attracted to another area. The students who began the Great Atlantic migration, and the religious minorities who followed, left Europe because they felt alienated from that society.

The decision to move is reached through an evaluation of the incentives and obstacles to migration. Incentives may include increased employment opportunities, better housing, or a more sympathetic political or cultural environment. Obstacles to migration are unfamiliarity with the new location, lack of information about distant opportunities, language barriers, transportation costs or difficulties, and immigration or emigration restrictions. Studies have shown that differences between housing and employment opportunities predominate in the decision of whether or not to migrate.

The modern direction of internal migration

has been from rural to urban areas. Cityward migration, which began historically in Mesopotamia and gained momentum during the Industrial Revolution, now results in urban overpopulation and, often, the flight of the affluent to the suburbs.

human rights, rights that belong to an individual as a consequence of being human. They refer to a wide continuum of values that are universal in character and in some sense equally claimed for all human beings. Human rights are understood to represent individual and group demands for the shaping and sharing of respect, tolerance, and forbearance in the pursuit of other values.

A brief treatment of human rights follows. For full treatment, *see* MACROPAEDIA: Human Rights.

The origins of the concept of human rights are usually agreed to be found in the Greco-Roman natural-law doctrines of Stoicism, which held that a universal force pervades all creation and that human conduct should therefore be judged according to the law of nature, and in the *jus gentium* ("law of nations"), in which certain universal rights were extended beyond the rights of Roman citizenship. These concepts taught more of duties than rights, however, and allowed for slavery and serfdom.

It was during the period from the Renaissance until the 17th century that the beliefs and practices of society so changed that the idea of human (or natural) rights could take hold as a general social need and reality. The writings of St. Thomas Aquinas and Hugo Grotius, as well as the Magna Carta, the Petition of Rights of 1628, and the English Bill of Rights all reflected the view that human beings are endowed with certain eternal and inalienable rights.

This modernist conception of natural law as meaning natural rights was elaborated in the 17th and 18th centuries by such writers as René Descartes, Gottfried Leibniz, Benedict de Spinoza, and Francis Bacon. Particularly to be noted are the writings of the English philosopher John Locke, who was perhaps the most important natural-law theorist of modern times, and the Philosophes, including Denis Diderot, Voltaire, Montesquieu, and Jean-Jacques Rousseau.

The struggle against political absolutism in the late 18th and 19th centuries further advanced the concept of human rights. Thomas Jefferson and the Marquis de Lafayette gave eloquence to the plain prose of the previous century, and freedoms were specified in a variety of historic documents such as The Declaration of the Rights of Man and of the Citizen (1789) and the Bill of Rights (1791) of the Constitution of the United States (1787).

The idea that natural law is the foundation for human rights came under attack during the late 18th century by such men as conservatives Edmund Burke and David Hume, as well as by Jeremy Bentham, a founder and leading proponent of Utilitarianism. This assault continued into the early 20th century. Such writers as John Stuart Mill, Friedrich Karl von Savigny, Sir Henry Maine, John Austin, and Ludwig Wittgenstein sought other justifications for, and definitions of, those rights. But the idea of the rights of mankind endured in one form or another—the abolition of slavery, labour laws, popular education, trade unionism, universal suffrage—and came into its own following the rise and fall of Nazi Germany.

Although the existence of human rights is no longer debated, the nature and scope of those rights remain the subject of dispute. Questioned, among other matters, are the source of human rights, the way in which they are validated, whether or not they are irrevocable, and what their limits are.

By the late 20th century, it had generally come to be agreed that all human beings are entitled to some basic rights, marking the birth of the international and universal recognition of human rights. In the charter establishing the United Nations, all members were pledged to achieve "universal respect for, and observance of, human rights and fundamental freedoms for all without distinction as to race, sex, language, or religion," and the UN has continued to affirm its commitment to human rights, particularly in such documents as the Universal Declaration of Human Rights (*q.v.;* 1948).

International concern for human rights has also been evident outside of the United Nations. For example, the Conference on Security and Cooperation in Europe, which met in Helsinki in 1973–75, produced the Helsinki Final Act; the European Convention for the Protection of Human Rights and Fundamental Freedoms, which first met in 1950, eventually produced the International Covenant on Civil and Political Rights and the European Social Charter; the Ninth Pan-American Conference of 1948 adopted the American Declaration on the Rights and Duties of Man; and the Organization of African Unity in 1981 adopted the African Charter on Human and Peoples' Rights. In the 1980s a new approach to human-rights advocacy—the use of domestic courts to clarify and safeguard international human rights—also began to evolve.

There are also a number of private groups involved in human-rights advocacy. One of the best-known international human-rights agencies is Amnesty International (*q.v.;* founded in 1961), an organization dedicated to publicizing violations of human rights, especially freedoms of speech and religion and the right of political dissent.

human sacrifice, the offering of the life of a human being to a deity. The occurrence of human sacrifice can usually be related to the recognition of blood as the sacred life-force in man. Bloodless forms of killing, however, such as strangulation and drowning, have been used in some cultures. The killing of a human being, or the substitution of an animal in place of a person, has often been part of an attempt to effect communion with a god and participation in his divine life. The offering of human life, as the most valuable material for sacrifice, in an attempt at expiation has also occurred. Human sacrifices have been offered in return for victory in war. The killing of prisoners of war was once a common custom.

The relation of human sacrifice to the promotion of the earth's fertility may explain why the phenomenon has been most widely adopted by agricultural rather than by hunting or pastoral peoples. In particular, sacral kings (considered to embody gods of vegetation) were sacrificed when their vigour declined, in order to prevent corresponding effects on soil fertility; or sometimes a substitute was assigned divine status for a period of time and then put to death.

In various places in Africa, where human sacrifice was connected with ancestor worship, some of the slaves of the deceased were buried alive with him, or they were killed and laid beneath him in his grave. The Dahomey made especially elaborate sacrifices at the death of a king. Among the Ashanti, the victims sacrificed as first-fruit offerings during the Festival of New Yams were usually criminals, though slaves were also killed.

In what is now Mexico the belief that the Sun needed human nourishment led to sacrifices in which thousands of victims perished annually in the Aztec and Nahua calendrical maize (corn) ritual. The Incas confined such wholesale sacrifices to the accession of a ruler. There were instances of human sacrifice in what now is Peru and among some tribes of North American Indians.

Excavations in Egypt and elsewhere in the ancient Middle East have revealed that numerous servants were at times interred with the rest of the funerary equipment of a member of the royal family in order to provide that person with a retinue in the next life. The burning of children seems to have occurred in Assyrian and Canaanite religions and at various times among the Israelites.

Human sacrifice, practiced in Vedic India, was continued later by the followers of the goddess Kālī, to whom a male child was sacrificed every Friday evening. In Japan human sacrifice was abandoned in the early Middle Ages, and the Chinese practice of burying the king's retinue with him continued intermittently until the 17th century.

Rites among the ancient Greeks and Romans that involved the killing of animals may have originally involved human victims. Christians later were accused of consuming sacrificial victims at nocturnal feasts. From the Middle Ages until quite recently, Jews were often maliciously accused of having sacrificed Christian children at the Passover.

humanism, an attitude of mind attaching prime importance to man and human values, often regarded as the central theme of Renaissance civilization.

A brief treatment of humanism follows. For full treatment, *see* MACROPAEDIA: Humanism.

Renaissance humanism is traceable to the 14th-century Italian poet Petrarch, whose scholarship and enthusiasm for classic Latin writings ("the humanities") gave great impetus to a movement that eventually spread from Italy to all of western Europe. The diffusion of humanism was facilitated by the universal use of Latin and by the invention of movable type. Although humanism gradually became identified with classroom studies of the classics, it more properly embraced any attitude that exalted man's relationship to God, his free will, and his superiority over nature. Philosophically, humanism made man the measure of all things.

Excitement over Latin sources touched off a widespread search for ancient documents that led in time to Greek and Hebrew studies. Textual criticism and philology were born, and with them renewed interest in Aristotle and the Scriptures. The arts found patrons and flourished in conscious imitation of classical ideals and forms.

In its return to antiquity, humanism found inspiration in man's personal quest for truth and goodness. Confining systems of philosophy, religious dogmas, and abstract reasoning were shunned in favour of human values. Though ceaseless efforts were made to relate Christian thought to the philosophies of the ancient world, seeds were likewise sown for the flowering of Reformation thought.

In recent years the term *humanism* has often been used to refer to value systems that emphasize the personal worth of each individual but that do not include a belief in God. There is a certain segment of the Unitarian Universalist Association that is nontheistic and yet uses religious forms to promote distinctive human values. In the same vein the 19th-century French Positivist Auguste Comte established a nontheistic religion of humanity designed to promote social reform. The American Humanist Association publishes a quarterly magazine, *The Humanist,* and propagates the humanist point of view.

In addition to these nontheistic humanisms, there is some tendency among Christian theologians to refer to Christianity as humanistic. Karl Barth, a noted 20th-century Swiss Protestant theologian, affirmed that "there is no humanism without the Gospel." Similarly, Roman Catholic theologians have claimed that Catholic Christianity is humanistic in that it

emphasizes the uniqueness of man as a being created in the image of God.

humanistic psychology, a 20th-century movement in psychology that believes that man, as an individual, is a unique being and should be recognized and treated as such by psychologists and psychiatrists. The movement grew in opposition to the two mainstream 20th-century trends in psychology, behaviourism and psychoanalysis. Humanistic psychologists believe that behaviourists are overconcerned with the scientific study and analysis of the actions of man as an organism, to the neglect of basic aspects of man as a feeling, thinking individual, and that too much effort is spent in laboratory research, which quantifies and reduces human behaviour to its elements. Humanists also take issue with the deterministic orientation of psychoanalysis, which postulates that man's early experiences and drives cause his behaviour. Humanists tend to believe that the individual is responsible for his life and actions and may at any time creatively change his attitudes or behaviour through awareness and will. The humanist is concerned with the fullest growth of the individual in the areas of love, fulfillment, self-worth, and autonomy; maturation is considered a process during which one establishes and follows his own system of values. The Association for Humanistic Psychology lists five basic postulates: "man, as man, supersedes the sum of his parts; man has his being in a human context; man is aware; man has choice; and, man is intentional."

The American psychologist Abraham H. Maslow (1908–70), considered to be one of the leading architects of humanistic psychology, proposed a hierarchy of needs or drives in order of decreasing priority or potency but increasing sophistication: physiological needs, safety, belongingness and love, esteem, and self-actualization. Only when the more primitive needs are met can the individual progress to higher levels in the hierarchy. The person reaching self-actualization will have fully utilized his potential.

The concept of the self is a central focal point for most humanistic psychologists. In the "personal construct" theory of American psychologist George Kelly (1905–67) and the "self-centered" theory of American psychotherapist Carl Rogers (b. 1902), the individual perceives his world according to his own experience. This perception affects his personality and leads him to direct his behaviour to satisfy the needs of the total self. Rogers stresses that in the development of an individual's personality he strives for "self-actualization (to become oneself), self-maintenance (to keep on being oneself), and self-enhancement (to transcend the status quo)."

Following the writings of Jean-Paul Sartre (1905–80) and other Existential philosophers, many humanistic psychologists adopted the existential view of the importance of being and the meaning of life. The Swiss psychiatrist and early leader of existential psychology, Ludwig Binswanger (1881–1957), stressed the concept of "world design," which he considered the totality of a person's being. Man, according to Binswanger, was not a product of his environment but its creator. Binswanger described the various "modes" of being-in-the world. The single mode is the individual who chooses to live within himself, the loner. The dual mode occurs when two people unite in feeling for each other. Thus, "You" and "I" become "We." The plural mode is when an individual interacts with others. Finally, the mode of anonymity occurs when an individual loses himself in a crowd or disassociates his feelings from others. The American psychologist Rollo May (b. 1909) believed we have neglected the basic nature of man as a being who does the experiencing and to whom the experiences happen. To May, man's awareness of his own mortality makes vitality and passion possible. The American psychologist Clark Moustakas is concerned with the impact of loneliness on the individual and its effects on his behaviour. Moustakas notes that while "existential loneliness" is an inevitable part of the human experience, the "loneliness of self-alienation and self-rejection" can create excessive anxiety.

Humanistic principles attained application during the "human potential" movement, which became popular in the United States during the 1960s. Gestalt therapy enjoyed popularity during that period, emphasizing the "here and now" (immediate present): feelings, body language, expressiveness, spontaneity, acceptance, and responsibility for oneself. Bearing little resemblance to Gestalt psychology, the experimental school of psychology of the early 20th century, Gestalt therapy adopts an essentially positive view of human beings and their potential to achieve real joy. This form of therapy, developed by Fritz Perls, borrowed from Gestalt psychology the concept of holism, or wholeness; the restoration of wholeness (*i.e.*, self-realization) is the aim of its techniques.

Another influential therapy of the human potential movement was the technique known as transactional analysis, developed by Eric Berne (1910–70). As practiced by its founder, transactional analysis proved to be both a method of examining human interactions as well as a way of labeling and systematizing the information gained from observed transactions. The goal of this approach is to build a strong state of maturity by learning to recognize the "child" and "parent" aspects of personality in oneself and others.

Humanité, L', daily newspaper published in Paris, the organ of the French Communist Party, and one of the most influential Communist papers published in non-Communist countries. It was established in 1904 by Socialist Jean Jaurès and in 1920 came under the control of the newly organized Communists. As a party organ, *L'Humanité* has seen its fortunes shift along with those of its parent. In August 1939 it was dissolved along with the party in reaction to the German–Soviet Nonagression Pact. During World War II it was published clandestinely. Immediately after the war, with the Communist Party at its greatest popularity, the paper had a circulation of more than 1,000,000, but within a few years it was publishing fewer than 200,000 copies daily.

In the 1950s and later, *L'Humanité*, which faithfully reflected the line of the Soviet Communist Party, came under pressure for publishing material that was critical of the French government. In 1960, for example, the De Gaulle government confiscated all copies of the edition carrying an International Red Cross report on atrocities committed in French-run internment camps in Algeria.

humanities, also called LIBERAL ARTS, those branches of knowledge that concern themselves with man and his culture or with analytical and critical methods of inquiry derived from an appreciation of human values and of the unique ability of the human spirit to express itself. In the United States the term *humanities* also denotes an administrative division of many colleges and universities.

The modern conception of the humanities has its origin in the classical Greek *paideia,* a course of general education dating from the Sophists in the mid-5th century BC, which prepared young men for active citizenship in the polis, or city-state; and in Cicero's *humanitas* (literally, "human nature"), a program of training proper for orators, first set forth in *De Oratore* (*Of the Orator*) in 55 BC. In the early Middle Ages the Church Fathers, including St. Augustine, himself a rhetorician, adapted *paideia* and *humanitas,* or the *bonae* ("good") or *liberales* ("liberal") arts, as they were also called, to a program of basic Christian education; mathematics, linguistic and philological studies, and some history, philosophy, and science were included.

The word *humanitas,* although not the substance of its component disciplines, dropped out of common use in the later Middle Ages but underwent a flowering and a transformation in the Renaissance. The term *studia humanitatis* ("studies of mankind") was used by 15th-century Italian humanists to denote secular literary and scholarly activities (in grammar, rhetoric, poetry, history, moral philosophy, and ancient Greek and Latin studies) that the humanists thought to be essentially humane and classical studies rather than divine ones. In the 18th century, Diderot and the French Encyclopédistes censured *studia humanitatis* for what they claimed had by then become its dry, exclusive concentration on Latin and Greek texts and language. By the 19th century, when the purview of the humanities expanded, the humanities had begun to take their identity not so much from their separation from the realm of the divine as from their exclusion of the material and methods of the maturing physical sciences, which tended to examine the world and its phenomena objectively, without reference to human meaning and purpose.

Modern problems. Contemporary conceptions of the humanities resemble earlier conceptions in that they propose a complete educational program based on the propagation of a self-sufficient system of human values. But they differ in that they also propose to distinguish the humanities from the social sciences as well as from the physical sciences, and in that they dispute among themselves as to whether an emphasis on the subject matter or on the methods of the humanities is most effectual in accomplishing this distinction. In the late 19th century the German philosopher Wilhelm Dilthey called the humanities "the spiritual sciences" and "the human sciences" and described them, simply, as those areas of knowledge that lay outside of, and beyond, the subject matter of the physical sciences. On the other hand, Heinrich Rickert, a turn-of-the-century Neo-Kantian, argued that it is not subject matter but method of investigation that best characterizes the humanities; Rickert contended that whereas the physical sciences aim to move from particular instances to general laws, the human sciences are "idiographic"—they are devoted to the unique value of the particular within its cultural and human contexts and do not seek general laws. These points of view form the basis of, and cause some of the controversy among, four representative theories of the meaning of the humanities today.

General arts theory. As rendered by Ronald Crane, this theory holds that no subjects are barred from investigation by the methods and arts of the humanities; but that mathematics and the physical sciences, sociology, psychology, and so forth all have histories, languages and literature, and fundamental philosophical precepts that can be discussed and analyzed by means of the general arts of the humanities. These are four: analysis of ideas; analysis of symbolic expression, including use of language; explication and interpretation; and historical research.

Language function theory. In this theory the humanities are characterized by the language they employ. Linguistic functions of the humanities, it is said, are relatively noncognitive and expressive, compared to the more cognitive and designative functions of scientific and social-scientific language, according to William T. Jones, a proponent of the theory.

Special faculty theory. As its name suggests, this theory asserts a radical division, not just of language but of mind, between the rational (scientific) and the imaginative (humanistic), the latter of which concerns itself with nonlinear images and ideas—of life, fate, freedom, and so on—rather than with fact, objective observation, and prediction. The rational and imaginative faculties each use different methods, and these create the basis for subdivisions—the humanities, for example, may be divided into fine arts, devoted to imaginative production, and liberal arts, devoted to learning and teaching.

General experience theory. This is a theory that emphasizes differences between the "natural" logic of the humanities, a logic of everyday life to which all human beings have access, and the highly specialized, goal-identified logic of science and mathematics. The aims of "natural" logic, according to Henry B. Veatch, are "simply a knowledge of man, of human nature, and still more broadly of our human situation and the real world in which we find ourselves."

Although these theories suggest different criteria by which the humanities may be understood and valued, the champions of each are agreed that the study of the humanities should form the foundation of a liberal education. Today—although enrollments in humanities programs are shrinking slightly in relation to science and professional programs in colleges and universities—this study generally includes literature, incorporating Latin and Greek classics in translation; some history, philosophy, and theology; and a basic familiarity with a second language.

Humann, Karl (b. Jan. 4, 1839, Steele, Prussia [Germany]—d. April 12, 1896, İzmir, Tur.), German engineer and archaeologist, whose excavation of the ancient Greek city of Pergamum (now Bergama, Tur.) brought to light some of the choicest examples of Hellenistic sculpture and revealed much about Hellenistic city planning.

While directing the construction of railway lines for the Ottoman government, Humann traveled extensively in Asia Minor and was the first to note the archaeological importance of the ruins of Pergamum. His excavations there, under the auspices of the Berlin Museum (1878–86), disclosed the remains of many important public buildings and yielded a notable portion of the ornamental sculpture from the great altar of Zeus, which he reconstructed in Berlin.

Humann took part in an archaeological exploration of northern Syria (1888) and from 1891 to 1894 completed the excavation of another Hellenistic city in Turkey, Magnesia, on the Maeander River. His final years were occupied with the excavation of the remains of Priene. With various collaborators he published *Ergebnisse der Ausgrabungen zu Pergamon,* 3 vol. (1880–88; "Results of the Excavations at Pergamum"), and *Reisen in Kleinasien und Nordsyrien,* 2 vol. (1890; "Travels in Asia Minor and Northern Syria").

Humāyūn, also called NĀṢIN-UD-DĪN MUḤAMMAD (b. March 6, 1508, Kābul, India—d. January 1556, Delhi), second Mughal ruler of India, who was more an adventurer than a consolidator of his empire. The son and successor of Bābur, who had founded the Mughal dynasty, Humāyūn ruled from 1530 to 1540 and again from 1555 to 1556.

Humāyūn inherited the hope rather than the fact of empire, because the Afghans and Rājputs were merely restrained but not reconciled to Mughal supremacy by the Mughal victories at Pānīpat (1526), Khānua (1527), and the Ghāghara (1529). Bahādur Shāh of Gujarāt, encouraged by Afghan and Mughal émigrés, challenged the Mughals in Rājasthān; and, although Humāyūn occupied Gujarāt in 1535, the danger there ended only with Bahādur's death in 1537. Meanwhile, a Sūr Afghan soldier of fortune, Shēr Shāh, had consolidated his power in Bihār and Bengal and defeated Humāyūn at Chausa in 1539 and at Kannauj in 1540, expelling him from India. Humāyūn became a homeless wanderer, seeking support first in Sind, then in Mārwār, and then in Sind again; his famous son, Akbar, was born in 1542. Reaching Persia in 1544, Humāyūn was granted military aid by Shāh Ṭahmāsp and went on to conquer Qandahār (1545) and to seize Kābul three times from his own disloyal brother, Kāmrān, the final time being in 1550. Taking advantage of civil wars among the descendants of Shēr Shāh, Humāyūn captured Lahore in February 1555, and, after defeating Sikandar Sūr, the rebel Afghan governor of the Punjab, at Sirhind, he recovered Delhi and Āgra that July. Humāyūn was fatally injured by falling down the staircase of his library.

Humber, River, North Sea inlet on the east coast of England, one of the major deepwater estuaries (in Great Britain called "rivers") of the United Kingdom. The River Humber originates with the confluence of the Ouse and Trent rivers. The Humber is about 40 miles (64 km) long, extends west to east, and, with associated rivers and canals, drains 9,550 square miles (24,750 square km). The estuary itself is more than 0.75 mile (1.2 km) across at its farthest inland point and widens to more than 7 miles (11 km) near its mouth, where Spurn Head, a sand and shingle spit with lighthouse, lifeboat station, and bird sanctuary, extends into the estuary. The great width of the estuary has prevented unified economic development of its traditionally quite different north and south banks. The Humber Bridge spanning the estuary, opened in 1981, was constructed chiefly to aid further development. The River Humber is lined by several major ports—Kingston upon Hull, Grimsby, Immingham, and Goole.

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Humber Bridge, suspension bridge extending across the River Humber about 5 miles (8 km) west of Kingston upon Hull, Humberside, Eng. Its 4,626-foot (1,410-metre) main span is the second longest in the world, and it has a total length of 7,283 feet (2,220 m). The main span is suspended between towers that rise 500 feet (152 m) above their supporting piers. It carries a four-lane highway and pedestrian walkways.

The Humber Bridge was opened in July 1981 after more than eight years of construction. Its total cost exceeded $250,000,000. The building of the bridge had caused much controversy both because of the high cost and because the bridge site was not along a heavily traveled route. The Town Council of Kingston upon Hull, however, proceeded with its construction in an effort to stimulate industrial and commercial development in the area.

Humber River, river on the western side of the island of Newfoundland, Can., rising in the Long Range Mountains, inland from St. Pauls Inlet. It flows generally southward for 75 miles (121 km) over a series of falls and through several lakes, including Deer Lake, to the Humber Arm of the Bay of Islands at Corner Brook. The river and its valley form a major salmon-fishing, lumbering, hunting, and farming region. A hydroelectric plant at Deer Lake supplies power for the huge paper and pulp mills in Corner Brook, as well as for mining operations at Buchans and local sawmills. The Trans-Canada Highway and the Canadian National Railway parallel much of the Humber's lower course.

Humberside, county of eastern England, extending along the North Sea coast from Flamborough Head south across the mouth of the River Humber to Cleethorpes. It includes nine districts: Beverley, Boothferry, Cleethorpes, East Yorkshire (formerly North Wolds), Glanford, Great Grimsby, Holderness, Scunthorpe, and the city of Kingston upon Hull. The county has an area of 1,356 square miles (3,512 square km). Inland it includes parts of the Vale of York and the River Trent lowlands. Its administrative centre is at the town of Beverley. Kingston upon Hull, the only major city, shares the seaborne trade along the River Humber with the cities of Grimsby, Immingham, and Goole. Administrative unification of the two traditionally very separate sides of the broad tidal channel, which extends inland more than 20 miles (32 km) from the sea, took place before the opening of the Humber Bridge at Hessle in 1981.

The River Humber, an estuary, has a deepwater channel 22 miles (35 km) long from the open sea at Spurn Head westward to Kingston upon Hull. Upstream of the outfall of the River Trent, the waterway is known as the River Ouse and receives tributaries that drain the Vale of York and the River Trent lowlands. The low-lying, formerly marshy area around Goole at the estuary's farthest inland point is separated from the coastal lowlands to the east by chalk uplands, the Wolds. From their white cliffs at Flamborough Head, the Wolds, rising inland to 800 feet (240 m), sweep in a crescent west and south and are breached by the Humber at Brough. In the south and east of the county, chalk underlies hummocky glacial deposits and alluvium in Holderness and the Lincolnshire marsh. Humberside is one of the drier parts of Britain and in places has less than 24 inches (600 mm) annual rainfall.

Prehistoric peoples kept to the dry uplands in the area, as did the Roman settlements and road. The region was one of the first districts to be settled by the Anglo-Saxons, whose kingdoms of Deira and Lindsey were established both north and south of the estuary. The importance of subsequent Scandinavian settlement is reflected in many place-names.

The agricultural prosperity of the area in the European Middle Ages and its flourishing wool trade are indicated by many fine parish churches as well as the magnificent minster at Beverley, which was superseded as a port by Edward I's creation of Hull. The river port of Goole is a creation of the canal era; Grimsby (for fish) and Immingham (for coal) are creations of the railways, which also played a major part in the later development of Hull and the rise of other towns, such as the coastal resorts of Bridlington and Cleethorpes and the steel-making town of Scunthorpe, which soon outgrew its local ore field. Pop. (1986 est.) 848,500.

Humbert I, byname HUMBERT THE WHITE-HANDED, Italian UMBERTO BIANCAMANO (d. *c.* 1048), count of Savoy and founder of the House of Savoy, whose services to the Holy Roman emperor Conrad II were rewarded with the cession of lands that placed him in control of the strategic Alpine passes between Italy and France.

Humbert, whose origins are surrounded by controversy but who may have been the son of the semilegendary hero Bérold of Saxony, ally of King Rudolf III of Burgundy, made his appearance in history when Rudolf died in 1032, leaving his domains to Conrad II. Already holder of extensive territories commanding the Little St. Bernard Pass, Humbert also gained control of the Great St. Bernard Pass and the northern approach to the Simplon Pass as a result of family connections and through his alliance with Conrad, who wanted the Alpine routes in friendly hands. In 1033 he led troops of Archbishop Heribert

of Milan and Margrave Boniface of Tuscany, defending Conrad's inheritance against Eudes (Odo) of Champagne, whom he pursued into Lorraine, defeated, and killed. When Everard, bishop of the neighbouring region of Maurienne, bordering on the northern approach to the Mont-Cenis pass, refused to pay homage to Conrad, Humbert seized and burned the city of Saint-Jean de Maurienne in 1035. Rewarded with new territories, Humbert, as Conrad's most faithful vassal, exercised power over lands that sealed Lombardy off from France while making it accessible to the Emperor.

Humbert I–II (Italian kings): *see* Umberto I–II.

Humbert OF SILVA CANDIDA (b. *c.* 1000, Lorraine—d. May 5, 1061, Rome), cardinal, papal legate, and theologian whose ideas advanced the 11th-century ecclesiastical reform of popes Leo IX and Gregory VII. His doctrinal intransigence, however, occasioned the definitive schism between the Eastern and Western churches in 1054.

A monk of the Benedictine monastery of Moyenmoutier, Vosges mountains, France, from the age of 15, Humbert became expert in Greek and Latin and concentrated his theological studies on the problem of church–state relations. His friendship with Bruno of Toul and a common zeal in reforming ecclesiastical abuses ended in his being summoned to Rome in 1049 after Bruno's accession to the papal throne as Leo IX. Thenceforth he developed as the major instrument in implementing papal policy during the reigns of Leo and his successors, Victor II, Stephen IX, and Nicholas II.

Humbert joined in a wide-ranging dispute over the nature of the eucharist (*q.v.*), and in 1050, castigated the reform doctrine of Berengar of Tours (*q.v.*). In the spring of 1050 Leo named Humbert archbishop of Sicily and later made him cardinal. Humbert advocated a monarchical concept of the bishop and centralized authority in the papacy. To a denunciation of the Latin rite by Michael Cerularius, patriarch of Constantinople, he replied in 1053 with the tract *Adversus Graecorum calumnias* ("Against the Slanders of the Greeks"). Pope Leo dispatched Humbert to Constantinople in 1054 to determine the significance of Emperor Constantine IX Monomachus' expression of a desire for Greek–Roman reunion, and while there Humbert engaged leading Byzantine theologians in public disputation. Frustrated by the theological stalemate in the discussions with the Greeks and by their repudiation of his inflexible demands for submission to the Latin Church, Humbert, in a formal convocation in the cathedral of Hagia Sophia on July 16, 1054, excommunicated Patriarch Michael as a heretic; a general condemnation of the entire Greek Orthodox Church followed. With the death of Pope Leo in 1054 Humbert returned to Rome and continued as consultant to Pope Victor II. He was made papal chancellor and librarian of the Roman Church when his friend Frederick of Lorraine became Pope Stephen IX in August 1057. Humbert assisted in drafting the Papal Election Decree diminishing secular influence in church government and in effecting the papal alliance of 1059 with the Normans. He also wrote the tract *Adversus simoniacos* ("Against Simoniacs"—those who bought spiritual benefits and offices), in which he maintained the extreme opinion that the ministerial acts of simonaical or schismatic churchmen were invalid. In order to abolish the rampant abuses of lay investiture (the practice of laymen conferring ecclesiastical offices), he proposed that the election of bishops be carried out by the people and clergy, as had been practiced in early Christianity.

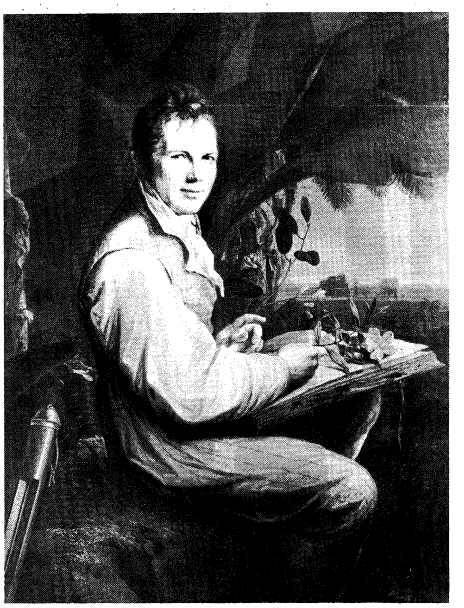
Historians hold the extent of Humbert's influence on the papal policy of this period. Other writings attributed to him on the basis of textual evidence are the *Vita Leonis IX* ("Life of Pope Leo IX") and *Diversorum patrum sententie* ("Collection of Seventy-Four Titles"), a compilation of ecclesiastical law. Concepts embodied in these works and expressed by Humbert elsewhere were reflected in the later reform executed by Pope Gregory VII. Central to Humbert's thought were the separation of temporal and spitirual jurisdiction and opposition to lay ownership of church property. His tendency toward reactionary theology was challenged by the conservative St. Peter Damian, leading spokesman for the 11th-century Roman orthodoxy.

Humbert's works have been collected in *Monumenta Germaniae Historica, Libelli de Lite* (1891) 1:95–253, and in *Patrologia Latina,* ed. J.-P. Migne (1878–90). An evaluation of his thought is contained in K. Hallinger, A. Michel, and A. Pelster, *Studi Gregoriani,* vol. 1–7 (1947–60).

humble-bee: *see* bumblebee.

Humboldt, Alexander von, in full FRIEDRICH WILHELM HEINRICH ALEXANDER, FREIHERR (baron) VON HUMBOLDT (b. Sept. 14, 1769, Berlin—d. May 6, 1859, Berlin), German naturalist and explorer who was a major figure in the classical period of physical geography and biogeography—areas of science now included in the earth sciences and ecology. With his book *Kosmos* he made a valuable contribution to the popularization of science. The Humboldt Current off the west coast of South America was named after him.

Early life. Humboldt was the son of an officer in the army of Frederick the Great. His mother belonged to a family of Huguenots (French Protestants) who had left France after Louis XIV's revocation, in 1685, of religious liberty for Protestants. After his father's death in 1779, he and his brother Wilhelm were raised by their mother, an unemotional woman of strict Calvinist beliefs. They were privately educated; instruction in political history and economics was added to the usual courses in classics, languages, and mathematics, as their mother intended them to be qualified for high public positions. Alexander, a sickly child, at first was a poor student. He was restless, thought of joining the army, and followed his courses only under parental pressure. After futile studies in economics at the University of Frankfurt an der Oder he spent a year in Berlin, where he obtained some training in engineering and suddenly became passionately interested in botany. He began to collect plant specimens in the surroundings of Berlin and learned to classify them. But the poor flora of the province of Brandenburg did not provide much stimulus for an ardent botanist, and Humboldt soon dreamed of journeys to more exotic lands.



Alexander von Humboldt, oil painting by Friedrich Georg Weitsch, 1806; in the Staatliche Museen Zu Berlin

By courtesy of the Staatliche Museen zu Berlin

A year spent at the University of Göttingen, from 1789 to 1790, finally opened the world of science to him; he became particularly interested in mineralogy and geology and decided to obtain a thorough training in these subjects by joining the School of Mines in Freiberg, Saxony, the first such establishment. Although founded only in 1766, the school had already acquired an international reputation. There, buttressed by a prodigious memory and driven by an unending thirst for knowledge, he began to develop his enormous capacity for work. After a morning spent underground in the mines, he attended classes for five or six hours in the afternoon and in the evening scoured the country for plants.

He left Freiberg in 1792 after two years of intensive study but without taking a degree. A month later he obtained an appointment in the Mining Department of the Prussian government and departed for the remote Fichtel Mountains in the Margraviate of Ansbach-Bayreuth, which had only recently come into the possession of the Prussian kings. Here Humboldt came into his own; he travelled untiringly from one mine to the next, reorganizing the partly deserted and totally neglected pits, which produced mainly gold and copper. He supervised all mining activities, invented a safety lamp, and established, with his own funds, a technical school for young miners. Yet he did not intend to make mining his career.

Expedition to South America. The conviction had grown in Humboldt that his real aim in life was scientific exploration, and in 1797 he resigned from his post to acquire with great single-mindedness a thorough knowledge of the systems of geodetic, meteorological, and geomagnetic measurements. The political upheavals caused by the Napoleonic Wars prevented the realization of several scientific expeditions in which Humboldt had been given an opportunity to participate. At last, dispirited by his disappointments but refusing to be deterred from his purpose, he obtained permission from the Spanish government to visit the Spanish colonies in Central and South America. These colonies were then accessible only to Spanish officials and the Roman Catholic mission. Completely shut off from the outside world, they offered enormous possibilities to a scientific explorer. Humboldt's social standing assured him of access to official circles, and in the Spanish prime minister Mariano de Urquijo he found an enlightened man who supported his application to the king for a royal permit. In the summer of 1799 he set sail from Marseille accompanied by the French botanist Aimé Bonpland, whom he had met in Paris, then the liveliest scientific centre in Europe. The estate he had inherited at the death of his mother enabled Humboldt to finance the expedition entirely out of his own pocket. Humboldt and Bonpland spent five years, from 1799 to 1804, in Central and South America, covering more than 6,000 miles (9,650 kilometres) on foot, on horseback, and in canoes. It was a life of great physical exertion and serious deprivation.

Starting from Caracas, they travelled south through grasslands and scrublands until they reached the banks of the Apure, a tributary of the Orinoco River. They continued their journey on the river by canoe as far as the Orinoco. Following its course and that of the Casiquiare, they proved that the Casiquiare

River formed a connection between the vast river systems of the Amazon and the Orinoco. For three months Humboldt and Bonpland moved through dense tropical forests, tormented by clouds of mosquitoes and stifled by the humid heat. Their provisions were soon destroyed by insects and rain; the lack of food finally drove them to subsist on ground-up wild cacao beans and river water. Yet both travellers, buoyed up by the excitement provided by the new and overwhelming impressions, remained healthy and in the best of spirits until their return to civilization, when they succumbed to a severe bout of fever.

After a short stay in Cuba, Humboldt and Bonpland returned to South America for an extensive exploration of the Andes. From Bogotá to Trujillo, Peru, they wandered over the Andean Highlands—following a route now traversed by the Pan-American Highway, in their time a series of steep, rocky, and often very narrow paths. They climbed a number of peaks, including all the volcanoes in the surroundings of Quito, Ecuador; Humboldt's ascent of Chimborazo (20,561 feet [6,265 metres]) to a height of 19,280 feet, but short of the summit, remained a world mountain-climbing record for nearly 30 years. All these achievements were carried out without the help of modern mountaineering equipment, without ropes, crampons, or oxygen supplies; hence, Humboldt and Bonpland suffered badly from mountain sickness. But Humboldt turned his discomfort to advantage: he became the first person to ascribe mountain sickness to lack of oxygen in the rarefied air of great heights. He also studied the oceanic current off the west coast of South America that was originally named after him but is now known as the Peru Current. When the pair arrived, worn and footsore, in Quito, Humboldt, the experienced mountaineer and indefatigable collector of scientific data, had no difficulty in assuming the role of courtier and man of the world when he was received by the Viceroy and the leaders of Spanish society.

In the spring of 1803, the two travellers sailed from Guayaquil to Acapulco, Mex., where they spent the last year of their expedition in a close study of this most developed and highly civilized part of the Spanish colonies. After a short stay in the United States, where Humboldt was received by President Jefferson, they sailed for France.

Humboldt and Bonpland returned with an immense amount of information. In addition to a vast collection of new plants, there were determinations of longitudes and latitudes, measurements of the components of the Earth's geomagnetic field, and daily observations of temperatures and barometric pressure, as well as statistical data on the social and economic conditions of Mexico. Whenever Humboldt had found himself in a centre of commerce in America, he had sent off reports and duplicates of his collections to his brother, Wilhelm, who had become a noted philologist, and to French scientists; unfortunately, the continental blockade then enforced by British ships prevented the greater part of his mail from reaching its destination.

Professional life in Paris. The years from 1804 to 1827 Humboldt devoted to publication of the data accumulated on the South American expedition. With the exception of brief visits to Berlin, he lived in Paris during this important period of his life. There he found not only collaborators among the French scientists—the greatest of his time—but engravers for his maps and illustrations and publishers for printing the 30 volumes into which the scientific results of the expedition were distilled. Of great importance were the meteorological data, with an emphasis on mean daily and nightly temperatures, and Humboldt's representation on weather maps of isotherms (lines connecting points with the same mean temperature) and isobars (lines connecting points with the same barometric pressure for a given time or period)—all of which helped lay the foundation for the science of comparative climatology. Even more important were his pioneering studies on the relationship between a region's geography and its flora and fauna, and, above all, the conclusions he drew from his study of the Andean volcanoes concerning the role played by eruptive forces and metamorphosis in the history and ongoing development of the Earth's crust. These conclusions disproved once and for all the hypothesis of the so-called Neptunists, who held that the surface of the Earth had been totally formed by sedimentation from a liquid state. Lastly, his *Political Essay on the Kingdom of New Spain* contained a wealth of material on the geography and geology of Mexico, including descriptions of its political, social, and economic conditions, and also extensive population statistics. Humboldt's impassioned outcry in this work against the inhumanities of slavery remained unheard, but his descriptions of the Mexican silver mines led to widespread investment of English capital and mining expertise in the mines.

During his years in Paris, Humboldt enjoyed an extraordinarily full life. He had the ability to cultivate deep and long-lasting friendships with well-known scientists, such as the renowned physicist and astronomer François Arago, and to evoke respect and admiration from the common man, an ability that reflected his generosity, humanity, and vision of what science could do. A gregarious person, Humboldt appeared regularly in the salons of Parisian society, where he usually dominated the conversation. He lived simply, in a modest apartment at the top of an old house in the Latin Quarter. His fortune had been seriously depleted by the cost of his expedition and the publication of his books, and for the rest of his life he was often in financial straits. He was, moreover, always willing and anxious to assist young scientists at the beginning of their careers. Due to his magnanimity, generosity, and wise judgment, promising students who lacked funds were given the necessary encouragement, financial assistance, and introductions to the scientific community to insure a successful start in life. Such men as the German chemist Justus von Liebig and the Swiss-born zoologist Louis Agassiz owed to Humboldt the means to continue their studies and embark on an academic career. The best proof of his wide interests and affectionate nature lies in his voluminous correspondence: about 8,000 letters remain.

Later years. The happy years in Paris came to an end in 1827. Humboldt's means by then were almost completely exhausted; unable to maintain his financial independence, he had to return to Berlin, where the King impatiently demanded his presence at court. Until a few years before his death, Humboldt served as a tutor to the Crown Prince, as a member of the privy council, and as a court chamberlain. He made use of his position to acquaint the young prince and the royal family with scientific methods and the scientific ideas of his time. His enthusiasm for the popularization of science prompted him to give a course on physical geography to the professors and students of all faculties of the University of Berlin, part of which he repeated in a public lecture to an audience of more than 1,000. In the autumn of the same year, 1828, he also organized in Berlin one of the first international scientific conferences. Such large gatherings of possibly liberal-minded people were frowned upon by governments in the wake of the Napoleonic Wars and the attendant rise of democratic expectations, and it is a tribute to Humboldt's adroitness that he was able to overcome the misgivings of official Prussian circles.

In 1829 Humboldt was given the opportunity to visit Russia and Siberia. On the initiative of the Russian minister of finance, Count Yegor Kankrin, he was invited to visit the gold and platinum mines in the Urals, as an adviser to the government on the techniques and organization of mining. But Humboldt had to pledge himself to refrain from commenting on the political situation of the country whose despotism he abhorred. This expedition, lasting only one summer, was very different from the South American journey; the members, Humboldt and two young scientists, were accompanied throughout by an official guard, since they were guests of the Tsar. Humboldt and his companions had to endure tiresome receptions at the imperial court and in the homes of provincial governors. They travelled in carriages as far as the Altai Mountains and the Chinese frontier. The resulting geographical, geological, and meteorological observations, especially those regarding the Central Asian regions, were of great importance to the Western world, for Central Asia was then to a large degree unknown territory.

Humboldt passed the last 30 years of his life in Berlin. Once a year he travelled to Paris, where he renewed his contacts with the French scientists, enjoyed daily discussions with his friend Arago, and breathed the cosmopolitan air he so sadly missed in Berlin.

Even before his visit to Russia, he had returned to an investigation of a phenomenon that had aroused his interest in South America: the sudden fluctuations of the Earth's geomagnetic field—the so-called magnetic storms. With the help of assistants, he carried out observations of the movement of a magnetometer in a quiet garden pavilion in Berlin; but it had been clear to him for a number of years that, to discover whether these magnetic storms were of terrestrial or extraterrestrial origin, it would be necessary to set up a worldwide net of magnetic observatories. The German mathematician Carl Friedrich Gauss had already begun to organize simultaneous measurements of the magnetic field by several observatories in Germany, England, and Sweden. In 1836 Humboldt, still interested in the problem, approached the Royal Society in London with the request that it establish an additional series of stations in the British possessions overseas. As a result, the British government provided the means for permanent observatories in Canada, South Africa, Australia, and New Zealand and equipped an Antarctic expedition. With the help of the mass of data produced by this international scientific collaboration, one of the first of its kind, the English geophysicist Sir Edward Sabine later succeeded in correlating the appearance of magnetic storms in the Earth's atmosphere with the periodically changing activity of sunspots, thus proving the extraterrestrial origin of the storms.

During the last 25 years of his life, Humboldt was chiefly occupied with writing *Kosmos,* one of the most ambitious scientific works ever published. Four volumes appeared during his lifetime. Written in a pleasant, literary style, *Kosmos* gives a generally comprehensible account of the structure of the universe as then known, at the same time communicating the scientist's excitement and aesthetic enjoyment at his discoveries. Humboldt had taken immense pains to discipline his inclination to discursiveness, which often gave his writing a certain lack of logical coherence. He was rewarded for his effort by the success of his book, which, within a few years, had been translated into nearly all European languages.

While still working on the fifth volume of *Kosmos* with hardly diminished vitality and enthusiasm and with an unimpaired memory, Humboldt died in his 90th year. (C.L.K.)

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Works. Ansichten der Natur, mit wissenschaftlichen Erläuterungen, (1808; *Aspects of Nature, in Different Lands and Different Climates,* 1849), descriptions of scenic aspects and a sketch of the geography of plants for the general reader; *Voyage de Humboldt et Bonpland aux régions équinoxiales du nouveau continent, fait en 1799–1804,* 23 vol. (1805–34; *Personal Narrative of Travels to the Equinoctial Regions of the New Continent During the Years 1799–1804,* 7 vol., 1814–29), a well-known account of the journey through the grasslands of Venezuela and the Orinoco Basin that had a great influence on Darwin; *Asie Centrale,* 3 vol. (1843), significant for its report on relatively unknown regions and for its ideas on comparative climatology.

Humboldt, (Karl) Wilhelm, Freiherr von (baron of) (b. June 22, 1767, Potsdam, Prussia—d. April 8, 1835, Tegel, near Berlin), German language scholar, philosopher, diplomat, and educational reformer whose contribution to the development of language science became highly valued in the 20th century. He



Wilhelm, Freiherr von Humboldt, oil painting by F. Krüger

Bruckmann—Art Reference Bureau

contended that language is an activity the character and structure of which express the culture and individuality of the speaker, and he also asserted that man perceives the world essentially through the medium of language. He thus foreshadowed the modern development of ethnolinguistics, which explores the interrelationship of language and culture. He was the elder brother of Alexander von Humboldt.

While completing studies at the University of Jena, Humboldt formed a close, lifelong friendship with Friedrich Schiller. (His correspondence with Schiller was published in 1830 and, in a new edition, in 1889.) Humboldt's literary renown in the late 1790s helped him obtain Prussian ministerial posts at Rome (1801–08), where he was a generous patron of the arts and sciences. In 1809 he became Prussian minister of education and was chiefly instrumental in founding the Friedrich-Wilhelms-Universität (modern Humboldt-Universität) at Berlin. He also reformed elementary education by elevating the standards for teacher training and certification and generally helped to place Prussia in the forefront of educational progress. After his brief term in the education ministry he retired to private life, but in 1812 he was sent as ambassador to Vienna. In 1813, at the Congress of Prague, he helped to induce Austria to join forces with Russia and Prussia against France; and in 1815 he was one of the signatories of the Treaty of Paris.

During the later period of his diplomatic career (in 1817) he made notable corrections and additions, especially on the Basque language, to J.C. Adelung's *Mithradates,* a comparative study of languages. Humboldt's additions brought Basque to the attention of scholars and facilitated its scientific study. He also visited the Basque country and in 1821 wrote a study on the early inhabitants of Spain. In 1828 he published *Über den Dualis* ("On the Dual"), in which his considerations on the dual (as distinct from singular and plural) "number" led him toward the metaphysics of language.

Humboldt died without completing perhaps the great work of his life, a study of the ancient Kawi language of Java. The imperfect fragment, edited by his brother and J. Buschmann in 1836, contained an introduction, *Ueber die Verschiedenheit des menschlichen Sprachbaues . . .*(1980), on language differences and their influence on man's development, an essay that has been called the textbook of the philosophy of speech. His other linguistic writings, along with poems and essays on aesthetic subjects, were published by his brother in seven volumes (1841–52). His correspondence with Goethe was published in 1876. Two 20th-century biographies are H. Nette's *Wilhelm und Caroline von Humboldt: ein Leben in Briefen* (1956) and Paul R. Sweet's *Wilhelm von Humboldt,* 2 vol. (1978–79).

Humboldt Current (Pacific Ocean): *see* Peru Current.

Humboldt Glacier, largest known glacier in the world, northwestern Greenland, 210 mi (340 km) north-northeast of Dundas. The largest known glacier, rises to a height of 328 ft (100 m), and discharges into the Kane Basin along a 60-mi (100-km) front. It was discovered in 1853 by an American expedition headed by Elisha Kent Kane.

Humboldt River, river formed by the confluence of the East and North forks, which rise in fragments of the discontinuous Humboldt National Forest in Elko County, northern Nevada, U.S. Flowing in a tortuous channel generally west and southwest past Elko, Winnemucca, and Lovelock, it then, after a course of about 300 mi (480 km), enters Humboldt Lake (also called Humboldt Sink), an intermittently dry lake bed with no outlet, near Humboldt Range. Named by the soldier-explorer John C. Frémont for Alexander von Humboldt, the German explorer and scientist, it was an important route for emigrants going from Salt Lake City, Utah, to central California, especially after the discovery of gold there in 1848. The Rye Patch Dam (1936), forming Rye Patch Reservoir, is part of the Humboldt Irrigation Project.

Humboldt-Universität zü Berlin: *see* Berlin, University of.

Humch'igyo (Korean religion): *see* Poch'ŏngyo.

Hume, Alexander (b. *c.* 1560, Polwarth, Berwick, Scot.—d. Dec. 4, 1609, Logie, near Stirling, Stirling), Scots poet known for a collection of religious poems.

Hume probably attended the University of St. Andrews and spent four years studying law in Paris. After practicing law in Edinburgh and trying his fortune at the Scottish court, he was finally ordained, becoming in 1590 minister of Logie, where he remained until his death. Hume wrote a few ardent and puritanical religious tracts and published in the Scottish dialect a small collection of poems, *Hymnes, or Sacred Songs* (1599). He is remembered chiefly for the evocatively descriptive "Of the Day Estival." "Epistle to Maister Gilbert Mont-Crief" is an interesting early example of autobiography.

Hume, Alexander Hume, 1st earl of: *see* Home, Alexander Home, 1st earl of.

Hume, Allan Octavian (b. June 6, 1829, Montrose, Forfarshire, Scot.—d. July 31, 1912, London), British administrator in India, one of the leading spirits in the founding of the Indian National Congress.

Hume was the son of the radical politician Joseph Hume and entered the Indian civil service in Bengal in 1849 after serving as magistrate in the district of Etāwah at the time of the Indian Mutiny of 1857, he was assigned to the board of revenue in the North-Western Provinces. In 1870–79 he was attached to the central government of India as secretary in the revenue and agriculture department. His views favouring greater participation for Indians in Indian affairs created difficulties, and he returned to provincial administration. On his retirement from the civil service in 1882, he involved himself in political activities aimed at giving Indians more democratic, representational government and was one of the conveners of the first session of the Indian National Congress, held at Bombay in 1885. He served as general secretary of the Congress for its first 22 years.

By the time he left India in 1894, Hume was no longer able to control the nationalist movement, in which radical ideas were gaining force. Retiring to the Dulwich district of London, he participated in and financed radical political causes, serving as president of the Dulwich Liberal association from 1894 until his death.

While in the North-Western Provinces, he produced several works on ornithology, including, as co-author, *The Game Birds of India, Burmah and Ceylon* (1879–81). He later presented his collection of bird skins and eggs to the British Museum.

Hume, David (b. May 7 [April 26, old style], 1711, Edinburgh—d. Aug. 25, 1776, Edinburgh), Scottish philosopher, historian, economist, and essayist, known especially for his philosophical skepticism and Empiricism, restricting human knowledge to the experience of ideas and impressions and denying the possibility of ultimately verifying their truth.

A brief account of the life and works of David Hume follows; for a full biography, *see* MACROPAEDIA: Hume.

Hume's early years were spent in Edinburgh and Bristol. In 1734 he went to France, where he wrote *A Treatise of Human Nature* (1739–40), an attempt to formulate a full-fledged philosophical system, that he later repudiated as juvenile. Returning to England, he wrote *Essays, Moral and Political* (1741-42) and tried unsuccessfully (1744) to obtain the chair of moral philosophy at Edinburgh. He then began a period of wandering, during which he wrote extensively, including *An Enquiry Concerning Human Understanding* (1748, revised 1758) and *An Enquiry Concerning the Principles of Morals* (1751).

Hume remained in Edinburgh from 1751 to 1763, except for two periods in London, during which he wrote *The History of England* (1754–62). In 1763 he became secretary to the British embassy in Paris. He returned to London in 1766, bringing with him Jean-Jacques Rousseau, but Rousseau, delusional, suspected a plot and fled back to France. Hume reported on the matter in *A Concise and Genuine Account of the Dispute Between Mr. Hume and Mr. Rousseau.* Hume tired of public life in London and returned to Edinburgh in 1769, where he revised his collected writings and

wrote his autobiography, *The Life of David Hume, Written by Himself,* which was published posthumously.

Hume, (Andrew) Hamilton (b. June 19, 1797, near Parramatta, New South Wales, Australia—d. April 19, 1873, Coomer Cottage, Yass, New South Wales), Welsh explorer whose work did much to open up the Berrima-Bong Bong District.

Hume was the eldest son of Andrew Hamilton Hume (1762–1849), a farmer and a superintendent of convicts. The son began exploring at the age of 17 with his brother John and an Aboriginal, and extended his range (1814–15). He travelled with Charles Throsby and James Meehan (1818), accompanied John Oxley and Meehan to Port Jervis (1819), and with others discovered the Yass Plains (1822).

Unable to get financial support from the government for an overland expedition to the southern coast of Australia, Hume accepted that of William Hovell, a sailor whose inexperience in the bush was compensated by his skill at navigation. They traversed from Gunning to Corio Bay (October 1824–January 1825), discovering part of the Murray River and valuable farming and grazing lands. For this journey Hume was rewarded by a grant of 500 acres (200 hectares) on the Crookhaven River.

In 1828 Hume accompanied Charles Sturt on an expedition that discovered Darling River, but as a result his health was broken, and he settled on the Yass Plains, where he was granted 500 acres by Governor Darling.

When in 1853 Hovell visited Geelong, established after his and Hume's 1824–25 exploration, and was celebrated as its discoverer, Hume wrote *A Brief Statement of Facts in Connection with an Overland Journey from Lake George to Port Phillip* (1855) to redress what he considered a slight. Hovell published *A Reply* (1855), and their friendship ended.

In 1860 Hume was elected a fellow of the Royal Geographical Society, and later he served as magistrate until his death.

Hume, Joseph (b. Jan. 22, 1777, Montrose, Angus, Scot.—d. Feb. 20, 1855, County of Norfolk, Eng.), British radical politician responsible for a number of social reforms.

After making his fortune in India, he returned to England and, in 1812, purchased a seat in the House of Commons, where he



Joseph Hume, detail of a portrait by J.W. Walton, 1854; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

voted as a Tory. Parliament dissolved, and six years elapsed before Hume returned to the House; during that time he adopted the doctrines of James Mill and the philosophical radicals. When Hume returned to Parliament, he became the self-appointed guardian of the public purse by challenging and bringing to a direct vote every single item of public expenditure. He was responsible for adding the word retrenchment to the radical "peace and reform" program. A believer in free trade, Hume was largely responsible for the repeal of the laws prohibiting the export of machinery and of the act preventing the emigration of workmen; he also fought the Combination Acts, which made trade unionism illegal. An energetic and tireless reformer, he also protested against flogging in the army, the impressment of sailors, and imprisonment for debt; he advocated Catholic emancipation and the admission of dissenters to the universities; and he advocated the repeal of the Test and Corporation Acts and parliamentary reform.

His son Allan Octavian Hume was active in the Indian civil service and participated in the founding of the Indian National Congress.

Hume, Sir Patrick, 2ND BARONET, Hume also spelled HOME, also called (1690–97) LORD POLWARTH, or (from 1697) 1ST EARL OF MARCHMONT (b. Jan. 13, 1641—d. Aug. 1, 1724, Berwick-on-Tweed, Northumberland, Eng.), Scottish Protestant opponent of James II, who was involved in the rebellion of the Duke of Monmouth and the invasion of William of Orange.

As a member of the Scottish Parliament in 1665, he was active in opposing the harsh policy of the Earl of Lauderdale toward the Covenanters, and for his contumacy he was imprisoned. After his release he went to London, where he associated himself with the Duke of Monmouth. Suspected of complicity in the Rye House Plot, he remained for a time in hiding and then crossed over to the Netherlands, where he took part in the deliberations of Monmouth, the Earl of Argyll, and other exiles about the projected invasion of Great Britain. Although he appeared to distrust Argyll, he sailed to Scotland with him in 1685, and after the failure of the rising he escaped to Utrecht, where he lived in great poverty until 1688.

He accompanied William of Orange to England, and in 1689 he was again a member of the Scottish Parliament. In 1690 he was made a peer as Lord Polwarth; in 1696 he became lord high chancellor of Scotland, and in 1697 he was created earl of Marchmont. When Anne became queen in 1702 he was deprived of the chancellorship and later retired from politics.

Hume Reservoir, reservoir in Australia, on the Victoria–New South Wales border, at the confluence of the Mitta-Mitta and Murray rivers, 10 mi (16 km) above Albury. Completed in 1934 and named for the Australian bushman and explorer Hamilton Hume, it was enlarged in 1961 to a capacity of 2,500,000 ac-ft (3,100,000,000 cu m); this necessitated the moving of the township of Tallangatta. The reservoir is part of the Murray River Scheme, which provides both states with water for domestic uses and for livestock, irrigation, and hydroelectric power.

Hume-Rothery, William (b. May 15, 1899, Worcester Park, Surrey, Eng.—d. Sept. 27, 1968, Oxford, Oxfordshire), British founder of scientific metallurgy, internationally known for his work on the formation of alloys and intermetallic compounds.

Originally planning on a military career, Hume-Rothery entered the Royal Military Academy at Woolwich, but when an illness left him completely deaf, he transferred to Oxford, where he received an M.A. in chemistry in 1926. At the Royal School of Mines, London, he received a Ph.D. in metallurgy in 1926. He spent his professional life mostly at Oxford, studying the structures of copper, silver, and iron alloys and discovering the proportions in which metals form substitutional and interstitial alloys.

humerus, long bone of the upper limb or forelimb of land vertebrates, which forms the shoulder joint above, where it articulates with a lateral depression of the shoulder blade (glenoid cavity of scapula) and the elbow joint below, where it articulates with projections of the ulna and radius.

In humans the articular surface of the head of the humerus is hemispherical; two rounded projections below and to one side receive, from the scapula, muscles that rotate the arm. The shaft is triangular in cross section and roughened where muscles attach. The lower end of the humerus includes two smooth articular surfaces (capitulum and trochlea), two depressions (fossae) that form part of the elbow joint, and two projections (epicondyles). The capitulum, laterally, articulates with the radius; the trochlea, a spool-shaped surface, articulates with the ulna. The two depressions—the olecranon fossa, behind and above the trochlea, and the coronoid fossa, in front and above—receive projections of the ulna as the elbow is alternately straightened and flexed. The epicondyles, one on either side of the bone, provide attachment for muscles concerned with movements of the forearm and fingers. For a depiction of the humerus in human anatomy, shown in relation to other parts of the body, *see* the colour Trans-Vision in the PROPAEDIA: Part Four, Section 421.

Humfrey, Pelham (b. 1647—d. July 14, 1674, Windsor, Berkshire, Eng.), English composer and lutenist, especially admired for his anthems and sacred solo songs.

Humfrey was a chorister in the Chapel Royal under Capt. Henry Cooke and at age 17 was sent by Charles II to France and Italy to study. While abroad he was appointed royal lutenist and gentleman of the Chapel. He returned to England in 1667 and later succeeded Cooke as master of the children, one of his pupils being Henry Purcell. He also was composer for the king's violins. He produced many fine works, particularly anthems. In his solo songs with continuo, he shows great care in reflecting the feeling and accentuation of the texts in the music and was one of the English masters of the monodic style. He also wrote incidental music for plays by William Wycherly and John Dryden and for Shakespeare's *The Tempest*. Many of his songs appear in the collections published by John Playford.

humic acid, any of various organic acids produced in the process of soil formation and composed of large complex molecules formed by the union of many smaller molecules (a process known as polymerization). In the past, various names have been assigned to humic acids on the basis of either their degree of polymerization or the products resulting from their chemical separation. Highly polymerized humic acid, or gray humic acid, stabilizes clay and impedes its removal by water; medium polymerization yields brown humic acid. Slightly polymerized humic acid, also called fulvic acid, acts, through a process known as podsolization, to produce two kinds of soil. It forms complexes with the iron and clay, dissolves them, and aqueously removes (eluviates) them from the upper soil layers. When the soil is only moderately podsolized—*i.e.,* when the fulvic acid removes mainly the clay, the resulting soil is termed podsolic; when an ashy layer is formed because all weathering products are removed, or when the clay or iron, or both, are removed, the soil is called a podsol.

humidity, the amount of water vapour in the air. It is the most variable characteristic of the atmosphere and constitutes a major factor in climate and weather.

A brief treatment of humidity follows. For full treatment, *see* MACROPAEDIA: Climate and Weather.

Atmospheric water vapour is an important factor in weather for several reasons. It regulates air temperature by absorbing thermal radiation both from the Sun and the Earth. Moreover, the higher the vapour content of

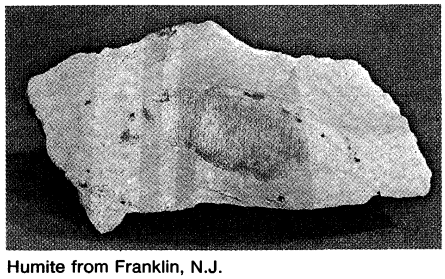
the atmosphere, the more latent energy is available for the generation of storms. In addition, water vapour is the ultimate source of all forms of condensation and precipitation.

Water vapour enters the atmosphere primarily by the evaporation of water from the Earth's surface, both land and sea. The water-vapour content of the atmosphere varies from place to place and from time to time because the humidity capacity of air is determined by temperature. At 30° C (86° F), for example, a volume of air can contain up to four percent water vapour. At −40° C (−40° F), however, it can hold no more than 0.2 percent.

When a volume of air at a given temperature holds the maximum amount of water vapour, the air is said to be saturated. Relative humidity is the water-vapour content of the air relative to its content at saturation. Saturated air, for example, has a relative humidity of 100 percent, and near the Earth the relative humidity very rarely falls below 30 percent. Unsaturated air can become saturated in three ways—by evaporation of water into the air; by the mixing of two masses of air of different temperatures, both initially unsaturated but saturated as a mixture; or, most commonly, by cooling the air, which reduces its capacity to hold moisture as water vapour sometimes to the point that the water vapour it holds is sufficient for saturation. This atmospheric cooling can be brought about in a number of ways, as by the arrival of a cooler air mass or by the movement of an air mass up a mountain side. If the cooling continues beyond the point of saturation, and provided there are sufficient condensation nuclei in the air around which tiny cloud or fog droplets can form, the excess moisture will condense out of the air as cloud or fog droplets or various forms of precipitation at the Earth's surface. The condensation process, however, releases latent heat, which may help the cloud to grow upward, by warming the humid air, causing it to rise, or, conversely, may evaporate the clouds as the warmed air falls below the saturation point and is able to absorb more water vapour. When clouds form, however, they block out some solar radiation and thereby have a net effect of cooling the air.

Care must be taken to distinguish between the relative humidity of the air and its moisture content or density, known as absolute humidity. The air masses above the tropical deserts such as the Sahara and Mexican deserts contains vast quantities of moisture as invisible water vapour. Because of the high temperatures, however, relative humidities are very low. Conversely, air in very high latitudes, because of low temperatures, is frequently saturated even though the absolute amount of moisture in the air is low.

humite, member of a group of layered silicate minerals related to the olivines that are nearly always restricted in occurrence to altered limestones and dolomites adjacent to acid or alkaline plutonic rocks and to skarns (contact-metamorphic rocks) near iron-ore deposits. The humite group includes norbergite, chondrodite, humite, and clinohumite. These yellow to brown, moderately hard minerals have a layered structure; the olivine mineral forsterite, magnesium silicate (Mg_2SiO_4), alternates with brucite, magnesium hydroxide [$Mg(OH)_2$], and differences in the physical properties and the crystallization result from differences in the stacking sequence. The humites rarely occur together in the same mass, but humite crystals have been found penetrated by clinohumite. For detailed physical properties, *see* olivine (table).



Humite from Franklin, N.J.

By courtesy of the American Museum of Natural History; photograph, Emil Javorsky—EB Inc.

Hummel, Johann Nepomuk (b. Nov. 14, 1778, Pressburg, Bohemia [now Bratislava, Czech.]—d. Oct. 17, 1837, Weimar, Thuringia [Germany]), Austrian composer and the outstanding virtuoso pianist during the period of transition from Classical to Romantic musical styles.

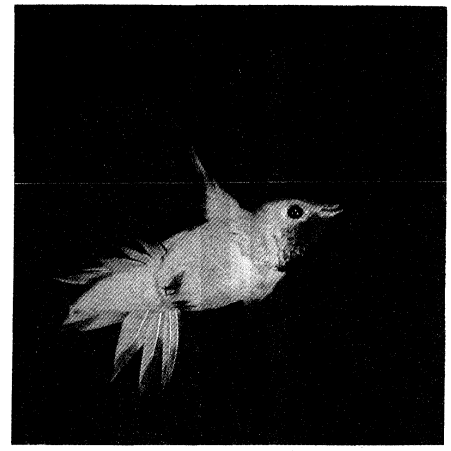
Hummel studied at an early age with Wolfgang Amadeus Mozart, at whose house in Vienna he lived for two years. Later, accompanied by his father, he toured Germany, Holland, and England for four years as a child-prodigy pianist. In England he studied a year with Muzio Clementi. Returning to Vienna in 1793 he took instruction from J.G. Albrechtsberger, Joseph Haydn, and Antonio Salieri. From 1804 to 1811 he was chapelmaster to the Esterházy family (a post formerly held by Haydn). After further successes as a pianist and teacher, he became chapelmaster at Weimar (1819).

Hummel's most important compositions are his piano works, consisting of trios, sonatas, rondos, and six concerti, all elegant in style and virtuosic in their melodic writing and ornamentation. Fluent, clear in texture, and well-suited to the light Viennese piano action of his day, these works nevertheless lack the emotional depth and coherence evident in the works of Hummel's great contemporary rival, Ludwig van Beethoven. Hummel also composed nine operas, three masses, a mandolin concerto, and chamber works, notably the *Septet in D Minor.* He made innovations in fingering methods, published in his *Klavierschule* ("Piano School") in 1828.

hummingbird, any of about 320 species of small, often brightly coloured birds of the family Trochilidae, usually placed with the swifts in the order Apodiformes but sometimes separated in their own order, Trochiliformes. The brilliant, glittering colours and elaborately specialized feathers of many species (usually of the males only) led the 19th-century British naturalist John Gould to give many hummingbirds exotic common names, many of which are still in use—*e.g.,* coquette, fairy, hill star, wood star, sapphire, topaz, sun gem, and sylph.

Hummingbirds are restricted in distribution to the New World, where the greatest variety and number of species occur in South America. About 12 species are found regularly in the United States and Canada. Only the ruby-throated hummingbird (*Archilochus colubris*) breeds in eastern North America, where it is found from Nova Scotia to Florida. The northernmost hummingbird is the rufous (*Selasphorus rufus*), which breeds from southeastern Alaska to northern California.

All hummingbirds are small, and many are minute. Even the largest, the giant hummingbird (*Patagona gigas*) of western South America, is only about 20 cm (8 inches) long, with a body weight of about 20 g (⅔ ounce), less than that of most sparrows. The smallest species, the bee hummingbird (*Mellisuga,* sometimes *Calypte, helenae*) of Cuba and the Isle of Pines, is slightly more than 5.5 cm (2⅛ inches), of which the bill and tail make up about half. Weighing about 2 g (0.07 ounce), this species is the smallest living bird and ranks with the pygmy shrews as the smallest of warm-blooded vertebrates.



Allen's hummingbird (*Selasphorus sasin*)

Arvil L. Parker

Hummingbirds have compact, strongly muscled bodies and rather long, bladelike wings that, unlike the wings of other birds, articulate (connect) to the body only from the shoulder joint. The architecture of the wing permits hummingbirds to fly not only forward but also straight up and down, sideways, and backward and to hover in front of flowers as they obtain nectar and insects from them. The rate at which a hummingbird beats its wings is the same during directional and hovering flight. It varies with the size of the bird—the larger the bird, the lower the rate. Consequently, the smallest hummingbirds have extremely rapid wing-beat rates. In *Calliphlox amethystina,* one of the tiniest species, the male has a wing-beat rate of about 80 per second; the female, which is larger, beats her wings at a rate of about 60 times per second. The ruby-throated hummingbird has a wing-beat rate of about 70 per second in the male and about 50 per second in the female. The rate is much lower in the larger hummingbirds; the giant hummingbird, for example, beats its wings only about 10 times per second. In fact, the larger hummingbirds appear to beat their wings more slowly than do other birds of comparable size.

The hummingbird's body feathers are sparse and often strongly metallic and rather scalelike in appearance. The sexes are alike in appearance in a few species but are different in most species; males of the latter species display a variety of brilliance and ornamentation rivaled only by birds-of-paradise and certain pheasants. The most typical badge is the gorget, a bib of iridescent feathers the colour of which depends on the viewing angle. Other specializations include crests; abbreviated or thickened shafts of wing feathers; spatulate, wiry, or flaglike tail feathers; and "pantaloons," tufts of puffy feathers on the thighs (usually white).

The hummingbird's bill, which is adapted for securing nectar from certain types of flowers, is usually rather long and always slender. In the thornbills (*Ramphomicron* and *Chalcostigma*), it is quite short, but in the sword-billed hummingbird (*Ensifera ensifera*), it is unusually long, contributing more than half of the bird's 21-centimetre (8¼-inch) length. The bill is slightly downcurved in many species, strongly so in the sicklebills (*Eutoxeres*); it is turned up at the tip in the awlbill (*Avocettula*) and avocetbill (*Opisthoprora*).

Most of the species that have been adequately studied do not show pair-bond formation. In the violet-ears (*Colibri*) and a few others, pair bonds are formed, and both sexes assume parental duties. In the majority of other species, the male defends a territory, where he displays in flight to passing females with swoops, dashes, and sudden stops and starts. Often he hovers in front of the female, oriented so that the light reflects the colour of his

gorget. Territorial males chase off hummingbirds of their own and other species and dive at large birds, such as crows and hawks, and even at mammals, including humans. Most hummingbirds, especially the smaller species, have scratchy, twittering, or squeaky, songs. In their U-shaped display flights, however, the wings often produce humming, hissing, or popping sounds, which apparently function much as do the songs of other birds. In many species the tail feathers produce the sounds.

The hummingbird's nest is a tiny cup of plant fibres, spider webs, lichens, and moss that is attached to a branch, a forked twig, a large leaf, or a rock ledge. In certain species of hummingbirds known as hermits (*Phaethornis*), the nest is hung by a narrow stalk from the underside of a ledge or from the roof of a cave or culvert; the nest cup is set on one side of a mass of mud and plant material and is held level by careful weighting of the other side of the mass.

The two elliptical white eggs (rarely, one) are the smallest laid by any bird, although, proportionately, they are equal to about 10 percent of the female's body weight. They are incubated for about 15 to 20 days. The young, hatched blind and virtually naked, are fed by regurgitation and fledge in about three weeks; the time from laying to fledging apparently is correlated with food supply.

hummingbird moth: *see* hawk moth.

humor: *see* humour.

humoresque, German HUMORESKE, a type of character piece, generally a short piano composition expressing a mood or a vague nonmusical idea, usually more good-humored than humorous. Robert Schumann, the first composer to use the term as a musical title, called his Opus 20 (1839) *Humoreske* (it is atypically like a long suite). His Opus 88, No. 2, is a humoresque for violin, cello, and piano. The best-known is Antonín Dvořák's *Humoresque in G-flat,* the seventh in his collection *Eight Humoresques* for piano (1894). Gustav Mahler originally called his *Des Knaben Wunderhorn* (1888–99; *Songs From the Youth's Magic Horn*) "Humoreske."

humour, also spelled HUMOR, form of communication in which a complex mental stimulus illuminates or amuses, or elicits the reflex of laughter.

A brief treatment of humour follows. For full treatment, *see* MACROPAEDIA: Humour and Wit.

Most humour, from the crudest practical joke to the most elegant witticism or comic anecdote, comes from the sudden perception of a relation between two consistent but mutually incompatible contexts. The sudden clash between these two different contexts produces the comic effect because it compels the listener to perceive a given situation in two self-consistent but incompatible frames of reference at the same time. This creative type of mental activity seems to be innately delightful to human beings, at least in the context of a humorous appreciation of life.

There is a bewildering variety of moods involved in different forms of humour, but whatever the mixture, it must contain one basic and indispensable ingredient: an impulse, however faint, of aggression, apprehension, or even malice. Sometimes the aggressiveness in humour is obvious, as in children's practical jokes or in the pratfalls of adults. At other times it may be more subtle, as when a pun suddenly makes an earnest conversation appear ridiculous. The elements of aggression and apprehension are so universally common in humour that some writers have theorized that its function is to discharge these emotions in a socially acceptable manner. Laughter serves as a safety valve for the overflow of redundant tensions.

Anthropological accounts have often shown that the humour of simpler cultures is quite cruel by modern standards. The literature is rife with accounts of tribesmen laughing at the torments of wounded animals, as well as playing painful practical jokes on one another. This form of play is often too abrasive or divisive for larger or less closely knit social groups, and the increasing urbanization of humanity has tended to produce less physical and more verbal humour.

humour, also spelled HUMOR (from Latin "liquid," or "fluid"), in early Western physiological theory, one of the four fluids of the body that were thought to determine a person's temperament and features. In the ancient physiological theory still current in the Middle Ages and later, the four cardinal humours were blood, phlegm, choler (yellow bile), and melancholy (black bile); the variant mixtures of these humours in different persons determined their "complexions," or "temperaments," their physical and mental qualities, and their dispositions. The ideal person had the ideally proportioned mixture of the four; a predominance of one produced a person who was sanguine (Latin *sanguis,* "blood"), phlegmatic, choleric, or melancholic. Each of these complexions had specific characteristics, so that the words carried much weight that they have since lost: the choleric man, for example, was not only quick to anger but also yellow-faced, lean, hairy, proud, ambitious, revengeful, and shrewd. By further extension, "humour" in the 16th century came to denote an unbalanced mental condition, a mood or unreasonable caprice, or a fixed folly or vice.

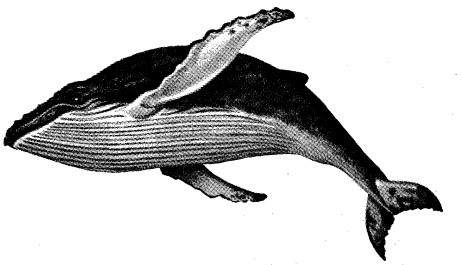
humours, comedy of, a dramatic genre most closely associated with the English playwright Ben Jonson from the late 16th century. The term derives from the Latin *humor* (more properly *umor*), meaning "liquid," and its use in the medieval and Renaissance medical theory that the human body held a balance of four liquids, or humours: blood, phlegm, yellow bile (choler), and black bile (melancholy). Properly balanced these humours were thought to give the individual a healthy mind in a healthy body.

In his play *Every Man Out of his Humour* (1599), Jonson explains that the system of humours governing the body may by metaphor be applied to the general disposition, so that a peculiar quality may so possess a man as to make him act in one way. Jonson's characters usually represent one humour and, thus unbalanced, are basically caricatures. Jonson distinguished two kinds of humour: one was true humour, in which one peculiar quality actually possessed a man, body and soul; the other was an adopted humour, or mannerism, in which a man went out of his way to appear singular by affecting certain fashions of clothing, speech, and social habits.

humpback salmon: *see* pink salmon.

humpback whale (*Megaptera novaeangliae,* or *M. nodosa*), baleen whale, the only species of the genus *Megaptera,* belonging to the family Balaenopteridae. The humpback is a thickset whale that usually attains a length of about 12 to 15 m (40 to 50 feet). It is black, with a variable amount of white below, and is distinguished by its very long, narrow pectoral fins—scalloped on the forward edge—and by large knobs, each associated with one or two hairs, on its head and jaws. The dorsal fin is small and set far back, and there are about 20 lengthwise grooves on the throat and chest.

The humpback lives along the coasts of all major oceans, occasionally swimming close inshore or even into harbours and up rivers. It migrates between polar oceanic waters in summer and tropical or subtropical breeding grounds in winter. Its diet consists of shrimplike crustaceans, small fish, and plankton, which it strains out of the water by means of its baleen. The humpback is one of the most acrobatic of all whales. On occasion it may perform a somersault by leaping from the water belly up, arching backwards, and plunging headfirst back into the water with a loud slapping sound. When making deep dives, it



Humpback whale (*Megaptera novaeangliae*)
Painting by Richard Ellis

hunches its back and rolls steeply forward, bringing its tail vertically clear of the water.

The humpback is also probably the most vocal of all whales, making a great variety of sounds which it strings together to form a "song" that may last from 5 to 35 minutes. The sounds range from moans and cries to groans and snores. The songs themselves vary among groups of whales in different areas of the ocean, and the songs undergo gradual but distinctive changes from year to year.

The humpback whale is commercially valuable and was much reduced in numbers by overhunting in the early and mid-20th century. Protected worldwide since the mid-1960s, it is listed as an endangered species in the *Red Data Book.*

humpbacked fly, also called COFFIN FLY, a tiny, dark-coloured fly with a humped back, member of the insect family Phoridae (order Diptera). The adults are abundant around decaying vegetation. Larvae may be scavengers, parasites, or commensals in ant and termite nests. Some species have reduced or no wings.

Humpen glass, extremely large, cylindrical beaker (*Humpen*), often with outward-curving sides, on a simple base, made in Germany in the 16th and 17th centuries. Typical features are the rim ornamentation—a ring of fine powdered gold below a line of beading in pearls of various colours—and the enamel



Reichsadlerhumpen, enameled glass *Humpen* with a double-headed eagle wearing the imperial German crown, 1604; in the Victoria and Albert Museum, London
By courtesy of the Victoria and Albert Museum, London; photograph, A.C. Cooper Ltd.

decoration. *Humpen* can be divided into three types. *Reichsadlerhumpen* carry a double-headed eagle and imperial German crown. The bird's breast is usually covered with either a large crucifix or a ball of empire; the arms of the German electors and the 48 members of the Holy Roman Empire are sometimes arranged along the wing feathers. The earliest example dates from 1547. *Kurfürstenhumpen* depict either the German emperor on horseback, with the three spiritual electors behind him and four princes below, or the kaiser enthroned, with three or four princes on either side. *Fichtelgebirgehumpen* are decorated with mountain landscapes. None of the surviving examples of *Humpen* dates before the middle of the 16th century. The best examples come from southern Germany but cannot be attributed to any particular manufacturer.

Humperdinck, Engelbert (b. Sept. 1, 1854, Sieberg, Hanover—d. Sept. 27, 1921, Neustrelitz, Ger.), German composer known for his opera *Hänsel und Gretel.*

Humperdinck studied at Cologne and at Munich. In 1879 a Mendelssohn scholarship enabled him to go to Italy, where he met Wagner, who invited him to assist in the production of *Parsifal* at Bayreuth. He taught at the Barcelona Conservatory (1885–87) and at Frankfurt (1890–96), where he was also music critic of the *Frankfurter Zeitung.* Early works were the choral ballads *Die Wallfahrt nach Kevelaar* (1878), *Das Glück von Edenhall* (1884), and the *Humoreske* (1880) for orchestra. *Hänsel und Gretel,* conducted by Richard Strauss, was produced at Weimar on Dec. 23, 1893. The libretto, by the composer's sister Adelheid Wette, was based on the folktale made familiar by the brothers Grimm. In this work Humperdinck showed an understanding of a child's mind and a sense of poetry, notably in the atmosphere of the woodland scene at twilight and in the realistic effects in the episode of the broken milk jug; the Wagnerian harmonies, the simple tunes, and the resourceful orchestration maintain the musical interest on a high level.

Between 1895 and 1919 Humperdinck produced six more operas, including *Dornröschen* (Frankfurt, 1902) and *Königskinder* (New York City, 1910), but neither they nor the spectacle *The Miracle* (London, 1911) enhanced his prestige. He also wrote incidental music for plays by Aristophanes, Shakespeare, and Maeterlinck; a *Moorish Rhapsody* for orchestra (1898); a string quartet; works for piano; and songs.

Humphrey DE HAUTEVILLE, Italian UMFREDO D'ALTAVILLA, French ONFROI DE HAUTEVILLE (b. Hauteville-la-Guichard, Normandy—d. 1057, Melfi, Apulia), soldier of fortune who led the Norman conquest of southern Italy after the deaths of his older brothers William and Drogo and succeeded them as count of Apulia (1051).

Arriving in Italy *c.* 1035, Humphrey fought in Sicily and Apulia, in southern Italy, becoming count of Lavello in 1045. Six years later, as count of Apulia, he married the sister of the Lombard prince Gaimar V of Salerno. In 1052, after pro-Byzantine forces murdered Gaimar and seized Salerno, Humphrey helped Gaimar's brother, the Duke of Sorrento, to recover the throne for Gaimar's young son.

Humphrey also played an important role in the decisive Battle of Civitate (1053), in which the Normans defeated a papal army; Pope Leo IX was taken prisoner, and on his release and return to Rome in 1054, Humphrey escorted him as far as Capua, north of Naples.

Humphrey designated his half brother Robert Guiscard as successor and guardian of his infant son Abelard, but on Humphrey's death Robert seized Abelard's lands, thus becoming the greatest landholder in southern Italy and laying the foundation for his own power.

Humphrey, Doris (b. Oct. 17, 1895, Oak Park, Ill., U.S.—d. Dec. 29, 1958, New York City), pioneer of the American modern dance and an innovator in technique, choreography, and theory of dance movement.

Humphrey studied many kinds of dance in Chicago and in 1917 entered the Denishawn School in Los Angeles. The following year she joined the Denishawn company



Doris Humphrey
Culver Pictures

and became one of its leading dancers. After choreographing several of her own solos she became choreographic assistant to Ruth St. Denis. She created her first group work in 1925 to Edward MacDowell's *Sonata Tragica.* Although similar in form to St. Denis' "music visualizations," *Sonata Tragica* possessed such strong choreographic rhythms that St. Denis later presented it as the first American modern dance performed without music. Dissatisfied with choreography dictated by music and with the foreign dance styles emphasized at Denishawn, Humphrey left the company in the late 1920s with another Denishawn dancer, Charles Weidman (*q.v.*). Together they founded the Humphrey–Weidman school and company, which was active until 1944; Sybil Shearer, Katherine Litz, and José Limón were among the more famous members of their company.

Humphrey wanted to create dances that reflected her individuality and were appropriate to contemporary America. To develop a personal technique she spent many hours in front of a mirror and came to believe that all movement fell within the "arc between two deaths," or the range between motionless balance and falling imbalance incapable of recovery. She understood that every movement a dancer makes away from the centre of gravity has to be followed by a compensating readjustment to restore balance and prevent uncontrolled falling; the more extreme and exciting the controlled fall attempted by the dancer, the more vigorous must be the recovery. As Mary Wigman had utilized space as the ever-present antagonist, so Humphrey made dramatic use of gravity, displaying the human desire for security (balance) in conflict with the urge for progress and adventure (imbalance). Another of her innovative theories held that movement is not always the consequence of emotional impulse but can itself create meaning. Humphrey's choreography began with experiments in dance theory and as an attempt to reduce dance to pure movement. *Water Study* (1928) incorporated her theory of fall and recovery and used only nonmusical rhythms (waves and natural human breath and pulse rhythms). *Drama of Motion* (1930) was themeless and also performed without music; it has been described as one of the first symphonic dances and exemplifies her belief that movement creates its own meaning.

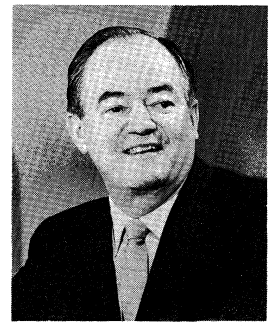
After the essentials of her dance had been successfully established, Humphrey's work grew more complex, eventually developing into a full theatrical art. *Dance of the Chosen* (1931; later and better known as *The Shakers*) added drums, accordions, and incoherent speech to portray the ecstatic nature of the Shakers' religious fervour. Her trilogy known as *New Dance,* after the title of the third section, is often considered her masterpiece. Completed in 1936 but never performed as a whole, it explored human relationships through the so-called symphonic form of dance. *With My Red Fires,* the second section, portrayed romantic love, a theme previously held unsuitable or too difficult for modern dance. *Theater Piece,* the work designed to open the trilogy, was co-choreographed with Weidman. *Inquest* (1944), a social protest and the last work in which she performed, displayed her mastery of both abstraction and stylized gesture. Noted for successful group choreography, Humphrey removed the modern dance from the confines of individual emotion. With that theoretical foundation she choreographed a wide variety of works, including the abstract *Passacaglia,* danced to Bach's C minor *Passacaglia and Fugue,* dances for musical plays, and her version of James Thurber's *Race of Life.*

She retired from performing in 1945, but as artistic director for José Limón's company, she choreographed such successful works as *Lament for Ignacio Sanchez Mejias, Night Spell, Day on Earth,* and *Ritmo Jondo.* She also founded the Juilliard Dance Theatre and taught choreography. Many of her dances were recorded on film and performed after her death by the Limón and Juilliard companies. She wrote *The Art of Making Dances* (1959).

Humphrey, Hubert H(oratio) (b. May 27, 1911, Wallace, S.D., U.S.—d. Jan. 13, 1978, Waverly, Minn.), 38th vice president of the United States (1965–69), presidential candidate in 1968, and liberal Senate leader (1949–65; 1971–78) who built his political base on a Democrat–Farmer-Labor coalition reminiscent of the Populist movement.

Originally a pharmacist, Humphrey held a variety of jobs—teacher, radio news commentator, federal administrator, and Army Air Forces instructor—before becoming Minnesota campaign manager for Pres. Franklin D. Roosevelt in 1944. During this period he was instrumental in merging the state's Democratic and Farmer-Labor parties.

Humphrey's public political career was launched in 1945, when he was elected mayor of Minneapolis. Three years later he ran successfully for the U.S. Senate, in which he served for the next 16 years; after 1961 he became assistant Senate majority leader. As a senator he developed a reputation as an effective, outspoken debater, a prolific initiator of legislation, and a skilled parliamentary leader. He won particular acclaim for achiev-



Hubert Humphrey
Paul Conklin

ing bipartisan support for the Nuclear Test-Ban Treaty (1963) and the Civil Rights Act (1964).

When he became vice president under Lyndon B. Johnson, Humphrey's earlier reputation as a glib and sometimes abrasive "do-gooder" was supplanted by a more conservative image, especially after he defended U.S. participation in the Vietnam War. As vice president, he served as chairman of the National Advisory Council of the Peace Corps, coordinator of the antipoverty program, and chairman of the Civil Rights Council.

Following President Johnson's withdrawal from active politics in 1968, Humphrey became the Democratic presidential candidate, but, with his party divided over the Vietnam War, he was narrowly defeated by Republican Richard M. Nixon. He continued his interest in education by conducting classes at Macalester College, St. Paul, and at the University of Minnesota, Minneapolis, and by his two-year association with the educational enterprises of the Encyclopædia Britannica, Inc. He was reelected to the Senate in 1970 as the Democratic–Farmer-Labor Party candidate from Minnesota. In 1972 he unsuccessfully sought the Democratic nomination for president but stayed in the Senate and thereafter played an active legislative role as well as those of elder statesman and party sage. In and out of the Senate he was assessed as one of the giants in the history of that body.

Humphreys, Joshua (b. June 17, 1751, Haverford Township, Pa., U.S.—d. Jan. 12, 1838, Haverford, Pa.), American shipbuilder and naval architect who designed the U.S. frigate *Constitution,* familiarly known as "Old Ironsides" (launched Oct. 21, 1797).

Humphreys was commissioned in 1794 to design six frigates for the newly formed U.S. Navy, thus becoming the first American naval construction contractor. His designs called for ships that were longer and broader than usual, lower in the water, and able to equal the speed of any fighting ship. They were stabler than other ships of their time and could carry, with better maneuverability, as many guns on one deck as others did on two. Thus his frigates, which were to protect the otherwise defenseless American commerce, could compensate for the naval superiority of hostile powers and pirates. The first vessel to be completed, the *United States,* was launched on May 10, 1797, and became the Navy's first capital ship at sea; the *Constitution, Chesapeake, Constellation, President,* and *Congress* followed. His ships were renowned for their speed and individual accomplishments, and the efficiency of his designs eventually influenced European shipbuilders.

Humphreys, West Hughes (b. Aug. 26, 1806, Montgomery County, Tenn., U.S.—d. Oct. 16, 1882, near Nashville, Tenn.), federal judge, the only U.S. government official impeached for supporting the secession of the Southern states during the American Civil War (1861–65).

After serving as Tennessee attorney general and reporter of cases for the state Supreme Court (1839–51), Humphreys was appointed U.S. district judge in 1853 for the three districts in Tennessee. In 1862 he accepted appointment as district judge of Tennessee under the Confederate States of America, was impeached by the U.S. Senate, and was found guilty on June 26. He was acquitted of authorizing confiscation of the property of Andrew Johnson, U.S. military governor of Tennessee and later president, and that of John Catron, justice of the U.S. Supreme Court. After the Civil War he became known as an advocate of Prohibition.

Humphreys, William Jackson (b. Feb. 3, 1862, Gap Mills, Va., U.S.—d. Nov. 10, 1949, Washington, D.C.), American atmospheric physicist who applied basic physical laws to explain the optical, electrical, acoustical, and thermal properties and phenomena of the atmosphere.

Humphreys received his Ph.D. from Johns Hopkins University and, in 1905, after holding a number of teaching and research positions, began the affiliation with the U.S. Weather Bureau that lasted until his death. Much of his work, and indeed most of classical physical meteorology, is summarized in his *Physics of the Air* (1920).

Humphreys Peak, highest point (12,633 feet [3,851 m]) in Arizona, U.S., 10 miles (16 km) north of Flagstaff in the Colorado Plateau. It is one of the three San Francisco Peaks, on the rim of an eroded volcano, and is situated in the Coconino National Forest. The mountain was named after Andrew Humphreys, a 19th-century railroad surveyor.

humus, nonliving, finely divided organic matter in soil, derived from microbial decomposition of plant and animal substances. Humus, which ranges in colour from brown to black, consists of about 60 percent carbon, 6 percent nitrogen, and smaller amounts of phosphorus and sulfur. As humus decomposes, its components are changed into forms usable by plants.

Humus is classified into mor, mull, or moder formations according to the degree of its incorporation into the mineral soil, the types of organisms involved in its decomposition, and the vegetation from which it is derived.

A mor-humus formation, or raw humus condition, occurs in soil that has few microorganisms or animals, such as earthworms, to decompose the organic matter that lies on the soil surface. Below this surface-litter layer is a distinct, strongly compacted humus layer; a layer of mineral soil underlies the humus. Fungi and small arthropods are the most common organisms. Mor soils are usually acidic (low pH) and are characteristic of coniferous forest areas, especially in cold regions and at high altitudes.

A mull-humus formation is characteristic of hardwood forests, deciduous forests, or grasslands in warm, humid climates. The porous, crumbly humus rapidly decomposes and becomes well mixed into the mineral soil, so that distinct layers are not apparent. Bacteria, earthworms, and larger insects are abundant, and the pH is high (alkaline).

A moder-humus formation is intermediate between mor and mull extremes. Moder is sometimes known as insect mull because its distinguishing characteristic is the presence of many arthropod fecal pellets. Chains of these pellets bind plant debris and mineral particles together into a netlike structure. A moder formation contains more organic material than a mull formation, but this material is not as well mixed with mineral components.

Humus is valued by farmers and gardeners because it provides nutrients essential for plant growth, increases soil water absorption, and improves soil workability.

Hun, member of a nomadic pastoralist people who invaded southeastern Europe *c.* AD 370 and during the next seven decades built up an enormous empire there and in central Europe. Appearing from beyond the Volga River some years after the middle of the 4th century, they first overran the Alani, who occupied the plains between the Volga and the Don rivers, and then quickly overthrew the empire of the Ostrogoths between the Don and the Dnestr. About 376 they defeated the Visigoths living in what is now approximately Romania and thus arrived at the Danubian frontier of the Roman Empire.

The earliest systematic description of the Huns is that given by the historian Ammianus Marcellinus, writing *c.* 395. They were apparently primitive pastoralists who knew nothing of agriculture. They had no settled homes and no kings; each group was led by *primates,* as Ammianus called them. Whether or not they had a single overall leader in the 4th century is still a matter of dispute.

As warriors the Huns inspired almost unparalleled fear throughout Europe. They were amazingly accurate mounted archers, and their complete command of horsemanship, their ferocious charges and unpredictable retreats, and the speed of their strategical movements brought them overwhelming victories.

For half a century after the overthrow of the Visigoths, the Huns extended their power over many of the Germanic peoples of central Europe and fought for the Romans. By 432 the leadership of the various groups of Huns had been centralized under a single king, Rua, or Rugila. When Rua died in 434 he was succeeded by his two nephews, Bleda and Attila. The joint rulers negotiated a peace treaty at Margus (Pozarevac) with the Eastern Roman Empire, by which the Romans agreed to double the subsidies they had been paying the Huns. The Romans apparently did not pay the sums stipulated in the treaty, and in 441 Attila launched a heavy assault on the Roman Danubian frontier, advancing almost to Constantinople.

About 445 Attila murdered his brother Bleda and in 447, for unknown reasons, made his second great attack on the Eastern Roman Empire. He devastated the Balkans and drove south into Greece as far as Thermopylae.

Since Ammianus' time the Huns had acquired huge sums of gold as a result of their treaties with the Romans as well as by way of plunder and by selling their prisoners back to the Romans. This influx of wealth altered the character of their society. The military leadership became hereditary in Attila's family, and Attila himself had autocratic powers in peace and war alike. He administered his huge empire by means of "picked men" (*logades*), whose main function was the government of and the collection of food and tribute from the subject peoples who had been assigned to them by Attila.

In 451 Attila invaded Gaul but was defeated by Roman and Visigothic forces at the Battle of the Catalaunian Plains, or, according to some authorities, of Maurica. This was Attila's first and only defeat. In 452 the Huns invaded Italy and sacked several cities, but famine and pestilence compelled them to leave. In 453 Attila died; his many sons divided up his empire and at once began quarreling among themselves. They then began a series of costly struggles with their subjects, who had revolted, and were finally routed in 455 by a combination of Gepidae, Ostrogoths, Heruli, and others in a great battle on the unidentified river Nedao in Pannonia. The Eastern Roman government thereupon closed the frontier to the Huns, who ceased to play any significant part in history, gradually disintegrating as a social and political unit.

The Hephthalites, who invaded Iran and India in the 5th and 6th centuries, and the Hsiung-nu, known earlier to the Chinese, are sometimes called Huns, but their relationship to the invaders of Europe is uncertain.

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hun, in Chinese Taoism, the heavenly (superior, spiritual) soul of man, as distinguished from *p'o,* the earthly (inferior, material) soul. Following the cosmological principles of yin–yang, the union of which opposites is said to explain all reality, the Chinese attributed breathing and superior functions to the *hun* (yang) soul. Separation of the two souls brings death. If prescribed burial rituals and sacrifices

are then properly observed, the *hun* soul will send blessings to the bereaved family from its abode in heaven.

Hunan, Wade-Giles romanization HU-NAN, landlocked *sheng* (province) of the People's Republic of China, located in central China at the crossroads of two historic lines of communication—the great waterway of the Yangtze River, which flows from Szechwan province east to the sea, and the Imperial Highway, running from Canton north to Peking. Hunan is bounded by the provinces of Hupeh to the north, Kiangsi to the east, and Kwangtung to the southeast, by the Chuang Autonomous Region of Kwangsi to the southwest, and by the provinces of Kweichow and Szechwan to the west. The capital and most important city is Ch'ang-sha.

A brief treatment of Hunan follows. For full treatment, *see* MACROPAEDIA: China.

Hunan's history began as early as 350 BC, when it formed the southernmost extension of the state of Ch'u. For hundreds of years thereafter, under the rule of various dynasties, Hunan experienced heavy waves of migration from northern China. During the Taiping Rebellion (1850–64), the province was desolated. It was not opened to foreign trade until 1904. Revolution in 1911 left in its wake years of unrest, including the abortive Autumn Harvest Uprising of 1927, led by Mao Zedong (Mao Tse-tung). From Hunan in 1934 Mao led his forces westward on what later came to be known as the Long March. Hunan was the scene of bitter fighting between 1939 and 1941 during the Sino-Japanese War (1937–45). The years of unrest subsided with the establishment of the People's Republic of China in 1949.

More than one-fourth of Hunan's terrain lies at elevations above 1,650 feet (500 m), and much of it is well over 3,000 feet (900 m) above sea level. The western highlands run northeast to southwest and form the eastern edge of the Kweichow Plateau, whose Hsüeh Mountain extension lies in the heart of the province. In the south, the Nan Range forms a broad mountain border between Hunan, Kwangtung province, and Kwangsi. The uplands of the west, south, and east fall steadily in elevation toward the plain of the Tung-t'ing Lake in the north. The part of the plain that lies within the borders of Hunan has an area of 3,800 square miles (9,800 square km). Weather conditions in the north of Hunan are more extreme than those in the south. Summers are long and humid, and rainfall is ample. Hunan lies in the path of cyclones that pass from west to east along the Yangtze River basin in summer, bringing with them at times long periods of heavy rain that result in extensive flooding.

The majority of the population is rural. Although mining and industry have been developed since 1949, the province's economy is basically agricultural. The population is primarily concentrated on the Tung-t'ing Plain and in the main river valleys. Most of the people are Han Jen (Northern Chinese). Villages are usually small; it is not unusual for an entire village to belong to one extended family.

Hunan has nine cities of 100,000 population or more. Three of these, Ch'ang-sha, Hsiang-t'an, and Chu-chou, lie close together at the intersection of road, rail, and river communications along the Hsiang River. They have grown rapidly and now form a single vast urban region. Hunan possesses considerable mineral wealth, including coal reserves, iron-ore, tin, and manganese deposits, and rich deposits of antimony, lead, zinc, and tungsten.

One of China's great rice-producing regions, Hunan exports a large surplus to other provinces. Other food crops include sweet potatoes, corn (maize), barley, potatoes, *kao-liang* (sorghum), buckwheat, peas, millet, and beans. Industrial crops are rape (an herb), ramie, cotton, jute, tea, peanuts (groundnuts), and various fruits. Most farms are small and use simple machines and tools, such as foot-operated rice-threshing machines and rubber-tired carts and wheelbarrows.

Railroad construction began early in the 20th century with the historic Peking-Canton line, passing through eastern Hunan. Another north-south line traverses western Hunan. There are east-west lines as well. A large proportion of Hunan's goods are moved by water, mainly by sailing junks using the rivers. Village life in Hunan has developed markedly since 1949. Every village of any size has its civic centre and library, however humble. Area 81,300 square miles (210,500 square km). Pop. (1988 est.) 57,826,000.

Ḥunayn ibn Isḥāq (al-Ibādī), Latin name JOHANNITIUS (b. 808, al-Ḥīrah, near Baghdad, Iraq—d. 873, Baghdad), Arab scholar whose translations of Plato, Aristotle, Galen, Hippocrates, and the Neoplatonists made accessible to Arab philosophers and scientists the significant sources of Greek thought and culture.

Ḥunayn was a Nestorian Christian who studied medicine in Baghdad and became well versed in ancient Greek. He was appointed by Caliph al-Mutawakkil to the post of chief physician to the court, a position that he held for the rest of his life. He traveled to Syria, Palestine, and Egypt to gather ancient Greek manuscripts, and, from his translators' school in Baghdad, he and his students transmitted Arabic and (more frequently) Syriac versions of the classical Greek texts throughout the Islāmic world. Especially important are his translations of Galen, most of the original Greek manuscripts of which are lost.

Hund, Friedrich (Hermann) (b. Feb. 4, 1896, Karlsruhe, Ger.), German physicist known for his work on the electronic structure of atoms and molecules. He helped introduce the method of using molecular orbitals to determine the electronic structure of molecules and chemical bond formation.

Hund taught and did research at German universities (Rostock, Leipzig, Jena, Frankfurt am Main, and Göttingen) exclusively, except for one year spent as a visiting lecturer at Harvard University. His publications include *Einführung in die theoretische Physik,* 5 vol. (1945–50; "Introduction to Theoretical Physics"), *Theoretische Physik,* 3 vol. (1956–63), *Theorie des Aufbaues der Materie* (1961; "Theory of the Structure of Matter"), *Grundbegriffe der Physik* (1969; "Fundamental Principles of Physics"), and *Geschichte der physikal Begriffe* (1972; "History of Physics Terminology").

hundred, unit of English local government, intermediate between village and shire, which survived into the 19th century. Originally, the term probably referred to a group of 100 hides (units of land required to support one peasant family). In the areas of Danish settlement these units were usually called wapentakes, and in the extreme northern counties of England, wards. The term hundred first appears in the laws of King Edmund I (939–946), but an anonymous Ordinance of the Hundred (issued before 975) indicates that the hundred was already a long-established institution. The hundred had a court in which private disputes and criminal matters were settled by customary law. The court met once a month, generally in the open air, at a time and place known to everyone. Originally, all dwellers within the hundred were expected to attend, but gradually suit of court (attendance) became restricted to the tenants of specific land. The suitors normally acted as the judges, but the sheriff was judge on the two annual visits (his "tourn") he made to each hundred court. Increasingly, hundred courts fell into the hands of private lords. In medieval times the hundred was collectively responsible for various crimes committed within its borders if the offender were not produced. These responsibilities were extinguished by statute in the 19th century, and any reasons for maintaining or remembering the hundred boundaries disappeared.

Hundred Days, French CENT JOURS, in French history, period between March 20, 1815, the date on which Napoleon arrived in Paris after escaping from exile on Elba, and July 8, 1815, the date of the return of Louis XVIII to Paris. The phrase was first used by the prefect of the Seine, Count Gilbert de Chabral de Volvic, in his speech welcoming the king.

Napoleon landed at Cannes on March 1, leading 1,500 men, and marched at once upon Paris. Louis XVIII fled to Ghent on March 13, and Napoleon entered Paris one week later. On March 25 Austria, Britain, Prussia, and Russia concluded an alliance against Napoleon and forced a series of military engagements leading up to the fatal Battle of Waterloo (June 18). On June 22 Napoleon abdicated a second time; on July 15 he boarded a British warship at Rochefort, essentially a prisoner; and exactly three months later he was landed at St. Helena. Meanwhile, on July 8, Louis XVIII had returned to Paris.

Hundred Days, in U.S. history, the early period of Franklin D. Roosevelt's presidency (March 9–June 16, 1933), during which a major portion of New Deal legislation was enacted. *See* New Deal.

Hundred Days of Reform (1898), in Chinese history, imperial attempt at renovating the Chinese state and social system. It occurred after the Chinese defeat in the Sino-Japanese War (1894–95) and the ensuing rush for concessions in China on the part of Western imperialist powers.

Following the Sino-Japanese War, a series of clubs sprang up across China urging reform on the Western model. One of these was founded by a civil service examination candidate, K'ang Yu-wei, who led a group of other candidates in the writing of a "Ten Thousand Word Memorial," which advocated the rejection of the peace treaty and the institution of a whole series of reforms. This petition was ignored by the imperial government. Meanwhile, within established official circles, a group of conservative reformers—led by Chang Chih-tung, whose famous work *Ch'üan-hsüeh p'ien* ("Exhortation to Learning") was distributed in 1898—called for the development of Western-style industrialization without the abandonment of China's cultural heritage.

Spurred by this group and alarmed by the slow dismemberment of China by Western powers in the wake of the Sino-Japanese War, the government began to seriously consider the idea of reform. As a result K'ang finally came to the attention of the Kuang-hsü emperor, and in January 1898 he met with a group of high government officials. On June 11, 1898, the emperor acceded to one of K'ang's requests and issued his first reform decree, urging his subjects to learn useful foreign information. This was the start of what was to be known as the Hundred Days of Reform. On June 16, 1898, K'ang was given his first interview with the emperor. Thereafter the government officials who had been advocating moderate reforms were pushed to the background, and K'ang, his famous disciple Liang Ch'i-ch'ao, and other followers became trusted imperial advisers.

In all, the emperor issued more than 40 edicts, which if enacted would have trans-

formed every conceivable aspect of Chinese society. The old civil service examination system based on the Chinese Classics was ordered abolished, and a new system of national schools and colleges was established. Western industry, medicine, science, commerce, and patent systems were promoted and adopted. Government administration was revamped, the law code was changed, the military was reformed, and corruption was attacked.

The attack on corruption, the army, and the traditional educational system threatened the privileged classes of traditional Chinese society. Conservative forces rallied behind the Empress Dowager; with the army on her side, she carried out a coup d'etat and imprisoned the Emperor in his palace. K'ang and Liang managed to escape to Japan, but six other young reformers were executed. Although some moderate reform measures, such as the establishment of modern schools, were retained, the examination system was reestablished and most of the reform edicts, which had never been enacted anyway, were repealed. In the early 1900s, officials like Chang Chih-tung were allowed to carry out a full-scale reform effort, but it was a piecemeal, belated effort. The failure of the Hundred Days marked the last attempt at a radical revolution by the Imperial regime in China.

Hundred Flowers Campaign, movement begun in May 1956 within the Communist government of China to lift the restrictions imposed upon Chinese intellectuals and thus grant greater freedom of thought and speech. Motivated by the relaxation of strict Communist controls in the Soviet Union that accompanied N.S. Khrushchev's denunciation of Stalin in February 1956, Mao Tse-tung invited criticism of the Communist Party's policies by anti-Communist intellectuals with the famous slogan from Chinese classical history "Let a hundred flowers bloom, and a hundred schools of thought contend." Criticism was slow in developing, but other Communist leaders continued to echo Mao's theme in speeches during the next year. Not until the spring of 1957 did articulate members of society begin to criticize Communist policy openly; within a few weeks the party became subjected to an ever-increasing crescendo of criticism. Wall posters denounced every aspect of the government, and students and professors criticized party members. In June, with the publication of an amended version of a speech Mao had given in February "On the Correct Handling of Contradictions Among the People," the party began to signal that the criticism had gone too far. By early July an anti-rightists' campaign was underway in which the recent critics of the regime were subjected to severe criticism.

Hundred Years' War, an intermittent struggle between England and France in the 14th–15th century over a series of disputes, including the question of the legitimate succession to the French crown. The struggle involved several generations of English and French claimants to the crown and actually occupied a period of more than 100 years. By convention it is said to have started in 1337 and ended in 1453, but there had been periodic fighting over the question of English fiefs in France going back to the 12th century.

Medieval legalities were such that one king could be the vassal of another king if the first had inherited titles outside his own kingdom. Such was the case with the English kings since William I, who, as the duke of Normandy, had conquered England in 1066. Marriage alliances and wars had altered the nature of the English titles in France, but at the death of the French king Charles IV in 1328 Edward III of England was also duke of Guyenne (part of Aquitaine in southwest France) and count of Ponthieu (on the English Channel). Furthermore, because his mother was Charles IV's sister and because Charles IV had no sons, Edward III considered himself a legitimate claimant to the French throne. The other major claimant was the Count of Valois, a grandson of Philip III of France through a younger branch of the family.

A French assembly called to settle the question chose the Valois claimant as Philip VI. Edward III appeared to accept the decision, but when Philip VI, afraid of another king's power in his realm, manoeuvred to confiscate Guyenne in 1337, Edward III renewed his claim to the French throne and brought an army to Flanders.

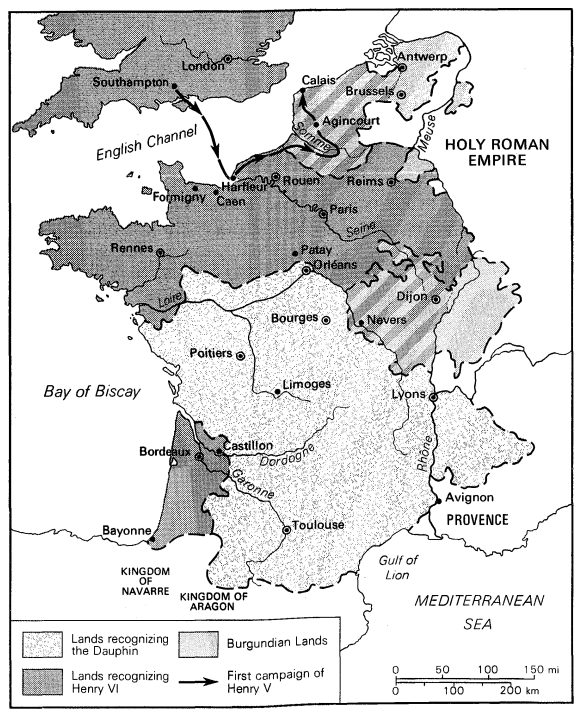
Medieval warfare occasionally involved pitched battles that could be decisive. More often, however, warfare consisted of long costly sieges conducted against important fortified cities. Even though the English armies of Edward III kept both Philip VI (d. 1350) and his son John II (ruled 1350–64) on the defensive, progress in expanding the area of English occupation was slow. Edward failed to press the advantage at his major victory at Crécy in 1346 in order to besiege the town of Calais. Edward III's son Edward the Black Prince even managed to capture John II at the crushing victory of Poitiers (1356). This forced the French to try to reach some agreement. The treaties of Calais (1360) gave Edward III full sovereignty over lands that he formerly held as a vassal of Philip VI. However, when John II died in captivity, awaiting fulfillment of all the provisions of the treaties, his son Charles, crowned as Charles V, refused to respect the treaties and reopened the conflict. This time the French put the English on the defensive until Charles V's death in 1380 halted progress in the reduction of English territory.

After 1380 both countries were preoccupied with internal power struggles and the war lapsed into uncertain peace. Possession of Flanders remained the outstanding issue. Edward III's grandson Richard II was eventually deposed (1399) by another grandson, who became Henry IV. In France, Charles V's brothers fought over who should administer affairs of state in the name of Charles VI, who suffered from bouts of insanity that rendered him incapable of ruling.

One of Charles VI's uncles, Philip the Bold, duke of Burgundy and count of Flanders, died in 1404. His son and heir, John the Fearless, had a rival uncle, Louis d'Anjou, duc d'Orléans, assassinated in 1407. Civil war broke out in France between the Armagnacs (supporters of Orléans and, later, adherents of the dauphin Charles) and the Burgundians. The English king, Henry V, upon assuming the throne after his father's death in 1413, decided to take advantage of the French discord to campaign anew for the English claims on the French crown. When John the Fearless was assassinated in his turn by the Armagnacs, Henry V found an ally in John's son, Philip the Good. By 1422, the Anglo-Burgundian alliance controlled Aquitaine and all France north of the Loire, including Paris.

Then English fortunes changed. Henry V died in 1422 leaving only an infant son. Weeks later the incapacitated Charles VI died, allowing his son to come to the French throne as Charles VII. The war's turning point was reached in 1429, when the English army was forced to raise its siege of Orléans by a relief force organized by Joan of Arc. Although Joan was captured by the Burgundians, sold to the English, and tried and executed for heresy, Philip the Good became convinced that the English could never impose their authority on a region as large as France without more support from the native nobility. He therefore switched sides in 1435, and Paris once again came under the authority of the king of France. Charles VII conquered Normandy and, taking advantage of the internal dynastic struggles connected with the English Wars of the Roses, conquered all of Aquitaine by 1453. England retained only Calais, which it relinquished in 1558.

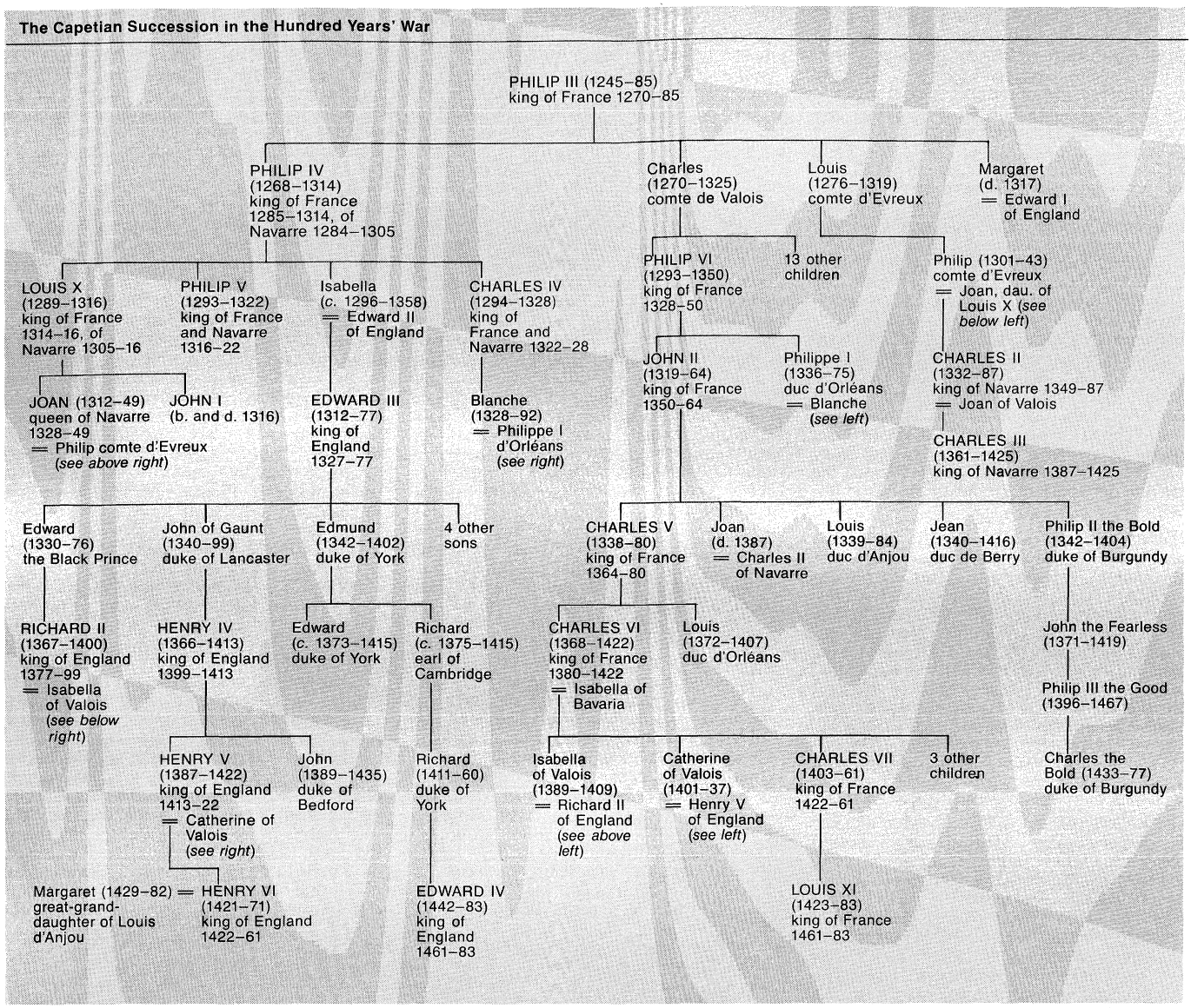
Historians have long considered the Hundred Years' War a milestone in the development of national consciousness in western Europe. The English, after their many successes and frustrations, were finally cured of their taste for continental intervention, and the English monarchs turned increasingly to the problems of internal development. The hard-fought success of the House of Valois in securing the



France in 1429

Adapted from R. Treharne and H. Fullard (eds.), *Muir's Historical Atlas: Ancient, Medieval and Modern*, 9th edition (1965); George Philip & Son Ltd., London

The Capetian Succession in the Hundred Years' War

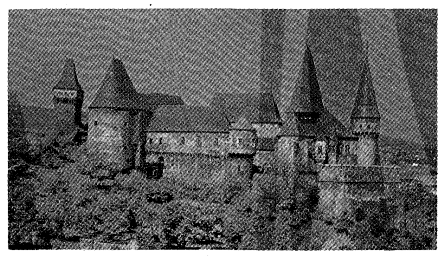


French crown helped insure that France would not become a realm in name only, partitioned among numerous independent princes.

Hunedoara, *judeţ* (district), western Romania, occupying an area of 2,708 sq mi (7,016 sq km). The Transylvanian Alps (Southern Carpathians) and the Western Carpathians rise above settlement areas in the valleys. The Mureş River and its tributaries drain the district southwestward. Deva (*q.v.*) is the district capital. Roman and Dacian archaeological remains were discovered in several towns, including Deva, Orăştie, Mintia, and Grădestea de Munte. Archaeological finds, dating from the Middle Neolithic Age (3500–2600 BC), were found in Turdaş town. Gurusada, Sîntămaria, and Strei towns are known for their 14th-century churches. Metallurgical industries operate in Deva, Călan, Hunedoara, and Sîntuhalu. Copper, andesite, iron, and coal mines are worked in the district. The Ghelar and Teliuc iron mines have been operated since the Roman occupation. Chemicals and building materials are produced in Sîntuhalu. Agricultural activities in the district include livestock raising and fruit and cereal cultivation. A bamboo grove is situated near Mintia, and an arboretum containing deer and aurochs (European bison), was established in the 18th century near Simeria. Silvas Forest and the national park of Retezat are other nature reserves. The Petroşani Basin contains karst formations. Deva, Hunedoara, and Orăstie are highway and railway centres. Pop. (1982 est.) 543,643.

Hunedoara, city, Hunedoara *judeţ* (district), west central Romania, in the eastern foothills of the iron-ore-bearing Poiana Ruscăi Mountains, 185 mi (300 km) northwest of Bucharest. The ore deposits at nearby Ghelari and Teliucu were known in Roman times. Hunedoara Castle, west of the city, was completed by Matthias I Corvinus in 1453 on the ruins of a 13th-century predecessor.

The first major development of the iron- and steelworks did not take place until 1884. After World War II, their expansion and modernization included blast furnaces, open-hearth furnaces, electric ore furnaces, coking and chemical works, a sintering plant, rolling mills, and related facilities. The city has become a major metallurgical production centre. Pop. (1982 est.) 86,871.



Hunedoara Castle, Romania
By courtesy of Editura Enciclopedica Romana

Huneker, James Gibbons (b. Jan. 31, 1860, Philadelphia—d. Feb. 9, 1921, Brooklyn, N.Y., U.S.), U.S. critic of music, art, and literature, a leading exponent of impressionistic criticism. His perceptive comments and brilliant style won him a wide audience in both Europe and the United States.

Huneker studied piano in Philadelphia, Paris, and New York, taught piano at the National Conservatory of Music, New York City, 1886–98, and was musical and dramatic critic for the *New York Recorder* and *Morning Advertiser*. He joined the *New York Sun* in 1900, the *Times* in 1918, and the *World* in 1919. His published works include: *Chopin: The Man and His Music* (1900); *Overtones: A Book of Temperaments* (1904); *Iconoclasts: A Book of Dramatists* (1905); *Franz Liszt* (1911); *Egoists: A Book of Supermen* (1909); and *Ivory Apes and Peacocks* (1915). He also wrote a novel, *Painted Veils* (1920), and two collections of short stories, *Melomaniacs* (1902) and *Visionaries* (1905). Autobiographical material may be found in *Old Fogy* (1913) and *Steeplejack* (1920). Two volumes of his letters were published in 1922 and 1924.

Hung Ch'eng-ch'ou, Pinyin HONG CHENG-CHOU (b. Oct. 16, 1593, Nan-an, Fukien Province, China—d. April 3, 1665, Nan-an), leading Ming dynasty (1368–1644) official who became an important minister of the Ch'ing (Manchu) dynasty (1644–1911/12) after he was captured by Manchu troops. Hung served the new government as grand secretary, the top ministerial position. He was responsible for influencing many of the Chinese gentry to accept the new dynasty, and he played a leading role in raising funds and providing food for the Ch'ing armies in their campaigns to crush the continued resistance of Ming forces in South China. Although the Manchus were continually suspicious that he had secret relations with the Ming forces, Hung held his post for almost 15 years.

In 1659 troops under Hung's command crushed major Ming resistance in the South and drove the Ming prince and claimant to the throne, Chu Yu-lang, out of South China into Burma. Hung refused to pursue the Prince further and was granted permission to retire from the campaign. He continued to serve as grand secretary for one more year before being allowed to withdraw from public life.

Hung-ch'i Canal, Wade–Giles romanization HUNG-CH'I CH'Ü, Pinyin HONGQI QU, English RED FLAG CANAL, canal and irrigation system in northern Honan and in Shansi provinces, China, constructed in 1960–69 to irrigate the poor and infertile area of Lin-hsien in the foothills of the T'ai-hang Shan (mountains) west of An-yang. To relieve this area's chronic shortage of water, the canal was constructed for 105 mi (170 km) across the mountains to a large dam on the Chang Ho (river) in Shansi. Construction of the canal was an engineering feat involving cutting the channel along sheer cliff faces and constructing 42 tunnels and many aqueducts, some of considerable length. Since 1965, when the main canal was completed, Lin-hsien has been linked with a system of drainage channels and reservoirs and with more than 600 mi of irrigation canals. The system irrigates some 100,000 ac (40,000 ha); it is harnessed by 14 hydroelectric stations that supply power to local coal-fueled industries, producing cement, fertilizer, iron, and steel for local consumption.

Hung Dao Vuong (Vietnamese hero): *see* Tran Hung Dao.

Hung Hsiu-ch'üan, Pinyin HONG XIUQUAN (b. Jan. 1, 1814, Fuyüan-shui, Kwangtung, China—d. June 1, 1864, Nanking), Chinese religious prophet and leader of the Taiping Rebellion (1850–64), during which he declared his own new dynasty, which centred on the captured (1853) city of Nanking. This great upheaval, in which more than 20,000,000 people are said to have been killed, drastically altered the course of modern Chinese history.

Early life. Hung was the youngest son of four children in a poor but proud Hakka family. The Hakkas were an industrious people who had migrated into South China from the north several centuries earlier and still retained their original customs. At an early age, Hung showed signs of great intelligence; his entire village sponsored him in his studies, hoping that he would eventually pass the Confucian civil service examination, enter the government bureaucracy, and bring wealth and honour to his family and friends.

Hung took the government examination for the first time in 1827 and failed to obtain even the lowest official degree, an outcome not surprising in view of the great number of candidates competing. He took the test several times, each time travelling to the provincial capital in Canton, which was also the centre for trade with the West. When he failed the exam for the third time in 1837, the strain was more than he could bear. He suffered an emotional collapse. During a delirium that lasted several days, he imagined himself to be in the presence of a venerable old man with a golden beard. The old man complained that the world was overrun by evil demons, and he gave Hung a sword and seal to use in eradicating the bad spirits. Hung also believed himself to have encountered a middle-aged man who aided and instructed him in the extermination of demons.

Hung's conversion to Christianity. When Hung recovered he returned to his occupation as a village schoolteacher. In 1843 he took the examination for the fourth and last time, but again he failed. Shortly after this, Li Ching-fang, a cousin, noticed on Hung's bookshelves an unusual work entitled *Ch'üan-shih liang-yen* ("Good Words for Exhorting the Age"). Written by a Chinese missionary, the work, which explained the basic elements of Christianity, had been given Hung on his visit to Canton in 1837. Apparently, Hung had briefly glanced at the book's contents and then forgotten about it. When Li brought it to his attention, Hung reexamined the work and suddenly discovered the explanation for his visions. He realized that during his illness he had been transported to heaven. The old man he had spoken with was God, and the middle-aged man was Jesus Christ. Hung further understood that he was the second son of God, sent to save China. In reading the portions of the Bible contained in the *Ch'üan-shih liang-yen,* Hung often translated the pronouns I, we, you, and he as referring to himself, as if the book had been written for him. He baptized himself, prayed to God, and from then on considered himself a Christian.

Hung began to propagate the new doctrine among his friends and relatives. One of his most important converts was his schoolmate Feng Yün-shan. In 1844 Hung lost his job because he had destroyed the tablets to Confucius in the village school where he was teaching, and Feng accompanied him on a preaching trip to neighbouring Kwangsi Province. Hung returned from Kwangsi after a few months, but Feng remained, establishing the Pai Shang-ti Hui (God Worshippers' Society), a religious group devoted to Hung's new doctrines.

In 1847 Hung went to Canton to study Christianity with the Rev. I.J. Roberts, an American missionary. The two months he spent with Roberts marked his sole formal training in the doctrines of Christianity; his writings show little understanding of concepts alien to Chinese culture. New Testament ideas of humility and kindness are ignored, as are the Christian ideas of original sin and redemption. Rather Hung stressed a wrathful Old Testament God, one who was to be worshipped and obeyed. He demanded the abolition of evil practices such as opium smoking, gambling, and prostitution and promised an ultimate reward to those who followed the teachings of the Lord.

Hung's contacts with Western Christianity did, however, teach him that there were other nations in the world. Rather than the traditional Chinese ethnocentrism, he postulated a world of many nations, all of them equal under God. Moreover, he was iconoclastic in his attitude toward the Chinese culture of his day, labelling it the work of evil demons and insisting that all symbols of it be destroyed.

The Taiping Rebellion. After leaving Roberts, Hung joined Feng and the God Worshippers and was immediately accepted as the new leader of the group. Conditions in the countryside were deplorable, and sentiment ran high against the foreign Manchu rulers of China. As a result, Hung and Feng began to plot the rebellion that finally began in July 1850. Hung's rebels expanded into neighbouring districts, and on Jan. 1, 1851, Hung's 37th birthday, he proclaimed his new dynasty, the T'ai-p'ing T'ien-kuo (Heavenly Kingdom of Great Peace) and assumed the title of T'ien Wang, or Heavenly King. The Taipings pressed north through the fertile Yangtze River Valley. As the rebels passed through the countryside, whole towns and villages joined them. They grew from a ragged band of a few thousand to a fanatical but highly disciplined army of more than a million, divided into separate divisions of men and women soldiers. Men and women were considered equal by the Taipings but were allowed no contact with one another—even married couples were forbidden sexual intercourse.

After Hung's army captured the great central China city of Nanking on March 10, 1853, he decided to halt his troops and make the city his permanent capital, renaming it T'ien-ching (Heavenly Capital). A northern expedition to capture the Manchu capital at Peking failed, but Taiping troops scored great victories in other places.

Meanwhile, Hung's friend Feng had died en route to Nanking, and Hung had placed much power in the hands of his minister of state, Yang Hsiu-ch'ing. It was Yang who organized the new Taiping state and mapped the strategy of the Taiping armies. Eventually Yang began to chastise Hung and to usurp his prerogatives as supreme leader. To legitimize his authority, Yang occasionally lapsed into trances in which his voice supposedly became that of the Lord's. In one of his trances, Yang claimed that the Lord demanded Hung be whipped for kicking one of his concubines (although Taiping followers were allowed no sexual relations with members of the opposite sex, Taiping leaders maintained enormous harems). On Sept. 2, 1856, Hung had Yang murdered by Wei Ch'ang-hui, another Taiping general. Wei in turn became haughty, and Hung had him slain as well.

After this, Hung ignored his ablest followers and entrusted affairs of state to his incompetent elder brothers. He withdrew from all government matters for long periods, spending his time with his harem or in religious speculation. By 1862 Hung's generals were telling him that the situation at Nanking was desperate and that he ought to abandon the city. He refused, stating that he trusted in divine guidance. He even declined to lay in supplies in a case of a siege because he was sure that God would provide. On June 1, 1864, Hung, despairing after a lingering illness, committed suicide. His young son succeeded him on the throne. The city finally fell on July 19, 1864, and government troops initiated a terrible slaughter in which more than 100,000 people were said to have been killed. Sporadic Taiping resistance continued in other parts of the country until 1866. (L.N.F.)

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Hung-jen, Pinyin HONGREN, original name CHIANG T'AO (b. 1610, Hsi-hsien, Anhwei Province, China—d. 1663), foremost painter of the Anhwei (Hsin-an) school, a centre of painting in southeast China during the Ch'ing period, noted for its unusual land features, especially of Huang Shan (Yellow Mountain), which frequently appears in paintings of the school.

Chiang T'ao adopted his Buddhist name Hung-jen after the collapse of the Ming dynasty and the death of his mother. He was known for being quiet and retiring, and his paintings reveal something of the same attitude. While it is said that he started to paint at an early age to aid in the support of his family, virtually all of his extant works are from his later years. His paintings are restrained

and cool to the point of being brittle, yet they have a precision of structure that gives them an unusual strength in spite of their apparent fragility. They generally exhibit an intensification of characteristics of the work of the Yüan dynasty (1206–1368) master Ni Tsan.

Hung Jen-kan, Pinyin HONG RENGAN, Wade–Giles romanization HUNG-JIN (b. Feb. 18/20, 1822, Hua-hsien, Kwangtung Province, China—d. Nov. 23, 1864, Nanch'ang, Kiangsi Province), leader of the Taiping Rebellion, the great uprising that occupied South China between 1850 and 1864; he tried to reorganize the Taiping movement by introducing Western ideas of government and religion.

Hung Jen-kan was a cousin and neighbour of Hung Hsiu-ch'üan, the supreme Taiping leader, who began the rebellion after a series of visions in which he saw himself as the younger son of God sent to save China. When the rebellion broke out, Jen-kan fled to the British settlement of Hong Kong, where he was baptized and educated by a Protestant missionary. In 1859 he finally made his way to the Taiping camp with the intention of teaching the Taipings the correct version of Protestant Christianity and helping them improve their relations with the Western countries.

Soon after his arrival at the Taiping camp, Jen-kan was elevated to prime minister of the Taiping state. In that position he tried to introduce his program, which included railroad construction, telegraph facilities, modern banks and hospitals, and reform of the administration along Western democratic lines. His suggestions aroused the jealousy of many of the older Taiping leaders, however, and they refused to cooperate. Moreover, the Western countries, having forced the Chinese government to grant their trade concession to them in the "Arrow" War (1856–60), threw their support to the dynasty in the suppression of the rebels. Jen-kan's policies therefore failed, and he was demoted. After the fall of the Taiping capital in 1864, he was captured and executed by government troops.

Hung-ku-tzu: *see* Ching Hao.

Hung-li (Chinese emperor): *see* Ch'ien-lung.

Hung lou meng (Chinese literature): *see* Dream of the Red Chamber.

Hung Shen, Pinyin HONG SHEN (b. Dec. 31, 1894, Ch'ang-chou, Kiangsu Province, China—d. Aug. 29, 1955, Peking), pioneering Chinese dramatist and filmmaker.

Educated in Peking and at Harvard in the United States, Hung Shen taught dramatic arts and Western literature at various universities. Invited to join the Shanghai Dramatic Society in 1923, he soon began directing its plays by modern Chinese authors, including himself, and by Western writers whom he translated (*e.g.,* Oscar Wilde's *Lady Windermere's Fan,* 1923).

In 1924 Hung Shen joined the Star Motion Picture Company and produced one of China's first sound films, which enjoyed tremendous popularity. The following year the company sent him to Hollywood to study film technique. On his return he produced a highly successful anti-Japanese film. During the Sino-Japanese War (1937–45), he directed tour companies in plays boosting wartime morale. Under the Communist government, he was active in cultural relations and served as vice chairman of the Chinese Stage Artists.

An active member of the Tso-i Hsi-chü-chia Lien-meng (Left-wing Dramatists League), Hung Shen often included a strong political message in his carefully staged productions. His plays and films also reflected the Western dramatic techniques he had studied in the United States.

Hung-shui River, Wade–Giles romanization HUNG-SHUI HO, Pinyin HONGSHUI HE, river in Kweichow Province and in Kwangsi Autonomous Region of Chuang, southern China. It is one of the principal tributaries of the Hsi (West) River, which forms its delta at Canton. The Hung-shui River rises in the Wu-meng Mountains in western Kweichow. Its upper course is named the Lai-mou River. It flows southeast and is joined by the Hsi-sa River near Pan-chiang-ch'iao. Below this point it is known as the Pei-p'an River. Near Wang-mo it swings east and forms the Kweichow–Kwangsi border for some 50 miles (80 km) until, at T'ien-o, it again turns southeast and, under the name Hung-shui, flows across northwestern Kwangsi, joining the main stream of the Yü River at Kuei-p'ing after a course of 215 miles (345 km). The Hung-shui River and its tributaries together drain almost all of southwestern Kweichow and northwestern Kwangsi. Its chief tributary is the Liu River, which joins it shortly below Lai-pin (Laiping). The section below Lai-pin and the Liu River as far as Liu-chou are navigable by shallow-draft junks. The upper stream of the Hung-shui River, however, is so impeded by rapids and deep gorges as to be virtually unnavigable. Its valley and those of its tributaries, nevertheless, provide the principal routes into Kweichow from the south.

Hung-tse Lake, Wade–Giles romanization HUNG-TSE HU, Pinyin HONGZE HU, large lake in the Huai River Valley, on the border between Kiangsu and Anhwei provinces, China. Tradition has it that until the early 7th century its name was Po-fu-chien Lake and that it was given the name Hung-tse Lake by Emperor Sui Yang Ti (reigned AD 604–617) of the Sui dynasty (581–618). In T'ang and early Sung times (from the 7th to the 10th century) it was smaller than its present surface area of 757 square miles (1,960 square km), probably less than a third of its present size. It was also separated from the main course of the Huai River, which flowed to the south and southeast of the lake. The Huai was shallow and difficult to navigate; and in the 11th century, under the Sung dynasty (960–1279), various canals were constructed to make use of the lake as a part of the canal system between K'ai-feng (Honan Province) and Ch'u-chou (modern Huai-an in Kiangsu Province), joining the lake to the Huai. When, in 1194, the Huang Ho changed its course to the south to join the Huai at modern Ch'ing-chiang (Kiangsu), it usurped the lower course of the Huai, which no longer had a direct outlet to the sea. The waters of the Huai discharged into Hung-tse Lake, which then grew to its present size, inundating a vast area of fertile irrigated land. The surplus waters of the lake flowed southeast, via the Kao-pao and Pao-ying lakes and the channel of the Grand Canal (Ta-Yün-ho) to the Yangtze River (Ch'ang Chiang), east of Yang-chou (Kiangsu). The lake is very shallow, and, in the course of centuries, its bottom silted up. By the 19th century, flooding in the area was frequent and severe. In the 1930s a new channel was dug from the eastern shore of the lake direct to the sea. This canal was restored and improved in 1951–52 under the name of the Su-pei Canal, and together with the comprehensive water conservancy project for the Huai River Valley, it has reduced the incidence of flooding. The lake surface is only some 50 feet (15 m) above sea level, however, and drainage remains a problem. Most of the lake is too shallow for any but very small boats.

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Hung Vuong (fl. *c.* 2879 BC), legendary founder of the first Vietnamese state—Van Lang (the Land of the Tattooed Men)—probably located north of what is now Hanoi.

Existing archaeological evidence does not support the Vietnamese ancient texts that credit Hung Vuong with establishing, in 2879, the Hong Bang dynasty, which is said to have survived for 2,621 years. According to available data, the earliest Vietnamese kingdom originated between 1000 and 500 BC.

Some of the ancient texts describe Hung Vuong's domain as stretching southward from Dong Dinh to present-day central Vietnam; others indicate that his sovereignty may have centred only around the present site of Hue. According to the written records, Hung Vuong, whose name means Strong Leader, or Strong Elder, was the son of the mythical Lac Long Quang. He divided his kingdom into administrative districts and assigned civil servants and military officers to govern them.

Hung-wei Ping (China): *see* Red Guards.

Hung-wu, Pinyin HONGWU (reign name), posthumous name, or *shih,* KAO-TI, temple name (MING) T'AI TSU, personal name CHU YÜAN-CHANG (b. Oct. 21, 1328, Hao-chou, China—d. June 24, 1398), Chinese emperor (1368–98), founder of the Ming dynasty that ruled China for nearly 300 years. During his reign, the Hung-wu emperor instituted military, administrative, and education reforms that centred power in the emperor.



The Hung-wu emperor; in the National Palace Museum, Taipei

By courtesy of the National Palace Museum, Taipei, Taiwan, Republic of China

Early life. The Hung-wu emperor was born in 1328 as Chu Yüan-chang, a poor peasant of Hao-chou (about 100 miles [160 km] northwest of Nanking, near China's east coast). Orphaned at 16, he became a monk at the Huang-chüeh monastery near Feng-yang to avoid starvation—a common practice for the sons of poor peasants. As a wandering mendicant, he often begged for food at Ho-fei (some 80 miles west of Nanking) and surrounding areas, where no constituted authority existed. Indeed, all Central and North China was suffering from drought and famine, and more than 7,000,000 persons starved, a situation that encouraged the popular rebellions that started from around 1325. Led by plebeian bandits, the rebels attacked the rich, distributing their wealth and goods among the people.

Emergence as general. One such rebel was Kuo Tzuhsing, who in 1352 led a large force to attack and take Hao-chou. Chu Yüan-chang joined the rebel forces, rising from the ranks to become second-in-command. Kuo Tzu-hsing, a mere bandit leader, became jealous of Chu Yüan-chang, who distinguished himself as a military leader. These problems were later mitigated when Chu Yüan-chang married Kuo's adopted daughter, the princess

Ma, who was influential in reconciling the two men.

In 1353 Chu Yüan-chang captured Ch'u-chou (now Ch'u district in Anhwei Province, an area west of Nanking). Subsequently he received important commissions, gaining a following of outstanding men, some of whom later became officials under the early Ming dynasty. In 1355 Kuo Tzu-hsing died, and Chu Yüan-chang took over the leadership of the rebel army.

Chu Yüan-chang attacked and captured towns and cities in eastern China and, on reaching the Yangtze Delta, encountered educated men of the gentry class. Some decided to join his movement, and Chu had the foresight to seek their guidance. From them he learned the rudiments of the Chinese language and studied Chinese history and the Confucian Classics. More significantly, he learned the principles of government and built up an effective administration in local areas alongside the military structure. Moreover, he was persuaded by his scholars to present himself as a national leader against the Mongols rather than as a popular rebel. His choice of advisers and his shrewd ability to adopt sound governmental measures ultimately made him the most formidable leader against the Mongols.

Now determined to overthrow the Yüan dynasty (1206–1368), Chu Yüan-chang marched toward Nanking and captured it in 1356. Nanking was a strategic point, close to the rich lands of the Yangtze Delta. Proclaiming himself duke of Wu, Chu established an effective administration over the Nanking area with the help of the scholars and on their advice refrained from roaming aimlessly from place to place to plunder. He also encouraged agriculture by granting unused land to the landless peasants, but, in spite of his successes, he was still reluctant to proclaim himself king (*wang*). At that time he acknowledged the Sung dynasty pretender, Han Lin-erh, as his superior, even though Han was ineffectual.

Meanwhile, the northern provinces were as restless as the south, and, when various rebels defied the Mongols, the capable Mongol minister T'o-t'o personally led troops to subdue them. The north, thus, had a semblance of peace, whereas the south could not be controlled by the Mongol authorities.

National military leadership. Chu Yüan-chang now emerged as the national leader against the Mongols, though he had other rivals for power. Chief among them were Ch'en Yu-liang and Chang Shih-ch'eng. Ch'en Yu-liang was the self-proclaimed emperor of the Han dynasty and was based in Wu-ch'ang (in Hupeh Province, about 400 mi west of Shanghai), controlling a large portion of western China. Chang Shih-ch'eng, the self-proclaimed prince Ch'eng of the Chou dynasty, operated at P'ing-chiang (in Kiangsu Province adjoining the east coast and including Nanking) in the east.

In 1363 a decisive naval battle at the Po-yang Lake (south of the Yangtze in the north of Kiangsi Province) was fought between Ch'en Yu-liang's huge fleet of war junks and Chu's small but swift barges. The three-day battle ended with Ch'en's death and the destruction of his fleet. Wu-ch'ang, Ch'en's stronghold, was captured in 1364, followed by the capture of Hupeh, Hunan (a large province west of Kiangsi Province), and Kiangsi provinces. In the same year Chu proclaimed himself prince of Wu.

With the death of Ch'en Yu-liang, events moved quickly to a climax. In 1367 the Sung pretender Han Lin-erh felt so threatened by the Mongols at his headquarters at Ch'u-chou that he decided to flee to Nanking for protection. Escorted by one of Chu Yüan-chang's men during the trip, Han died by drowning when his boat capsized—an event perhaps contrived by Chu. In the same year Chang Shih-ch'eng was captured and brought to Nanking, where he committed suicide. Other rebels decided to submit or were eliminated. One such was Fang Kuo-chen, one of the first to rebel against the Mongols, who had operated as a pirate along the coast; when he surrendered to Chu Yüan-chang, he was given honours and a stipend but no real power. On the other hand, Ch'en Yu-ting, a Yüan loyalist who protected Fukien Province (on the southeast coast, opposite Taiwan), was captured and brought to Nanking for execution.

Reign as Emperor. With the south pacified, Chu Yüan-chang sent his generals Hsü Ta and Ch'ang Yü-ch'un to lead troops against the north. At the beginning of 1368 Chu Yüan-chang finally proclaimed himself emperor of the Ming dynasty, establishing his capital at Nanking. Hung-wu (Vastly Martial) was adopted as his reign title, and he is usually referred to as the Hung-wu emperor, though T'ai Tsu is more strictly correct.

The troops sent to conquer the north were highly successful. Shantung and Honan provinces (south of Peking) submitted to Ming authority. By August 1368, Ming troops had entered Peking. The Mongol emperor Shun Ti fled to Inner Mongolia, and, although Mongol power was not immediately destroyed, historically the Yüan dynasty now came to an end. The rest of the country fell easily as Ming troops subdued first the northwest, then the southwest (Szechwan and Yünnan). Unification was completed by 1382.

The Hung-wu emperor was cruel, suspicious, and irrational, especially as he grew older. Instead of eliminating Mongol influence, he made his court resemble the Mongol court, and the despotic power of the emperor was institutionalized for the rest of the dynasty.

One of his political acts was to grant principalities to all his sons, ostensibly from fear of another Mongol invasion, so that the Imperial princes could be given military powers to aid the regular armies. A contributing factor was his interest in maintaining personal control over the empire through his sons' principalities.

Despotic tendencies. The trend toward political despotism can be seen in the Hung-wu emperor's various other actions. In 1380 the prime minister Hu Wei-yung was implicated in a widespread plot to overthrow the throne and was executed along with 30,000 members of his clique. The Emperor consequently abolished the prime ministership in perpetuity as well as the central chancellery. Thus, the next highest level of administration, the six ministries, became merely advisory to the Emperor himself, who now exercised direct control. This change had serious defects, the most important being the inability of even the most vigorous emperor to attend to all the affairs of state. In an attempt to overcome this difficulty, the Emperor made use of six or more grand secretaries, who were responsible for routine administration. The institution of the grand secretaries evolved from that of the Hanlin Academy, the original function of which was to assist in the education of the heir designate. Although superior in practice to the six ministries, the grand secretaries (later institutionalized as the grand secretariat) were mere servants of the despotic emperor.

The Sung emperors, learning from the T'ang dynasty's experience, had felt that the militarists were the most dangerous group in the country and had purposely encouraged the scholar class, but the Hung-wu emperor felt that, after the Mongol expulsion, the scholars formed the most dangerous group. Nevertheless, his interest in restoring traditional Chinese values involved rehabilitating the Confucian scholar class, and from experience he knew that effective government depended upon the scholars. He therefore encouraged education and purposely trained scholars for the bureaucracy. At the same time he used methods to deprive them of power and position and introduced the use of heavy bamboo as a punishment at court, often beating to death scholar-officials for the slightest offense. He felt that scholars should be mere servants of the state, working on behalf of the emperor. Because of the Emperor's attitude, a great many members of the gentry were discouraged from embarking on official careers.

Administration. To train scholars for the bureaucracy, the Hung-wu emperor in 1369 ordered the establishment of schools at each local level. Students were subsidized and were privileged to apply for admission to the Hanlin Academy, which presumably formulated policy and supervised the local schools. As a result of this edict, more schools developed during the Ming than in previous periods of Chinese history, and education became inseparable from civil-service recruitment by examination, the realization of which had been an ideal during the T'ang and Sung dynasties. Imperial authorities controlled the system of examination as far down as the provincial examinations that provided candidates for the metropolitan and palace examinations at the capital. The examination system made it possible to recruit the best minds for governmental service, though examinations stressed only the Sung Neo-Confucian interpretation of the Classics and forced candidates to write in an artificial literary style, discouraging the development of originality.

The Hung-wu emperor's military system, the *wei-so* ("guard-post") system, was of earlier origin. The practice of granting land to soldiers for cultivation in peace realized his ideal of having the troops support themselves so as not to burden the people.

Foreign affairs. In foreign relations the Hung-wu emperor extended the Ming empire's prestige to outlying regions: southern Manchuria was brought into the empire; outlying states, such as Korea, the Liu-ch'iu (now Ryukyu) Islands, Annam, and other states, sent tribute missions to acknowledge the suzerainty of the Ming emperor; and, not satisfied with the expulsion of the Mongols, he sent two military expeditions into Mongolia, reaching the Mongol capital of Karakorum itself. Ming forces even penetrated Central Asia, taking Hami (in the Gobi) and accepting the submission of several states in the Chinese Turkistan region. When Ming emissaries traversed the mountains to Samarkand, however, they were met with a different reception. Timur (one of history's greatest conquerors) was building a new Mongol empire in that region, and the Chinese envoys were imprisoned. Eventually, they were released, and Timur and the Ming exchanged several embassies, which the Chinese regarded as tributary missions. Timur was preparing an invasion of China when he died in 1405.

The Hung-wu emperor was less successful with Japan, the buccaneers of which ravaged the Chinese coast. Three missions went to Japan, armed with inducements and threats, but were unable to curb piracy, because the Japanese authorities were themselves helpless.

The succession. A great problem for the Hung-wu emperor was the succession. His first choice, made when he was prince of Wu, was Piao, his eldest son, later known as the heir designate I-wen. As the Hung-wu emperor's reign progressed there were indications that he favoured his fourth son, Ti, the prince of Yen, whose principality was at Peking and whose personal qualities and military ability were more impressive. In 1392, when the heir designate I-wen died, the Hung-wu emperor was persuaded to appoint I-wen's eldest son as his successor, rather than the Prince of Yen, who was angered by this decision. After the Hung-wu emperor's death in June 1398,

he was succeeded by his grandson Yün-wen, known in history as Hui Ti, or the Chien-wen emperor, who reigned until 1402, when the throne was usurped by the Prince of Yen (the Yung-lo emperor).

Assessment. The Hung-wu emperor's achievement, first as rebel leader and then as emperor, was to focus national resentment against the foreign rulers and to resuscitate a more truly Chinese way of government. This he did so forcefully that his reign has been seen as a culmination of the despotic trends that had been in evidence since the Sung dynasty (960–1279). He considered certain groups (for instance, maternal relatives; court eunuchs, who were often entrusted with power; and the military) as having been peculiarly prone to intrigue in the past, and vigorously stamped out such tendencies. He prohibited eunuchs, for instance, from participating in government, forbade the Empress to meddle with court politics, and appointed civilian officials to control military affairs. Of lowly peasant origins, he always was aware of the popular misery that administrative corruption could engender, and he savagely punished malpractices. (D.B.C.)

BIBLIOGRAPHY. No biography or definitive works dealing with the Hung-wu emperor and his period exist in English. Charles Hucker (ed.), *Chinese Government in Ming Times: Seven Studies* (1969), contains articles based on recent research covering the political, military, and educational aspects of the Ming.

Hungarian, also called MAGYAR, member of a people speaking the Hungarian language of the Finno-Ugric family and living primarily in Hungary, but represented also by large minority populations in Romania, Yugoslavia, Czechoslovakia, and the Ukraine. Those in Romania, living mostly in the area of the former Magyar Autonomous Region (the modern districts [*judete*] of Covasna, Harghita, and Mureş) and numbering overall about 860,000, are called Szeklers.

The proto-Hungarians were apparently an ethnic blend of Ugric and Turkish peoples living in western Siberia. By the early 5th century they had migrated southwestward and were roaming over the Khazar Turkish empire, centred near the Caspian Sea. By AD 830, however, they were appearing on the right banks of the Don and, as a body, consisted of seven tribes, who had been joined by three dissident tribes of Khazars known as Kavars. By the late 9th century the Hungarians had entered their present location, subjugating the resident Slavs and Huns. Until they were checked a half century later, the Hungarians were the scourge of Europe, raiding as far afield as Bremen, Orléans, and Constantinople (the English word ogre, a corruption of "Hungar," attests to their notoriety).

Hungary was, and is, an exposed crossroads of Europe; it has been invaded or overrun repeatedly, and it has expanded and contracted over the centuries. (The Szeklers, meaning Frontier Guards, received their name, it seems, because they were Hungarians sent to Transylvania to protect the eastern flank.) Surrounded by heterogeneous Slavs, Germans, and Romanians, the Hungarians have been subject to a continuous mixture of physical types and cultural influences. Two major influences were the Turks, who conquered and occupied the country in the 16th and 17th centuries, and the Austrian Habsburgs, who followed and exercised a strong Germanizing influence. Nevertheless, national consciousness was not quenched; Hungary received autonomy in 1867 and independence in 1918; an indigenous art, music, and literature persisted over the years, and such folk arts as embroidery and ceramics are still important.

No religious statistics have been released in Hungary since World War II; but before the war about 65 percent of the population was Roman Catholic, 25 percent Protestant, 6 percent Jewish (almost completely eliminated during the war), and 3 percent Greek Orthodox.

Hungarian Catholic Church: *see* Ruthenian Catholic Church.

Hungarian language, Hungarian MAGYAR, member of the Finno-Ugric group of the Uralic language family, spoken primarily in Hungary but also in Czechoslovakia, Romania, and Yugoslavia, as well as in scattered groups elsewhere in the world. Hungarian belongs to the Ugric branch of Finno-Ugric, along with the Ob-Ugric languages, Mansi and Khanty, spoken in Western Siberia.

The language has been written in a modified Latin alphabet since the 13th century AD, and its orthography was stabilized from the 16th century with the introduction of printing. Characteristic of Hungarian orthography are the acute accent (*ó*) marking long vowels—doubled in the case of long front rounded vowels (ő)—and special representations for sibilant sounds (*e.g., sz* corresponds to English *s*, but *s* corresponds to English *sh*).

Surrounded by non-Uralic languages, Hungarian has borrowed many words from such sources as Iranian, Turkic, Caucasian, Slavic, Latin, and German. Its phonology and grammar are, however, typically Uralic. Characteristic of its sound system is vowel harmony. Vowels are classed into three groups depending on position of articulation: back vowels (*a, á, o, ó, u, ú*), front rounded vowels (*ö, ő, ü,* ű), and front unrounded vowels (*e, é, i, í*). Back vowels and front rounded vowels may not occur together in the same word. Consonant clusters in Hungarian are simple and usually do not occur at the beginning of words. Stress (accent) is always on the first syllable of the word.

Hungarian grammatical categories are usually marked by the use of suffixes; *e.g., ver-et-het-né-lek* "I might cause thee to be beaten" is comprised of *ver* "beat" + *et* "cause" + *het* "may" + *né* (a conditional marker) + *lek* "I thee." In many cases vowels in suffixes shift to match those of the stem in order to maintain vowel harmony (*e.g., ház-ban* "in the house" versus *ember-ben* "in the man"). *See also* Finno-Ugric languages.

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Hungarian literature, the body of written works produced in the Hungarian language. The earliest written literature in Hungary was religious writing in Latin, beginning about the middle of the 11th century. When written texts in Hungarian started to appear, they were almost exclusively religious in nature and were often translations from Latin.

A brief treatment of Hungarian literature follows. For full treatment, *see* MACROPAEDIA: Hungarian Literature.

The earliest extant text in Hungarian is the *Halotti Beszéd,* a short but beautiful and original funeral oration written in about 1200. This written literature coexisted with an oral tradition of folk songs and tales, of which only a few scattered second-hand fragments remain from early times. Throughout the Middle Ages religion dominated the written literature. The most influential single work in the development of a Hungarian national language was Gáspár Károlyi's translation of the Bible (1590), which appeared at the end of the Hungarian Reformation. Nevertheless, during this time a body of secular literature was growing out of the native oral tradition, and in the late 16th century its first luminary appeared, the poet Bálint Balassi (1554–94), who foreshadowed the great Petőfi of the 19th century with his mingling of themes of love and nationalism.

The 17th century was marked by the onset of the Baroque in the western portion of Hungary under the Hapsburgs. The most outstanding prose writer of the Counter-Reformation, as well as the initiator of the Baroque, was Péter Pázmány (1570–1637), who was influential in both his philosophy and his style. The most important 17th-century poet was Miklós Zrínyi (1620–64); his great epic poem *Szigeti Veszedelem* ("The Peril of Sziget") combined both Renaissance and Baroque elements.

The 18th century was essentially a time of stagnation until the Enlightenment, when European ideas poured new energy into Hungarian letters. The first proponent of the ideas of the Enlightenment was the didactic writer György Bessenyei (1747–1811). The major surge came in Hungarian poetry, where two men especially deserve mention: Dániel Berzsenyi (1776–1836) mastered classical form, but had few substantial ideas, and Mihály Csokonai Vitéz (1773–1805) was a gifted lyric poet in the Hungarian tradition. Ferenc Kazinczy (1759–1831) was an influential personality whose lasting contribution was to initiate a broad language reform.

The Englightenment gave way to a brief period of Romanticism, which included several important figures. József Katona (1791–1830) wrote *Bánk bán* (the *bán* was a high Hungarian dignitary), the first great play of the Hungarian national theatre. Ferenc Kölcsey (1790–1838) was a poet and statesman who among other things wrote the Hungarian national anthem. Mihály Vörösmarty (1800–55), the finest Romantic poet, wrote on both personal and national themes.

By the 1840s and '50s, as Romanticism was fading and Realism emerging, two of the greatest Hungarian poets were writing. Sándor Petőfi (1823–49) was a passionate, nonintellectual, forceful, innovative poet whose best poems combine revolutionary fervor and direct, simple language. János Arany (1817–82), a friend of Petőfi, also wrote popular poetry, but he wrote carefully rather than impulsively, maintaining a distance between himself and his poems. Imre Madách (1823–64) is primarily known for writing *Az ember tragédiája* ("The Tragedy of Man"), a superior religious-philosophical dramatic poem.

Though the novel became established as a genre early in the 19th century, it was not until Realism took hold that serious novels began to appear, starting with the early political novels of József Eötvös (1813–71). Other outstanding novelists followed. Zsigmond Kemény (1814–75) wrote tragic, generally depressing psychological novels. Mór Jókai (1825–1904) is the most popular Hungarian novelist; he wrote many superficial but entertaining books with a strong romantic element. Kálmán Mikszáth (1847–1910) is notable for his ironic novels and stories, which often explored the interaction and conflict between the various classes of Hungarian society.

The most spectacular burst of fruitful literary activity in Hungary came at the beginning of the 20th century, beginning with the great Symbolist poet Endre Ady (1877–1919). He was a brilliant lyric poet, a revolutionary, a magnificent stylist, and a deep and candid observer of himself and the world around him. The international reputation and influence of Ady, as well as of other Hungarian poets, would be much greater if they had written in a more accessible language. Though poetry generally suffers in translation, Ady's language is particularly unsuited for translation. Ady was the spiritual leader of the group of writers associated with the highly influential leftist literary magazine *Nyugat* ("The West").

A step behind Ady were four other fine poets: Mihály Babits (1883–1949), an outstanding intellectual and humanist; Dezső Kosztolányi

(1885–1936), the best Hungarian Impressionistic poet; Árpád Tóth (1886–1928), an original, melancholy lyric poet; and Gyula Juhász (1883–1937), an Impressionist with deep roots in Hungarian tradition. Of the prose writers of the *Nyugat* school, Zsigmond Móricz (1879–1942) was the outstanding figure. In his realistic stories and novels, he drew effective characterizations economically and treated a multitude of social themes. Frigyes Karinthy (1887–1938) wrote effective short stories with a strong satirical and grotesque element.

Of the new writers who emerged between the world wars, most were socialists or fellow travelers. Gyula Illyés (1902–83) began as a radical peasant writer and became the dean of Hungarian poetry. The poetry of the proletarian writer Attila József (1905–37) is full of the conflict between seething emotions and intellectual, rational thought. Miklós Radnóti (1909–44) wrote some concise, tragic poems at the end of his life in a Nazi concentration camp. László Németh (1901–76) was an important psychological novelist and philosopher. Tibor Déry (1894–1977) was an influential socialist writer whose unorthodox views got him into trouble after World War II and resulted in his intimate involvement in the 1956 Revolution. Among the younger writers who came to the fore after World War II, the poets János Pilinszky (1921–81) and László Nagy (1925–78) are perhaps the most important figures.

Hungary, officially REPUBLIC OF HUNGARY, Hungarian MAGYARORSZÁG, or MAGYAR KÖZTÁRSASÁG, landlocked country in central Europe, covering an area of 35,920 square miles (93,033 square km). The capital is Budapest.



Hungary

Hungary extends for about 195 miles (315 km) from north to south and about 325 miles (525 km) from east to west. Hungary is bordered by Czechoslovakia in the north, the Soviet Union and Romania in the east, Yugoslavia in the south, and Austria in the west. The population in 1990 was estimated to be 10,561,000.

A brief treatment of Hungary follows. For full treatment, *see* MACROPAEDIA: Hungary.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. Hungary may be divided into four physiographic regions. There are two lowland and two highland regions. The larger lowland, the Great Alfold (Great Hungarian Plain, or Nagy Magyar Alföld), is located in the east and south and occupies nearly half of the country. It is separated from the much smaller Little Alfold (Little Hungarian Plain, or Kis Alföld) in the northwest by Transdanubia (Dunántúl), an upland region of low relief (between 1,300 and 2,300 feet [400 and 700 m] above sea level), located in the southwest. To the northeast of Transdanubia lie the Northern Mountains, the country's other highland region, which is part of the inner volcanic arc of the Carpathian Mountains. They contain the country's highest point, Mount Kékes (3,327 feet [1,014 m] high), in the Mátra Mountains.

Hungary's two most important rivers, the Danube and Tisza, flow across the country from north to south and then southward into Yugoslavia. The more westerly of the two rivers is the Danube (Duna), the Hungarian tributaries of which are of Alpine origin. The country's other major river, the Tisza, rises in the north in the Czechoslovakian, U.S.S.R., and Romanian portions of the Carpathian Mountains. Twice a year, in early spring and in early summer, the Danube floods parts of the Great Alfold, although the vulnerable area has been much reduced in the 20th century by flood-control projects. During its flooding phases the river may quadruple its annual average flow. There are only three natural lakes in Hungary, but among these is Lake Balaton, in the Transdanubian highlands, one of Europe's major lakes at 231 square miles (598 square km).

Hungary enjoys a moderately dry continental climate. The temperature ranges from 25° to 32° F (−4° to 0° C) in January and from 64° to 73° F (18° to 23° C) in July, with a mean annual temperature of 50° F (10° C). Transdanubia generally experiences more than 28 inches (700 mm) of rain; the Little Alfold and the Northern Mountains receive between 22 and 28 inches (560 and 700 mm); over much of its area, the Great Alfold receives less than 22 inches each year.

Nearly three-fifths of the country is considered arable, most of it in the lowland regions. The country's relatively low elevations prevent the occurrence of natural coniferous forest. Beech at the higher elevations and oak at the lower constitute most of the deciduous forests that cover nearly one-fifth of Hungary. In the higher forested areas there is an abundance of deer and wild pigs; partridge, pheasant, hare, and rodents predominate in the lowlands.

Hungary has major reserves of bauxite (the principal ore of aluminum), as well as lesser quantities of such other metals as iron, gallium, molybdenum, and vanadium. Its large deposits of copper at Recsk are associated with substantial amounts of lead, zinc, and gold. Minable reserves of manganese are also substantial. Coal (including brown coal) is Hungary's main energy resource. Extensive oil and natural-gas fields have been discovered at several locations beneath the Great Alfold. Uranium-ore reserves at Mecsek provide an important resource for nuclear energy.

The people. The Hungarian people are known ethnically as Magyars. The mother tongue of 97 percent of the population is Hungarian, which belongs to the Finno-Ugric linguistic group of the Uralic family and, among the languages of Europe, is related only to Finnish and Estonian. Germans and Slovaks make up the largest ethnic minorities, followed by smaller numbers of Southern Slavs (mainly Croats and Serbs) and Romanians.

It is estimated that most of the people have some kind of religious affiliation; about two-thirds are Roman Catholics and one-fourth Protestants (Lutherans and Calvinists).

In the 1980s the death rate actually exceeded the birth rate, and the rate of natural increase was thus negative. The decline of population can be ascribed to a declining birth rate and an aging population (almost one-fifth of the population is 60 years of age or more). About one-fifth of the total population lives within the Budapest metropolitan area.

The economy. Until 1989 Hungary had a developed, socialist economy that was centrally planned and mainly state-owned. The government owned and controlled all large-scale enterprises and the service sectors, and cooperatives farmed more than two-thirds of the arable land. Hungary, however, had adapted such capitalist devices as bonus payments to workers to spur productivity, the election of company managers, and the liquidation of unprofitable businesses. Reforms instituted beginning in the late 1980s were intended to gradually convert the nation's centrally planned economy into a free-market one relying on private ownership. These reforms included reducing subsidies and lifting price controls on basic consumer items in order to pave the way for the adoption of free-market pricing mechanisms. Many bankrupt state-run companies were eliminated. Hungary is one of the more prosperous nations of eastern Europe, though its gross national product (GNP) per capita is still significantly lower than those of its western European neighbours.

Agriculture generates about one-seventh of the gross domestic product (GDP) and employs about one-fifth of the labour force. Nearly three-fifths of the arable land is planted with cereals, especially corn (maize), wheat, and barley. Sugar beets, potatoes, grapes, sunflower seeds, tomatoes, peppers, onions, plums, and watermelons are also produced in large quantities. Hungary is virtually self-sufficient in food production and exports several agricultural products. Pastures total one-seventh of the land area, and livestock include pigs, cattle (40 percent in dairies), and sheep. Hungary is one of Europe's major producers of honey.

Coal is Hungary's chief mineral, and the country is a major world producer of bauxite.

Manufacturing is well diversified, accounts for almost one-third of the GDP, and employs almost one-third of the labour force. The principal products include cement, crude steel, rolled steel, pig iron, alumina, petroleum, natural gas, fertilizers, textiles and clothing, electronic wares, television and radio receivers, electrical machinery, buses, locomotives, and railroad cars. Almost three-fourths of the nation's electricity is generated by thermal power plants; the remainder is largely generated by a nuclear-power station. Tourism is an important source of foreign exchange.

Hungary's railways are owned and operated by Magyar Államvasutak, the state railway corporation; about one-sixth of the total track mileage is electrified. Almost all of the nation's roads are paved. Inland waterways total about 1,000 miles (1,600 km), and there are river ports at Budapest and Dunaújváros. An international airport is located at Ferihegy, near Budapest, but there is no domestic air service.

Exports, about equal in value with imports, are primarily electrical and other machinery, motor vehicles, chemicals and chemical products, meat and meat products, and textiles and clothing. Imports are primarily mineral fuels and refined products, metal semimanufactured products, specialized machinery, and other mineral raw materials. Principal trading partners are the Soviet Union, Germany, and Austria.

Government and social conditions. Between 1949 and 1989 Hungary was a communist republic governed by a single party, the Hungarian Socialist Workers' Party, which dominated the country's political, economic, and cultural life. But the relaxation of the Soviet Union's control over eastern Europe in the late 1980s encouraged Hungarians to make fundamental changes in their Soviet-derived political system. In October 1989 Hungary's National Assembly amended the 1949 constitution in order to end the domination of the communist party and to create the means by which Hungary could move toward greater democratization. Among the formal constitutional amendments were those legalizing opposition parties, setting in motion the regulation of free elections, and creating the office of an executive president. By the time free, multiparty elections to the National Assembly were held in 1990, Hungary's political system had begun

to resemble a typical western European parliamentary democracy. A president is elected by the National Assembly; a premier directs the country's executive affairs and heads the Cabinet. The premier is usually that party leader who commands a voting majority in the National Assembly. The members of the National Assembly are chosen by universal adult suffrage in free multiparty elections. A major political party in Hungary is the centre-right Hungarian Democratic Forum.

Hungary's social-welfare system offers benefits for work injury, unemployment, maternity, disability, sickness, old age, and death, and the national health plan extends to the entire population. Medical care, previously of a high standard, has deteriorated. Shortages in medical supplies and appliances are frequent.

Housing remains a serious problem. Overcrowding and shared tenancies are common. While the state is active in the housing field, the majority of dwellings are privately owned.

In Hungary schooling is free and compulsory between the ages of 6 and 16. Institutions of higher education range from the traditional university to the very specialized college, such as the Franz Liszt Academy of Music in Budapest.

A large number of Hungarians have made substantial contributions to the arts and sciences. The achievements of the Hungarian-born scientists Albert Szent-Györgyi, Georg von Békésy, Eugene Wigner, Edward Teller, Leo Szilard, and John von Neumann have gained world recognition and Nobel prizes. The music of Franz Liszt, Béla Bartók, and Zoltán Kodály is also known throughout the world.

History. The Romans knew Hungary, at least its western part, as Pannonia, then inhabited by Illyrians and Celts; it was incorporated into the Roman Empire as a province in 14 BC. The area east of the Danube was never a part of the Roman Empire and was largely occupied by various Germanic and Asiatic peoples. The Avars held it for more than 200 years but were finally displaced by Charlemagne in about AD 800.

Some time in the 5th century, a nomadic Finno-Ugrian people known as Magyars began a westward march from their former home in the Eurasian Steppe. The Holy Roman Emperor Arnulf in 892 invited the Magyars to help him subdue the Moravians. The Magyars agreed and, under the elected leadership of Árpád, began the settlement of the Great Alfold.

The Magyars ravaged central Europe until defeated by Otto I in 955. Twenty years later Árpád's grandson, Géza, accepted Christianity. His son, Stephen, was crowned king, traditionally in the year 1000, and continued Hungary's Christianization while organizing the kingdom into a strong and independent state. Hungary was the principal state in east-central Europe in the 12th century.

A devastating invasion by the Mongols killed half of Hungary's population in 1241. The native Árpád dynasty died out in 1301; from that date until 1918, Hungary was ruled, with one exception, by foreign dynasties or powers.

Incursions by the Ottoman Turks began in the 14th century, and by 1568 the territory of modern Hungary had been divided into three parts: a strip of land in the west, Royal Hungary, fell to the Habsburgs; Transylvania in the east (much of modern northwestern Romania) gained autonomy (1566) under Turkish suzerainty; and the rest (the central plain) was under direct Turkish control.

The Austrian Habsburgs, who replaced the Ottomans as Hungary's rulers in the late 17th century, were, with the exception of Charles III and Maria Theresa, tyrannical as the Turks before them, and for a century their rule meant stagnation for Hungary. When reforms finally came in the early 1800s, the various non-Magyar nationalities, who by then comprised 60 percent of the population within Hungary's borders, resented the strongly pro-Magyar content of the new laws.

Revolution broke out in Vienna in 1848; one year later, under the leadership of Lajos Kossuth, Hungary declared its independence from Austria. The Austrians, with Russian help, reasserted control. Their own failing fortunes, however, forced the Austrians to make concessions to the Hungarians, and in 1867 the dual monarchy of Austria-Hungary was established.

The nationalities problem, however, persisted, and Austria-Hungary's defeat in World War I resulted in the dismemberment of Hungary. Romania, Czechoslovakia, Yugoslavia, Austria, Poland, and Italy all received parts of Hungary, with Hungary retaining only those areas in which Magyars predominated. In an attempt to regain some of this lost territory, Hungary cooperated with the Germans against the Soviet Union during World War II.

After Hungary's defeat in World War II, a Soviet occupation force remained to ensure implementation of a 1947 treaty reaffirming the 1920 frontiers. In 1945 local communists had established a pro-Soviet provisional government, and in 1949 the Hungarian People's Republic was formed. Fierce opposition to this Stalinist regime broke out in 1956 but was suppressed by the Soviet Union using military force.

Under the leadership of János Kádár (1956–88), communist Hungary henceforth maintained more liberal policies in the economic and cultural spheres, with the result that Hungary became the most tolerant of the Soviet-bloc nations of eastern Europe. Similarly, Hungary's communists abandoned their monopoly on power in 1989 voluntarily, and thus avoided the manifestations of popular unrest so prominent in neighbouring countries such as Czechoslovakia and Romania. Hungary's constitution was amended in October 1989 to allow a multiparty state, and free and open elections were held to the National Assembly in the spring of 1990. These elections were won by the centre-right Hungarian Democratic Forum and its allies, which favoured a controlled shift to a free-market economy. The Democratic Forum formed a government in May 1990, thus formally ending 45 years of communist rule in Hungary.

Hungary, Reformed Church of: *see* Reformed Church of Hungary.

Huniades, John (Hungarian general): *see* Hunyadi, János.

Hünkâr İskelesi, Treaty of, Hünkâr İskelesi also spelled UNKIAR SKELESSI (July 8, 1833), defensive alliance signed between the Ottoman Empire and Russia at the village of Hünkâr İskelesi, near Istanbul, by which the Ottoman Empire became a virtual protectorate of Russia.

Facing defeat by the insurgent Muḥammad ʿAlī Pasha of Egypt, the Ottoman sultan Mahmud II, after his requests of assistance had been rejected by Austria, Great Britain, and France, accepted Russian military aid early in 1833. In return he concluded, at Hünkâr İskelesi, an eight-year treaty that proclaimed peace and friendship between the two nations and a commitment to reach a mutual agreement on all matters relating to peace and security and to give each other assistance. The real significance of the treaty, however, lay in a secret article that limited Ottoman aid to Russia to the closing of the Strait of the Dardanelles to "any foreign vessels of war" except those of Russia.

The treaty aroused the suspicion of other powers, particularly Great Britain; Russia abandoned the Dardanelles privileges when it signed the London Straits Convention of 1841.

Hunkers and Barnburners, in United States history, two factions into which the New York State Democratic Party divided on the major and minor issues of the day. Their opposing views on slavery brought the two factions briefly into national politics. After 1844 the Hunkers supported the annexation of Texas and opposed all antislavery agitation. The Barnburners opposed the extension of slavery into new territories and in 1848 left the Democratic National Convention, nominated Martin Van Buren for president, and joined the Free-Soil Party. Later some of the Barnburners returned to the Democratic Party, and others joined the newly formed Republican Party.

Hunley, first submarine to sink an enemy ship, a Confederate invention of the American Civil War. The *Hunley* was designed and built at Mobile, Ala., and named for its chief financial backer, H.L. Hunley. About 25 feet (8 m) long, the submarine was armed with a spar torpedo and propelled by a single screw. The *Hunley* was shipped by rail in 1863 to Charleston, S.C., where, in an attempt to sink the Union frigate *New Ironsides,* it was swamped by a wave from a passing paddle wheeler; only the commander, Lieutenant John Payne, escaped. In early October 1863, in another try at the *New Ironsides,* the *Hunley* capsized near Fort Sumter; Payne and one seaman escaped. Raised by Hunley, the submarine went to the bottom again on October 15th during a practice dive, with loss of her crew. Raised again, on Feb. 17, 1864, it successfully attacked the new Union warship *Housatonic* with the spar torpedo and sank the vessel. The *Hunley,* however, was on the surface with its hatch open, and a wave resulting from the explosion swamped the ship, drowning the entire crew. It was never raised again.

Hunsaker, Jerome C(larke) (b. Aug. 26, 1886, Creston, Iowa, U.S.—d. Sept. 10, 1984, Boston, Mass.), American aeronautical engineer who made major innovations in the design of lighter-than-air ships, seaplanes, and carrier-based aircraft.

Upon graduating, in 1908, from the U.S. Naval Academy, Annapolis, Md., Hunsaker was assigned to the naval construction corps. In 1909 he was sent to study at the Massachusetts Institute of Technology (MIT), Cambridge, and graduated in 1912. After a two-year tour (1913–14) of Europe to ascertain the state of development of aeronautics there, he returned to MIT, where he instituted the first American university course in aerodynamics and aircraft design and, with Donald W. Douglas, built the first wind tunnel. From 1916 to 1923 he was in charge of aircraft design for the U.S. Navy. In the spring of 1919, his NC4 seaplane made the first transatlantic flight, via the Azores. He also designed the *Shenandoah,* the first airship to use helium instead of hydrogen.

As chief of design in the U.S. Bureau of Aeronautics, Hunsaker supervised the development of launching catapults and arresting gear for aircraft carriers, the construction of light carrier aircraft, the development of the torpedo plane, and the improvement of radial air-cooled aircraft engines.

In 1926 Hunsaker resigned from the navy and joined Bell Telephone Laboratories, Inc., where he worked on aircraft communications systems and weather advisory services for both military and commercial use. After serving as vice president (1928–33) of the Goodyear Zeppelin Corporation, he once again returned to MIT to expand its programs in propulsion, aerodynamics, instrumentation, and control; he served as chairman of the departments of aeronautical engineering and mechanical en-

gineering until he retired in 1951. He was a member of the National Advisory Committee for Aeronautics from 1938 to 1958, serving as chairman from 1941 to 1957.

Hunsrück, southernmost mountain region of the Rhenish Uplands in central Rhineland-Palatinate *Land* (state), western Germany, bounded by the Rhine (east), Mosel (north), Saar (west), and Nahe (south) rivers. The undulating Hunsrück plateau, extending approximately 55 mi (90 km) in a southwest-to-northeast direction and 20 to 25 mi in width, has an average elevation of 1,300 to 1,600 ft (400 to 500 m). It is traversed by several higher quartzite ridges including the Soonwald, Idarwald, and Hochwald, their highest peak, the Erbeskopf, reaching 2,684 ft (818 m) in elevation. The lower plateau regions have been cleared of much of their natural deciduous forest and are used primarily for cattle rearing, while the highlands remain covered by extensive beech and spruce forests. Small villages are the predominant form of settlement in the Hunsrück. Simmern is the region's principal town.

Hunt, H(aroldson) L(afayette) (b. Feb. 17, 1889, Ramsey, Ill., U.S.—d. Nov. 29, 1974, Dallas, Texas), American founder of a multibillion dollar oil business who promoted his ultraconservative political views on his own radio program.

Hunt speculated in cotton properties until 1920. With a borrowed $50, he went to Arkansas and began trading in oil leases, buying and selling almost simultaneously so that he made money without spending any. In 1930, when an oil lease speculator called Dad Joiner struck oil in east Texas, Hunt quickly paid a $30,000 down payment on Joiner's 4,000 acres and promised him more than $1,000,000 in oil later. The tract of land proved to be one of the richest oilfields in the United States.

Hunt continued to make shrewd investments in oil properties through his Hunt Oil Company, founded in 1936. One of his most successful ventures was his discovery and exploitation of vast oil deposits in Libya in the 1960s. With the immense wealth from sales of oil and natural gas, Hunt invested in publishing, cosmetics, pecan farming, and health food producers. By the time of his death, his fortune was variously estimated at between $2,000,000,000 and $3,000,000,000, with an income of more than $1,000,000 a week.

Hunt became best known for his political views. From 1951 to 1956 he funded his own foundation, called Facts Forum, which produced radio and television programs of conservative, anti-Communist political commentary. The foundation also distributed books by Senator Joseph R. McCarthy and others. In 1958 he revived the foundation as Life Line, to distribute a daily 15-minute radio program carried by more than 400 stations.

Hunt put a good portion of his assets in trusts for the families of his two marriages. The corporations that he founded are privately owned and managed by family members. In 1980 an unsuccessful attempt by two of his sons, N. Bunker and W. Herbert, to corner the world silver market nearly resulted in the collapse of silver prices. By 1985 losses from the silver fiasco, as well as the slumping oil and sugar-refining business, had reduced the family wealth by possibly one-third.

Hunt, Henry (b. Nov. 6, 1773, Upavon, Wiltshire, Eng.—d. Feb. 15, 1835, Alresford, Hampshire), British radical political reformer who gained the nickname "Orator" Hunt for his ubiquitous speechmaking in which he advocated universal suffrage and annual parliaments. Hunt's success as an orator came to national attention when he presided over an assembly of 60,000 demonstrating for parliamentary reform at St. Peter's Fields, Manchester (Aug. 16, 1819). The attempts to arrest Hunt and other leaders resulted in confusion and violence; about 500 of the unarmed demonstrators were injured and 11 were killed. The incident became known as the Peterloo Massacre. Hunt was uninjured, but the white hat he wore was staved in by a sword and became the symbol of reform.



Henry Hunt, detail of a watercolour by Adam Buck; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

In 1820 Hunt was arrested, tried, and imprisoned for two years for his radical views. While in prison he wrote an exposé of conditions in Ilchester Jail, *A Peep into Prison.* After his release he continued to agitate for popular parliamentary reform, and in 1830 he was elected to Parliament for Preston, Lancashire, a working-class district.

The reform movement in which Hunt had played an important part culminated in the Reform Act of 1832. In granting the vote to the middle class and in standardizing the franchise, the Act ironically caused Hunt to lose his seat in the election of 1832.

Hunt (of Llanfair Waterdine), (Henry Cecil) John Hunt, Baron, also called (1953–66) SIR JOHN HUNT (b. June 22, 1910, Marlborough, Wiltshire, Eng.), British army officer, mountaineer, and explorer who led the expedition on which Sir Edmund Hillary and Tenzing Norgay reached the summit of Mt. Everest, highest mountain (29,028 feet [8,848 metres]) in the world. He described the venture in *The Ascent of Everest* (1953).

While serving in India and Burma (Myanmar) in the 1930s, Hunt became acquainted with the Karakoram Range in northern Kashmir (1935) and with the Himalayas in Sikkim (1937 and 1939). During World War II he served in the North African and Italian campaigns, after which he was recalled from active army duties in 1952 to lead the 1953 British Everest expedition. Hunt retired from the army in 1956 and later served as rector of the University of Aberdeen from 1963 to 1966. He was made a life peer in 1966. As personal adviser to the prime minister, he led the government's mission to aid the starving Biafran population of southeastern Nigeria, during Biafra's unsuccessful attempt to secede from Nigeria (1968–70). He also served as chairman of the parole board for England and Wales from 1967 to 1974. His autobiography, *Life Is Meeting,* was published in 1978.

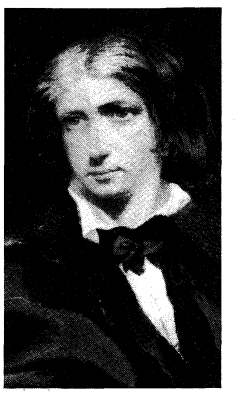


John Hunt, 1953

BBC Hulton Picture Library

Hunt, (James Henry) Leigh (b. Oct. 19, 1784, Southgate, Middlesex, Eng.—d. Aug. 28, 1859, Putney, London), English essayist, critic, journalist, and poet, who was an editor of influential journals in an age when the periodical was at the height of its power. He was also a friend and supporter of the poets Percy Bysshe Shelley and John Keats. Hunt's poems, of which "Abou Ben Adhem" and "Jenny Kissed Me" are probably the best known, reflect the influence of foreign versification.

Though he falls short of greatness, Hunt, at his best, in some essays and his *Autobiography* (1850; a rewriting of *Lord Byron and Some of His Contemporaries,* 1828), has a charm that has gained him a high place in his readers' affection. He excels in perceptive judgments of his contemporaries, from Keats to the Victorian Tennyson; and, as Radical journalist, though not much interested in politics, he attacks oppression with indignation. He considered himself to be essentially a dilettante.



Leigh Hunt, detail of an oil painting by Margaret Gillies; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

The poems in *Juvenilia* (1801), his first volume, show his love for Italian literature. He looked to Italy for a "freer spirit of versification," and in *The Story of Rimini* (1816), published in the year of his meeting with Keats, he reintroduced a freedom of movement in English couplet verse lost in the 18th century. From him Keats derived his delight in colour and imaginative sensual experience and a first acquaintance with Italian poetry, a potent influence long after he had outgrown Hunt's tutelage.

In 1808 Leigh Hunt and his brother John had launched the weekly *Examiner,* which advocated abolition of the slave trade, Catholic emancipation, and reform of Parliament and the criminal law. For their attacks on the unpopular prince regent, the brothers were imprisoned in 1813. Leigh Hunt, who continued to write *The Examiner* in prison, was regarded as a martyr in the cause of liberty. After his release (1815) he moved to Hampstead, home of Keats, whom he introduced in 1817 to Shelley, a friend since 1811. *The Examiner* supported the new Romantic poets against attacks by *Blackwood's Magazine* on what it called "the Cockney school of poetry."

In Hunt's writings for the quarterly *Reflector* (1810–11), politics was combined with criticism of the theatre and of the fine arts, of which he had considerable knowledge. *Imagination and Fancy* (1844), his most sustained critical work, draws interesting parallels between

painting and poetry. It was in the weekly *Indicator* (1819–21) and *The Companion* (1828), however, that, taking a holiday from politics, Hunt published some of his best essays. He continued to edit and write for periodicals to 1853.

Hunt, Richard Morris (b. Oct. 31, 1827, Brattleboro, Vt., U.S.—d. July 31, 1895, Newport, R.I.), fashionable society architect who established in the United States the manner and the traditions of the French Beaux-Arts style. He took a prominent part in the founding of the American Institute of Architects and from 1888 was its president. Eclectic in style, he was almost equally successful in the ornate style of the early Renaissance in France, in his picturesque villa style, and in the monumental classical style of the Lenox Library.

He studied in Europe (1843–54), mainly in the School of Fine Arts at Paris. In 1854 he was appointed inspector of works on the buildings connecting the Tuileries with the Louvre. Under Hector Lefuel he designed the Pavillon de la Bibliothèque (French: "Library Pavilion"), opposite the Palais-Royal. In 1855 he returned to New York and was employed on the extension of the Capitol at Washington. He designed the Lenox Library, the Tribune Building (1873), and the facade of the Metropolitan Museum of Art (1900–02) in New York City; the theological library and the Marquand Chapel at Princeton; the Divinity College and the Scroll and Key Club at Yale; the Vanderbilt Mausoleum on Staten Island; and the Yorktown Monument. For the administration building at the World's Columbian Exposition at Chicago in 1893, Hunt received the gold medal of the Royal Institute of British Architects. Among the most noteworthy of his domestic buildings were the residences of W.K. Vanderbilt (begun 1878), J.J. Astor (1893), and Henry G. Marquand (*c.* 1875) in New York City; George W. Vanderbilt's country house at Biltmore, N.C. (1890–95); and several of the large summer houses at Newport, R.I., including Marble House and the Breakers (1892–95).

Hunt, Ward (b. June 14, 1810, Utica, N.Y., U.S.—d. March 24, 1886, Washington, D.C.), associate justice of the United States Supreme Court (1873–82).

Admitted to the bar in 1831, Ward quickly developed a successful practice. He was elected to the state legislature as a Jacksonian Democrat in 1838 and served as mayor of Utica in 1844. His opposition to the annexation of Texas and the extension of slavery led to his support of the Free-Soil ticket in 1848. In 1856 he helped organize the Republican Party in New York state.

He was elected in 1865 as a Republican to the state Court of Appeals. He served as chief judge of that court and then, after the judicial reorganization of 1869, as commissioner of appeals. In 1872 he was named by President Ulysses S. Grant to the U.S. Supreme Court. He served without special distinction until incapacitated by a stroke in 1879, but he refused to retire until he was granted full retirement pay by a special act of Congress in 1882.

Hunt, William Holman (b. April 2, 1827, London, Eng.—d. Sept. 7, 1910, London), British artist and prominent member of the Pre-Raphaelite Brotherhood. His style is characterized by clear, hard colour, brilliant lighting, and careful delineation of detail.

In 1843 Hunt entered the Royal Academy schools where he met his lifelong friend, the painter John Everett Millais. Public opinion was at first hostile toward Hunt; but, in 1854 "The Light of the World" (Keble College, Oxford), an allegory of Christ knocking at the door of the human soul, was championed by John Ruskin and brought Hunt his first public success. In 1854 Hunt began a two-year visit to Syria and Palestine, where he completed in 1855 "The Scapegoat," a painting depicting an outcast animal on the shores of the Dead Sea. Among the most important of his later paintings are "The Triumph of the Innocents" (two versions: 1884, Tate Gallery, London; 1885, Liverpool), "May Morning on Magdalen Tower" (1889; Lady Lever Art Gallery), and "The Miracle of the Sacred Fire" (1898), finished just before his sight began to fail.

Hunt, William Morris (b. March 31, 1824, Brattleboro, Vt., U.S.—d. Sept. 8, 1879, Isles of Shoals, N.H.), Romantic painter who created a fashion in the United States for the luminous, atmospheric painting of the Barbizon school.

After attending Harvard College, Hunt studied with Thomas Couture in Paris and then at Barbizon with Jean-François Millet. Upon returning to New England, Hunt introduced the works of Camille Corot and the Barbizon school to the Boston society circles in which he moved, thereby turning a rising generation of American painters toward Paris.

After 1855 he painted some of his best pictures, reminiscent of his life in France and of the influence of Millet—"The Belated Kid," "Girl at the Fountain," "Hurdy-Gurdy Boy"—studies characterized by simplicity in drawing and tone. The public demand, however, was for portraits, and Hunt obtained many commissions from well-known personages. Unfortunately many of his paintings and sketches, together with his art collection, were destroyed by the great Boston fire of 1872. His allegories, "The Flight of Night" (1878), were lost by the disintegration of the stone panels on which they were painted. Among his later works, American landscapes predominated.

Hunt wrote (*Talks on Art,* 1878) and was a magnetic and persuasive teacher; among those influenced by him were John LaFarge and William and Henry James.

Hunter, Alberta (b. April 1, 1895, Memphis, Tenn., U.S.—d. Oct. 17, 1984, New York, N.Y.), American blues singer who achieved international fame in the 1930s for her vigorous and rhythmically infectious style.

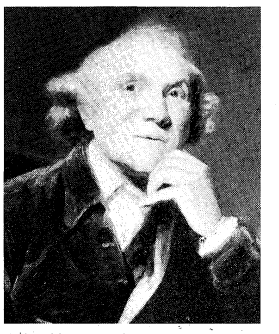
She went to Chicago at the age of 11 and there began to sing professionally. In the early 1920s she moved to New York City, where she proved to be a popular club and theatre performer. She recorded regularly throughout the decade, sometimes under the name of Josephine Beatty, her half sister. Her accompanists included Fats Waller, Eubie Blake, Louis Armstrong, Sidney Bechet, and, most frequently, Fletcher Henderson. She began writing songs at this time, and Bessie Smith's 1923 recording of Hunter's "Downhearted Blues" remains a popular classic.

Hunter costarred with Paul Robeson in the London production of *Show Boat* in 1928–29, and she continued to work frequently in Europe during the 1930s. She toured extensively for the USO during World War II and the Korean War. Then in 1954, after the death of her mother, Hunter, for all practical purposes, gave up her musical career to become a nurse. When she was forced in 1977 to retire from nursing because of her age, she resumed a full-time singing career.

Hunter, David (b. July 21, 1802, Washington, D.C., U.S.—d. Feb. 2, 1886, Washington, D.C.), Union officer during the American Civil War who issued an emancipation proclamation (May 9, 1862) that was annulled by President Abraham Lincoln (May 19).

Hunter graduated from the U.S. Military Academy at West Point, N.Y., in 1822 and served in the Mexican War (1846–48). In 1862, while in command of Federal troops along the South Atlantic coast, he proclaimed the freedom of slaves in Georgia, Florida, and South Carolina; Lincoln, determined to maintain his executive prerogatives, revoked the order. In South Carolina General Hunter organized the Union Army's first Negro regiment and was soon described by the Confederacy as a "felon to be executed if captured." He took command in West Virginia (May 21, 1864) but was defeated by General Jubal Early at Lynchburg, Va., on June 18 and resigned his command on August 8. After Lincoln's assassination, Hunter served as chairman of the commission that tried the conspirators.

Hunter, John (b. Feb. 13, 1728, Long Calderwood, Lanarkshire, Scot.—d. Oct. 16, 1793, London, Eng.), surgeon, founder of pathological anatomy in England, and early advocate of investigation and experimentation. He also carried out many important studies and experiments in comparative aspects of biology, anatomy, physiology, and pathology.



John Hunter, detail of an oil painting by J. Jackson after Sir Joshua Reynolds; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

Hunter never completed a course of studies in any university, and, as was common for surgeons during the 18th century, he never attempted to become a doctor of medicine. He went to London in 1748 to assist in the preparation of dissections for the course of anatomy taught by his brother William, a famed obstetrician. For 11 winters he studied anatomy in his brother's dissecting rooms, and in the summers of 1749 and 1750 he learned surgery from William Cheselden at Chelsea Hospital.

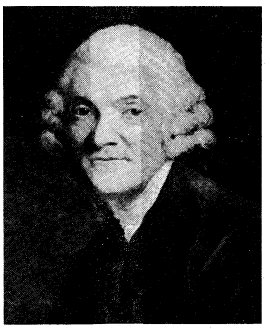
In 1753 he was elected a master of anatomy at Surgeon's Hall, responsible for reading lectures. He began his own private lectures on the principles and practice of surgery in the early 1770s. In addition, he had teaching duties from 1768 at St. George's Hospital, to which he had been elected surgeon in 1758. In 1760 Hunter accepted a commission as an army surgeon. He returned to London in 1763, where he continued in private practice until his death. In 1776 he was named physician extraordinary to King George III.

Hunter not only made specific contributions of great importance in surgery but also attained for surgery the dignity of a scientific profession, basing its practice on a vast body of general biological principles. In an attempt to demonstrate that gonorrhea and syphilis are manifestations of a single disease, he inoculated himself and contracted syphilis, which may have caused much of the illness he suffered in his later years.

Hunter wrote *The Natural History of the Human Teeth* (1771), *A Treatise on the Venereal Disease* (1786), and *Observations on Certain Parts of the Animal Oeconomy* (1786). *A Treatise on the Blood, Inflammation, and Gunshot Wounds* was published posthumously in 1794.

Hunter, Mary (writer): *see* Austin, Mary.

Hunter, William (b. May 23, 1718, Long Calderwood, Lanarkshire, Scot.—d. March 30, 1783, London, Eng.), British obstetrician, educator, and medical writer who did much,



William Hunter, detail of an oil painting by Sir Joshua Reynolds; in the Hunterian Collection, the University of Glasgow

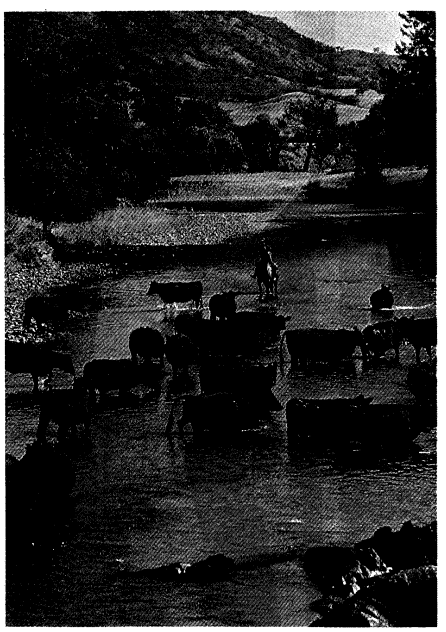
Hunterian Art Gallery, University of Glasgow

by his high standards of teaching and medical practice, to remove obstetrics from the hands of the midwives and establish it as an accepted branch of medicine.

Hunter received his medical degree from the University of Glasgow in 1750 and became a licensed physician in London in 1756. He did his first teaching in 1746 and continued to lecture, usually on topics of surgery or anatomy, throughout his life. While in France (1743–44 and 1748) he observed that individual medical students in that country were provided with cadavers for dissection; he, in turn, introduced the practice to Great Britain. When the Royal Academy was founded in 1768, Hunter was appointed professor of anatomy.

After 1756 Hunter's medical practice was devoted principally to obstetrics, and he was the most successful specialist in this field in Great Britain in his day, becoming physician extraordinary to Queen Charlotte in 1762. He wrote three books, the most important being *The Anatomy of the Human Gravid Uterus, Exhibited in Figures* (1774).

Hunter River, river in east-central New South Wales, Australia, rising in the Mount Royal Range of the Eastern Highlands and flowing generally southwest through Glenbawn Reservoir (for flood mitigation and irrigation) and past Muswellbrook and Denman. There, joined by its major tributary, the Goulburn River, the Hunter turns southeast to flow by Singleton, Maitland, Morpeth, and Raymond Terrace, entering the Tasman Sea at Newcastle after a course of 287 miles (462 km). Its drainage basin is approximately 8,500 square miles (22,000 square km), and its estuarine mouth forms one of the state's largest harbours at Newcastle. Cessnock, Kurri Kurri, Murrundi, and Scone are major valley towns but do not directly border the river, which is also fed by the Williams and Paterson rivers and Wollombi Brook.



Cattle crossing the Hunter River, New South Wales

David Moore—Black Star/EB Inc.

Visited in 1791 by convicts, who called it the Coal River, it was renamed in 1797 for John Hunter (colonial governor, 1795–1800). The coal outcrops found by these early visitors were being worked by 1800. The most important mines are in the Singleton–Muswellbrook–Denman "triangle," but the mines on the lower river between Cessnock and Maitland were important in establishing the Newcastle iron and steel industry. Six major thermal electricity generating plants in the area make it a major exporter of power to other parts of the state. The valley also supports diverse agriculture, including fruit orchards and wine vineyards. Cattle, sheep, and horses graze the upper valley, where timber is also cut. The riverine flats of the middle and lower reaches below Singleton are devoted to dairying and forage crops—corn (maize), hay, and lucerne (alfalfa). Poultry raising is the largest agricultural industry in the area, followed by beef production. Overcutting of timber has contributed to severe flooding, and control measures, such as Glenbawn Dam (1958), have been installed. Erratic seasonal changes in its level seriously limit navigation on the Hunter, but its valley is served by a rail line and two highways to Sydney.

Hunters' Lodges, secret organization of Canadian rebels and American adventurers in the United States, dedicated to freeing Canada from British colonial rule. Formed after the failure of the Canadian Rebellion of 1837, the lodges were concentrated in the northern border states. Lodge members (numbering perhaps 80,000) launched two abortive invasions of Upper Canada (now in Ontario).

On Nov. 11, 1838, about 400 lodge members crossed the St. Lawrence River at the village of Prescott, Ont. They were immediately engaged by local militia and a few regular troops. Many of the invaders escaped, but about half of them took refuge in a windmill, where they held out for five days before surrendering. About 30 of the invaders were killed in the battle and about 160 were made prisoners.

On Dec. 4, 1838, the Hunters launched a second invasion, this time at Windsor, Ont. Again, they were quickly scattered by the militia, and a large number of them were captured. After a number of other minor border incidents and raids, the Lodges ceased to be active in the 1840s.

Although they posed no threat to British rule in Canada, the Lodges' open defiance of U.S. neutrality laws—and local officials' refusal to enforce those laws—caused some tension in U.S.-British relations until President Martin Van Buren ordered the Lodges disbanded.

Hunter's syndrome, also called MUCOPOLYSACCHARIDOSIS II, rare sex-linked hereditary disorder that varies widely in its severity but is generally characterized by some degree of dwarfism, mental retardation, and deafness. The disease affects only males and makes its first appearance during the first three years of life. Many patients die before age 20. Speech and mental development are delayed, the child has frequent respiratory infections, and as the disease progresses a typical constellation of physical signs becomes evident: protuberant abdomen, claw hands, excessive hair growth, coarsening of the face, and retarded growth. The disorder is caused by a deficiency in the enzyme iduronate sulfatase. This deficiency results in a defective chemical breakdown of the mucopolysaccharides, carbohydrates essential in the development of the connective tissues, and a consequent accumulation of mucopolysaccharides in the body, which in turn causes the disease's characteristic mental and physical defects.

hunting, sport that involves the seeking, pursuing, and killing of wild animals and birds, called game and game birds, primarily in modern times with firearms but also with bow and arrow. In Great Britain and western Europe, hunting is the term employed for the taking of wild animals with the aid of hounds that hunt by scent, whereas the sport of taking small game and game birds with a gun is known as shooting. In the United States and elsewhere the term hunting is used for both hunting and shooting. In the fox hunt (*q.v.*), the kill is made by the hounds. *See also* falconry.

Origins. To early man, hunting was a necessity. His quarry provided not only food from the meat but clothing from the skins, and material for tools from the bones, horns, and hooves. Both archaeological evidence from the past and observation of simpler societies of the present show widespread preoccupation with, and ingenuity in, methods of hunting. These varied, and vary, with the nature of the terrain, the animal hunted, the ingenuity and inventiveness of the hunters, and the materials and technologies at their disposal. Weapons ranged upward in intricacy and effectiveness from sticks and stones used to kill birds and small game to specially shaped clubs and throwing sticks such as the African knobkerry, the trombash of the Upper Nile, and the Australian boomerang; to spears ranging from simple pointed sticks to those with a separate foreshaft, usually barbed, and armed with heads of sharpened stone, bone, or metal. Except in Australia, bows and arrows were universal among early hunters and were revived by modern hunters in the 19th century. The blowpipe, or blow gun, with its poisoned darts is one of the hunter's deadliest weapons.

Camouflages and disguises were used to conceal the early hunter, who also used nooses, traps, snares, pits, decoys, baits, and poisons. Dogs were probably trained to hunt as early as Neolithic times and came to be bred for specialized skills. The horse was adapted to the hunt in the 2nd millennium BC.

The development of agriculture made hunting less man's sole life support, but he still pursued it to protect crops, flocks, or herds as well as for food. The hunter's continual training with his implements and in tracking and stalking had a social value in maintaining group activity, earning prestige, and preserving tradition.

Ancient history. Early hunting for sport was for rulers and their nobles, those having the most leisure and wealth. In ancient Egypt the huntsmen constituted a social class; they hunted on their own as well as attending at the hunting of nobles. There was hunting in open deserts on both sides of the Nile valley, and sometimes animals were driven into enclosed preserves to be hunted there. Animals hunted included gazelle, antelope (oryx), stag, wild ox, Barbary sheep, and hare; the ostrich for its plumes; and fox, jackal, wolf, hyena, and leopard for their pelts or as enemies of the farmer. The hunters used the net, noose, arrow, and dart. The lion was occasionally trained to hunt. Later hunters occasionally rode in a chariot or on horseback.

The Assyrians and Babylonians also were partial to the chase, as is shown by the hunting scenes depicted on the walls of their temples and palaces. Ashurbanipal, the Hunting King, in the 7th century BC had himself immortalized in a bas-relief with the accompanying boast: "I killed the lion." A 5th-century silver dish showed the Sāsānian king Kavadh I galloping at full tilt after wild sheep. Hawks and falcons were used in hunting by Assyri-

ans before 700 BC; and falconry was widely known in India and China at an early date. Biblical references show that game was plentiful, much sought after, and duly appreciated by the Israelites.

Hunting began early among the ancient Greeks. Xenophon's *Kynēgetikos* ("On Hunting") in the 4th century BC was based on his own experience in hunting the hare but also describes boar and stag hunting. Lions, leopards, lynx, panthers, and bears are also mentioned, the last being taken in pitfalls or speared by mounted horsemen. The Romans viewed hunting with less favour as a sport for gentlemen and left it to inferiors and professionals.

Later history. The Franks and other Teutonic peoples were fond of falconry and the chase, and in later centuries both the laity and the clergy were warned by provincial councils against spending so much time and money on hounds, hawks, and falcons. Originally, among the northern nations all could hunt except slaves, who were forbidden to bear arms. The idea of game preservation arose in feudal times when the right to hunt became attached to the ownership of land. Because of their hereditary claim to the title Lord High Masters of the Chase for the Holy Roman Empire, the electors of Saxony enjoyed exceptional opportunities to hunt. Elector John George II of Saxony (reigned 1656–80) shot an astonishing total of 42,649 red deer. He refused the crown of Bohemia not for political reasons but because Bohemian stags were smaller than Saxon ones. To protect his stags he fenced the boundary between Saxony and Bohemia. An early landgrave of Hesse had a codicil added to the Lord's Prayer: "Give us this day our daily hart in the pride of grease," *i.e.,* a fattened stag. In 11th-century England, Edward the Confessor delighted in riding after stag hounds, as did many of his successors. In 18th-century France Louis XV was so fond of hunting that he stopped on the way home from his coronation to chase stags in the Villars-Cotterets forest. In 1726 he spent 276 days hunting. In Russia the tsars had superb hunting in the forest of Belovezh; one remarkable 12-day shoot produced a tally of 36 elks, 53 stags, 325 roebuck, 42 bison (wisent), and 138 wild boars.

European women were also famous in the hunt. Princess Frederika of Eisenach was known for her deer-stalking skill; Maria, governess of the Netherlands, could track a stag, shoot it with a crossbow, and gut it. In France, Diana de Poitiers, with her paramour Henry II (ruled 1547–59), hunted stags, roe deer, and boar from the saddle at Chenonceaux, Europe's most magnificent hunting lodge; and in England, Elizabeth I was fond of both hunting and hawking.

Hunting codes. A distinction between hunting for sport and hunting for food was made early. For the Normans the chase was principally for meat from the early Middle Ages on, and it was organized to provide the most kills for the least effort. Where hunting was a pastime, however, a strict code of behaviour developed based on standards enjoined by royalty and nobles. A gentleman taking game birds for recreation did so with a falcon; a fowler who earned his living by selling to the market used nets. From this distinction arose the complex, often mystifying, and seemingly contradictory European canon of fair play for the hunted. Those preying on wild creatures for amusement limited their means so as to give the quarry a fair chance to escape and to avoid unnecessary suffering of wounded game. The code demands that a hunter track down and kill an animal he has wounded. Shooting a sitting duck is still frowned upon, and hiding out in wait for a big-game animal to come to a water hole or a block of salt is considered unsportsmanlike. Hunters who consider themselves sportsmen uphold the code.

European game laws, written and unwritten, worked so that hunting is still excellent in many areas. Even Slav hunters in countries that became Communist observe the code of the aristocratic past. This protocol gave hunting a residual prestige verging on snob appeal long after social changes removed its origins. The spread of income now permits hunting in some form by virtually all who wish to hunt in nearly every country. The right to shoot vested in the ownership of land always could be sold or let. In western Europe the acquisition of such rights by shooting clubs, generally with large memberships, increased in modern times. In eastern European Communist countries shooting rights theoretically passed into the hands of the communes, but in practice the rights are often let to organizations, sometimes from other countries.

Hunting with guns. There are records of the shooting of game with firearms from the 16th century. The gun greatly increased the hunter's ability to kill game at greater distances and in larger numbers; and every improvement in the range, accuracy, and rapidity of fire further increased the kill. Eventually hunters adopted additional conventions, generally unwritten but sometimes included in game laws, to limit their means of destruction. In Great Britain and many other countries, for example, the pump gun, or repeater, is not accepted as a sporting weapon. Nothing more efficient than a double-barreled shotgun is used; this gun compels a pause after two shots, either to reload or change guns, thus allowing the quarry a chance to get out of range. While the hunter's ability to kill was increased, such conventions kept the actual kill under control.

North America. When European explorers and settlers came to the continent, game was abundant from coast to coast. Moose were common in New England and in the forested northern Atlantic coast. Deer roamed freely there and inland. There was a profusion of game birds, including the wild turkey, waterfowl, and small game. Westward the American buffalo (bison) blackened the plains, and passenger pigeons blackened the skies. In the western mountains elk (wapiti), mountain goat, sheep, and pronghorn were numerous, as were generally the predators: the puma, cougar, lynx, bobcat, wolf, and coyote.

The pioneers, for whom a gun was both a weapon of defense and a food-provider, hunted to put meat on the table. The pioneer farm family harvested the game of the swamps and forests as naturally as it harvested the planted crops. The supply of game seemed limitless just as the availability and fertility of the land did. Hunting as sport was reflected only in the very popular shooting match. The pioneer tradition of "every man a hunter" persisted until after the frontier closed near the end of the 19th century and the agrarian population began to decline, particularly in the South and the Midwest and parts of the West. The mark of a farm or small town boy's coming of age was when he received a gun for hunting.

Africa. When Europeans began to settle Africa in the late 19th century, the colonists shot game for meat and hides and hunting was principally for survival, as it had been for the indigenous hunters. As in North America, game seemed in unlimited supply. The amount of hunting increased and the wildlife population decreased. When hunting out of necessity disappeared, it continued as a sport.

Safari hunting was the most famous: an expedition usually for several hunters of from several days to several weeks, involving large numbers of bearers to carry equipment and supplies, gun bearers, game drivers, trackers, and skinners. The safari was led by one or more professional hunters, "white hunters." Ultimately automobiles replaced the bearers for transport, but so intense was the hunting that by the time air travel made the hunting grounds much more accessible after World War II, some species had been hunted to extinction and others nearly so. By the last quarter of the 20th century, safaris were made mainly by tourists who examined and photographed game in national preserves.

Asia. In contrast to North America and Africa, colonization in Asia tended to overcome earlier overexploitation of game, conservation being achieved by the introduction of European game management practices. Nonetheless, by the second half of the 20th century such species as the tiger and the Asiatic rhinoceros became threatened by extinction, and protection was furnished by special-license hunting and by programs inaugurated with the help of the International Union for Conservation of Nature and Natural Resources (founded 1948).

South America. European settlers found only three indigenous big-game animals: the jaguar of Brazil and Paraguay, the spectacled bear of the high Andes, and the puma. Hunting tended to be for meat and hides, and most hunting was for game birds and small animals. Early in the 20th century wild game animals were imported and introduced with considerable success: red deer and boar from the Carpathians; fallow deer from England; blackbuck and axis deer from India; and later Indian buffalo. This stock forms the basis for modern sport hunting in South America.

Australasia. Australia has no big game animals. Early settlers hunted the kangaroo, the dingo (a wild dog), and the emu (for plumage) as indigenous hunters had; deer were introduced but did not thrive. Fox hunting has persisted sporadically. In New Zealand, however, transplanted imports such as red and fallow deer and chamois from Europe; sambar, axis, and Japanese deer and tahr from Asia; and moose, elk, and white-tail deer from North America have all thrived. In the second half of the 20th century commercial meat hunting made heavy inroads into the stock.

Game management. In the second half of the 20th century with species extinction being a concern of conservationists, hunting was no longer feasible in some places.

The 19th-century extermination of the passenger pigeon and virtual extermination of the bison (buffalo) in North America, and the prospect of overhunting, both commercial and sport, led to laws protecting game and game birds. Much huntable land disappeared as industrial advance eliminated wildlife habitats and new farming methods reduced hedgerows and plowed under stubble soon after harvest, thus reducing food for game. State and national laws, however, established kill limits and required licenses for hunters, thus raising revenue to provide for replenishment of the stock. Much governmentally owned land was also opened for permit hunting. Conservation schemes may involve several governments and private bodies. In the United States, for example, the federal government controls game birds, which migrate from state to state and also summer in Canada and winter in Mexico. Ducks Unlimited, a private group, studies bird populations and advises on what seasons and bag limits are appropriate to assure a continuing supply of birds.

Game conservation schemes began in India in 1860, in Africa at the end of the 19th century, in North America from early in the 20th century, and in eastern Europe after World War II. In Great Britain and the rest of western Europe, preservation of wildlife is a function exercised or delegated by landowners.

Hunting methods. The basic methods of sport hunting are stalking, still-hunting, tracking, driving, sitting up, and calling.

In open country where game can be viewed from afar and, conversely, game can see the hunter, a slow, stealthy approach, stalking, is

necessary, the hunter taking advantage of even small cover and being careful that the wind does not blow his scent to the prey.

In dense forest, undergrowth, brush, or scrub, the hunter, unable to see more than a few yards, walks slowly and cautiously, ever alert, in what is called still-hunting, although deer hunters using this method speak of "jumping" a deer.

Elephants and other large animals that herd together cannot be stalked or still-hunted but must be tracked, a simple feat in soft ground and, for a skilled tracker, even on hard.

Some game goes into cover so dense that a hunter cannot penetrate it to get a shot. Such game must be driven into the open. This may be done with the help of a number of men or dogs or, as in certain parts of India, with the aid of a line of elephants. These methods are known universally as driving, or beating.

Sitting up, usually in blinds, is the most popular method of hunting waterfowl, with or without calling. It is called flighting in Great Britain. Hunting by calling involves waiting in hiding and making imitative noises by voice or with a call mechanism to attract the game. Game birds so hunted include ducks and geese, hunted from blinds near which decoys are placed, and wild turkeys, also hunted from blinds, but without decoys. Calling deer is an old European technique, especially in Germany and Austria; the technique was successfully adopted by moose hunters in North America.

Dogs. Recorded hunting with dogs dates back to ancient Egypt, where greyhounds were used to hunt gazelles. Coursing, the pursuit of game by hounds hunting by sight, has become now mainly a competition between hunting dogs. Hounds pursuing by scent are used in foxhunting and for such small game as hare, rabbit, and, in central and southern parts of the United States, raccoon.

Spaniels, setters, and pointers, which hunt by scent and sight, are called gun dogs. These dogs not only retrieve shot birds but also work before the shot, locating birds for the hunter and flushing them when the hunter is in shooting position.

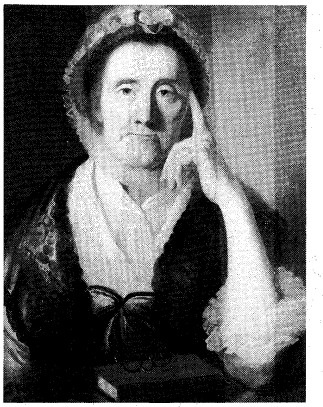
Equipment. Weapons are chosen according to the particular game being sought. For big game, high-powered rifles are used except that in some areas regulations for deer require the use of a shotgun firing a slug. Shotguns are used for shooting waterfowl and other game birds and most small animals, although squirrel hunters prefer a .22 calibre rifle. Bows and arrows and to a lesser extent crossbows are used primarily for small game, although in the United States, where such hunters numbered more than 1,750,000 in the 1980s, bow hunting for deer had special seasons. Other big game had successfully been taken with the bow.

hunting leopard: *see* cheetah.

hunting spider: *see* wolf spider.

Huntingdon, Selina Hastings, Countess of, *née* SHIRLEY (b. Aug. 24, 1707, Staunton Harold, Leicestershire, Eng.—d. June 17, 1791, London), central figure in the evangelical revival in 18th-century England, who founded the Countess of Huntingdon's Connexion, a sect of Calvinistic Methodists.

The daughter of Washington Shirley, 2nd Earl Ferrers, Selina in 1728 married Theophilus Hastings, 9th earl of Huntingdon, whose sister inspired her conversion to Methodism. In 1739 the countess joined the Methodist society founded by John Wesley (1703–91) and on her husband's death in 1746 became the "elect lady" of the new movement. Using her right as a peeress, she appointed evangelical clergymen as her chaplains and built chapels in Brighton, Bath, Tunbridge Wells, and other centres of aristocratic society. Services in her drawing room often featured her favourite



The Countess of Huntingdon, portrait by an unknown artist; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

preacher, George Whitefield, whose orphanage in the North American colony of Georgia she helped support.

The Countess of Huntingdon corresponded with her distant relative in America, George Washington, about Indians there, and she assisted in the formation of Dartmouth College, Hanover, N.H., and Princeton University. Though a devout Anglican, the countess wanted to provide preachers for Dissenting churches as well, and when six theological students were expelled from Oxford in 1767 for suspected "enthusiasm" (Anglican synonym for Methodism), she established (1768) Trevecca House in Talgarth, Brecknockshire, at her own expense, for the training of evangelical clergymen.

During the 1770s, however, conflicts arose between two factions in Methodism, one led by Whitefield and the other by Wesley, the founder of Methodism. In 1779 the local clergyman in Spa Fields protested that the countess' new chapel was an infringement on his rights. She was sued in an ecclesiastical court with the result that, in order to preserve her chapels, she had to register them as Dissenting meetinghouses, whereupon all the Anglican chaplains resigned.

After the countess' death her college was moved to Cheshunt, Hertfordshire, in 1792 and to Cambridge in 1904. Countess of Huntingdon churches were founded in 1792 in Sierra Leone by blacks freed from slavery in Nova Scotia. The chapels of her Connexion, or association, survive mostly under Congregational operation.

Consult the INDEX *first*

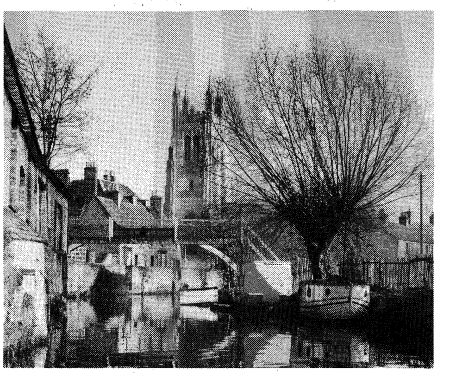
Huntingdon and Godmanchester, town ("parish"), Huntingdonshire district, county of Cambridgeshire, England. It was formed in 1961 by the amalgamation of the former boroughs of Huntingdon and Godmanchester, which lie respectively on the north and south banks of the River Ouse.

Godmanchester is the more ancient settlement. In contrast to Huntingdon, it is essentially agricultural in character, with many 16th- and 17th-century farmhouses bordering its narrow streets.

Huntingdon is an Anglo-Saxon–Danish foundation that prospered successively as a bridging point of the Ouse, as a market town, and, in the 18th and 19th centuries, as a coaching centre. Light engineering is now important. Pop. (1981) 17,603.

Huntingdonshire, district, county of Cambridgeshire, east-central England, occupying an area of 357 square miles (924 square km) in the western part of the county. Between 1965 and 1974 the district was a part of the former county of Huntingdon and Peterborough. Before 1965 it was, with only minor boundary changes, itself a separate county. Western Huntingdonshire district is a low limestone upland generally about 200 feet (60 m) high and covered by Oxford clay. Situated in the catchment basins of the Nene and Great Ouse rivers, the district gradually descends eastward and extends into the Fens, an area of reclaimed marshland in the northeast. The clay-covered chalk uplands are generally in pasture or meadow; the more fertile peat soils of the Fens are intensively cultivated for cereals and sugar beets.

In ancient times the district was densely wooded and therefore only sparsely populated. The Roman occupation began in about AD 50, and, following the decline of Roman rule in the late 4th century, power fell gradually



The River Ouse at St. Neots, Huntingdonshire

E.W. Tattersall

into the hands of the Saxons. Little is known of early Saxon settlement, however, and it was not until the 8th and 9th centuries that many of the present villages were founded. Raids by the Danes began in the 9th century, and the region subsequently became a Danish headquarters. In about 921 the Anglo-Saxon king Edward the Elder won back the area, which then became merged in the earldom of East Anglia.

The Norman Conquest of 1066 was followed by a general confiscation of Saxon estates, which were redistributed among William I's followers. Many medieval abbeys (now in ruins) were established within or adjacent to the former marshlands. Old stone (mostly medieval) bridges still in use attest to the historic importance of the towns of St. Ives, St. Neots, and adjacent Huntingdon and Godmanchester, two former independent entities that have since merged administratively. The Black Death of 1348–49 decimated the town of Huntingdon, and several other areas in the district also suffered severely. Oliver Cromwell spent his childhood in the town of Huntingdon; during the English Civil Wars the town and surrounding countryside nevertheless remained steadfastly Royalist. The district's subsequent history was largely uneventful.

Huntingdonshire has been primarily an agricultural area for most of its history. In the 18th century a flourishing coaching trade also developed, but it declined with the coming of the railways in the 19th century. The town ("parish") of Yaxley, atop thick Oxford clay deposits in the extreme north, is now a principal brick-making centre of England. Huntingdon and Godmanchester, St. Ives, and St. Neots have expanding light industries. Huntingdon and Godmanchester is the district seat. Pop. (1986 est.) 141,700.

Huntington, city, seat (1834) of Huntington county, central Indiana, U.S., on the

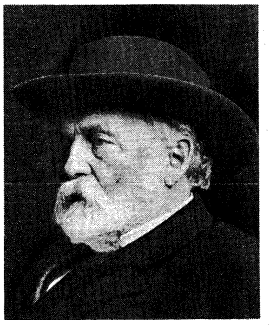
Little Wabash River near its juncture with the Wabash, 24 mi (39 km) southwest of Fort Wayne. The original site (Forks of the Wabash) was an Indian campground (home of the Miami chief La Fontaine), where many Indian treaties were signed; it was known as Wepecheange (Place of Flints). The settlement that developed there was renamed in 1831 to honour Samuel Huntington, a member of the first Continental Congress. The city is now an agricultural trade centre with limestone quarrying in the vicinity. Light manufactures include rubber products and electronic, heating, and air-conditioning equipment. Huntington College (United Brethren in Christ) was established in 1897. The Huntington County Historical Museum and a botanical garden and arboretum are in the city. Nearby are the Huntington and Salamonie reservoirs, dammed for flood control and recreation. Inc. town, 1848; city, 1873. Pop. (1980) 16,202.

Huntington, town (township), Suffolk County, southeastern New York, U.S., on the north shore of Long Island. The site, first settled in 1653, was named for Oliver Cromwell's birthplace in England. Nathan Hale, the patriot-spy, probably landed (1776) at Huntington Bay when he went behind the British lines to obtain information for Gen. George Washington; a monument marks the spot where he is believed to have been captured. Walt Whitman edited (1838–39) the *Long Islander*, a weekly newspaper published in Huntington; his farmhouse-birthplace at West Hills is preserved. An industrial home for the blind, a whaling museum, and a state fish hatchery are operated at Cold Spring Harbor, and Friends World College (1965), offering independent study abroad, is in Lloyd Harbor, as is the partially restored Joseph Lloyd Manor House (1766). Mainly rural–residential, with some precision industries, the town has more than 50 mi (80 km) of shorefront and includes the incorporated villages of Asharoken (incorporated 1925), Huntington Bay (1924), Lloyd Harbor (1926), and Northport (1894) and several unincorporated communities. Declared a first class town, 1954. Pop. (1980) 201,512.

Huntington, city, western West Virginia, U.S., in Wayne and Cabell counties, seat (1887) of Cabell County, at the confluence of the Ohio and Guyandotte rivers. It was laid out on Holderby's Landing (a stretch of farmland settled in 1796) when Collis P. Huntington built the Chesapeake and Ohio Railway's western terminal there in 1870. Huntington is now the metropolis of an industrial tristate region formed at the junction of the Ohio, Kentucky, and West Virginia boundaries and including Ashland, Ky., and Ironton, Ohio. It is a river and rail point of transfer, and bituminous coal, oil, and natural gas are local resources. True to its heritage, the city produces railroad equipment and has extensive railroad repair shops. Reduction and fabrication of nickel alloys and the manufacture of glass and stone products, chemicals, and clothing are also significant industrially. It challenges Charleston (45 mi [72 km] east) for the position of the state's largest population centre.

Huntington lies in a semicircle on broad lowlands and is protected from river floods by an 11-mi-long wall. Institutions include Marshall University (founded as an academy in 1837), a state mental hospital, an industrial school for girls, and the Huntington Galleries in Ritter Park. Inc. city, 1871. Pop. (1980) city, 63,684; Huntington-Ashland metropolitan area (SMSA), 311,350.

Huntington, Collis P(otter) (b. Oct. 22, 1821, Harwinton, Conn., U.S.—d. Aug. 13, 1900, Raquette Lake, N.Y.), U.S. railroad magnate who promoted the Central Pacific Railroad's extension across the West, making possible the first transcontinental railroad in 1869. He expanded the Southern Pacific Railroad into a 9,600-mile (15,450-kilometre) line that was the foundation of rail service in California and the western link for a southern transcontinental rail route.



Collis P. Huntington, *c.* 1900
By courtesy of the Southern Pacific Co.

Settling in California in the gold rush year of 1849, he soon became a successful merchandiser of miners' supplies. In the late 1850s he became interested in a plan to link California with the eastern U.S. by rail, culminating in the Central Pacific Railroad construction project (1863–69). He then helped to form the Southern Pacific Railroad, becoming president in 1890.

Huntington extended the lines of the Chesapeake and Ohio Railway, which he bought in 1869, to link with the Southern Pacific, forming a 4,000-mile continuous track from San Francisco to Newport News, Va. He also invested in steamship lines to Latin America and East Asia and gave a large donation to the Metropolitan Museum of Art in New York City.

Huntington, Ellsworth (b. Sept. 16, 1876, Galesburg, Ill., U.S.—d. Oct. 17, 1947, New Haven, Conn.), U.S. geographer who explored the influence of climate on civilization.

An instructor at Euphrates College, Harput, Tur. (1897–1901), Huntington explored the canyons of the Euphrates River in Turkey (1901). He described his travels through central Asia (1903–06) in *The Pulse of Asia* (1907). He taught at Yale University from 1907 to 1917, when he became a research associate in geography. Leader of the Yale expedition to Palestine and Asia (1909), he published *Palestine and Its Transformation* in 1911. As a research associate of the Carnegie Institution, Washington, D.C. (1910–13), he made climatic investigations of the United States, Mexico, and Central America. His work chiefly concerned the relation of climate to land forms, geological and historical changes, human activities, and the distribution of civilizations. These researches produced several works, including *Civilization and Climate* (1915; rev. ed. 1924), *The Human Habitat* (1927), and *Mainsprings of Civilization* (1945).

Huntington, Henry E(dwards) (b. Feb. 27, 1850, Oneonta, N.Y., U.S.—d. May 23, 1927, San Marino, Calif.), American railroad magnate and collector of rare books.

Huntington was interested in books as a child, but he did not begin collecting until 1903. A fortune amassed through his various business interests made it possible for him to buy entire libraries at one time: notable purchases include the E. Dwight Church Library of Americana, the Wilberforce Eames Collection of approximately 12,000 early American imprints, and Sir Thomas Egerton's collection from the 1600s. In 1919 Huntington established a trust bequeathing his collection for public benefit. The Henry E. Huntington Library is located in San Marino, Calif.

Huntington Beach, city, Orange County, southwestern California, U.S., on the Pacific coast. Originally part of the Rancho Las Bolsas and La Bolsa Chica, it was first called Shell Beach and after its subdivision (1901) was known as Pacific City. To encourage its promotion as a seaside resort, it was renamed Huntington Beach for Henry E. Huntington, owner of the Pacific Electric Railway. The discovery of oil (1919) beneath the townsite, supplemented after 1930 by production of tideland oil offshore, provided a basis for industrial development. Other major economic assets are the Douglas Aircraft Company's space centre and a large steam generating plant. The Golden West College (1966) is in the city. Inc. 1909. Pop. (1980) 170,505.

Huntington Library, Art Gallery, and Botanical Gardens, library and cultural institution created in 1919 at San Marino, Calif., near Los Angeles, by Henry Edwards Huntington and left as a public trust upon his death. Huntington, a railroad tycoon, began collecting books early in the 20th century, and the library is rich in rare books and manuscripts, mostly English and American. Functioning as a national resource for scholarship and research, the library also contains collections of incunabula and an outstanding collection of portraits and landscapes by such renowned English painters as Thomas Gainsborough, Sir Joshua Reynolds, Sir Thomas Lawrence, and George Romney. During his lifetime, Huntington purchased, among others, the entire collections of the E. Dwight Church Library of Americana and the Wilberforce Eames collection of 12,000 early American imprints. The library and the mansion in which it is housed were deeded to the American public in perpetuity. A trust fund of $8,000,000 was established for further additions, research, and publications.

Huntly, George Gordon, 1st marquess and 6th earl of (b. *c.* 1563—d. June 13, 1636, Dundee, Scot.), Scottish Roman Catholic conspirator who provoked personal wars in 16th-century Scotland but was saved by his friendship with James VI (James I of England).

Son of the 5th earl (George Gordon), he was educated in France as a Roman Catholic. Although he signed the Presbyterian confession of faith in 1588, he was soon engaging in plots for the Spanish invasion of Scotland. Elizabeth I discovered this and sent on to James VI some of Huntly's treasonable correspondence with the Spanish authorities, but James soon pardoned him. Huntly thereupon raised a rebellion in the north of Scotland, but was obliged to submit and, after a short imprisonment in Borthwick Castle, was again set at liberty.

Within three years he had received a royal commission to proceed against his hereditary enemy, the Earl of Moray. He set fire to Moray's castle of Donibristle in Fife on Feb. 7, 1592, and Huntly himself is said to have taken part in stabbing the Earl to death. This outrage, which originated the ballad "The Bonnie Earl of Moray," brought down upon Huntly his enemies, who ravaged his lands. In December the "Spanish Blanks" (eight blank papers, two of which bore Huntly's signature, which were taken from a man leaving for the Continent) led to another charge of treason against him. Despite the outcry of the ministers, James refused to take severe action against the powerful northern earls until, in the summer of 1594, Huntly joined the earls of Erroll and Bothwell in an open rebellion. Huntly and Erroll gained a victory in October over Argyll's troops at Glenlivet, but Huntly's castle of Strathbogie was blown up by James, and he left Scotland in March 1595.

He returned secretly, submitted to the kirk, and was restored to his estates. Huntly was created a marquess in April 1599, and soon after, with the Duke of Lennox, he was appointed lieutenant of the north. He was treated with great favour by the King and was reconciled

with Moray and Argyll. Doubts, however, as to the genuineness of his abjuration continued from time to time to trouble the kirk. He was excommunicated in 1608 and warded in Stirling Castle until late in 1610, when he again signed the confession of faith. After the accession of Charles I in 1625 Huntly lost much of his influence at court. For another minor private war he was imprisoned in Edinburgh Castle in 1635. He died declaring himself a Roman Catholic.

Huntsman, Benjamin (b. 1704, Lincolnshire, Eng.—d. 1776, Attercliffe, Yorkshire), English inventor of crucible, or cast, steel, which was more uniform in composition and more free from impurities than any steel previously produced. His method was the most significant development in steel production up to that time.

A clockmaker and instrument maker in Doncaster, Yorkshire, Huntsman opened (*c.* 1740) a plant in Sheffield, where he produced steel for clock and watch springs. Considering his steel too hard, Sheffield cutlers would not use it until they discovered that continental European cutlery made from Huntsman's steel was superior to their products. While Huntsman maintained extreme secrecy at his foundry, he did not patent his process, and it was later copied by others.

Huntsville, city, seat (1810) of Madison County, northern Alabama, U.S., near the Tennessee River. It was originally called Twickenham by Leroy Pope after the home of his kinsman, Alexander Pope, the English poet. It was the first community in Alabama to be granted a city charter (1811) by the territorial government and was renamed for John Hunt of Virginia, a Revolutionary War veteran who first settled the area in 1805 around Big Spring (still used for water supply). Huntsville was the site (1819) of Alabama's first constitutional convention and served briefly as the state capital. After the Civil War, its former position as a commercial centre for hay, cotton, corn, and tobacco was restored. The Redstone Arsenal complex including the George C. Marshall Space Flight Center (developed after 1950) and related industries and research projects greatly stimulated the city's growth. The University of Alabama in Huntsville (1951) is located there, as is Oakwood College (1896). Alabama Agricultural and Mechanical University (1875) is in suburban Normal. Monte Sano State Park is nearby. Pop. (1980) city, 142,513; metropolitan area (SMSA), 308,593.

Huntsville, city, seat (1846) of Walker County, southeastern Texas, U.S., 72 mi (116 km) north of Houston. It was founded (1830) as a trading post by Pleasant Gray and named for his hometown in Alabama. Gen. Sam Houston, first president of the Republic of Texas, took up residence at Raven Hill in 1847; his last two homes (including Steamboat House, where he died in 1863), his personal effects, and historic relics have been preserved in a memorial park on the campus of Sam Houston State University (1879). His tomb is in Oakwood Cemetery. Farming and stock raising are economically significant, but lumbering, based on vast tracts of pine trees that cover much of the county, has become a major activity. The city is the headquarters of the Texas Department of Corrections, and inmates of the Huntsville Unit stage an annual Prison Rodeo in October. Huntsville State Park is 6 mi south, and the Sam Houston National Forest is nearby. Inc. 1845. Pop. (1980) 23,936.

Hunyadi, János, English JOHN HUNYADI, or HUNIADES (b. 1407?, Hunyad, Transylvania—d. Aug. 11, 1456, Belgrade), Hungarian general and governor of the Kingdom of Hungary from 1446 to 1452, who was a leading commander against the Turks in the 15th century.

Early career. Hunyadi is first mentioned, probably as a small child, in the diplomas by which King Sigismund transferred possessions of Hunyad castle (now at Hunedoara, Rom.) to one of his knights, Woyk (or Vajk), who was Hunyadi's father. János was of Walachian (a region now in Romania) ancestry.



Hunyadi, engraving by André Thevet

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co., Ltd.

According to the usage of Hungarian noblemen of the time, János took his family name after his landed estate. The royal donation had elevated the Hunyadi family to the top ranks of the lesser (nonbaronial) group of Hungarian nobility. Proprietors of a domain containing 40 villages, they were considered as well-to-do as but ranked far below the great magnates who formed the king's council and exercised the real power in the country.

Young János followed the normal career of his class. As a knight leading troops of up to 12 mounted warriors, he offered his services to more influential members of the ruling class. Through the influence of Stephan Lazarević, prince of the northern Serbs, and Philippo Scolari, one of Sigismund's best soldiers, Hunyadi found his way to the royal court. Soon after, he married Erzsébet Szilágyi, daughter of a nobleman who had distinguished himself in military actions along the borders. The young knight accompanied the King to Italy and other foreign countries. In Milan he made the acquaintance of the condottiere (mercenary captain) Francesco Sforza and studied the new military art of Italy; he later studied the techniques of warfare developed by the Hussite insurgents in Bohemia.

On his return home, Hunyadi was considered the best warrior in southern Hungary. He was still without high office, but he commanded 50 to 100 armed men against the increasing wave of Turkish attacks. His victories, though of local importance, attracted wide notice. With Ottoman troops occupying Serbia in 1439, the peril of a direct invasion of Hungary became imminent. Thus, Hunyadi was appointed *bán* (military governor) of Severin (now in Romania), a district exposed to continual attacks. His success in this command brought him rapid advancement and higher honours, including gifts of landed properties and other income. He was made *voivode* (governor) of Transylvania, count of Temes (now Timiş, Rom.), captain of Belgrade, and military leader of the whole defense system on the southern borders. He soon reached and surpassed the level of the wealthiest old baronial families. In the years that followed, he was able to repel the Turks not only from the borderlands of Hungary but from neighbouring Walachia as well.

After the death of the Habsburg German king Albert II, who, as Sigismund's son-in-law, also was the king of Hungary, Hunyadi supported the election of the young Polish king Władysław III (Ulászló I in Hungary) in the hope of active and powerful support for a crusade against the Turks.

The "Long Campaign." The famous "Long Campaign" took place in the autumn and winter of 1443–44. The preparations needed time. Internal troubles in Hungary and the hostility of the Habsburgs were mollified with papal help. Venice and the papacy supported Hunyadi's army financially and diplomatically. Poland and other neighbouring countries sent troops, and in Hungary the King levied an "extraordinary" tax for the crusade. Hunyadi himself recruited some 10,000 to 12,000 well-trained soldiers, including Czech veterans of the Hussite wars. Hunyadi recognized the inefficiency and unreliability of feudal levies and was one of the first European commanders to employ a regular army on a large scale. The whole army, after having penetrated into Serbian territories under Turkish occupation, reached a total in excess of 30,000 men. The combined forces crossed the Danube in October and occupied Niš (now in Yugoslavia), Sofia (now in Bulgaria), and some fortified Turkish garrisons. Hunyadi's troops, advancing ahead of the rest of the army, prevented the Turks from unifying their forces and dispersed them in a series of battles. The crusader force reached the Balkan Mountains in December, but frost and difficulties of supply forced its retreat. They returned to Buda at the beginning of February, having broken the Sultan's power in Bosnia, Hercegovina, Serbia, Bulgaria, and Albania.

The success of the campaign was unprecedented in the history of Turkish wars in Europe and evoked great enthusiasm in the Christian world. Sultan Murad II sued for peace. A 10-year truce was concluded but was broken when it was learned that a Venetian fleet was sailing to the Dardanelles to prevent the Sultan from recrossing into Europe. In July the Hungarian army went on the offensive to drive the remaining Ottoman forces from Europe. When the Venetian fleet failed to reach the Dardanelles, however, the Sultan crossed over with a large army and overwhelmed the outnumbered Christian forces at Varna on Nov. 10, 1444. Although Hunyadi's troops were able to disperse the Turkish cavalry, King Ulászló's attack on the Sultan's camp miscarried. The King was killed, and Hunyadi narrowly escaped.

Governor of Hungary. The renewal of feudal anarchy in Hungary after the death of Ulászló demanded exceptional measures, and in 1446 Hunyadi was elected to rule the country as a governor during the minority of the young king Ladislas Posthumus (László V in Hungary). Hampered internally by the jealousy of the magnates and harassed externally by Emperor Frederick III, Hunyadi nevertheless restored order and tried to reorganize the economic, political, and military base of the country for a counterattack against the Turks. In 1448, before he could make contact with his Albanian allies, he met the Turkish army at Kosovo, where he lost a hard-fought battle. After that defeat his influence in Hungary waned, though he remained captain general of the kingdom with the right to administer royal incomes. He was unable to launch a counterattack against the Turks and could not go to the aid of Constantinople during the Turkish onslaught in 1453. A few years later, Sultan Mehmed II, conqueror of Constantinople, mounted a new offensive and in 1456 laid siege to Belgrade. Hunyadi provisioned

and armed the fortress of that city, collected a considerable army of mercenaries, and was joined by a poorly equipped and ragged army of peasants. This untrained army, with the aid of Hunyadi's troops, won one of the most remarkable victories in the history of Turkish wars, on July 22, 1456. Not only was the siege raised, but the relieving forces actually made sorties into the enemy camp. A few days later Hunyadi died of an epidemic that had broken out among the troops. The military success remained unexploited, though not without consequences; Hungary was saved from Ottoman conquest for 70 years.

Though he never realized the dream of contemporary humanists of driving the Turks from Europe, Hunyadi earned a glorious name by his considerable successes and by the mere fact that he succeeded in stopping the supposedly invincible Turkish armies: hence, his characterization in contemporary sources, "the only fear of Turks" or—with an expression of Turkish origin—"war's lightning and thunderbolt"—an appraisal rarely granted by Turkish warriors even to their own leaders. His younger son became king of Hungary in 1458 as Matthias I (*q.v.*). (L.El.)

BIBLIOGRAPHY. There is no modern biography of Hunyadi in English. Lajos Elekes, *Hunyadi* (1952), is an analysis (in Hungarian) of contemporary sources concerning the family, personality, and political and military activities of Hunyadi, with bibliographical notes.

Hunyadi, Mátyás: *see* Matthias I *under* Matthias (Hungary).

Hunyani River, river in northern Zimbabwe and Mozambique, rising northwest of Marondera (formerly Marandellas) and flowing westward past Harare (formerly Salisbury) to Kutama. The river then turns north past Chinhoyi (formerly Sinoia) and the Hunyani Range and cuts through the Rukowakuona Mountains to the Lowveld. It crosses the Mozambique border at Hunyani, receiving the Duângua River after a course of 260 miles (418 km). It continues as the Panhame River, which joins the Zambezi at the town of Panhame. The Hunyani is dammed along its section south of Harare by the Prince Edward and Hunyani Poort dams. The latter impounds Lake McIlwaine (6,000 acres [2,400 hectares]), which has been developed as a pleasure resort, with boating and fishing facilities.

Hunza, also called BALTIT, town in Pakistani-administered northwestern Jammu and Kashmir state, in the northern part of the Indian subcontinent. Formerly a small principality under the Mir of Hunza, it joined with Pakistan in 1947. The town, situated on the west bank of the Hunza River, was a stopping place for travelers descending from the Hindu Kush mountains into the Vale of Kashmir. Surrounded by snow-capped mountain peaks such as the Rakaposhi, vast glaciers such as the Ulter, and deep gorges, Hunza is accessible by mountain road from Gilgit. Roses, pansies, lilies, zinnias, and cosmos grow wild in the area, as do willow, fir, and poplar trees. Snow leopard, markhor (a goat), ibex, yak, red-striped fox, duck, and Marco Polo sheep are found. The local inhabitants use irrigation to grow crops of rice, corn (maize), fruits, and vegetables.

huo (Chinese bronze vessel): *see* ho.

Huon de Bordeaux, Old French poem, written in epic metre, dating from the first half of the 13th century. Charlot, son of the emperor Charlemagne, lays an ambush for Huon, son of Séguin of Bordeaux; but Huon kills Charlot without being aware of his identity. Huon is then saved from hanging by performing a series of seemingly impossible tasks.

Thought to be based on *Huon d'Auvergne*—a hypothetical earlier version that told a much grimmer other-world story—*Huon de Bordeaux* marks the transition from the epic chanson de geste, based on national history, to the *roman d'aventure,* or romance. *Huon de Bordeaux* had a great vogue in England through a prose translation by John Bouchier, Lord Berners, that was printed *c.* 1534 by Wynkyn de Worde. This was used as a source book by Edmund Spenser, William Shakespeare, and John Keats.

Huon Gulf, large inlet of the Solomon Sea, southwestern Pacific, indenting Papua New Guinea. Stretching 100 miles (160 km) from Cape Cretin in the northeast to Cape Ward Hunt near Manau, it extends 65 miles (105 km) inland. Flanked by the Rawlinson Range on the Huon Peninsula (north) and the Kuper and Bowutu Mountains (southwest), the gulf receives the Markham River, which flows into it from the west. Port towns on the gulf are Lae, Salamaua, and Morobe. The entire 170-mile (275-kilometre) shoreline of the inlet was charted in 1873–74 by the British navigator Captain John Moresby.

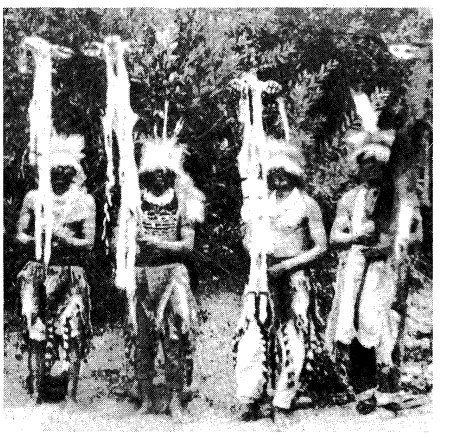
Huon Peninsula, peninsula extending from northeastern Papua New Guinea, southwestern Pacific. The promontory (55 miles [89 km] wide) is bounded by the Vitiaz Strait of the Bismarck Sea (north), the Solomon Sea (east), Huon Gulf (south), and the Markham River (west). The peninsula's terrain rises to more than 13,000 feet (4,000 m) in the Saruwaged, Cromwell, and Rawlinson ranges. Receiving 180–190 inches (4,600–4,800 mm) of rainfall annually, it is densely forested. The town of Lae is in the southwest; Finschhafen, in the east. Occupied in 1942 by the Japanese, the peninsula was recaptured by Allied forces in 1943.

Huon pine, also called MACQUARIE PINE (*Dacrydium franklinii*), gray-barked timber tree of the family Podocarpaceae. It is found along Tasmanian river systems at altitudes of 150 to 600 m (500–2,000 feet). The tree is straight-trunked, pyramidal, 21 to 30 m (70 to 100 feet) tall, and 0.7 to 1 m (2 to 3 feet) in diameter. The Huon pine's fragrant, soft wood is used for furniture and cabinetry. An oil obtained from the wood is used as a paint preservative.

Huon River, river in southern Tasmania, Australia, rising on the slopes of Mounts Wedge, Bowen, and Anne. It flows south and then, blocked by the Arthur Range, east to be joined by its tributaries, the Weld and Picton rivers, below Huon Gorge. Turning southeast, it passes Huonville at the limit of navigation and enters a wide estuary after a course of 105 miles (170 km). At Geeveston the estuary bends eastward to flow into the D'Entrecasteaux Channel. The river was named in 1792 by the French admiral Bruni d'Entrecasteaux for his second-in-command, Huon de Kermadec. Although only about 25 miles (40 km) southwest of Hobart, the river's lower valley was not settled until the 1850s because of its heavily wooded and swampy character. The area, encompassing the Huon Peninsula, is now intensively cultivated and has some of the highest rural population densities in Tasmania. The island's leading apple-growing area is centred on Huonville, where there is a pulp mill using timber cut in the valley. A popular tourist region, with a large annual apple festival at Cygnet, the valley is accessible from Hobart via the Huon and Channel highways.

Hupa, Indians of the Northwest Pacific Coast of North America who lived along the lower Trinity River in California and spoke Hupa, an Athabascan language. They were culturally similar to the Yurok Indians. They often traded with the Yurok, exchanging acorns and inland food for redwood canoes, saltwater fish, mussels, and seaweed; they sometimes intermarried and attended each other's ceremonials.

Hupa villages were located on the river bank and consisted of family dwellings, where women slept and possessions were stored; sweathouses, semisubterranean lodges where



White deerskin dance, Hupa tribe, 1890
By courtesy of the Museum of the American Indian, New York

men slept and took sweat baths; and small menstrual lodges for women. Subsistence was based on elk and deer hunting and trapping, salmon fishing, and acorn gathering. Fine basketry was made by twining segments of certain roots, leaves, and stems around prepared shoots. Wealth was based on the ownership of dentalium shells, which were probably received in trade from the Yurok, and woodpecker scalps. The headman of the village was the richest man; his power descended with his property to his son, but anyone else who acquired more property might obtain the dignity and power. Personal insult, injury, or homicide were usually settled through the payment of blood money (*q.v.*).

The recitation of magical formulas was an important part of Hupa religion. Professional shamans diagnosed and treated diseases; fees were paid in dentalium shells or deerskin blankets. Three major dances were held annually for the benefit of the community, as well as spring and fall ceremonial feasts.

This southern section of the Northwest Coast culture area lacked the potlatch (*q.v.*), masked dances, carved columns (totem poles), and other carved art of northern groups.

Hupeh, Wade–Giles romanization HU-PEI, Pinyin HUBEI, *sheng* (province) lying in the centre of the People's Republic of China and forming a part of the middle basin of the Yangtze River. It is bounded on the north by the eastern extension of the axis of the Tsinling, T'ung-pai, and Tapieh mountain ranges. In the southeast the Mu-fu Mountains divide the province from Kiangsi. There is no clear physical divide along the central southern border apart from the Yangtze itself.

A brief treatment of Hupeh follows. For full treatment, *see* MACROPAEDIA: China.

Until the reign of the Great Ch'ing emperor K'ang Hsi (1661–1722), Hupeh and its neighbour Hunan formed a single province, Hukuang. They were then divided and given their present names. Since the mid-19th century, many momentous events have occurred in Hupeh. It was the scene of devastating battles for 10 years following the 1850 Taiping Rebellion. Then certain cities were opened to Western nations as commercial ports and European influence began to increase steadily in central China. The Revolution of 1911, which toppled the Ch'ing (Manchu) dynasty, began in Hupeh. The province was heavily bombed during the Sino-Japanese War of 1937–45; restoration began in 1949 with the advent of

the People's Republic of China. The provincial capital is Wu-han.

Almost all of Hupeh Province lies immediately north of the Yangtze River. Western Hupeh has highlands that lie above 6,000 ft (1,830 m) and consist of the eastern extension of two ranges that mark the boundary between Hupeh and Szechwan. The Shih Pao Shan forms the boundary between southwest Hupeh and northwest Hunan. The Yangtze cuts its way from the Szechwan Basin through the Ta-pa Shan in a series of magnificent gorges, and descends rapidly to the Hupeh Plain in I-ch'ang.

Hupeh is subject to disastrous flooding, mainly due to enormous rises of the Yangtze. The province's winters, although short, are often rigorous. Summers are long, hot, and so oppressive that on intolerable nights mothers bring their bamboo beds into the streets and sit fanning their children.

Most of the population is rural, concentrated around the lake plain and around the Yangtze and lower Han rivers. Villages are small, usually consisting of 10 families or fewer. The urban population is found mainly in Wu-han and in a tri-city complex including Hankow, the commercial and industrial centre; Han-yang, formerly residential but now largely industrialized; and Wu-ch'ang, the administrative, educational, and cultural hub of the province.

Hupeh lies in the agricultural transition zone between the wheat-growing north and the rice-growing south. In addition to these two crops, barley, corn (maize), sweet potatoes, millet, beans, and peas are grown. The most important economic crops are cotton, vegetable oils, and fibres. Hupeh's mineral wealth consists mainly of iron, copper, phosphorus, ores, coal, and gypsum.

For more than 2,000 years waterways have been the main means of communication in Hupeh. The Yangtze and Han rivers and their tributaries are used by all types of craft. Railway and road networks are continually being developed. Wu-ch'ang has become an important centre for air traffic, second only to Peking.

Both cities and towns have undergone great cultural changes. In the cities, not only have museums and libraries been opened, but also large stadiums, sports halls, and swimming pools have been built. Athletics has reached a high international standard. Rural districts now have electricity, which has enabled the opening of stores, libraries, and various community facilities. Area 72,400 sq mi (187,500 sq km). Pop. (1983 est.) 48,010,000.

ḥuppa, also spelled ḤUPPAH, or CHUPPAH, plural ḤUPPOT, ḤUPPOTH, or ḤUPPAS, in a Jewish wedding, the portable canopy beneath which the couple stands while the ceremony is performed. Depending on the local custom and the preference of the bride and groom, the *ḥuppa* may be a simple Jewish prayer shawl (*ṭallit*) suspended from four poles, a richly embroidered cloth of silk or velvet, or a flower-covered trellis. In ancient times *ḥuppa* signified the bridal chamber, but the canopy now symbolizes the home to be established by the newlyweds. In popular usage the term *ḥuppa* may refer to the wedding ceremony itself.

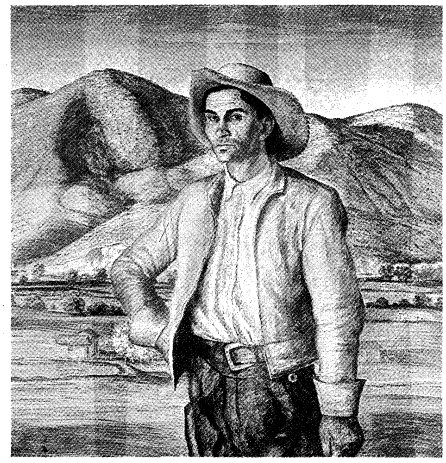
ḥūr (singular *ḥawrā'*; Islāmic myth): *see* ḥawrā'.

Huram: *see* Hiram.

Hurban (Jewish persecution): *see* Holocaust.

Hurd, Peter (b. Feb. 22, 1904, Roswell, New Mexico Territory, U.S.—d. July 9, 1984, Roswell, N.M.), U.S. painter, printmaker, and illustrator in the regional realist tradition.

Hurd attended the U.S. Military Academy at West Point, N.Y., resigning after two years to pursue a career in painting. During a term at



"Portrait of José Herrera," tempera on panel by Peter Hurd, 1938; in the William Rockhill Nelson Gallery and Mary Atkins Museum of Fine Arts, Kansas City, Mo.

By courtesy of the Nelson Gallery–Atkins Museum, Kansas City, Mo., gift of Mr. and Mrs. Robert B. Fizzell, Kansas City, Mo.

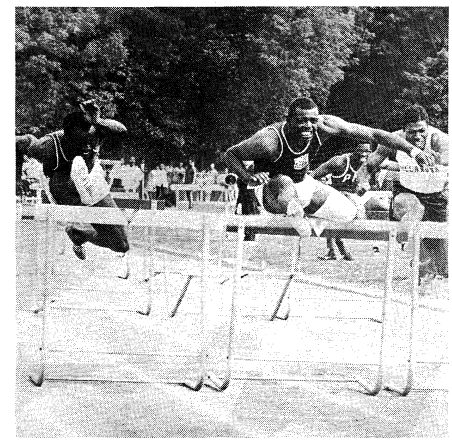
Haverford College in Pennsylvania he made the acquaintance of the renowned illustrator N.C. Wyeth, who lived in the area, and subsequently apprenticed in his studio. At Wyeth's urging he entered the Pennsylvania Academy of Fine Arts in 1924. In 1929 Hurd married Wyeth's eldest daughter, Henriette, herself a painter.

The influence of his mentor's heightened realistic style was strong in Hurd's illustrations for children's books in the late 1920s. During the early '30s he began experimenting with egg tempera and in 1933 received the commission for a mural triptych at the New Mexico Military Institute at Roswell, which he executed in the newfound medium. Hurd found the vivid New Mexico light and landscape of his childhood profoundly conducive to his art and resettled there with his family in the '30s. During 1942 and 1944 he travelled abroad as a war correspondent for *Life* magazine. In 1967 Hurd's official portrait of Pres. Lyndon B. Johnson was rejected by Johnson; the painting was purchased by the Smithsonian Institution. In his later paintings, Hurd continued to work in watercolours, egg tempera, and lithographs and remained a steadfast realist, perfecting an anonymous, dry, luministic technique for evoking the arid expanse of his native territory.

hurdle race, horse race over a course on which a number of obstacles, called hurdles, must be jumped. Hurdle racing, a kind of preparation for steeplechasing, originated in England and Ireland in the 18th century and by the second half of the 20th century had spread to Commonwealth countries, Europe, and the eastern United States. Its hurdles are light and movable and are lower than steeplechase fences. There are usually at least six jumps in the first 1½ miles (2,400 metres) of a hurdle race, then one in each succeeding quarter-mile (400 metres). The less challenging hazards allow racers to maintain a faster pace than in steeplechasing.

hurdling, track-and-field sport of running races over a series of obstacles called hurdles, which are set a fixed distance apart. Runners must remain in assigned lanes throughout a race, and, although they may knock hurdles down while running over them, a runner who trails a foot or leg alongside a hurdle or knocks it down with a hand is disqualified. The first hurdler to complete the course is the winner.

Hurdling probably originated in England in the early 19th century, where such races were held at Eton College about 1837. In those days hurdlers merely ran at and jumped over

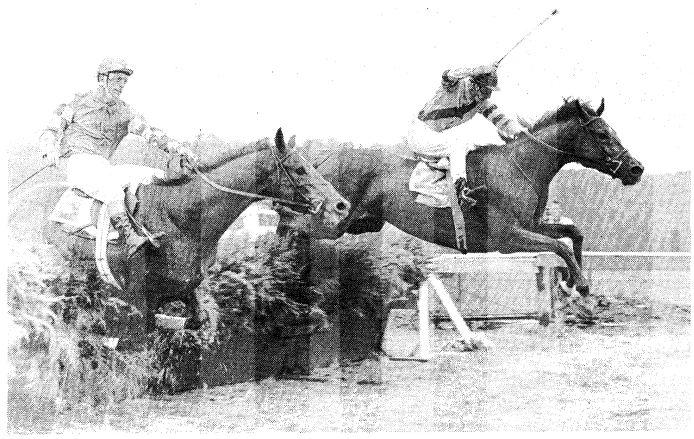


Hurdlers competing in a 110-m race

Albert Session—*Track and Field News*

each hurdle in turn, landing on both feet and checking their forward motion. Experimentation with numbers of steps between hurdles led to a conventional step pattern for hurdlers—3 steps between each high hurdle, 7 between each low hurdle, and usually 15 between each intermediate hurdle. Further refinements were made by A.C.M. Croome of Oxford University about 1885, when he went over the hurdle with one leg extended straight ahead at the same time giving a forward lunge of the trunk, the basis of modern hurdling technique.

A major improvement in hurdle design was



Hurdle racing

Ray Woolfe, Jr.—FPG/EB Inc.

the invention in 1935 of the L-shaped hurdle, replacing the heavier, inverted-T design. In the L-shaped design and its refinement the curved-L, or rocker hurdle, the base-leg of the L points toward the approaching hurdler. When upset, the hurdle tips down, out of the athlete's path, instead of tipping up and over as did the inverted-T design.

Modern hurdlers use a sprinting style between hurdles, a double-arm forward thrust and exaggerated forward lean while clearing the hurdle, and then bring the trailing leg through at nearly a right angle to the body, enabling them to continue forward without breaking stride after clearing the hurdle.

Under rules of the International Amateur Athletic Federation (IAAF), world governing body of track-and-field athletics, the standard hurdling distances for men are 110, 200, and 400 m (120, 220, and 440 yards, respectively). Men's Olympic distances are 110 and 400 m. The 110-metre race includes 10 high hurdles (1.067 m [42 inches] high), spaced 9.14 m apart. The 200-metre race, run occasionally, has 10 low hurdles (76.2 cm high) spaced 18.29 m apart. The 400-metre race is over 10 intermediate hurdles spaced 35 m apart. Distances and specifications vary somewhat for indoor and scholastic events.

The women's international distance formerly was 80 m over eight 76.2-centimetre hurdles. In 1966 the IAAF approved two new hurdle races for women: 100 m over 10 84-centimetre hurdles, to replace the 80-metre event in the 1972 Olympics; and 200 m (supplanted in 1976 by 400 m) over 10 76.2-centimetre hurdles.

For world championship and World Cup winners, *see* Sporting Record: *Athletics. See also* Olympic Games.

hurdy-gurdy, squat, pear-shaped fiddle having strings that are sounded not by a bow but by the rosined rim of a wooden wheel turned by a handle at the instrument's end. Notes are made on the one or two melody strings by stopping them with short wooden keys pressed by the left-hand fingers. Up to four unstopped strings, called bourdons, sound drones.

The hurdy-gurdy was first mentioned in the 10th century as the organistrum. It was then a church instrument played by two men, one



Hurdy-gurdy played by a French lady of fashion, 18th century
H. Roger-Viollet

fingering the keys, one turning the wheel. Secular, one-man forms, called symphonia, appeared in the 13th century. It was fashionable during the reign of Louis XIV as the *vielle à roue* ("wheel fiddle") and was played into the 20th century by folk and street musicians, notably in France and eastern Europe. The Swedish *nyckelharpa* is a similar fiddle with keys, but it is played with a bow.

Joseph Haydn composed a group of concerti and nocturnes for the *lira organizatta,* a variety of hurdy-gurdy having several small organ pipes attached to it. The name hurdy-gurdy sometimes mistakenly refers to other handle-operated street instruments, such as the barrel organ and barrel piano.

Huria Kristen Batak Protestant: *see* Batak Protestant Christian Church.

Hurler's syndrome, also called GARGOYLISM, or MUCOPOLYSACCHARIDOSIS I, one of several rare genetic disorders involving a defect in the metabolism of mucopolysaccharides, the class of polysaccharides that bind water to unite cells and to lubricate joints. Onset of the syndrome is in infancy or early childhood, and the disease occurs with equal frequency in both sexes. Affected individuals exhibit severe mental retardation, clouding of the corners of the eyes, deafness, hirsutism (hairiness), enlarged liver and spleen, dwarfism with hunched back, short limbs and clawed hands, a large head with wide-set eyes, heavy brow ridges and deep bridge of nose, and poorly formed teeth. The disorder is identifiable within two years of birth; such children require institutional care and usually do not live beyond adolescence. Death most often results from heart failure, which is attributable to infiltration of heart muscle and coronary vessels with mucopolysaccharides.

Hurley, Patrick J(ay) (b. Jan. 8, 1883, Indian Territory, U.S.—d. July 30, 1963, Santa Fe, N.M.), military diplomat who served abroad—especially in the Far East—as a per-



Patrick J. Hurley
By courtesy of the U.S. Army

sonal representative of high U.S. political officials during World War II.

Beginning the practice of law in Oklahoma (1908), Hurley served as a colonel in the American Expeditionary Force in World War I. During the 1920s he became active in Republican Party politics, serving as secretary of war in the administration of President Herbert Hoover (1929–33). When the United States entered World War II (1941), he was promoted to brigadier general and went to the Far East as General George C. Marshall's personal representative to examine the possibility of relieving U.S. troops on the island of Bataan. Three times he succeeded in delivering food and ammunition to the beleaguered force there and was present in Australia to greet General Douglas MacArthur when he was flown out.

Though Hurley was a staunch Republican, throughout the remainder of the war he served as President Franklin D. Roosevelt's personal representative in various diplomatic capacities. After serving as minister to New Zealand (1942), he flew to Moscow and received permission to visit the Eastern Front—the first foreigner to do so; he next visited the Near East, Middle East, and China (1943) and Afghanistan (1944). As U.S. ambassador to China (1944–45), in the interest of unifying and strengthening the Chinese war effort, he attempted to reconcile the Nationalist (Kuomintang) government and the Communist faction in the north; his mission was a failure, and he resigned his post in November 1945.

hurling, also called HURLEY, outdoor stick-and-ball game somewhat akin to field hockey and lacrosse and long recognized as the na-



Hurling final (Croke Park, Dublin, 1970)
By courtesy of the Irish Tourist Board

tional pastime of Ireland. There is considerable reference to hurling (*iomáin* in Gaelic) in the oldest Irish manuscripts describing the game as far back as the 13th century BC; many heroes of ancient tales were expert hurlers. The stick used is called a hurley, *camán* in Gaelic, and *camán*s in relief decorate some monuments to 15th-century chieftains. Hurling was for long a game played between neighbouring clans or rival parishes with unlimited numbers of players on either side.

An association to revive and standardize hurling, the Gaelic Athletic Association, was founded in Thurles, County Tipperary, in 1884.

The hurley, or *camán,* resembling a hockey stick except that the head is shorter and wider, is made of young pliable ash, 3.5 feet (1.07 m) long and 3 inches (7.6 cm) wide in the oval-shaped striking blade. The width of the blade enables the ball to be hit overhead from man to man as well as along the ground. Each team consists of 15 players. The average pitch, or field, is 150 yards (137 m) long and 90 yards (82 m) wide. Goalposts at each end are 21 feet (6.4 m) high and 21 feet apart with a crossbar 8 feet (2.4 m) above the ground. A point is scored by hitting the ball over the opposing crossbar. A goal, scored by driving the ball under the crossbar, is three points. The ball, or *sliothar,* has a cork centre, wound with wool and covered with leather, 9–10 inches (22.9–25.4 cm) in circumference. It may be caught in the hand before hitting but not thrown or lifted; it may also be juggled or carried on the blade of the stick or may be hit from left or right. There is a women's version of the game, called camogie.

Hurok, Sol(omon Isaievich) (b. April 9, 1888, Pogar, near Kharkov, Russia—d. March 5, 1974, New York City), one of the world's foremost impresarios who, through his persistent efforts to bring distinguished foreign virtuosos and ensembles to American audiences, did much to inspire interest in classical music and, particularly, in ballet.

Hurok came to the United States in 1906, nearly penniless. (He was naturalized in 1914.) He took a series of odd jobs and began arranging concerts for labour organizations. In 1911 he persuaded the violinist Efrem Zimbalist to play at a benefit for the Socialist Party, and by 1916 he was staging concerts at the New York Hippodrome with such vir-

tuosos as Mischa Elman and Alma Gluck. Eventually, Hurok sponsored a vast array of artistic performers and distinguished companies, many of them from his native Russia. Through him, many Americans came to appreciate the Bolshoi Ballet, Sadler's Wells (later Royal) Ballet, the Ballet Russe de Monte Carlo, the Kirov Ballet, the Old Vic, the Comédie Française, and such stars as Anna Pavlova, Feodor Chaliapin, Isadora Duncan, Arthur Rubinstein, Michel Fokine, Andrés Segovia, Isaac Stern, Gregor Piatigorsky, the Oistrakhs, Margot Fonteyn, Galina Ulanova, Maria Callas, and Van Cliburn. More than 4,000 performers are said to have appeared under his auspices. One of his greatest discoveries and future stars was the contralto Marian Anderson, whom he heard singing in Paris in 1935. He was also known for his great sense of showmanship, style, and lavish treatment of his performers.

In 1969 he sold his company, S. Hurok Concerts, Inc., to the Transcontinental Investing Corp., although he remained in control and actively promoted concerts until his death.

He wrote two volumes of autobiography—*Impresario* (1946; movie version *Tonight We Sing,* 1953). He was made a chevalier of the Legion of Honour (1953) for his achievements in promoting French cultural institutions.

Huron, Iroquoian-speaking North American Indians who lived along the St. Lawrence River when it was discovered by French explorer Jacques Cartier in 1534. The Huron lived in villages, sometimes palisaded, consisting of large, bark-covered dwellings that housed several families who were related through maternal descent. The Huron practiced agriculture; men cleared the fields, which were then planted, tended, and harvested by women. Crops included corn (maize), beans, squash, sunflowers, and tobacco. Hunting and fishing were of lesser importance.

The Huron were divided into exogamous clans, each headed by a clan chief; all of the clan chiefs of a village formed a council, which, with the village chief, decided civil affairs. Villages were grouped into bands (each of which had a band chief and a band council, consisting of village chiefs, to deal with civil matters affecting the entire band), and all of the bands constituted the Huron nation. A tribal council of band chiefs and their councils dealt with matters concerning the whole tribe. Women were influential in Huron affairs, clan matrons having the responsibility of selecting the political leaders.

The Huron were bitter enemies of tribes of the Iroquois League (*q.v.*), with whom they competed in the fur trade. Before the 17th century the Iroquois drove some Hurons from the St. Lawrence River westward into Ontario, where related groups seem to have already been resident; four of these bands (the Rock, Cord, Bear, and Deer peoples) formed a confederacy called the Wendat (*q.v.*), but it was destroyed by Iroquois invasions in 1648–50. The survivors were either captured and forced to settle among their conquerors or driven west. The latter remnants drifted back and forth between Michigan, Wisconsin, Ontario, Ohio, and Quebec, in alliance or conflict with many tribes. They gradually reestablished some influence in Ohio and Michigan, but whites eventually forced them to sell their lands and migrate to Kansas and then to Oklahoma.

Where the same name may denote a person, place, or thing, the articles will be found in that order

Huron, city, seat of Beadle County, east central South Dakota, U.S., on the James River. Named for the Huron Indians, it was established in 1879 as a division headquarters of the Chicago and North Western Railway. Since 1898 it has been the seat of Huron College, which opened at Pierre in 1883 and later moved to Huron. The city's economy depends on diversified agriculture (based on the Missouri Basin Development Plan, enacted 1944) and allied activities. Its income is augmented by tourism in the pheasant-hunting season and by the South Dakota State Fair, held there annually in September. Huron is the hometown of the U.S. political leader and vice president Hubert H. Humphrey (1911–78), and the location of his family's pharmacy. Inc. 1883. Pop. (1980) 13,000.

huron (mammal): *see* grison.

Huron, Lake, second largest of the Great Lakes of North America, bounded on the west by Michigan (U.S.) and on the north and east by Ontario (Can.). The lake is 206 mi (331 km) long from northwest to southeast, and its maximum width is 101 mi. The total area of its drainage basin is 51,700 sq mi (133,900 sq km), exclusive of the lake surface area, which is 23,000 sq mi. Inflow into the lake is received from Lake Superior (via the St. Marys River), from Lake Michigan (via the Straits of Mackinac), and from numerous streams draining the adjacent lands. The lake discharges at its southern end into Lake Erie (via the St. Clair River, Lake St. Clair, and the Detroit River). With a mean surface height of 579 ft (176 m) above sea level, the lake reaches a maximum depth of 750 ft. Many islands lie in the northeastern part of the lake, notably in Georgian Bay and the North Channel. Mackinac Island and several others are located near the Straits of Mackinac in the northwest part of the lake, and Saginaw Bay indents the Michigan coast.

Lumbering and fishing have been important economic activities in the Lake Huron region, and many resorts line the lake's shores. As part of the St. Lawrence Seaway, the lake supports heavy commercial traffic. The average navigation season extends from early April to late December. Large tonnages of limestone are loaded at Rockport and Rogers City, Mich. Other harbours important in local trade include Cheboygan, Alpena, Bay City, and Harbor Beach (in Michigan) and Collingwood, Midland, Tiffin, Port McNicoll, and Depot Harbor on Georgian Bay (in Ontario).

Lake Huron was the first of the Great Lakes to be seen by Europeans. The French explorers Samuel de Champlain and Étienne Brûlé travelled up the Ottawa and Mattawa rivers and reached Georgian Bay in 1615. Brûlé traversed the North Channel to the St. Marys River in 1618. A Jesuit mission was established among the Huron Indians at the Wye River (southeastern corner of Georgian Bay) in 1638 and named Sainte-Marie; but it was destroyed by the Iroquois Indians in 1649. After that, the centre of French activities shifted northwestward to the settlement at Sault Ste. Marie on the St. Marys River. Jacques Marquette, the French missionary and explorer, founded a mission at St. Ignace on the Straits of Mackinac in 1671.

Meanwhile, Louis Jolliet, the French-Canadian explorer, canoed down Lake Huron in 1669 before discovering Lake Erie. The French explorer Robert Cavelier, sieur de La Salle, sailing westward from Niagara, traversed Lake Huron in 1679. British penetration of the lower lakes developed strongly in the mid-18th century, leading to the British capture of Fort-Pontchartrain Détroit (Ft. Detroit) in 1760 and Michilimackinac on the Straits of Mackinac (1761). The current boundary between the U.S. and Canada was drawn after the Revolutionary War (1775–83) and was firmly established after the War of 1812. In the latter war, the fort on Mackinac Island (overlooking the Straits of Mackinac) was taken by the British, but U.S. troops reoccupied it at the close of the war. The lake was named by the French after the Huron Indians.

Huronian System, major division of Precambrian rocks in North America (the Precambrian began about 4,600,000,000 years ago and ended 570,000,000 years ago). The Huronian System is well known in the Great Lakes region and has been divided into three major series of rocks: the lowermost, the Bruce Series, is followed in turn by the Cobalt and Animikie series. The Huronian System forms a wide belt of sedimentary rock units along the north shore of Lake Huron and consists of about 4,000 metres (about 12,000 feet) of sandstones, shales, and conglomerates. The sequence is more complete and thicker to the west, where thicknesses of about 6,000 metres (20,000 feet) of Huronian rocks occur. Important iron-bearing Huronian rock units found in northern Wisconsin and central Minnesota are of major economic significance.

Hurrian, one of a people who played an important role in the history and culture of the Middle East during the 2nd millennium BC. The earliest recorded presence of Hurrian personal and place names is in Mesopotamian records of the late 3rd millennium; these point to the area east of the Tigris River and the mountain region of Zagros as the Hurrian habitat. From then on, and especially during the early 2nd millennium, there is scattered evidence of a westward spread of Hurrians. An even greater westward migration, probably set in motion by the intrusion of Indo-Iranians from the north, seems to have taken place after 1700 BC, apparently issuing from the area between Lake Van and the Zagros. Evidence indicates that the Hurrians overthrew the Assyrian rulers and subsequently dominated the area. East of the Tigris the flourishing commercial centre of Nuzu was a basically Hurrian community, and Hurrian influence prevailed in many communities of Syria. Hurrians likewise occupied large sections of eastern Anatolia, thereby becoming eastern neighbours and, later, partial dependents of the Hittites.

Yet the Hurrian heartland during this period was northern Mesopotamia, the country then known as Hurri, where the political units were dominated by dynasts of Indo-Iranian origin. In the 15th century BC the Hurrian area ranging from the Iranian mountains to Syria was united into a state called Mitanni (*q.v.*). In the middle of the 14th century, the resurgent Hittite Empire under Suppiluliumas I defeated Mitanni and reduced its king, Mattiwaza, to vassalage, while Assyria seized the opportunity to reassert its independence.

Despite political subjection, the continued Hurrian ethnic and cultural presence in Syria and the Cilician region (Kizzuwadna) strongly influenced the Hittites. The carvings at Yazılıkaya, for instance, suggest that the official pantheon of the Hittite Empire was thoroughly Hurrianized; Hittite queens had Hurrian names; and Hurrian mythology appears in Hittite epic poems.

Except for the principality of Hayasha in the Armenian mountains, the Hurrians appear to have lost all ethnic identity by the last part of the 2nd millennium BC.

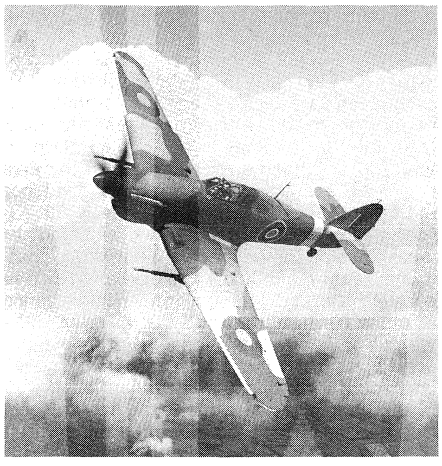
Hurrian language, extinct language spoken from the last centuries of the 3rd millennium BC until at least the latter years of the Hittite Empire (*c.* 1400–*c.* 1190 BC); it is neither an Indo-European nor a Semitic language. A number of sources for the language exist, among which are the numerous passages marked *hurlili* ("Hurrian") in cuneiform tablets discovered in the ruins of the Hittite archives at Boğazköy (the ancient Hattusa, in modern Turkey). It is generally believed that the speakers of this language originally came from the Armenian mountains and spread over southeast Anatolia and northern Mesopotamia at the beginning of the 2nd millennium BC. Be-

fore the middle of the 2nd millennium BC, parts of Hurrian territory were under the control of an Indo-Aryan ruling class, the Mitanni, whose name was incorrectly applied to the Hurrians by early researchers. The later Urartian language is thought to be descended from the same parent language as Hurrian. *See also* Urartian language.

Hurrian writing: *see* cuneiform writing.

hurricane, in the Caribbean and western Atlantic area, any large, travelling tropical cyclone (*q.v.*).

Hurricane, British single-seat fighter aircraft manufactured by Hawker Aircraft, Ltd., and used with great effect in many areas of the world during World War II. A low-wing monoplane designed and first flown in 1935, it was the first airplane of the Royal Air Force to exceed a speed of 300 miles per hour (483 kilometres per hour) in level flight. The first production-line plane flew in 1937. In some 20 modifications the Hurricane served as a fighter-bomber, an attack plane, and a carrier plane. More than 14,000 Hurricanes in various



British Hawker Hurricane
By courtesy of the RAF Museum, London

adaptations were made before manufacturing was halted in 1944. In its original conformation, the Hurricane had a ceiling of 36,000 feet (10,980 metres) and a maximum speed of 330 mph and was armed with eight .303-calibre machine guns in its wings. In that version, British pilots shot down over 1,500 Luftwaffe planes in their first year of war; all other British aircraft combined hardly exceeded that total. Later modifications included more and heavier guns, including 40-millimetre cannon, and bomb and rocket racks.

Hurst, Fannie (b. Oct. 18, 1889, Hamilton, Ohio, U.S.—d. Feb. 23, 1968, New York City), U.S. novelist, dramatist, and movie scenarist.

Hurst was educated at Washington University (St. Louis, Mo.) and Columbia University. Her first book of short stories, *Just Around the Corner* (1914), was followed by more than 40 novels and story collections, noted for sympathetic but shallow portrayals of women of various social levels. A number of her books were made into motion pictures, some with scripts by her. Her autobiography, *Anatomy of Me,* appeared in 1958. She was president of the Authors Guild in 1937.

Hurston, Zora Neale (b. Jan. 7, 1903, Eatonville, Fla., U.S.—d. Jan. 28, 1960, Fort Pierce, Fla.), U.S. black folklorist and writer associated with the Harlem Renaissance who celebrated black culture in the voice of the rural black South.

At age 16, Hurston joined a travelling theatrical company, ending up in New York City during the Harlem Renaissance. She studied anthropology with Franz Boas at Columbia University, taking a scientific approach to ethnicity. As an ethnologist, Hurston travelled to Haiti to study voodoo. She ultimately rejected the conventional viewpoint of the scholar in favour of personal involvement with her heritage. In 1931 she collaborated with Langston Hughes on a play, *Mule Bone: A Comedy of Negro Life in Three Acts.* Her second novel, *Their Eyes Were Watching God* (1937), was both widely acclaimed and highly controversial. It was criticized by blacks because, although Hurston refused to endorse the myth of black inferiority, neither did she portray blacks as victims of this myth.

The tone of Hurston's work is celebratory, rooted in a rural black South reminiscent of her hometown, Eatonville. Her characters act freely within their rich heritage and narrow social position. Hurston has influenced such contemporary black authors as Ralph Ellison and Toni Morrison. Her autobiography is titled *Dust Tracks on a Road* (1942), and an anthology of her work, *I Love Myself When I Am Laughing and Then Again When I Am Looking Mean and Impressive,* was released in 1979.

Hürth, city, North Rhine-Westphalia *Land* (state), northwestern Germany, southwest of Cologne. The district was frequented by the Romans, and the name appeared in Frankish times. Its history was linked with that of Cologne. It is a centre of truck farming and lignite mining, and its manufactures include coal briquettes, stoneware, and automobiles. It is the administrative centre for the neighbouring Kottenforst-Ville nature park. There is a lignite-fed power station. Pop. (1989 est.) 49,094.

ḥurūf al-muqaṭṭaʿah (Islām): *see* fawātiḥ.

Hus, Jan, Hus also spelled HUSS (b. 1372/73, Husinec, Bohemia—d. July 6, 1415, Imperial free city of Constance), the most important 15th-century Czech religious Reformer, whose work was transitional between the medieval and the Reformation periods and anticipated the Lutheran Reformation by a full century. He was embroiled in the bitter controversy of the Western Schism for his entire career, and he was convicted of heresy at the Council of Constance. His most important treatise was *De ecclesia.*

Early life and teaching career. Hus was born of poor parents in Husinec in southern Bohemia. At the age of 13 he entered the elementary Latin school in nearby Prachatice. Five years later he enrolled in the University of Prague, earning his living as a choirboy. Hus's life was hard, and although he looked back on these years with some humour, he frankly admitted that the reason he wanted to become a priest was "to secure a good livelihood and dress and be held in esteem by men." Two years after his graduation in 1394 he received his master's degree and began teaching at the university.

As a teacher, Hus lectured for two years on Aristotle and on the Realist philosophy of the radical English Reformer John Wycliffe, whose views were enthusiastically received by the nationalistic Czech university masters. As a young master, Hus lived a merry life—of which he later genuinely repented, but which in reality consisted chiefly in being proud of his academic costume, in the love of fine apparel, in playing chess, and in sharing in the feasts and the other pastimes of his colleagues. His "conversion" into a rather stern religious reformer remains a mystery, one that he never explicitly explained, except to state that "when the Lord gave me knowledge of the Scriptures, I discarded from my foolish mind that kind of stupid fun-making."

Leader of Czech reform movement. Because the university did not pay a salary to masters—only to a few full professors—Hus had to seek other means of livelihood. Thus, after he was ordained a priest, he received an appointment (1402) as rector and preacher of the large Bethlehem Chapel in Prague, the centre of the growing national reform movement where sermons were preached in Czech rather than in Latin. In his 12 years of preaching he became the popular leader of the movement. Hus also became the adviser to the young nobleman Zbyněk Zajíc of Hazmburk when Zbyněk was named archbishop of Prague in 1403, a move that helped to give the reform movement a firmer foundation.

Despite his extensive duties at the Bethlehem Chapel, Hus continued to teach in the university faculty of arts and became a candidate for the doctor's degree in theology. It had not been until 1401, when the theological works of Wycliffe had been brought to Prague, that Hus had become acquainted with them; earlier, he had known only Wycliffe's philosophical realism. Of these books, Jerome of Prague, a disciple of Hus, brought in Wycliffe's *Dialogus, Trialogus,* and perhaps *De eucharistia.* He stoutly supported Hus when other former friends dared not do so. He even intended to come to his aid at the trial in Constance, but was taken prisoner, condemned to death, and burned at the stake a year later than Hus. In 1403 a German university master, Johann Hübner, drew up a list of 45 articles, presumably selected from Wycliffe's writings, and had them condemned as heretical. Because the German masters had three votes as against only one vote for the Czech masters, the Germans easily outvoted the Czechs and the 45 articles were henceforth regarded as a test of orthodoxy. The principal charge against Wycliffe's teaching was his tenet of remanence; *i.e.,* that the bread and wine in the Eucharist retain their material substance. Wycliffe also declared the Scriptures to be the sole source of Christian doctrine and denounced the pope as Antichrist. Hus did not share all of Wycliffe's radical views, such as that on remanence, but several members of the reform party did, among them Hus's teacher, Stanislav of Znojmo, and his fellow student, Štěpán Páleč.

During the first five years of Zbyněk's reign as archbishop his attitude toward the "evangelical party" radically changed. The opponents of reform won him over to their side and, in 1407, succeeded in charging Stanislav and Páleč with heresy, and they were cited to the Roman Curia for examination. They returned completely changed in their theological views and became the principal opponents of the Reformers. Thus, Hus was brought into the forefront of the party and into conflict with his former friends.

Hus and the Great Schism. Ever since 1378 the church had been split by the Great Schism, during which the papal jurisdiction was divided between two popes. The French king, with the aid of King Wenceslas (Václav IV) of Bohemia, sought to terminate this division by calling a council to Pisa in 1409. Wenceslas had the support of the Czech university masters, Hus among them, whereas the Archbishop and the German masters were opposed. This so enraged the King that in January 1409 he subverted the university constitution by granting the Czechs three votes and the Germans only one; the result was a mass emigration of the Germans from Prague to several German universities. In the fall of 1409 Hus was elected rector of the then Czech-dominated university.

The final break between the Archbishop and Hus occurred when the Council of Pisa deposed both Pope Gregory XII, whose authority was recognized in Bohemia, and the antipope Benedict XIII and in their place elected Alexander V. The deposed popes, however,

retained jurisdiction over portions of western Europe; thus, instead of two, there were three popes.

The Archbishop and the higher clergy remained faithful to Gregory, whereas Hus and the reform party acknowledged the new pope. After being forced by the King's punitive measures to recognize Alexander V as the legitimate pope, the Archbishop, through a large bribe, induced Alexander to prohibit preaching in chapels, including the Bethlehem Chapel. Nevertheless, Hus refused to obey the Pope's order, whereupon he was excommunicated and denounced at the Curia before which he was ordered to appear. Instead, Hus sent three procurators to represent his case, and even Wenceslas and the Queen sent letters urging that Hus be absolved. There were two reasons that Hus did not go to Rome: his enemies were plotting to kill him on his journey to Rome, and he believed there was "but little of God's truth at the papal court." The Archbishop, however, sent rich gifts to be distributed among the cardinals and even to the Pope, and Hus was excommunicated for failing to appear (1411), although not for heresy. Despite his condemnation, Hus continued to preach at the Bethlehem Chapel and to teach at the university.

The Archbishop's faction thereupon accused Hus of the heresy of remanence, a move that incensed King Wenceslas for the aspersion of heresy that it cast upon his country and led him to take punitive measures against the higher clergy and pastors. The Archbishop fled from Prague and excommunicated the royal officials who carried out the King's order; he even imposed an interdict on Prague. Wenceslas ordered that the interdict be ignored and appointed an arbitration commission to judge between him and the Archbishop. The commission directed that the Archbishop submit to the King, lift the interdict, and annul Hus's excommunication. He was even to write to the Pope to stop all the proceedings against Hus and to declare that there was no heresy in the land. The Archbishop submitted, but then, without fulfilling his promise, fled to the country to seek protection of King Sigismund of Hungary. At Bratislava, however, he died suddenly under mysterious circumstances.

An even greater conflict arose in the same year (1411) when the antipope John XXIII issued his "crusading" bull against King Ladislas of Naples, who was a supporter of the deposed Gregory XII and had driven John out of Rome. The bull ordered all the secular rulers to seize the sword "in defense of the Church and us." All who obeyed the summons were promised "remission of their sins of which they were heartily contrite." John also ordered a sale of indulgences to finance his campaign against Gregory XII.

Unable to remain silent in the face of John's call to a fratricidal war and "trafficking in sacred things," Hus vigorously denounced the bull as un-Christian and blasphemous. But in this struggle he lost the support of King Wenceslas, who shared in the proceeds of the sale of indulgences. The Prague populace rose in revolt against the sales and conducted a mock burning of the papal bulls. The King then called the representatives of the warring camps to his castle, and the royal council ruled that no one was to oppose the sale of indulgences. About the same time three young opponents of indulgences were seized and beheaded; thus the reform movement gained its first martyrs.

Hus's enemies then renewed his trial at the Curia, where he was declared under major excommunication for refusing to appear and an interdict was pronounced over Prague or any other place where Hus might reside, thereby denying certain sacraments of the church to communicants in the interdicted area. In order to spare the city the consequences, Hus voluntarily left Prague in October 1412. He found refuge mostly in southern Bohemia in the castles of his friends, and during the next two years engaged in feverish literary activity. His enemies, particularly Stanislav and Páleč, wrote a large number of polemical treatises against him, which he answered in an equally vigorous manner. The most important of his treatises was *De ecclesia.* He also wrote a large number of treatises in Czech, among them, "The Exposition of the Faith," "The Exposition of the Decalogue," and "The Exposition of the Lord's Prayer," and a collection of sermons entitled *Postilla.*

The final trial. With the Schism continuing unabated, King Sigismund of Hungary, as the newly elected (1411) king of Germany, saw an opportunity to gain prestige as the restorer of the church's unity. He forced John to call a council to Constance to find a final solution of the Schism and to put an end to all the heresies. Sigismund, therefore, sent an emissary to invite Hus to attend the council—an invitation Hus naturally was reluctant to accept. But when John threatened King Wenceslas for noncompliance with the interdict, and after Sigismund had assured Hus of safe-conduct for the journey to Constance and back (no matter what the decision might be), Hus finally consented to go.

He left for Constance on Oct. 11, 1414, but did not receive the safe-conduct until two days after his arrival in Constance, on November 3. He could move freely in the city, for the Pope had suspended the interdict. Nevertheless, in less than a month he was lured into the papal residence and imprisoned in the dungeon of the Dominican monastery, and his enemies, particularly Michael de Causis, the papal procurator, and Štěpán Páleč, succeeded in having him put on trial as a Wycliffite heretic. A panel of judges—all Hus enemies—was appointed by the council and subjected him to an examination, which was illegal because he had come to Constance freely under a safe-conduct and not under an accusation. He had been promised an opportunity to present his faith to the whole council. The trial is described in great detail by an eyewitness, Hus's former pupil, Petr of Mladoňovice, who was in the service of one of the Czech nobles appointed to guard Hus.

At first the judges had hoped to convict him of heresy on the grounds of 45 articles ostensibly summarizing Wycliffe's teachings, but distorting them in the Hussite view. Hus successfully refuted most of the charges. Thereupon, Páleč selected 42 articles, presumably from Hus's *De ecclesia,* to which 20 other articles were added.

In the meantime, the sentiment of the council turned against all three popes; John fled from Constance on March 21, 1415, hoping thereby to render the council illegitimate. The council, however, declared itself supreme over the whole church, including the popes, and reorganized itself. Hus's trial then was entrusted to a new commission headed by Cardinal Pierre d'Ailly. In January Sigismund had repudiated his safe-conduct to Hus in exchange for the promise that Hus be given a free hearing before the council, which was finally permitted on June 5. The session became so disorderly, however, that it was adjourned until June 7, when the trial resumed.

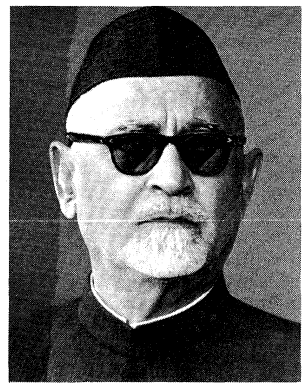
Hus was accused of many serious offenses through the testimonies of witnesses from Prague and Constance. Hus again resolutely denied the charge of the Wycliffite heresy of remanence. When Cardinal d'Ailly demanded that Hus abjure the articles, in vain Hus insisted that he did not then and never had held such beliefs and that he would be committing perjury if he recanted them. He begged only that the council prove to him from Scripture where he was wrong. This the council refused to do.

The final session was held on July 6 in the cathedral before the general congregation of the whole council. The final 30 articles—none of which correctly stated Hus's teachings—were read to him. When Hus still refused to recant on the ground that such teachings had been falsely ascribed to him, he was declared a Wycliffite heretic, deposed from priesthood and ignominiously divested of his priestly garments and functions with appropriate ritualistic anathemas, and his soul was consigned to the devil. He himself committed his soul to God. Thereupon, Hus was turned over to the secular arm for execution and on the same day was burned at the stake on the outskirts of the city. He prayed loudly until the flames choked him. (M.Sp.)

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Husain, Zakir (b. Feb. 8, 1897, Hyderābād, India—d. May 3, 1969, New Delhi), Indian statesman, the first Muslim to hold the largely ceremonial position of president of India. His fostering of secularism was criticized by some Muslim activists.

Husain responded to the nationalist leader Mahatma Gandhi's appeal to Indian youth to shun state-supported institutions; he helped

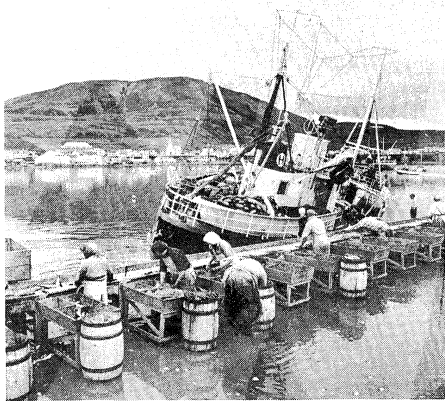


Zakir Husain
Camera Press

found the Jamia Millia Islamia (Muslim National University) in Alīgarh (later moved to New Delhi) and served as its vice chancellor from 1926 to 1948. At Gandhi's invitation, he also became chairman of the National Committee on Basic Education, established in 1937 to design a Gandhian syllabus for schools.

In 1948 Husain became vice chancellor of Alīgarh Muslim University, and four years later he entered the upper house of the central legislature. In 1956–58 he served on the executive board of the United Nations Educational, Scientific, and Cultural Organization. He was appointed governor of Bihār in 1957 and was elected vice president of India in 1962. As the official Indian National Congress party candidate, he was elected president in 1967 and served until his death.

Húsavík, town, northern Iceland, on the bay Skjálfandi, northeast of Akureyri. It is the oldest settlement in Iceland. According to legend, Húsavík ("Bay of the Houses") was so named because a Swedish seafarer, Gardar, blown off course, built a house and wintered there in



Cleaning and salting a herring catch at Húsavík, Ice.
Thomas Hollyman—Photo Researchers/EB Inc.

864. In the 1880s one of Iceland's first cooperatives was organized there. Húsavík is a fishing port and serves as a market centre for a farming and sheep-raising area. Pop. (1983 est.) 2,514.

Ḥusayn (personal name): *see under* Hussein, except as below.

Ḥusayn I, also called SHĀH SULṬĀN ḤUSAYN (b. 1668—d. 1726, Isfahan, Ṣafavid Iran), shah of Iran from 1694 to 1722, last independent ruler of the Ṣafavid dynasty, whose unfitness led to its disintegration.

Ḥusayn was reared in the harem and had no knowledge of state affairs. He depleted the treasury for personal expenses and allowed the mullahs (clergy) to control the government. Russia and Ottoman Turkey took advantage of Ḥusayn's weakness to seize border territory. Despite those losses, Ḥusayn ruled in relative peace for 20 years, while the nation slowly declined. Suddenly he was faced with a series of revolts by his tribal subjects, the most serious of which came from Maḥmūd, who had seized the throne of Afghanistan.

After making raids into Iran in 1720, the Afghans undertook a full-scale invasion in 1722. Maḥmūd marched on the capital at Eṣfahān and laid siege to the city. Seven months later Ḥusayn surrendered and abdicated, giving his crown to Maḥmūd.

Although two more members of the Ṣafavid royal house sat on the throne, they were but puppets, and Ḥusayn's reign accordingly marked the effective end of the dynasty.

Ḥusayn ʿAlī Nūrī, MĪRZĀ: *see* Bahā' Ullāh.

Ḥusayn at-Tikrītī, Ṣaddām: *see* Hussein, Saddam.

Ḥusayn ibn ʿAli (b. *c.* 1854, Constantinople, Tur., Ottoman Empire [now Istanbul, Tur.]—d. 1931, Amman, Jordan), emir of Mecca from 1908 to 1916 and king of Hejaz from 1916 to 1924 who was a leader in the Arab revolt in World War I. In October 1916 he proclaimed himself "king of the Arab countries." He refused to ratify the Versailles Peace Treaty (1919) as a protest against the mandatory regimes imposed on Syria, Palestine, and Iraq. In March 1924 he proclaimed himself caliph, but war with Ibn Saʿūd threatened, and the Wahhābīyah attack on aṭ-Ṭā'if in September found him unprepared. On October 5 he abdicated. The British conveyed him to Cyprus, where he lived until 1930.

Ḥusayn ibn ʿAlī, al- (b. January 626, Medina, Arabia—d. Oct. 10, 680, Karbalā', Iraq), Shīʿite Muslim hero, grandson of the prophet Muḥammad, son of ʿAlī (the fourth Islāmic caliph) and Fāṭima, daughter of Muḥammad; he is revered by Shīʿite Muslims as the third *imām* (after ʿAlī and Ḥusayn's older brother, Ḥasan).

After the assassination of their father, ʿAlī, Ḥasan and Ḥusayn acquiesced to the rule of the first Umayyad, Muʿāwiya, from whom they received pensions. Ḥusayn, however, refused to recognize the legitimacy of Muʿāwiya's son and successor, Yazīd (April 680). Ḥusayn was then invited by the townsmen of Kūfah, a city with a Shīʿite majority, to come there and raise the standard of revolt. After receiving some favourable indications, Ḥusayn set out for Kūfah with a small band of relatives and followers. According to traditional accounts, he met the poet al-Farazdaq on the way and was told that the hearts of the Iraqis were for him, but their swords were for the Umayyads. The governor of Iraq, on behalf of the caliph, sent 4,000 men to arrest Ḥusayn and his small band. They trapped Ḥusayn near the banks of the Euphrates (October 680). When Ḥusayn refused to surrender, he and his escort were slain, and Ḥusayn's head was sent to Yazīd in Damascus (now in Syria).

In remembrance of the martyrdom of Ḥusayn, Shīʿite Muslims observe the first 10 days of Muḥarram (the date of the battle according to the Islāmic calendar) as days of lamentation. Revenge for Ḥusayn's death was turned into a rallying cry that helped undermine the Umayyad caliphate and gave impetus to the rise of a powerful Shīʿite movement.

The details of Ḥusayn's life are obscured by the legends that grew up surrounding his martyrdom, but his final acts appear to have been inspired by a definite ideology—to found a regime that would reinstate a "true" Islāmic polity as opposed to what he considered the unjust rule of the Umayyads.

Ḥusayn Shāh ʿAlā' ad-Dīn (b. Bengal? [now in India and Bangladesh]—d. 1519, Bengal), founder of the Ḥusayn Shāhī dynasty of Bengal. He is often regarded as the most illustrious ruler (1493–1519) of late medieval Bengal.

The details of ʿAlā' ad-Dīn's early life are obscured by myth and legend. His father is said to have been a direct descendant of the Prophet Muḥammad and an Arab who emigrated to Bengal. After completing his studies, ʿAlā' ad-Dīn joined the court of Muẓaffar Shāh (reigned 1491–93), the Abyssinian ruler of Bengal, and had risen to the rank of chief minister when he led a successful rebellion against the shah, after which he was proclaimed king. In order to consolidate his position he moved his capital from Gaur to Ikdālā and systematically eliminated all possible rivals: some 12,000 troops were executed; the Payks, the elite Hindu palace guard, disbanded; the Abyssinians exiled and their places filled with Muslim and Hindu notables.

ʿAlā' ad-Dīn, although a devout Muslim, did not discriminate against the Hindu minority, a policy that accounted for a large part of his success in building a sound political structure for the Bengali kingdom. In 1498 he conquered the neighbouring states of Kāmrūp and Assam. It was not until about 1516, however, that Orissa was finally annexed to Bengal. ʿAlā' ad-Dīn was a wise and benevolent ruler, an active patron of the arts, and a great builder of public works. He was succeeded in 1519 by his eldest son, Nuṣrat Shāh.

Ḥusaynī, Amīn al-, also called AL-ḤAJJ ĀMĪN (b. 1897, Jerusalem [now in Israel]—d. July 4, 1974, Beirut, Lebanon), grand mufti of Jerusalem and Arab nationalist figure who played a major role in Arab resistance to Zionist political ambitions in Palestine.

Ḥusaynī studied in Jerusalem, Cairo, and Istanbul, and in 1910 he was commissioned in the Turkish artillery. He became a strong voice in the Arab nationalist and anti-Zionist movements. In December 1921 the British, who had accepted a mandate for Palestine after World War I, named Ḥusaynī permanent president and mufti of the newly created Supreme Muslim Council—the most authoritative religious body in the Palestinian Muslim community.

Ḥusaynī came to dominate the Palestinian Arab movement after a bitter clash with other nationalist elements, notably the Nashashabis, over personal rather than ideological differences. During most of the period of the British Mandate, bickering between these groups seriously weakened the effectiveness of Arab efforts. In 1936 they achieved a measure of unity when all the Palestinian groups joined to create a permanent executive organ known as the Arab High Committee under Ḥusaynī's chairmanship. The committee demanded a cessation of Jewish immigration and a prohibition of land transfers from Arabs to Jews. A general strike developed into a rebellion against British authority. The British removed Ḥusaynī from the council presidency and declared the committee illegal in Palestine. In October 1937 he fled to Lebanon, where he reconstituted the committee under his domination. Ḥusaynī retained the allegiance of most Palestinian Arabs, using his power to punish the Nashashabis.

The rebellion forced Britain to make substantial concessions to Arab demands in 1939. They abandoned the idea of establishing Palestine as a Jewish state, and, while Jewish immigration was to continue for another five years, it was thereafter to depend on Arab consent. Ḥusaynī, however, felt that the concessions did not go far enough, and he repudiated the new policy. This was a serious error for the Arab cause; solid Arab support for Britain might have prevented the establishment of the state of Israel in 1948.

Ceasing to play an active role in Palestinian affairs, Ḥusaynī spent most of World War II (1939–45) in Germany. At the war's end he fled to Egypt.

Ḥusaynid DYNASTY, the ruling dynasty of Tunisia from 1705 until the establishment of the Republic of Tunisia in 1957.

Al-Ḥusayn ibn ʿAlī, an Ottoman officer, was proclaimed bey in 1705 after the Algerians captured the former ruler of Tunis. He received legal recognition by the Ottoman sultan as governor (*beylerbeyi*) of the province and assured the survival of his line by promulgating a law of succession in 1710. Al-Ḥusayn conducted his affairs without Ottoman interference and with a measure of independence that allowed him to maintain separate treaties with France (1710; 1728), Great Britain (1716), Spain (1720), Austria (1725), and Holland (1728).

Intermittent internal struggles for succession and difficulties with the French marred subsequent Ḥusaynid history. In 1756 the Algerians occupied Tunis and beheaded ʿAlī Bey (reigned 1735–56). Ḥammūda Bey (reigned 1782–1814) severed ties with Venice after its attacks on the Tunisian coastal towns of Sūsah (1784) and Ḥalq al-Wādī (1785). He also faced two Algerian invasions (1807; 1813) and a revolt of the Janissaries in 1811, which forced him to disband the elite Ottoman military corps periodically recruited to supplement the local armies.

Their European alliances made the Ḥusaynid beys subject to European pressures in the 19th century. Privateering, an important source of Tunisian revenue, was suppressed at European insistence in 1819; slavery and restrictions on Tunisian Jews were abolished under Aḥmad Bey (reigned 1837–55). The Ottoman government also sought to curb Tunisian autonomy, but Aḥmad Bey refused to pay tribute.

Western-style reforms followed in the second

half of the 19th century. With the imposition of a French protectorate over Tunisia in 1883, the Ḥusaynids receded into a purely figurative role. During World War II, Munṣif Bey (reigned June 1942–May 1943) briefly became leader of the nationalist movement, but the dynasty proved unable to regain any real power. It came to an end with the proclamation of a Tunisian republic (July 25, 1957).

Husband's Message, The, Old English lyric preserved in the Exeter Book, one of the few surviving love lyrics from the Anglo-Saxon period; it is remarkable for its ingenious form and for its emotive power. It is also known as *The Lover's Message.* The speaker is a wooden staff on which a message from an exiled husband to his wife has been carved in runic letters. The staff tells how it grew as a sapling beside the sea, never dreaming it would have the power of speech, until a man carved a secret message on it. The husband's message tells of how he was forced to flee because of a feud but now has wealth and power in a new land and longs for his wife. It implores her to set sail and join him.

Husein (personal name): *see under* Hussein, or Ḥusayn.

Hüseyin ibn Eyne Beg: *see* Neşri.

húskarl (military guard): *see* housecarl.

Huskisson, William (b. March 11, 1770, Birch Moreton, Worcestershire, Eng.—d. Sept. 15, 1830, Eccles, Lancashire), British statesman and financier and a leading advocate of free trade.

Huskisson went to Paris at age 13 in the care of his uncle and there witnessed the French Revolution. In 1793 he was employed by Henry Dundas (later Lord Melville) as a clerk. His abilities were so marked that in 1795 he was appointed undersecretary for war. He was a member of Parliament from 1796 to 1802 and again from 1804 to the year of his death. He was also secretary to the treasury under William Pitt (1804–05) and the Duke of Portland (1807–09). He resigned from the Cabinet in 1809 but rejoined in 1814.

After participating prominently in the Corn Law debates of 1814 and 1815 on regulation of the export and import of grain, Huskisson was appointed to the committee that was set up in 1821 to inquire into agricultural distress, and, subsequently, he led the committee to propose relaxation of the Corn Laws. Once he became president of the Board of Trade in 1823, he attempted to reconcile the Tory merchants to a free-trade policy. Among the chief legislative changes with which he was principally connected were the reform of the Navigation Acts, to admit other nations to a full equality and reciprocity of shipping duties, and the reduction of the duties on manufactures and on imports. In 1827 Huskisson became secretary for the colonies and leader of the House of Commons, but he resigned in 1828. Huskisson was fatally injured at the opening of the Liverpool and Manchester Railway.

Hüsnümansur (Turkey): *see* Adıyaman.

Huss, Jan (Czech religious reformer): *see* Hus, Jan.

hussar, member of a European light-cavalry unit employed for scouting, modeled on the 15th-century Hungarian light-horse corps. The typical uniform of the Hungarian hussar was brilliantly coloured and was followed, with modification, in other European armies. It consisted of a busby, or a high, cylindrical cloth cap; a jacket with heavy braiding; and a dolman, or pelisse, a loose coat worn hanging from the left shoulder. Several hussar regiments of the British army were converted from light dragoons in the 19th century. The name survived into the Korean War, when the 29th British Commonwealth brigade group included the 8th Royal Irish Hussars as the tank unit.

Hussarek von Heinlein, Max Hussarek, Freiherr (Baron) (b. May 3, 1865, Pressburg, Slovakia [now Bratislava, Czech.]—d. March 6, 1935, Vienna, Austria), Austrian statesman, jurist, and academic who served as prime minister of Austria during the last months of World War I.

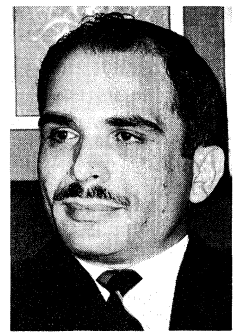
A professor of canon law at the University of Vienna, Hussarek began a public-service career with a series of minor posts. Between 1911 and 1917 he served as Austrian minister of education in the cabinets of three different prime ministers.

Appointed prime minister of Austria on July 25, 1918, Hussarek regarded federal restructuring as the only hope of the moribund Habsburg empire and proposed the creation of an autonomous Croatian state within the imperial framework. On Oct. 16, 1918, he presented a manifesto of Emperor Charles (Oktobermanifest) proclaiming the federalization of Austria, but his effort was wrecked by Hungarian opposition. A short time after this last attempt at reconstruction, Hussarek resigned his ministry (Oct. 27, 1918). He later served as president of provincial administration for the Red Cross in Vienna and lower Austria (1923).

Hussein (personal name): *see under* Ḥusayn, except as below.

Hussein (ibn Talal) (b. Nov. 14, 1935, Amman, Transjordan [now Jordan]), king of Jordan from 1953; during much of his reign he was preoccupied by the problem of trying to accommodate the interests of Palestinian refugees from Israel in his country.

Educated partly in England, Hussein succeeded his father, King Talal, who was deposed in 1952 because of mental illness.



King Hussein
Gamma

Hussein's policies fostered slow but steady economic progress, though he was forced to depend on continual financial aid from the West. Hussein's base of support was his country's indigenous Bedouin tribesmen. Because the Palestinian majority in Jordan felt no attachment to his dynasty, Hussein augmented the military establishment to assert royal authority over that of Parliament.

Hussein's socially conservative policies and his alignment with the Western powers were often criticized by other Arab leaders as well as by his domestic opposition. Political unrest precluded his joining the Western-sponsored Baghdad Pact (1955), a Middle Eastern security alliance, and forced him in 1956 to dismiss General John Bagot Glubb, the British officer who commanded the Arab Legion (Jordanian army).

With American aid he steadily expanded and modernized his military forces, but Israel's military victory over Jordan in the Arab–Israeli War of June 1967 was a severe setback to Hussein's regime, resulting as it did in the loss of the West Bank to Israel and the influx of more Palestinian refugees into Jordan. After the war Hussein's rule was threatened by the military forces of the Palestinian Liberation Organization (PLO), who based themselves in Jordan to carry out guerrilla raids against Israel. In September 1970 full-scale warfare broke out between the PLO and Hussein's army in a struggle for control of the country. Hussein's army succeeded in completely expelling the PLO's forces from Jordan in 1971. In the following years Hussein steered a difficult course; he refrained from confronting Israel militarily, he mended relations with the PLO, and he sought both closer ties with and financial aid from Saudi Arabia and other moderate Arab states. He also maintained good relations with the United States and Great Britain. During the mid-1980s Hussein worked with PLO chairman Yāsir ʿArafāt toward negotiating a settlement with Israel over the disputed West Bank, but in 1988 he surrendered Jordan's claim to the area, as well as its role in representing the Palestinians living there, to the PLO.

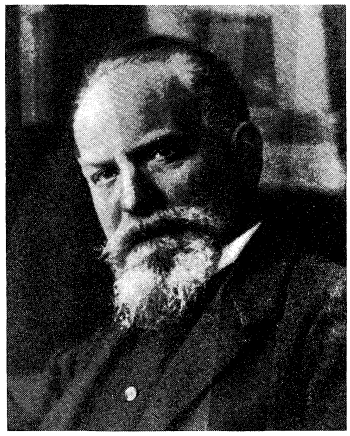
Hussein (at-Takrītī), Saddam, also spelled ṢADDĀM ḤUSAYN AT-TIKRĪTĪ (b. April 28, 1937, Tikrīt, Iraq), president of Iraq from 1979.

Hussein joined the Baʿth Socialist Party in 1957. He participated in an unsuccessful attempt by Baʿthists to assassinate the Iraqi prime minister, Abdul Karim Kassem, and, wounded, escaped to Syria and then Egypt. There he attended Cairo Law School (1962–63) and continued his studies at Baghdad Law College after the Baʿthists took power in Iraq in 1963. After the Baʿthists were overthrown that same year, Hussein spent several years in prison in Iraq. He again escaped, becoming a leader of the Baʿth party, and was instrumental in the coup that brought the party back to power in 1968. Hussein then effectively held power in the country along with the head of state, President Aḥmad Ḥassan al-Bakr. He directed the nationalization of Iraq's oil industry in 1972. Hussein began to assert open control of the government in 1979, becoming president upon Bakr's resignation in that year. Hussein then became chairman of the Revolutionary Command Council and prime minister, among other positions. He used an extensive secret-police establishment to suppress any internal opposition to his rule, and he made himself the object of an extensive personality cult among the Iraqi public. His goals as president were to supplant Egypt as leader of the Arab world, to achieve hegemony over the Persian Gulf, and to use oil revenues to raise the country's standard of living.

Hussein launched an invasion of Iran in September 1980, but the campaign bogged down in a war of attrition. The war's cost and the interruption of Iraq's oil exports compelled Hussein to scale down his ambitious programs for economic development. The Iran-Iraq War dragged on in a stalemate until 1988, when Iran and Iraq accepted a ceasefire that ended the fighting. Despite the large foreign debt Iraq found itself saddled with by war's end, Hussein continued to build up his armed forces. In 1990 his army overran neighbouring Kuwait in a surprise attack. Hussein apparently intended to use that nation's vast oil revenues to bolster Iraq's economy, but his occupation of Kuwait quickly triggered a worldwide trade embargo against Iraq.

Husserl, Edmund (b. April 8, 1859, Prossnitz, Moravia [now Prostějov, Czech.], Austrian Empire—d. April 27, 1938, Freiburg im Breisgau, Ger.), German philosopher, the founder of Phenomenology, a method for the description and analysis of consciousness through which philosophy gains the character of a strict science. The method reflects an effort to resolve the opposition be-

tween Empiricism, which stresses observation, and Rationalism, which stresses reason and theory, by indicating the origin of all philosophical and scientific systems and developments of theory in the interests and structures of the experiential life.



Husserl, c. 1930
Archiv fur Kunst und Geschichte, West Berlin

Education and early life. Husserl was born into a Jewish family and completed his qualifying examinations on June 30, 1876, at the German public gymnasium in the neighbouring bishop city of Olmütz (Olomouc) and then studied physics, mathematics, astronomy, and philosophy at the universities of Leipzig, Berlin, and Vienna. In Vienna he received his doctor of philosophy degree on Nov. 22, 1882, with a dissertation entitled *Beiträge zur Theorie der Variations-rechnung* ("Contributions to the Theory of the Calculus of Variations"). In the autumn of 1883, after working in Berlin as the assistant to his teacher, the mathematician Karl Weierstrass, notable for arithmetizing analysis, Husserl moved to Vienna to study with a philosopher (and psychologist), Franz Brentano, an influential teacher.

Brentano had been a Catholic priest, but on the occasion of the publication of the dogma of the infallibility of the pope, he had left the church and worked as professor of philosophy at the University of Vienna. His fundamental work, *Psychologie vom empirischen Standpunkte,* had already appeared in 1874. Brentano's critique of any psychology oriented purely along scientific and psychophysical lines and his claim that he had grounded philosophy on his new descriptive psychology had a widespread influence.

Husserl received a decisive impetus from Brentano and from his circle of students (to which Tomáš Masaryk, later the first president of Czechoslovakia, also belonged). The spirit of the Enlightenment of Joseph II (who near the close of the 18th century had been the Holy Roman emperor), with its religious tolerance and its quest for a rational philosophy, was very much alive in this circle. Husserl's striving for a more strictly rational foundation found its corroboration here. From the outset, such a foundation meant for him not only a theoretical act but the moral meaning of responsibility in the sense of ethical autonomy. Later, Husserl depicted himself as a man who was sick as long as his ideas did not come to clarity; already he had impressed his friends as one who was possessed by his thoughts.

In Vienna Husserl converted to the Evangelical Lutheran faith, and one year later, in 1887, he married Malvine Steinschneider, the daughter of a secondary-school professor from Prossnitz. As his energetic and skilled wife, she was his indispensable support, until his death, in all of the things of their daily life. From their marriage came three children: Elisabeth, who married Jakob Rosenberg, a renowned expert of Dutch art who was a curator of the Kaiser-Friedrich Museum and later a professor at Harvard University; Gerhart, a lawyer and professor of law; and Wolfgang, who died in action in World War I.

Lecturer at Halle. In 1886 Husserl went—with a recommendation from Brentano—to Carl Stumpf, the oldest of Brentano's students, who had further developed his psychology and who was professor of philosophy and psychology at Halle. On July 26, 1887, Husserl qualified as a lecturer in the university (*Habilitation*). He had become a close friend of Stumpf, and he was indebted to Stumpf for many suggestions in the formation of his own descriptive concepts. The theme of Husserl's *Habilitation* thesis, *Über den Begriff der Zahl: Psychologische Analysen* ("On the Concept of Number: Psychological Analyses"), already showed Husserl in the transition from his mathematical research to a reflection upon the psychological source of the basic concepts of mathematics. These investigations were an earlier draft of his *Philosophie der Arithmetik: Psychologische und logische Untersuchungen,* the first volume of which appeared in 1891.

The title of his inaugural lecture in Halle was "Über die Ziele und Aufgaben der Metaphysik" ("On the Goals and Problems of Metaphysics"). In the traditional sense metaphysics is the study of Being. Though the text is lost, it is clear that Husserl already understood his method of the analysis of consciousness to be the way to a new universal philosophy and metaphysics, which would lay all previous schemes of metaphysics to rest.

The years of his teaching in Halle (1887–1901) were later seen by Husserl to have been his most difficult. He often doubted his ability as a philosopher and believed he would have to give up his occupation. The problem of uniting a psychological analysis of consciousness with a philosophical grounding of formal mathematics and logic seemed insoluble. But from this crisis there emerged the insight that the philosophical grounding of logic and mathematics must commence with an analysis of the experience that lies before all formal thinking. It demanded an intensive study of the British Empiricists (such as Locke, Berkeley, Hume, and Mill) and a coming to terms with the logic and semantics stemming from this tradition—especially the logic of John Stuart Mill—and with the attempts at a "psycho-logic" grounding of logic then being made in Germany.

The fruits of this interaction were presented in the *Logische Untersuchungen* (1900–01; "Logical Investigations"), which employed a method of analysis that Husserl now designated as "phenomenological." The revolutionary significance of this work was only gradually recognized, for its method could not be subsumed under any of the philosophical orientations well known at that time. Bertrand Russell, in a retrospective glance at the *Logische Untersuchungen,* spoke of them as comprising one of the monumental works of the present philosophical epoch.

His influence as a teacher. After the publication of the *Logische Untersuchungen,* Husserl was called, at the instigation of David Hilbert, a Formalist mathematician, to the position of *ausserordentlicher Professor* (university lecturer) by the University of Göttingen. Husserl's time of teaching in Göttingen, from 1901 to 1916, was important as the source of the Phenomenological movement—*i.e.,* as marking the formation of a school reaching out to many lands and branching out in numerous directions.

The phenomenological analysis of experienced reality—*i.e.,* of reality as it immediately presents itself to consciousness—not only drew the German students who were unsatisfied with the Neo-Kantianism that then prevailed in Germany but also many young foreign philosophers who came from the traditions of Empiricism and Pragmatism. At times, Husserl's seminar brought together students from 12 countries. From about 1905, Husserl's students formed themselves into a group with a common style of life and work. Standing in close personal contact with their teacher, they always spoke of him as the "master" and often accompanied him, philosophizing, on his walks. They understood Phenomenology as the way to the reform of the spiritual life.

In their rejection of the superficial life of the Wilhelmene Era (around the turn of the century), this group shared many of the traits of the German youth movement. It was not a school, however, in any sense of swearing by every word of the master; Husserl gave each of his students the freedom to pursue suggestions in an independent way. He wanted his teaching to be not a transmission of finished results but rather the preparation for a responsible setting of the problem. Thus, he understood Phenomenology as a field to be worked over by the coming generations of philosophers and claimed for himself only the role of the "beginner." In view of this freedom of his teaching, the fact that Phenomenology soon branched off in many directions is understandable, and it explains its rapid international expansion.

Husserl himself had developed an individual style of working: all of his thoughts were conceived in writing—the minutes, so to speak, of the movement of his thought. During his life he produced more than 40,000 pages written in Gabelberger stenographic script.

Husserl was still at Göttingen when Max Scheler, who was at that time a *Privatdozent* (unsalaried university lecturer) in Jena and who later became an important Phenomenologist, came in contact with Husserl (1910–11). Scheler was influenced methodologically by Husserl but soon elaborated in speculative metaphysics. Because of these facts, as well as for personal reasons, there later ensued an estrangement between them.

Husserl's friendship with Wilhelm Dilthey, a pioneering theoretician of the human sciences, also falls within the Göttingen period. Dilthey saw the publication of the *Logische Untersuchungen* as a new encouragement to the further development of his own philosophical theory of the human sciences; and Husserl himself later acknowledged that his encounter with Dilthey had turned his attention to the historical life out of which all of the sciences originated and that, in so doing, it had opened for him the dimension of history as the foundation of every theory of knowledge.

Phenomenology as the universal science. In the Göttingen years, Husserl drafted the outline of Phenomenology as the universal philosophical science. Its fundamental methodological principle was what Husserl called the phenomenological reduction. It focusses the philosopher's attention on uninterpreted basic experience and the quest, thereby, for the essences of things. In this sense, it is "eidetic" reduction. On the other hand, it is also the reflection on the functions by which essences become conscious. As such, the reduction reveals the ego for which everything has meaning. Hence, Phenomenology took on the character of a new style of transcendental philosophy, which repeats and improves Kant's mediation between Empiricism and Rationalism in a modern way. Husserl presented its program and its systematic outline in the *Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie* (1913; *Ideas; General Introduction to Pure Phenomenology,* 1931), of which, however, only the first part was completed. (Completion of the second part was hindered by the outbreak of World War I.) With this work, Husserl wanted to give his students a manual. The result, however, was just the opposite: most of his students took Husserl's turn to transcendental philosophy as

a lapse back into the old system of thought and therefore rejected it. Because of this turn, as well as the war, the phenomenological school fell apart.

In contrast to the esteem that Husserl enjoyed from his students, his position among his colleagues in Göttingen was always difficult. His appointment to *Persönlichen Ordinarius* (full professor) in 1906 had resulted from the decision of the minister of education against the will of the faculty. The representatives of the humanities faculty had predominantly philological and historical interests and had little appreciation for philosophy, whereas the natural scientists were disappointed that, with the division of the philosophical faculty, Husserl did not go over to the new faculty of natural sciences.

Phenomenology and the renewal of spiritual life. Thus his call in 1916 to the position of *ordentlicher Professor* (university professor) at the University of Freiburg meant a new beginning for Husserl in every respect. His inaugural lecture on "Die reine Phänomenologie, ihr Forschungsgebiet und ihre Methode" ("Pure Phenomenology, Its Area of Research and Its Method") circumscribed his program of work. He had understood World War I as the collapse of the old European world, in which spiritual culture, science, and philosophy had held an incontestable position. In this situation, the epistemological grounding that he had previously provided for Phenomenology no longer satisfied him; after this, his reflections were directed with special emphasis upon philosophy's task in the renewal of life.

In this sense he had set forth in his lectures on *Erste Philosophie* (1923–24; "First Philosophy") the thesis that Phenomenology, with its method of reduction, is the way to the absolute vindication of life—*i.e.,* to the realization of the ethical autonomy of man. Upon this basis, he continued his clarification of the relation between a psychological and a phenomenological analysis of consciousness and his research into the grounding of logic, which he published as the *Formale und transzendentale Logik: Versuch einer Kritik der logischen Vernunft* (1929; *Formal and Transcendental Logic,* 1969).

Husserl's teaching, in this last period of his life, assumed a different style from that at Göttingen. It did not lead to the founding of a new school. Husserl was so intent upon completing his work that his thinking and teaching assumed more the character of a monologue. At the same time, however, his influence upon his listeners and the members of his seminar was not diminished, and he placed his intellectual stamp upon many of them. Numerous foreign guests usually took part in his seminar. For a period, Rudolf Carnap, a leading figure in the Vienna Circle, where Logical Positivism was born, also studied under Husserl.

Recognition from without was not wanting. In 1919 the law faculty of the University of Bonn bestowed upon Husserl the title of *Dr. jur. honoris causa.* He was the first German scholar after the war to be invited to lecture at the University of London (1922). He turned down a prestigious call to the University of Berlin as the successor to Ernst Troeltsch in order to devote his energies to Phenomenology without interruption. An invitation followed to give some lectures at the University of Amsterdam and later, in 1930, at the Sorbonne—lectures that furnished the occasion for preparing a new systematic presentation of Phenomenology, which then appeared in a French translation under the title of *Méditations cartésiennes* (1931).

When he retired in 1928, Martin Heidegger, who was destined to become a leading Existentialist and one of Germany's foremost philosophers, became his successor. Husserl had looked upon him as his legitimate heir. Only later did he see that Heidegger's chief work, *Sein und Zeit* (1927; *Being and Time,* 1962), had given Phenomenology a turn that would lead down an entirely different path. Husserl's disappointment led to a cooling of their relationship after 1930.

Later years. Adolf Hitler's seizure of power in 1933 did not break Husserl's ability to work. Rather, the experience of this upheaval was, for him, the occasion for concentrating more than ever upon Phenomenology's task of preserving the freedom of the mind. He was excluded from the university; but the loneliness of his study was broken through his daily philosophical walks with his research assistant, Eugen Fink, through his friendships with a few colleagues who belonged to the circles of the resistance and the "Denominational Church," and through numerous visits by foreign philosophers and scholars. Condemned to silence in Germany, he received, in the spring of 1935, an invitation to address the Cultural Society in Vienna. There he spoke freely for two and one-half hours on "Die Philosophie in der Krisis der europäischen Menschheit" ("Philosophy in the Crisis of European Mankind") and repeated the lecture two days later.

During this time, the Cercle Philosophique de Prague made it possible through a Rockefeller grant for Ludwig Landgrebe, a *Dozent* (lecturer) at the German University in Prague and Husserl's former assistant, to begin the classification and transcription of Husserl's unpublished manuscripts. Through the Cercle, Husserl received an invitation to address the German and Czechoslovakian University in Prague in the fall of 1935, after which many discussions took place in the smaller circles. Thus, in a place which already stood under the threat of Hitler, the voice of free philosophy was once again audible through Husserl. The impression of his absolute sovereignty over all of the confusions of this time was overpowering for his listeners.

Out of these lectures came Husserl's last work, *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie: Eine Einleitung in die phänomenologische Philosophie* (1936; *The Crisis of European Sciences and Transcendental Phenomenology,* 1970), of which only the first part could appear, in a periodical for emigrants. The following period until the summer of 1937 was entirely devoted to the continuation of this work, in which Husserl developed for the first time his concept of the *Lebenswelt* ("life-world").

In the summer of 1937, the illness that made it impossible for him to continue his work set in. From the beginning of 1938 he saw only one remaining task: to be able to die in a way worthy of a philosopher. Not committed to a particular church creed, he had respect for all authentic religious belief, just as his philosophy demanded the recognition of each authentic experience as such. His concept of absolute philosophical self-responsibility stood close to the Protestant concept of the freedom of man in his immediate relationship with God. In fact, it is evident that Husserl characterized the maintenance of the phenomenological reduction not only as a method of but also as a kind of religious conversion. Thus, on the one hand, he could refuse spiritual help at his death—"I have lived as a philosopher," he said, "and I want to die as a philosoper"—yet, on the other hand, he could explain a few days before his death: "God has in grace received me and allowed me to die." He died in April 1938, and his ashes were buried in the cemetery in Günterstal near Freiburg.

(L.M.L.)

BIBLIOGRAPHY. Husserl's *Logische Untersuchungen,* 2nd ed., 2 vol. (1913–21; *Logical Investigations,* 2 vol., 1970), are ably reported on in J.M. Findlay's article "Phenomenology" in the 1956 through 1966 printings of the *Encyclopædia Britannica* and more fully paraphrased in Marvin Farber, *The Foundation of Phenomenology* (1943). The first book of Husserl's *Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie* is available in a not always reliable translation (1931, reissued 1952); the *Cartesianische Meditationen* in a faithful rendering (1960). The *Husserliana* edition of the Husserl Archives (1950 *ff.*) in its early volumes emphasized previously unpublished materials but will eventually include all of Husserl's works. A short biography is given in the "Husserl" article in the *Neue deutsche Biographie,* vol. 10 (1974). Reflections on his personality may be found in Ludwig Landgrebe and Jan Patočka, *Edmund Husserl zum Gedächtnis.* Paul Ricoeur, *Husserl: An Analysis of His Phenomenology* (1967), is a valuable collection of interpretive and critical essays. Maurice Natanson, *Edmund Husserl: Philosopher of Infinite Tasks* (1973), is a good introduction to the philosopher's fundamental ideas.

Hussey, Obed (b. 1792, Maine—d. Aug. 4, 1860, Exeter, Maine, U.S.), U.S. inventor of a full-sized grain reaper that was in wide use throughout Illinois, Maryland, New York, and Pennsylvania until Cyrus Hall McCormick's reaper captured the market.

Hussey had invented machines for grinding corn and crushing sugarcane before he began work on a grain-cutting machine in 1830. His reaper made its first successful trial run in July 1833, near Carthage, Ohio, and was patented later that year. McCormick's reaper, first demonstrated in 1831, was patented in 1834. Hussey and McCormick competed fiercely for the reaper market, each patenting improvements and exhibiting machines with great success in the United States and England. Other inventors devised further improvements, which were quickly adopted by McCormick, but Hussey obstinately refused to use the ideas of others. Hussey's business declined, and he sold out in 1858. He died in a train accident, while working on a steam plow.

Hussite, any of the followers of the Bohemian religious reformer Jan Hus, who was condemned by the Council of Constance (1414–18) and burned at the stake. After his death in 1415 many Bohemian knights and nobles published a formal protest and offered protection to those who were persecuted for their faith. The movement's chief supporters were Jakoubek of Stříbro (died 1429), Hus's successor as preacher at the Bethlehem chapel in Prague; Václav Koranda, leader of the Taborites (extreme Hussites named for Tábor, their stronghold, south of Prague); and Jan Želivský, who organized the extreme reform party in Prague.

The Hussites broke with Rome in using a Czech liturgy and in administering Holy Communion to the laity under the forms of both bread and wine. (The doctrine supporting this was called Utraquism and the more moderate Hussites were called Utraquists.)

Under King Wenceslas (Václav) IV of Bohemia, the movement spread widely. In 1419, however, he died and was succeeded by a bitter enemy of the Hussites, his half brother Sigismund, king of the Romans and of Hungary. The Hussites would have acknowledged Sigismund had he accepted the Four Articles of Prague that Jakoubek had formulated: (1) freedom of preaching; (2) communion in both kinds; (3) poverty of the clergy and expropriation of church property; (4) punishment of notorious sinners. In 1420, however, Sigismund, who had failed to get possession of Prague, published a bull of Pope Martin V proclaiming a crusade against the Hussites. The Hussite union, which included the municipalities of Prague and other cities and the chief military power of Bohemia, deposed Sigismund and repelled two crusading attacks against Prague. Various crusades and battles against the Hussites failed for the next several years. In 1427 the Hussites, led by Prokop Holý, began a more revolutionary, rather than

defensive, political program. Pope Martin V organized another crusade against them but did not live to see it decisively beaten by the Hussites in 1431.

Peace negotiations began in 1431, when the Council of Basel of the Roman Catholic Church agreed to negotiate with the Hussites on an equal basis, which Pope Martin V had refused to do. A Hussite delegation spent three months in Basel in 1433 discussing the Four Articles of Prague. The Council then sent a mission to Prague, which granted communion in both kinds to the Hussites. This grant split the Hussites, since the Utraquists were willing to make peace on these terms, but the Taborites were not. Utraquists and Catholics then joined forces to defeat the Taborites in a battle at Lipany in 1434, which ended the Taborites' influence.

The Utraquist Hussites then resumed peace negotiations, and in July 1436 they obtained a peace treaty (the Compact of Iglau) that ensured all the principal gains of the war: communion in both kinds, the expropriation of church lands (which broke the economic power of the Roman Catholic Church in Bohemia), and an independent Bohemian Catholic church under Jan Rokycana as its elected archbishop. Although association with the Roman Catholic Church continued, the church of the Utraquist Hussites survived schisms and periodic persecutions until *c.* 1620, when it was finally absorbed by the Roman Catholics.

In the mid-15th century the Unitas Fratrum (Unity of Brethren) movement began in Bohemia among some of the Hussites, and it established its own independent organization in 1467. During the Reformation, the Unitas Fratrum was in contact with Lutheran and Reformed Protestants. Eventually, however, Bohemian and Moravian Protestantism was suppressed, and the Roman Catholic Counter-Reformation was victorious after 1620, when the Protestant barons were defeated at the Battle of the White Mountain during the Thirty Years' War.

Remnants of the Unitas Fratrum remained, however, and in 1722 a group of them fled Moravia and settled on the estate of Count Nikolaus Ludwig von Zinzendorf in Saxony. A number of exiles from Moravia and Bohemia followed, and they formed the community of Herrnhut, where they were organized as the Moravian Church (*q.v.*). There is also some continuity with 20th-century Czech Protestantism.

Huston, John (b. Aug. 5, 1906, Nevada, Mo., U.S—d. Aug. 28, 1987, Middletown, R.I.), American motion-picture director whose taut dramas were some of the most popular films from the 1940s on.

The son of the actor Walter Huston, he lived as a child in the many cities where his father appeared on the stage. He began his Hollywood career as a scriptwriter in 1931. Prior to that time Huston had been, for short periods, a professional lightweight boxer, a soldier in the Mexican cavalry, a reporter, the editor of a picture magazine, an author of short stories and plays, and an actor.

His first work as a film director was the classic hard-boiled detective tale *The Maltese Falcon* (1941), distinguished by sharply realistic dialogue and vividly realized characters. Other early classics were *The Treasure of the Sierra Madre* (1948), a story of self-destructive greed among American gold-seekers in Mexico; and *The African Queen* (1952), a comic romance-adventure film set in the jungles of Central Africa. These films starred Humphrey Bogart and marked the summit of that highly popular actor's career. Huston's other screen adaptations of literary works included *The Red Badge of Courage* (1951) from the novel by Stephen Crane, *Moby Dick* (1956) from Herman Melville, *The Night of the Iguana* (1964) from Tennessee Williams, *The Man Who Would Be King* (1975) from Rudyard Kipling, *Wise Blood* (1979) from Flannery O'Connor, *Under the Volcano* (1984) from Malcolm Lowry, and *The Dead* (1987) from James Joyce. Among his other more successful films were *Key Largo* (1948), *The Asphalt Jungle* (1950), *The List of Adrian Messenger* (1963), *Reflections in a Golden Eye* (1967), and *Prizzi's Honor* (1985).

Huston's best motion pictures feature fast-paced scripts, vivid characterizations, and exciting and unpredictable plots. Many of his lesser-known films were both critical and commercial failures, but even these show his ironic and often pessimistic view of human striving and his ability to coax outstanding performances from his leading actors. Huston also acted on screen, often in films that he directed, such as *The Life and Times of Judge Roy Bean* (1972). Perhaps his finest supporting role was in Roman Polanski's *Chinatown* (1974). He was also acclaimed for his World War II documentaries *Report from the Aleutians* (1943), *The Battle of San Pietro* (1944), and *Let There Be Light* (1945; suppressed until 1981). Huston's autobiography, *An Open Book,* appeared in 1980.

Huston, Walter (b. April 6, 1884, Toronto, Ont., Can.—d. April 7, 1950, Beverly Hills, Calif., U.S.), noted Canadian-born American character actor whose career in theatre and films ranged from musical comedy to high drama.

Originally trained as an engineer, Huston first appeared on the stage in Toronto (1902) and made his New York City debut three years later. He worked as an engineer for four years but returned to the stage in 1909 with Bayonne Whipple (his second wife); the two played as a song-and-dance team until 1924.

Huston's first noted Broadway appearance was in the role of Marshall Pitt in *Mr. Pitt* (1924); this was followed by an acclaimed performance as Ephraim Cabot in Eugene O'Neill's *Desire Under the Elms* (1924). That same year he married the actress Nan Sunderland. For *Dodsworth* (1934) he received a New York Drama Critics Award for best actor and an Academy Award nomination for best actor when he appeared in the film version (1936).

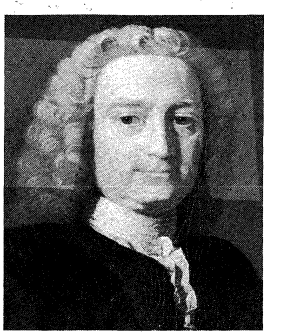
With the introduction of sound to motion pictures, Huston became chiefly a film actor, though he never gave up stage work completely. He appeared as Peter Stuyvesant in *Knickerbocker Holiday* (1938), and his recording of "September Song" from that play became very popular after his death.

Among Huston's more than 50 film roles were the lead in D.W. Griffith's *Abraham Lincoln* (1930); Frame Johnson in *Law and Order* (1932); and a celebrated performance as Scratch in *All That Money Can Buy* (1941). For his performance in *The Treasure of Sierra Madre,* directed by his son, John Huston, he received an Academy Award for best supporting actor (1948). He also appeared in several of his son's other films.

Huszgen, Johannes: *see* Oecolampadius, John.

Hutcheson, Francis (b. Aug. 8, 1694, Drumalig, County Down, Ire.—d. 1746, Glasgow), Scots-Irish philosopher and major exponent of the theory of the existence of a moral sense through which man can achieve right action.

The son of a Presbyterian minister, Hutcheson studied philosophy, classics, and theology at the University of Glasgow (1710–16) and then founded a private academy in Dublin in 1719. In 1729 he returned to Glasgow as professor of moral philosophy, a position he held until his death.



Hutcheson, oil painting by Allan Ramsay, *c.* 1740; in the University of Glasgow collection

By courtesy of the University of Glasgow

Hutcheson was licensed as a preacher in 1719 by Irish Presbyterians in Ulster, but in 1738 the Glasgow presbytery challenged his belief that people can have a knowledge of good and evil without, and prior to, a knowledge of God. His standing as a popular preacher was undiminished, however, and the celebrated Scottish philosopher David Hume sought his opinion of the rough draft of the section "Of Human Morals" in Hume's *Treatise of Human Nature.*

Hutcheson's ethical theory was propounded in his *Inquiry into the Original of Our Ideas of Beauty and Virtue* (1725), in *An Essay on the Nature and Conduct of the Passions and Affections, with Illustrations upon the Moral Sense* (1728), and in the posthumous *System of Moral Philosophy,* 2 vol. (1755). In his view, besides his five external senses, man has a variety of internal senses, including a sense of beauty, of morality, of honour, and of the ridiculous. Of these, Hutcheson considered the moral sense to be the most important. He believed that it is implanted in man and pronounces instinctively and immediately on the character of actions and affections, approving those that are virtuous and disapproving those that are vicious. Hutcheson's moral criterion was whether or not an act tends to promote the general welfare of mankind. He thus anticipated the Utilitarianism of the English thinker Jeremy Bentham, even to his use of the phrase "the greatest happiness for the greatest number." Hutcheson was also influential as a logician and theorist of human knowledge.

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Hutchins, Robert M(aynard) (b. Jan. 17, 1899, Brooklyn, N.Y., U.S.—d. May 17, 1977, Santa Barbara, Calif.), American educator and university and foundation president, who criticized over-specialization and sought to balance the college curriculum and to maintain the Western intellectual tradition.

After attending Oberlin College in Ohio (1915–17), he served in the ambulance service of the U.S. and Italian armies during World War I. He was graduated from Yale University (A.B., 1921) and Yale Law School (LL.B.,



Hutchins

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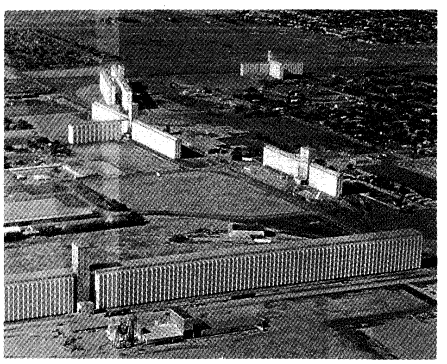
1925), where he was named dean in 1927. Two years later, at the age of 30, he became president of the University of Chicago; he remained at Chicago until 1951, the last six years as chancellor. A controversial administrator, he reorganized the departments for undergraduate and graduate study at Chicago. His Chicago Plan for undergraduates encouraged liberal education at earlier ages and measured achievement by comprehensive examination, rather than by classroom time served. He introduced study of the Great Books at various levels in the university. At the same time, Hutchins argued eloquently about the purposes of higher education. He deplored undue emphasis on nonacademic pursuits—Chicago abandoned intercollegiate football in 1939—and criticized the tendency toward specialization, vocationalism, and pragmatism of American educational institutions.

Hutchins was active in forming the Committee to Frame a World Constitution (1945), led the Commission on Freedom of the Press (1946), and vigorously defended academic freedom, leading opposition to faculty loyalty oaths in the 1950s. After serving as associate director of the Ford Foundation (from 1951), he became president of the Fund for the Republic (1954) and in 1959 founded the Center for the Study of Democratic Institutions (Santa Barbara, Calif.) as the fund's main activity. The Center was an attempt to approach Hutchins' ideal of "a community of scholars" engaged in serious dialogue on serious issues. It dealt with a wide range of issues—individual freedom, international order, ecological imperatives, the rights of minorities and of women, and the nature of the good life, among others.

From 1943 until his retirement in 1974 Hutchins was chairman of the Board of Editors of *Encyclopædia Britannica* and a director for Encyclopædia Britannica, Inc. He was editor in chief of the 54-volume *Great Books of the Western World* (1952) and coeditor, from 1961, with Mortimer J. Adler, of an annual, *The Great Ideas Today.*

Hutchins' views on education and public issues appeared in *No Friendly Voice* (1936), *The Higher Learning in America* (1936), *Education for Freedom* (1943), and others. Later books include *The University of Utopia* (1953) and *The Learning Society* (1968).

Hutchinson, city, seat (1872) of Reno County, south central Kansas, U.S., on the Arkansas River. Founded in 1872 by C.C. Hutchinson, an Indian agent, its establishment coincided with the arrival of the Santa Fe Railroad. Salt beds discovered there in 1887 became the basis of a major industry. Hutchinson is also a principal hard-wheat market and is the centre of one of the Middle West's richest oil fields. Its economy is based chiefly on these local resources. It is the site of the annual Kansas State Fair. Hutchinson Community Junior College was founded in 1928. Inc. 1872. Pop. (1982 est.) 40,411.



Grain elevators, Hutchinson, Kan.
Grant Heilman—EB Inc.

Hutchinson, Alfred (b. 1924, Hectorspruit, Transvaal, S.Af.—d. Oct. 14, 1972, Nigeria), writer and teacher noted for his imaginative experiments with language. His autobiography, *Road to Ghana* (1960), was highly acclaimed and translated into several languages. It tells of his escape from Johannesburg (via East Africa and Ghana) to the United Kingdom after he had been imprisoned in 1952 and charged with high treason in 1956 for opposing apartheid.

Hutchinson was graduated in education from the University College of Fort Hare and received his M.A. from the University of Sussex. He continued his teaching career in England until he moved to Nigeria in 1971. Hutchinson wrote a play, *The Rain-Killers* (published 1964), about the tensions between new and old ways of thought in a Swaziland village; a number of radio dramas, including "Fusane's Trial"; and several widely anthologized articles and short stories. *Road to Ghana,* however, is considered his most important work—for his skill in presenting in a simple and moving narrative his personal humiliations as a black in "white" South Africa and his subsequent escape from oppression there.

Articles are alphabetized word by word, not letter by letter

Hutchinson, Anne (baptized July 20, 1591, Alford, Lincolnshire, Eng.—d. August or September 1643, Pelham Bay, N.Y.), religious liberal who became one of the founders of Rhode Island after her banishment from Massachusetts Bay Colony.



Anne Hutchinson on trial, wood engraving after Edwin Austin Abbey, 19th century
The Granger Collection, New York

The daughter of a clergyman, she married William Hutchinson, a merchant, in 1612, and in 1634 they migrated to Massachusetts. Anne soon organized weekly meetings of Boston women to discuss recent sermons and to give expression to her own theological views. Before long her sessions attracted ministers and magistrates as well. She stressed the individual's intuition as a means of reaching God and salvation, rather than the observance of institutionalized beliefs and the precepts of ministers. Her opponents accused her of antinomianism—the view that God's grace has freed the Christian from the need to observe established moral precepts.

Her criticism of the Massachusetts Puritans for what she considered to be their narrowly legalistic concept of morality and her protests against the authority of the clergy were at first widely supported by Bostonians. John Winthrop, however, opposed her, and she lost much of her support after he won election as governor. She was tried by the General Court chiefly for "traducing the ministers," was convicted in 1637, and was sentenced to banishment. For a time in 1637–38 she was held in custody at the house of Joseph Weld, marshal of Roxbury, Mass. Refusing to recant, she was then tried before the Boston Church and formally excommunicated.

With some of her followers she established a settlement on the island of Aquidneck (now part of Rhode Island) in 1638. After the death of her husband in 1642, she settled on Long Island Sound, near present Pelham Bay. In 1643 she and most of her household were killed by Indians, an event regarded by some in Massachusetts as a manifestation of divine judgment.

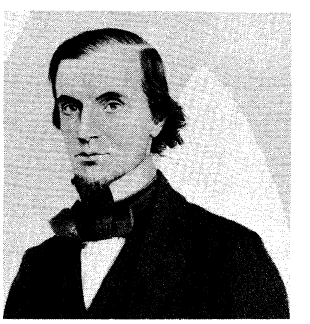
Hutchinson, G(eorge) Evelyn (b. Jan. 30, 1903, Cambridge, Cambridgeshire, Eng.), English-born American zoologist known for his ecological studies of freshwater lakes.

Hutchinson was educated at Greshams School in Holt, Norfolk, and at Cambridge; he lectured for two years at the University of the Witwatersrand in South Africa and then returned to take a master's degree at Cambridge. In 1928 he joined the faculty of Yale University and in 1941 became a U.S. citizen.

Hutchinson's earliest work was on aquatic ecosystems, particularly the systematics and distribution of aquatic Heteroptera (insects having mouthparts adapted to piercing and sucking). He studied the physical, biological, chemical, and meteorological conditions of lakes of the western Transvaal, South Africa; the Tibetan plateau; and northeastern North America. In 1935 he demonstrated the importance of the horizontal movements of water in stratified lakes in mixing the uppermost layers of water with the lowest layer. Later he obtained indisputable evidence of the circulation of phosphorus in stratified lakes and conducted a study of the chemistry of lake sediments. Not all of his work concerned the theoretical aspects of ecology, however, as can be seen in his later work on various aspects of evolution. Besides many important research papers, Hutchinson also wrote *The Clear Mirror* (1936), *The Itinerent Ivory Tower* (1953), *A Preliminary List of the Writings of Rebecca West, 1912–51* (1957), *A Treatise on Limnology*, 3 vol. (1957, 1967, 1975), *The Enchanted Voyage* (1962), *The Ecological Theater and the Evolutionary Play* (1965), *Introduction to Population Ecology* (1978), and *The Kindly Fruits of the Earth* (1979).

He was elected to the American Academy of Arts and Sciences in 1949 and to the National Academy of Science in 1950.

Hutchinson, Sir Jonathan (b. July 23, 1828, Selby, Yorkshire, Eng.—d. June 26, 1913, Haslemere, Surrey), British surgeon, pathologist, pioneer in the study of congenital syphilis.



Jonathan Hutchinson, detail of a lithograph
By kind permission of the President and Council of the Royal College of Surgeons of England

As Surgeon to the London Hospital (1859–83) and professor of surgery at the Royal College of Surgeons (1879–83), he became

an authority on eye and skin diseases, especially leprosy. He was best known, however, for his lifelong study of syphilis. He introduced "Hutchinson's triad" for the diagnosis of the inherited, or congenital, form of the disease: notched, narrow-edged permanent incisors (Hutchinson's teeth); interstitial keratitis, an inflammation with occlusion of the cornea of the eye; and labyrinthine disease, a disorder of the inner ear. He was knighted in 1908.

Hutchinson, Thomas (b. Sept. 9, 1711, Boston, Mass. [U.S.]—d. June 3, 1780, London, Eng.), royal governor of the British North American Province of Massachusetts Bay (1771–74) whose stringent measures helped precipitate colonial unrest and eventually the American Revolution (1775–83).

The son of a wealthy merchant, Hutchinson devoted himself to business ventures before beginning his public career (1737) as a member of the Boston Board of Selectmen and then the General Court (legislature) of Massachusetts Bay, where he served almost continuously until 1749. He continued to rise in politics by serving as a member of the state council (1749–66), chief justice of the Superior Court (1760–69), and lieutenant governor (1758–71).

Hutchinson was originally in harmony with his colleagues, even attending the Albany Congress of 1754, which projected a plan of union among the colonies. But he was deeply



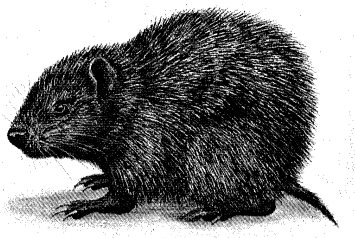
Thomas Hutchinson, detail of a portrait by Edward Truman; in the collection of the Massachusetts Historical Society
By courtesy of the Massachusetts Historical Society

Loyalist and resisted the gradual movement toward independence from the British crown. He was convinced that the rebellious spirit was only the work of such patriot hotheads as Samuel Adams, for whom he developed a deep enmity. Because many Bostonians considered that he had instigated the repugnant Stamp Act of 1765, a mob sacked his splendid Boston residence that year, destroying a number of valuable documents and manuscripts. Barely escaping with his life, the embittered Hutchinson from that time on increasingly distrusted the "common sort" and secretly advised Parliament to pass repressive measures that would emphasize that body's supremacy over the colonies.

Hutchinson was acting governor at the time of the Boston Massacre in 1770; he felt impelled to administer the letter of the British law and thus became more and more unpopular. Against the advice of both houses of the legislature, in 1773 he insisted that a shipment of imported tea be landed before being given clearance papers; this resulted in the Boston Tea Party, in which dissidents dumped the import into the harbour.

As the tension worsened, Hutchinson was replaced by General Thomas Gage as military governor (1774). He sailed to England and acted as an adviser to George III and to the British ministry on North American affairs; at that time he counseled moderation. He wrote *History of the Colony and Province of Massachusetts Bay,* 3 vol. (1764–1828).

hutia, any of several large, ratlike rodents of the family Capromyidae (order Rodentia) and the genera *Capromys, Geocapromys,* and



Bahaman hutia (*Geocapromys ingrahami*)
Painting by H. Douglas Pratt

Plagiodontia. Found in the forests and rough country of the Antilles and, reportedly, northern Venezuela, hutias are broad-headed, robust animals with small eyes and ears and coarse, yellowish to reddish brown or black fur. They are 20–60 cm (8–24 inches) long, excluding the tail, which is short in the Jamaican and Bahaman hutias (*Geocapromys*), longer in the Cuban and Hispaniolan hutias (*Capromys* and *Plagiodontia*). Hutias are primarily vegetarian. Cuban hutias are diurnal and arboreal; Jamaican and Bahaman hutias are terrestrial and nocturnal. The little-known Hispaniolan hutias are apparently nocturnal.

Hutias are becoming scarce in certain areas. The bushy-tailed hutia (*Capromys melanurus*) and dwarf hutia (*C. nanus*) of Cuba and the Bahaman and Haitian species are listed as rare in the *Red Data Book.* Their decline is presumably a consequence of hunting, for food and sport; destruction of the habitat; and predation by the mongoose, introduced from India. Two genera and several species are extinct.

Hutson, Don, byname of DONALD MONTGOMERY HUTSON (b. Jan. 31, 1913, Pine Bluff, Ark., U.S.), outstanding American professional football player (end) who, in his 11-year career from 1935 to 1945 in the National Football League (NFL), led the NFL in catching passes for a total of eight seasons, five of them consecutive. In addition, he was a skilled place-kicker and defensive halfback.

After graduation from the University of Alabama, Tuscaloosa, Hutson played with the Green Bay Packers of the NFL from 1935 through 1945. He led the league in scoring from 1940 through 1944; in touchdowns from 1935 through 1938 and from 1941 through 1944; in pass receptions in 1936, 1937, and 1939 and from 1941 through 1945; and in yards gained by pass receptions in 1936 and 1939 and from 1941 through 1944. In 1942, his greatest season, he set NFL records (subsequently tied or broken) by catching 74 passes for 1,211 yards and 17 touchdowns; he also kicked 33 points after touchdown and one field goal for a total of 138 points, which remained the NFL single-season scoring record until 1960. From Sept. 12, 1937, to Dec. 2, 1945, he caught at least one pass in each of 95 consecutive games. On his retirement he held NFL career records of 823 points, 105 total touchdowns, 100 touchdowns on passes caught, 488 pass receptions, and 7,991 yards gained by receiving passes.

Hutt River, river in southern North Island, New Zealand. It rises in the Tararua Range and, fed by the Pakuratahi, Mangaroa, Akatarawa, and Whakatikei rivers, flows south to enter Port Nicholson after a course of 35 miles (56 km). It supplies much of the fresh water used in the Wellington district.

The river valley, encompassing 250 square miles (650 square km) and known as Hutt, was settled under the auspices of the New Zealand Company in the 1840s and named for shareholder Sir William Hutt. It was previously an agricultural area but has become densely settled since the end of World War II. The valley is now a highly urbanized, industrialized part of the greater Wellington metropolitan area. It includes the cities of Lower Hutt and Upper Hutt and the boroughs of Petone and Eastbourne; Lower Hutt is the principal business and manufacturing centre.

Hutten, Philipp von, also called PHILIPP VON URRE, or PHILIPP VON UTRE (b. *c.* 1511, Königshofen, Lower Franconia [now in Germany]—d. 1546, Venezuela), last German captain general of Venezuela.

A relative of the humanist poet and satirist Ulrich von Hutten, he sailed to Venezuela under Georg Hohermuth (called George of Spires) to rule on behalf of the Augsburg banking house of Welser, which had been granted a concession by the Holy Roman emperor Charles V in 1528. The party landed at Coro in February 1535. When Hohermuth died in December 1540, Hutten became captain general.

He soon began five years' exploration of Venezuela's interior. During his absence from Coro, a Spaniard, Juan de Carvajal, was appointed governor in his place. On Hutten's return, he and a traveling companion, Bartholomew Welser the younger, were executed by the Spanish authorities, terminating the Welsers' venture.

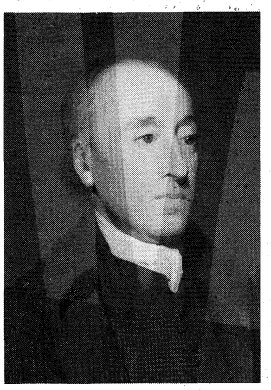
Hutterite, member of HUTTERIAN BRETHREN, Anabaptist sect that found refuge from persecution in Moravia and the Tirol; it stressed community of goods on the model of the primitive church in Jerusalem. The community, which acquired the name of its charismatic leader, Jakob Hutter (tortured and burned as a heretic in 1536), still survives, mostly in the western sections of the United States and Canada with a population of about 20,000. In colonies of 60 to 150 persons, they operate collective farms (*Bruderhof*) and, not unlike the Old Order Amish, remain aloof from outside society, taking no part in politics. Children are educated inside the colony until age 14 or until a minimum age decreed by state or province.

Persecutions drove the Hutterites to Hungary, the Ukraine, and in the 1870s to South Dakota; during World War I, because of persecution inspired by their pacifism, they migrated to Canada. After the war, many returned to the United States. Their high annual birth rate (45.9 per 1,000) has necessitated new colonies, sometimes to the displeasure of neighbours who distrust their communal life, object to their pacifism, and generally misunderstand their unorthodox way of life. Some areas have passed legislation to hinder the growth of Hutterite colonies. *See also* Amish; Mennonite.

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Hutton, James (b. June 3, 1726, Edinburgh, Scot.—d. March 26, 1797, Edinburgh), Scottish geologist, chemist, naturalist, and originator of one of the fundamental principles of geology—uniformitarianism, which explains the features of the Earth's crust by means of natural processes over geologic time.

Hutton was the son of a merchant and city officeholder. Though Hutton's father died when his son was quite young, Hutton managed an education in the local grammar school and at the University of Edinburgh. Although already interested in chemistry, he entered the legal profession. But as a lawyer's apprentice, he is said to have devoted more time to amusing his fellow clerks with chemical experiments than to copying legal documents. He, along with his friend James Davie, was also deeply



Hutton, detail of an oil painting by Sir Henry Raeburn; in the collection of Lord Bruntisfield

By courtesy of Lord Bruntisfield

interested in investigating the manufacture of sal ammoniac from coal soot. As a result, he was released from law apprenticeship before his first year was out, and he turned to the study of medicine as most closely related to chemistry. He spent three years at the University of Edinburgh, then two in Paris, and finally was granted his M.D. degree in Holland in September 1749.

But medicine held small appeal for him. His association with Davie in developing an inexpensive method for the manufacture of sal ammoniac proved financially rewarding, and so Hutton decided to take up farming in Berwickshire, England. By 1765 both the farm and the company producing sal ammoniac were prospering, and with a good income available, he gave up farming in 1768 to establish himself in Edinburgh, where he could pursue his scientific interests.

Hutton devoted his time to extensive scientific reading and traveled widely to inspect rocks and observe the actions of natural processes. His chief contribution to scientific knowledge, the uniformitarian principle, was put forward in his papers presented to the Royal Society of Edinburgh in 1785. Two of these papers were published in 1788 in the *Transactions of the Royal Society of Edinburgh* under the title "Theory of the Earth; or an Investigation of the Laws Observable in the Composition, Dissolution, and Restoration of Land Upon the Globe."

Hutton's view as stated in these papers was that the world's geologic phenomena can be explained in terms of observable processes, and that those processes now at work on and within the Earth have operated with general uniformity over immensely long periods of time. These two papers marked a turning point for geology; from that time on, geology became a science founded upon the principle of uniformitarianism.

Hutton's ideas were astonishing when viewed in the context of the opinion of his day. By the late 18th century, much knowledge had been gained about rocks, strata, and fossils, but none of this wealth of data had been synthesized into a workable general theory of geology. Such a task was seriously impeded by the still-accepted belief that the Earth had been created only about 6,000 years ago, according to the narrative in the biblical book of Genesis. The world's sedimentary rocks were believed by some geologists to have been formed when immense quantities of minerals precipitated out of the waters of the biblical flood. Erosional processes had long been recognized, but there was no equivalent explanation for the creation of land surfaces, as opposed to their destruction by erosion. The significance of rock formation by means of volcanism and other heat-generated processes in the Earth's crust was almost completely unrecognized, as was the existence of igneous rocks in general.

Hutton's ideas were diametrically opposed to much of this contemporary theory. He asserted that many rocks had indeed been formed by sedimentary processes—*i.e.,* that rock particles had been washed off the land into the oceans, had accumulated in beds there, and had solidified into rocks. But he posited that the solidification into rocks was due not to the particles' simple precipitation out of a watery solution but rather was due to the effects of pressure and heat, an explanation which stands to the present day. Hutton asserted that the wearing down of land surfaces by erosion was countered by the formation of new land surfaces due to volcanism and other processes in which the internal heat of the Earth brought new rock constitutents up to the Earth's surface. These new mountains and other landforms were then in turn eroded and were deposited as sediments in the sea, from which they could be upthrust into new land surfaces by subterranean heat-generated processes.

Hutton claimed that the totality of these geologic processes could fully explain the current landforms all over the world, and no biblical explanations were necessary in this regard. Finally, he stated that the processes of erosion, deposition, sedimentation, and upthrusting were cyclical and must have been repeated many times in the Earth's history. Given the enormous spans of time taken by such cycles, Hutton asserted that the age of the Earth must be inconceivably great.

Hutton summarized his views and provided ample observational evidence for his conclusions in a work published in two volumes, *Theory of the Earth,* in 1795. A third volume was partly finished at the time of Hutton's death.

Although Hutton's ideas received a fairly wide circulation among European scientists, their immediate impact was blunted by the fact that Hutton's writing style was difficult to understand. Fortunately, his close friend John Playfair wrote a clear and precise condensation of Hutton's work, embellished with additional observations of his own, and published it in 1802 under the title *Illustrations of the Huttonian Theory of the Earth.* It went far toward establishing the correctness of uniformitarianism, the cornerstone on which the science of geology is erected.

BIBLIOGRAPHY. John Playfair, "Biographical Account of the Late Dr. James Hutton, F.R.S., Edin.," *Transactions of the Royal Society of Edinburgh,* 5:39–99 (1805), an authoritative biographical account written by a close friend; E.B. Bailey, *James Hutton: The Founder of Modern Geology* (1967), a biographical account by a distinguished geologist with a detailed commentary on Hutton's geological work.

Hutu, also called BAHUTU, or WAHUTU, Bantu-speaking people of Rwanda and Burundi. Numbering about 9,500,000 in the late 20th century, the Hutu comprise the vast majority in both countries but were traditionally subject to the Tutsi (*q.v.*), warrior-pastoralists of Nilotic stock. The Hutu are generally stocky, with muscular frames, but intermixing with the Tutsi has given many of them a lighter skin and a more slender body structure.

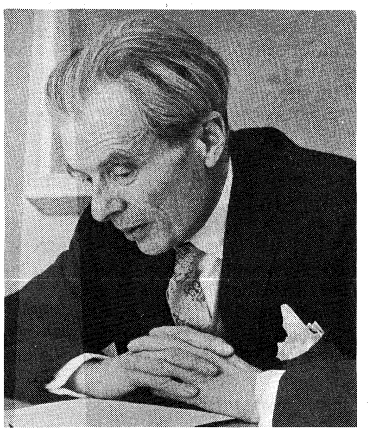
When the Hutu first entered the area, they found it inhabited by the Twa, Pygmy hunters whom they forced to retreat. Hutu life centred on small-scale agriculture, and social organization was based on the clan, with petty kings (*bahinza*) ruling over limited domains. The Tutsi in turn entered the area in the 14th or 15th century and gradually subjugated the Hutu, forcing them into a lord–vassal relationship. The Tutsi remained dominant in Rwanda until the period 1959–61, when the Hutu expelled most of the Tutsi from the country and took over control of the government. An unsuccessful Hutu coup attempt took place in Burundi in 1965, and that country's Hutu remained subordinate under a Tutsi-dominated military government.

The Hutu and Tutsi cultures have been largely integrated. The Tutsi adopted the mutually intelligible Bantu languages of Rwanda and Rundi, which were originally spoken by the Hutu. The Hutu's kinship and clan system is probably derived from Tutsi culture, as is the central importance of cattle. The Hutu and the Tutsi adhere essentially to the same religious beliefs, which include forms of animism and (today) Christianity.

Huxley, Aldous (Leonard) (b. July 26, 1894, Godalming, Surrey, Eng.—d. Nov. 22, 1963, Los Angeles), English novelist and critic gifted with an acute and far-ranging intelligence. His works were notable for their elegance, wit, and pessimistic satire.

Aldous Huxley was a grandson of the prominent biologist T.H. Huxley and was the third child of the biographer and man of letters Leonard Huxley. He was educated at Eton, during which time he became partially blind owing to keratitis. He retained enough eyesight to read with difficulty, and he graduated from Balliol College, Oxford, in 1916. He published his first book in 1916 and worked on the periodical *Athenaeum* from 1919 to 1921. Thereafter he devoted himself largely to his own writing and spent much of his time in Italy until the late 1930s, when he settled in California.

Huxley established himself as a major author in his first two published novels, *Crome Yellow* (1921) and *Antic Hay* (1923); these are witty and malicious satires on the pretensions of the English literary and intellectual coteries of his day. *Those Barren Leaves* (1925) and *Point Counter Point* (1928) are works in a similar vein. Huxley's deep distrust of 20th-century trends in both politics and technology found expression in *Brave New World* (1932), a nightmarish vision of a future soci-



Aldous Huxley, 1959

Robert M. Quittner—Black Star

ety in which psychological conditioning forms the basis for a scientifically determined and immutable caste system. The novel *Eyeless in Gaza* (1936) continues to shoot barbs at the emptiness and aimlessness experienced in contemporary society, but it also shows Huxley's growing interest in Hindu philosophy and mysticism as a viable alternative. Many of his subsequent works reflect this preoccupation, notably *The Perennial Philosophy* (1946).

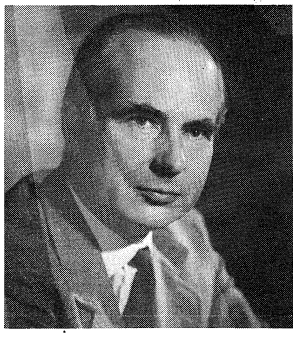
Huxley's most important later works are *The Devils of Loudun* (1952), a brilliantly detailed psychological study of a historical incident in which a group of 17th-century French nuns were allegedly the victims of demonic possession; and *The Doors of Perception* (1954), a book about Huxley's experiences with the hallucinogenic drug mescaline.

MAJOR WORKS. *The Defeat of Youth* (1918); *Limbo* (1920); *Crome Yellow* (1921); *Antic Hay* (1923); *Jesting Pilate* (1926); *Point Counter Point* (1928); *Brave New World* (1932); *Eyeless in Gaza* (1936); *Grey Eminence* (1941); *The Perennial Philosophy* (1946); *Ape and Essence* (1949); *The Doors of Perception* (1954); *Collected Essays* (1958); *Literature and Science* (1963).

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Huxley, Sir Andrew Fielding (b. Nov. 22, 1917, Hampstead, London), English physiologist, co-winner (with Sir Alan Hodgkin and Sir John Carew Eccles) of the 1963 Nobel Prize for Physiology or Medicine. His researches centred on nerve and muscle fibres. He received a knighthood in 1974.

Andrew Fielding, a grandson of the biologist T.H. Huxley and son of the biographer and man of letters Leonard Huxley, received his M.A. from Trinity College, Cambridge, where



Andrew Fielding Huxley
Walter Bird

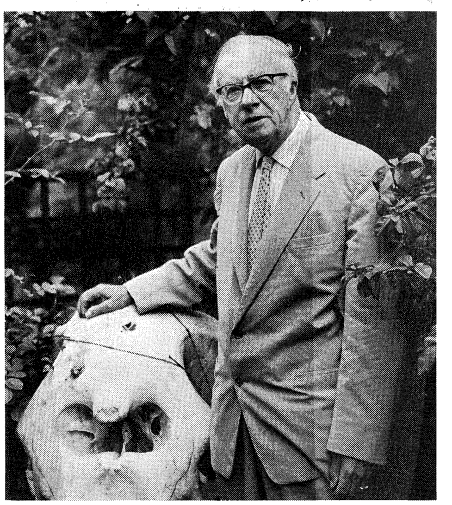
later, from 1941 to 1960, he was a fellow and then director of studies, a demonstrator, an assistant director of research, and finally a reader in experimental biophysics in the Department of Physiology. In 1960 he went to University College, London, first as Jodrell professor and then, from 1969, as Royal Society Research Professor, in the Department of Physiology. Huxley and Hodgkin's researches were concerned largely with the physicochemical analysis of the fundamental phenomena involved in the excitation in a peripheral nerve fibre and in conduction of excitation along it. Apart from the researches directly mentioned in the Nobel citation, Huxley made contributions of fundamental importance to knowledge of the process of contraction by a muscle fibre. He published many important papers in periodicals, particularly in the *Journal of Physiology*. His Sherrington Lectures were published as *Reflections on Muscle* (1980). (C.Bi.)

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Huxley, Hugh Esmor (b. Feb. 25, 1924, Birkenhead, Cheshire, Eng.), English molecular biologist whose study (with Jean Hanson) of muscle ultrastructure using the techniques of X-ray difraction and electron microscopy led him to propose the sliding-filament theory of muscle contraction. An explanation for the conversion of chemical energy to mechanical energy on the molecular level, the theory states that two muscle proteins, actin and myosin, arranged in partially overlapping filaments, slide past each other through the activity of the energy-rich compound adenosine triphosphate (ATP), during muscle contraction.

Huxley worked on the development of radar equipment for the Royal Air Force (1943–47), for which he was made a member of the Order of the British Empire. After the war he received his Ph.D. from Cambridge University (1952), and then worked at the Massachusetts Institute of Technology (1952–54), Cambridge (1953–56), and University College, London (1956–61). In 1962 he became a member of the Medical Research Council's Laboratory of Molecular Biology at Cambridge.

Huxley, Sir Julian (Sorell) (b. June 22, 1887, London—d. Feb. 14, 1975, London), English biologist, philosopher, educator, and



Sir Julian Huxley with the skull of an elephant, 1967
Horst Tappe—EB Inc.

author who greatly influenced the modern development of embryology, systematics, and studies of behaviour and evolution.

Julian, a grandson of the prominent biologist T.H. Huxley and the oldest son of the biographer and man of letters Leonard Huxley, was educated at Eton and Balliol College, Oxford, and saw service during World War I. His scientific researches included important work on hormones, developmental processes, ornithology, and ecology. He worked for some years at the Rice Institute in Houston, Texas; became professor of zoology at King's College, London University; served for seven years as secretary to the Zoological Society of London, transforming the zoo at Regent's Park and being actively involved in the development of that at Whipsnade in Bedfordshire; and became a Fellow of the Royal Society. In 1919 he married Marie Juliette Baillot, daughter of a Swiss lawyer, by whom he had two sons: Anthony Julian Huxley, who conducted valuable operational research on aircraft, became an authority on exotic garden plants, and produced the standard encyclopaedia on mountains, and Francis Huxley, who became a lecturer in social anthropology at Oxford. Julian Huxley was the first director general of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1946–48. He was knighted in 1958. A biography *The Huxleys* by Ronald W. Clark was published in 1968. (C.Bi.)

MAJOR WORKS. *The Individual in the Animal Kingdom* (1912); *Essays of a Biologist* (1923); *Religion Without Revelation* (1927); with H.G. and G.P. Wells, *The Science of Life*, 3 vol. (1929–30); *Ants* (1930); *Bird-Watching and Bird Behaviour* (1930); *What Dare I Think?* (1931); *A Scientist Among the Soviets* (1932); *Problems of Relative Growth* (1932); *The Captive Shrew* (poems, 1932); with Sir Gavin de Beer, *The Elements of Experimental Embryology* (1934); *The Beginnings of Life* (1938); *The Uniqueness of Man* (1941); *Evolution: The Modern Synthesis* (1942); *On Living in a Revolution* (1944); *Soviet Genetics and World Science* (1949); *Evolution in Action* (1953); *New Bottles for New Wine* (1957); *From an Antique Land* (1954); *The Human Crisis* (1963); *Essays of a Humanist* (1964); *Memories*, 2 vol. (1970–73).

Huxley, T(homas) H(enry) (b. May 4, 1825, Ealing, Middlesex, Eng.—d. June 29, 1895, Eastbourne, Sussex), English biologist whose speculations on philosophy and religion and whose promotion of Darwinism led him to an advocacy of agnosticism.

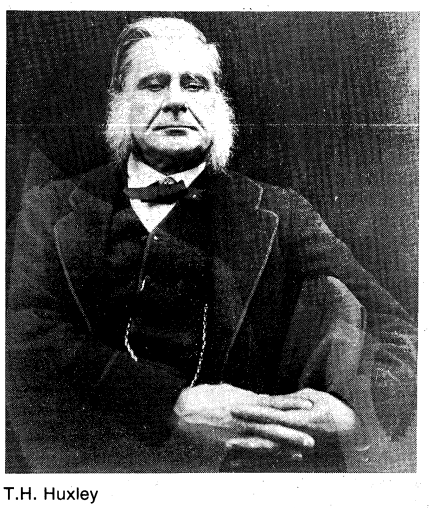
Early promise. T.H. Huxley was the seventh of eight children of George Huxley, a schoolmaster, and Rachel Huxley (*née* Withers). Although the family was not actually poor, there was never money to spare. In 1833 Thomas began attending Ealing school (at which his father taught mathematics until 1835, when his post terminated for some obscure reason). Thomas thus had only two years' schooling, between the ages of 8 and 10. Perhaps this was as well, for later he wrote,

> the society I fell into at school was the worst I have ever known . . . the people who were set over us cared about as much for our intellectual and moral welfare as if they were babyfarmers.

Apart from his admirable mother, whom T.H. Huxley resembled both physically and temperamentally, the family was not auspicious. Of the eight children, only Thomas and his favourite sister, Eliza, seem to have led fairly stable lives, and even she became involved in an odd affair about a legacy and emigrated to Tennessee with her husband.

Little is recorded of T.H. Huxley's life for a few years after 1835, but it is known that he taught himself German; that at the age of 12 he was reading advanced works on geology and logic; and that during early adolescence he was recording the results of simple, self-conducted scientific experiments. Huxley wanted to become an engineer but never had the chance. At the age of 15 he was apprenticed to a medical practitioner in London's poverty-stricken East End but soon secured a free scholarship at Charing Cross Hospital Medical School in central London. Despite a tendency to follow his own intellectual inclinations instead of the prescribed courses, he carried off several prizes at the medical school and had his first research paper published while he was still a student.

In his 21st year, Huxley's scholarship came to an end, and, though still unqualified, he secured a posting as assistant surgeon with HMS "Rattlesnake," a cockroach-ridden frigate being fitted out for exploration in the southern seas. For the next four years, wherever the ship sailed, Huxley—with his microscope lashed down against the ship's pitching and tossing and with such primitive aids as a



T.H. Huxley
By courtesy of the Gernsheim Collection, The University of Texas at Austin

wire-mesh meat safe adapted as dredge—studied marine specimens. From each port he packeted his observations back home, where they were accepted by such journals as those of the Royal Society and the Royal Institution. When eventually he returned to England in October 1850, the leading biologists of the day

were all anxious to make the acquaintance of this brilliant young newcomer to their ranks.

T.H. Huxley immediately and effectively manoeuvred to ensure special treatment from the Royal Navy. He managed to secure three years' leave, on pay, for research on specimens collected during his voyage. He had hoped that one day he might be able to study for a degree, but, after being elected fellow of the Royal Society within a year of his return, at the early age of 26, he naturally enough did not bother to do so. His only degree "qualifications" thus were honorary doctorates—from Breslau, Edinburgh, Dublin, Cambridge, Würzburg, Oxford, Bologna, and Erlangen.

During the 1850s Huxley established his reputation by publishing important papers on animal individuality, the cephalous mollusks (*e.g.,* squids), the methods of paleontology, the methods and principles of science and science education, the structure and functions of nerves, and the theory of the vertebrate skull. In 1854, however, he was struck off the Navy List for rejecting a thrice-repeated Admiralty order to return to active service—blandly insisting that not all his researches were as yet published. He was by now extremely anxious to marry, for, while ashore in Sydney from the "Rattlesnake," he had met Henrietta Anne Heathorn and had immediately fallen in love with her. Because there were few paid scientific posts, he contemplated settling in Australia, where a job in brewing would have enabled him to get married. Eventually, however, he was able to secure a part-time (later full-time) lectureship at the tiny government School of Mines in London and began to make additional earnings by his prolific pen; in 1855, his fiancée came to England, and they were soon married. For the rest of his life—despite extremely attractive offers from Edinburgh, Oxford, Harvard, and other universities—Huxley stayed with his original institution, gradually transforming it, first into the Normal School of Science and then into the great Royal College of Science. T.H. Huxley's marriage was singularly happy. His wife bore him eight children, and their family life was unusually warm and relaxed. Noel, their first-born, died in infancy, but the other seven all survived to display some sort of real ability, predominantly in arts and letters.

Widening spheres of influence. In 1859 Charles Darwin's *Origin of Species* burst like a bombshell on the 19th-century scene. Huxley, despite his youth, was one of three scientists (the others were Sir Joseph Dalton Hooker and Sir Charles Lyell) whose blessing Darwin sought before publication. A close attachment developed between the two men, and, while Darwin kept as far as possible out of the fray, Huxley became his "bulldog" for the next tumultuous decade, acting as his chief public supporter.

The most notable occasion of the Darwinian debate came in 1860 at the meeting at Oxford University of the British Association for the Advancement of Science. Bishop Samuel Wilberforce had decided that this gathering presented an opportunity to squash the "dangerous" new evolutionary theory, and the assembly room was crowded. Huxley sat quietly while the bishop spoke "with inimitable spirit, emptiness and unfairness." Wilberforce made the fatal error of voicing an offensive personal inquiry about Huxley's simian ancestry, whereupon Huxley murmured to his neighbour, "The Lord hath delivered him into mine hands." Soon the meeting was calling out for him to reply, which he did with devastating effect:

> If . . . the question is put to me, would I rather have a miserable ape for a grandfather or a man highly endowed by nature and possessed of great means of influence, and yet who employs these faculties and that influence for the mere purpose of introducing ridicule into a grave scientific discussion—I unhesitatingly affirm my preference for the ape.

The significance of this occasion was not merely that it secured a somewhat fair hearing for Darwin's theory but that science had made its declaration of independence from theology.

During the 1860s Huxley did valuable work in paleontology, taxonomy (especially the classification of birds), and ethnology. He served as secretary and later as president of the Geological Society, was Hunterian professor at the Royal College of Surgeons and president of the Ethnological Society, and acted on several royal commissions. He became honorary principal of the South London Working Men's College, was an active member of the Metaphysical Society, and served on the Jamaica committee set up (though unsuccessfully) to secure the murder trial of Gov. Edward John Eyre, who had suppressed a colonial uprising with some brutality. He also lectured throughout the country—not only to scientific societies but also to semipopular audiences and to the artisans whom he always held in such high esteem.

The 1870s saw a decisive development of Huxley's influence on educational reform. He was the dominant member of the first London School Board, and as such he did much to set the organizational pattern of English popular elementary education for the next 75 years. Through his personal influence on people in power, and through his essays and public addresses, he also played a major part in the reorganization of British and many other institutions of higher education. Even during the current scientific and technological revolution, his views on education have retained a remarkable relevance.

During this period he contributed authoritative articles to the 9th edition of *Encyclopædia Britannica,* published several seminal textbooks of science, and began the first courses of effective practical training for science teachers. He became secretary (later president) of the Royal Society and a senator of London University. He visited the United States to speak at the opening of Johns Hopkins University in Baltimore, served as reforming rector of Aberdeen University in Scotland, and gave notable help to the Working Men's Club and Institute Union. As a governor of Eton College (Buckinghamshire), he provided the chief motivating force for the college's development of science teaching, and he cajoled the wealthy guilds and livery companies of the City of London into putting some of their vast funds into the promotion of technical education. At the same time, he taught full-time at the School of Mines, under its successive titles, and continued his own researches.

In 1878, wishing to study the philosophy of Aristotle in the original Greek, he began teaching himself that language (he had long spoken French and German, had been reasonably competent in Italian, and was a fair translator of Latin). His interest in philosophy deepened, and—although he was never technically a philosopher—some of his writings on David Hume, George Berkeley, and René Descartes are still illuminating. He was deeply interested in theology and he coined the word agnostic—now a common term—to indicate his own intellectual position.

In 1885 Huxley resigned his professorship at what was by then the Normal School of Science but continued as its honorary (though by no means inactive) dean. He thought he had only a short time to live; but in fact his health permitted his engaging in many exciting disputations—from which he usually emerged the victor—with theologians, politicians, and, indeed, anyone he considered either intellectually dishonest or inclined to suppress intellectual freedom. He finally left London in 1889, moving to Eastbourne, a quiet resort on the south coast of England. From there he continued to conduct sparkling controversy by writing, and, most fittingly, it was in the middle of debate—with one half of an essay in print, the rest in proof—that he died, of influenza and bronchitis. A few days later, on July 4, 1895, he was buried, without religious ceremony, at Finchley, now part of north London.

Assessment. Huxley's eminence won worldwide recognition. Leaving quite aside his dominant position at home, he was honoured by at least 53 scientific societies overseas, in Egypt, Russia, Sweden, Italy, New Zealand, the United States, Austria, Prussia, Belgium, The Netherlands, and many other countries.

Although there have been greater scientists than he, there have been few as influential over such a wide field of scientific development, as effective in the total movement of thought and action within his own generation, and as relevant to successive generations.

(C.Bi.)

MAJOR WORKS. *Evidence as to Man's Place in Nature* (1863); *An Introduction to the Classification of Animals* (1869); *Lessons in Elementary Physiology* (1866); *Protoplasm: The Physical Basis of Life* (1869); *Lay Sermons, Addresses and Reviews* (1870; 3rd enlarged ed., 1895); *A Manual of the Anatomy of Vertebrated Animals* (1871); *More Criticisms on Darwin, and Administrative Nihilism* (1872); *Critiques and Addresses* (1873); *A Manual of the Anatomy of Invertebrated Animals* (1877); *Physiography* (1877); *American Addresses* (1877); *Hume* (1878); *The Crayfish: An Introduction to the Study of Zoology* (1880); *Science and Culture* (1881); *Essays upon Some Controverted Questions* (1892); *Evolution and Ethics* (1893); *T.H. Huxley's Diary of the Voyage of H.M.S. Rattlesnake,* ed. by Julian Huxley (1935). Many of Thomas Huxley's more general writings were republished in his *Collected Essays,* 9 vol. (1894–1908). Most of his research papers were republished after his death in his *Scientific Memoirs,* 5 vol. (1898–1903).

BIBLIOGRAPHY. The standard biography—Leonard Huxley, *Life and Letters of Thomas Henry Huxley* (1900)—is still valuable as a framework, but it displays some strange errors and omissions, especially relating to family matters and its subject's more radical views. There have been many later biographies, few of them containing anything new. Of some value are Edward Clodd, *Thomas Henry Huxley* (1902); Clarence E. Ayres, *Huxley* (1932); Ernest W. MacBride, *Huxley* (1934); and Houston Peterson, *Huxley: Prophet of Science* (1932). The first really fresh full study is Cyril Bibby, *T.H. Huxley: Scientist, Humanist, and Educator* (1959). Bibby has also produced three other substantial studies: *The Essence of T.H. Huxley* (1967), *T.H. Huxley on Education* (1971), and *Scientist-Extraordinary: The Life and Scientific Work of T.H. Huxley* (1972). These four volumes give bibliographic references to a considerable number of research papers on various aspects of Huxley's life and work. There is additional material of interest in Julian Huxley (ed.), *T.H. Huxley's Diary of the Voyage of H.M.S. Rattlesnake* (1935). For detailed reference to scientific researches, see Michael Foster and E. Ray Lankester (eds.), *The Scientific Memoirs of T.H. Huxley,* 5 vol. (1898–1903).

Huy, town, Liège province, south central Belgium, situated in the Meuse Valley at the confluence of the Meuse and Hoyoux rivers, 19 mi (30 km) southwest of Liège. First mentioned in a document dating from 636, the town was part of the Bishopric of Liège from 985 to 1794. A prosperous crafts (including metalworking, cloth making, tanning, wine making, and brewing) and commercial centre in the Middle Ages, Huy was the first place in the Holy Roman Empire to receive a civic charter, the Charte de Théoduin, in 1066. Peter the Hermit, after the Council of Clermont, preached the First Crusade in Huy in 1095 and later founded the abbey of Neufmoustier

(now in ruins) nearby. The town declined in prosperity during the 15th century despite the development of ironworking. In the 1600s, it was embroiled with the rest of the Meuse Valley in the wars between Louis XIV of France and the Habsburgs. Joseph Lebeau, a statesman influential in the founding of the Kingdom of Belgium in 1831 and later prime minister of foreign affairs to Leopold I, was born in Huy.

Today steel, machinery, paper, pewter, and pottery are manufactured in the town and wheat, oats, and rye are grown nearby. Coal mines are also found in the area. Huy is dominated by its citadel, the Chestia, built by the Dutch (1818–23) on the site of a 10th-century episcopal castle (demolished in 1717) around which the town grew. The citadel was used by the Germans as an internment camp in World War II. The Collegiate Church of Notre-Dame (built 1311–1536) is a Gothic structure with a noteworthy rose window. Pop. (1983 est.) mun., 17,544.

Huyen Phu So (Vietnamese philosopher): *see* Huynh Phu So.

Huygens, Christiaan, also spelled CHRISTIAN HUYGHENS (b. April 14, 1629, The Hague—d. July 8, 1695, The Hague), Dutch mathematician, astronomer, and physicist,



Christiaan Huygens, portrait by C. Netscher, 1671; in the Collection Haags Gemeentemuseum, The Hague

By courtesy of the Collection Haags Gemeentemuseum, The Hague

who founded the wave theory of light, discovered the true shape of the rings of Saturn, and made original contributions to the science of dynamics—the study of the action of forces on bodies.

Huygens was from a wealthy and distinguished middle-class family. His father, Constantijn Huygens, a diplomat, Latinist, and poet, was the friend and correspondent of many outstanding intellectual figures of the day, including the scientist and philosopher René Descartes. From an early age, Huygens showed a marked mechanical bent and a talent for drawing and mathematics. Some of his early efforts in geometry impressed Descartes, who was an occasional visitor to the Huygens' household. In 1645 Huygens entered the University of Leiden, where he studied mathematics and law. Two years later he entered the College of Breda, in the midst of a furious controversy over the philosophy of Descartes. Although Huygens later rejected certain of the Cartesian tenets including the identification of extension and body, he always affirmed that mechanical explanations were essential in science, a fact that later was to have an important influence on his mathematical interpretation of both light and gravitation.

In 1655 Huygens for the first time visited Paris, where his distinguished parentage, wealth, and affable disposition gave him entry to the highest intellectual and social circles. During his next visit to Paris in 1660, he met Blaise Pascal, with whom he had already been in correspondence on mathematical problems. Huygens had already acquired a European reputation by his publications in mathematics, especially his *De Circuli Magnitudine Inventa* of 1654, and by his discovery in 1659 of the true shape of the rings of Saturn—made possible by the improvements he had introduced in the construction of the telescope with his new method of grinding and polishing lenses. Using his improved telescope, he discovered a satellite of Saturn in March 1655 and distinguished the stellar components of the Orion nebula in 1656. His interest, as an astronomer, in the accurate measurement of time then led him to his discovery of the pendulum as a regulator of clocks, as described in his *Horologium* (1658).

In 1666 Huygens became one of the founding members of the French Academy of Sciences, which granted him a pension larger than that of any other member and an apartment in its building. Apart from occasional visits to Holland, he lived from 1666 to 1681 in Paris, where he made the acquaintance of the German mathematician and philosopher Gottfried Wilhelm Leibniz, with whom he remained on friendly terms for the rest of his life. The major event of Huygens' years in Paris was the publication in 1673 of his *Horologium Oscillatorium.* That brilliant work contained a theory on the mathematics of curvatures, as well as complete solutions to such problems of dynamics as the derivation of the formula for the time of oscillation of the simple pendulum, the oscillation of a body about a stationary axis, and the laws of centrifugal force for uniform circular motion. Some of the results were given without proof in an appendix, and Huygens' complete proofs were not published until after his death.

The treatment of rotating bodies was partly based on an ingenious application of the principle that in any system of bodies the centre of gravity could never rise of its own accord above its initial position. Earlier Huygens had applied the same principle to the treatment of the problem of collisions, for which he had obtained a definitive solution in the case of perfectly elastic bodies as early as 1656, although his results remained unpublished until 1669.

The somewhat eulogistic dedication of the *Horologium Oscillatorium* to Louis XIV brought to a head murmurs against Huygens at a time when France was at war with Holland, but in spite of this he continued to reside in Paris. Huygens' health was never good, and he suffered from recurrent illnesses, including one in 1670 which was so serious that for a time he despaired of his own life.

A serious illness in 1681 prompted him to return to Holland, where he intended to stay only temporarily. But the death in 1683 of his patron, Jean-Baptiste Colbert, who had been Louis XIV's chief adviser, and Louis's increasingly reactionary policy, which culminated in the revocation (1685) of the Edict of Nantes, which had granted certain liberties to Protestants, militated against his ever returning to Paris.

Huygens visited London in 1689 and met Sir Isaac Newton and lectured on his own theory of gravitation before the Royal Society. Although he did not engage in public controversy with Newton directly, it is evident from Huygens' correspondence, especially that with Leibniz, that in spite of his generous admiration for the mathematical ingenuity of the *Principia,* he regarded a theory of gravity that was devoid of any mechanical explanation as fundamentally unacceptable. His own theory, published in 1690 in his *Discours de la cause de la pesanteur* ("Discourse on the Cause of Gravity"), though dating at least to 1669, included a mechanical explanation of gravity based on Cartesian vortices. Huygens' *Traité de la Lumière (Treatise on Light),* already largely completed by 1678, was also published in 1690. In it he again showed his need for ultimate mechanical explanations in his discussion of the nature of light. But his beautiful explanations of reflection and refraction—far superior to those of Newton—were entirely independent of mechanical explanations, being based solely on the so-called Huygens' principle of secondary wave fronts.

As a mathematician Huygens had great talent rather than genius of the first order. He sometimes found difficulty in following the innovations of Leibniz and others, but he was admired by Newton because of his love for the old synthetic methods. For almost the whole of the 18th century his work in both dynamics and light was overshadowed by that of Newton. In gravitation his theory was never taken seriously and remains today of historical interest only. But his work on rotating bodies and his contributions to the theory of light were of lasting importance. Forgotten until the early 19th century, these latter appear today as one of the most brilliant and original contributions to modern science and will always be remembered by the principle bearing his name.

The last five years of Huygens' life were marked by continued ill health and increasing feelings of loneliness and melancholy. He made the final corrections to his will in March 1695 and died after much suffering later that same year. (J.He.)

BIBLIOGRAPHY. Christiaan Huygens, *Traité de la lumière: avec, un discours de la pesanteur* (1690; *Treatise on Light,* 1912), in which are explained the causes of that which occurs in reflexion and in refraction and particularly in the strange refraction of Iceland crystals; *Oeuvres complètes* (1888–1950), vol. 1–10 contains correspondence, vol. 22 biography and portraits; A.E. Bell, *Christiaan Huygens and the Development of Science in the Seventeenth Century* (1947); H.L. Brugmans, *Le Séjour de Christian Huygens à Paris et ses relations avec les milieux scientifiques français* (1935).

Huygens, Constantijn (b. Sept. 4, 1596, The Hague—d. March 28, 1687, The Hague), the most versatile and the last of the true Dutch Renaissance virtuosos, who made notable contributions in the fields of diplomacy, scholarship, music, poetry, and science.



Constantijn Huygens, oil painting by Adriaan Hanneman, 1640

By courtesy of the Foundation Johan Maurits van Nassau, Mauritshuis, The Hague; photograph, A. Dingjan

His diplomatic service took him several times to England, where he met and was greatly influenced by John Donne and Francis Bacon. He translated 19 of Donne's poems and was introduced by Bacon to the New Science, which he in turn introduced into Holland as a subject for poetry.

Among Huygens' writings, at one extreme

stands *Costelyck mal* (1622; "Exquisitely Foolish"), a satire of the ostentatious finery of the townswomen; and, at the other extreme, *Scheepspraet* (1625; "Ship's Talk"), in the language of the lower deck, and *Trijntje Cornelis* (1653), an earthy farce.

Huygens saw poetry only as "a small pastime," as the titles of his poetry collections indicate: *Otia of ledighe uren* (1625; "Idleness or Empty Hours") and *Korenbloemen* (1658 and 1672; "Cornflowers"). *Dagwerck* (1639; "Daily Work"), one of his three autobiographical works, provides insight into the contemporary intellectual climate.

Huygens' principle, in optics, a statement that all points of a wave front of light in a vacuum or transparent medium may be regarded as new sources of wavelets that expand in every direction at a rate depending on their velocities. Proposed by the Dutch mathematician, physicist, and astronomer, Christiaan Huygens, in 1690, it is a powerful method for studying various optical phenomena.

A surface tangent to the wavelets constitutes the new wave front and is called the envelope of the wavelets. If a medium is homogeneous and has the same properties throughout (*i.e.,* is isotropic), permitting light to travel with the same speed regardless of its direction of propagation, the three-dimensional envelope of a point source will be spherical; otherwise, as is the case with many crystals, the envelope will be ellipsoidal in shape (*see* double refraction). An extended light source will consist of an infinite number of point sources and may be thought of as generating a plane wave front.

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Huynh Phu So, Huynh also spelled HUYEN, also called DAO KHUNG, or PHAT SONG (b. 1919, Hoa Hao, Cochinchina [now in Vietnam]—d. 1947, Long Xuyen), Vietnamese philosopher, Buddhist reformer, and founder (1939) of the religion Phat Giao Hoa Hao, more simply known as Hoa Hao (*q.v.*), and an anti-French, anticommunist military and political activist.

Frail and sickly in his youth, he was educated by a Buddhist monk and at the age of 20 was apparently miraculously cured. He then set about preaching Buddhist reform, advocating a return to Theravāda ("Way of the Elders") Buddhism, from the Mahāyāna ("Greater Vehicle") form prevalent in Vietnam, and stressing austerity, Spartan living, simple worship, and personal salvation. Hoa Hao is an amalgam of Buddhism, ancestor worship, animistic rites, elements of Confucian doctrine, and indigenous Vietnamese practices. Its adherents have their own flag, maroon in colour, and their own special holidays.

Huynh Phu So traveled throughout Vietnam practicing herbal healing and acupuncture. In speaking, he exerted an almost hypnotic influence over his audiences and became known as Dao Khung ("Mad Monk"). He predicted with accuracy the fall of France in World War II, the Japanese invasion of Indochina, and the intervention of the United States at a later date. His success as a prophet led his followers to call him the Phat Song ("Living Buddha").

As his fame and his adherents increased, his inflammatory speeches brought him to the attention of the French colonial authorities. Exiled from one Vietnamese province after another, he continued to draw disciples. Finally he was committed to a mental institution, where he converted the doctor in charge to his philosophy. In desperation the French tried to exile him to Laos, but he was kidnapped by Japanese agents in 1942 and held prisoner in Saigon (now Ho Chi Minh City).

After the war, disagreement, first with the French and then with the communist Viet Minh, made the Hoa Hao sect an aggressive religio-political-military cult. Huynh Phu So was abducted while traveling to a meeting ostensibly to reconcile differences between Hoa Hao and the Viet Minh and was executed after a "trial" in Long Xuyen. Many of the Hoa Hao faithful refusing to believe that he died, predict his return in a time of crisis.

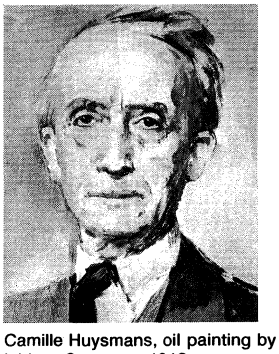
Huynh Tan Phat (b. 1913, near My Tho, Vietnam—d. Sept. 30, 1989, Ho Chi Minh City), one of the leading theoreticians of the National Liberation Front (NLF), the Vietnamese guerrilla organization formed in 1960 to oppose the U.S.-backed Saigon government and to reunite the country. From 1969 he was president of the South Vietnamese Provisional Revolutionary Government, which replaced the Saigon government in 1975.

While at Hanoi University in the 1930s, Huynh Tan Phat became active in the struggle for the liberation of Vietnam from French rule. During World War II he opposed the Japanese occupation. From 1944 to 1945 he edited an anti-French newspaper, *Thanh Nien* ("Youth"). After the war he joined the Vanguard Youth organization, a movement for social reform and political change, and eventually became secretary-general of the liberal Democratic Party. Despite his high standing in the Democratic Party, which claimed to be opposed to communism, Phat joined the Viet Minh, the united front guerrilla organization headed by Ho Chi Minh, as the only group constituting an effective resistance against the French. During the First Indochina War (1946–54), Phat, although twice imprisoned, was in charge of the organization's information service.

After the Viet Minh defeated the French and an international conference at Geneva divided Vietnam into northern and southern zones, Phat remained in Saigon, working as an architect while continuing to be active in the Democratic Party. In 1958, when President Ngo Dinh Diem moved to suppress all opposition parties in South Vietnam, Phat and his organization were forced to go underground. In 1960 he became chairman of the Saigon-Cho Lon-Gia Dinh Special Zone Central Committee, which opposed the Diem government; the same year he joined the newly formed NLF. From 1964 to 1966 he served as secretary-general of the NLF Central Committee, the most powerful position in the organization, and, in 1969, when the NLF established its Provisional Revolutionary Government, Phat became its president. In 1976 he was elected a vice premier in the Council of Ministers of Vietnam, and in 1982 he also became chairman of the State Commission for Capital Construction.

Huysman, Roelof (Dutch humanist): *see* Agricola, Rodolphus.

Huysmans, Camille (b. May 26, 1871, Bilzen, Belg.—d. Feb. 25, 1968, Antwerp),



Camille Huysmans, oil painting by Isidore Opsomer, 1948

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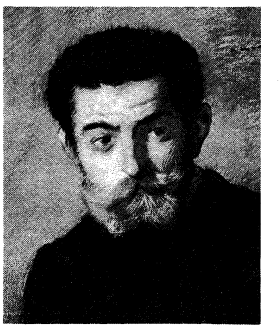
socialist writer and statesman, a leader of the moderate wing of the Flemish nationalist movement during the first decades of the 20th century, and prime minister of Belgium from 1946 to 1947.

Trained as a philologist, Huysmans taught at the *collège* at Ieper, Belg., the Atheneum at Ixelles, Belg., and the Université Nouvelle (French: "New University") in Brussels. From 1910 he served in the House of Representatives, first for Brussels and then for Antwerp, acting as secretary for the Second International based in Brussels (1905–22). In the years before World War I he wrote for several socialist newspapers, including *Le Peuple,* and after the war started the Flemish *Volksgazet* in Antwerp, where he helped form a Socialist Party branch and became the city's mayor (1933).

As minister of education (1925–27), Huysmans promoted teaching in Flemish in the Flemish provinces. After serving as president of the House of Representatives (1936–39), he fled the Nazi occupation (1940) to London, where he became vice chairman of the Belgian Parliamentary Consultative Committee. After the war he led a coalition ministry (1946–47) and served as minister of education (1947–49) in the succeeding ministry of Paul-Henri Spaak.

Huysman's writings include *Soixante-quinze années de domination bourgeoise* (1905; "Seventy-Five Years of Bourgeois Domination"), *La Révolution de 1830 et le mouvement politique* (1905), *L'Affiliation des syndicats* (1907; "The Consolidation of the Trade Unions"), *Études sur les assurances sociales* (1913; "Studies on Social Insurance"), and *Quatre Types* (1937; "Four Models").

Huysmans, Joris-Karl, original name CHARLES-MARIE-GEORGES HUYSMANS (b. Feb. 5, 1848, Paris, Fr.—d. May 12, 1907, Paris),



Joris-Karl Huysmans, detail of an oil painting by Jean-Louis Forain

J.E. Bulloz

French writer whose major novels epitomize successive phases of the aesthetic, spiritual, and intellectual life of late-19th-century France.

The only son of a French mother and a Dutch father, Huysmans at 20 began a long career in the Ministry of the Interior, writing many of his novels on official time (and notepaper). His early work, influenced by contemporary naturalistic novelists, include a novel, *Marthe, histoire d'une fille* (1876; *Marthe*), about his liaison with a soubrette, and a novella, *Sac au dos* (1880; "Pack on Back"), based on his experience in the Franco-German War. The latter was published in *Les Soirées de Médan* (1881), war stories written by members of Èmile Zola's "Médan" group of naturalistic writers. Huysmans soon broke with the group, however, publishing a series of novels too individual in content and violent in style to be classed as naturalistic literature.

The first was *À vau-l'eau* (1882; *Down Stream*), a tragicomic account of the misfortunes, largely sexual, of a humble civil servant,

Folantin. *À rebours* (1884; *Against the Grain*), Huysmans' best-known novel, relates the experiments in aesthetic decadence undertaken by the bored survivor of a noble line. The ambitious and controversial *Là-bas* (1891; *Down There*) tells of the occultist revival that occurred in France in the 1880s. A tale of 19th-century satanists interwoven with a life of the medieval satanist Gilles de Rais, the book introduced what was clearly an autobiographical protagonist, Durtal, who reappeared in Huysmans' last three novels: *En route* (1895), an account of Huysmans-Durtal's religious retreat in the Trappist monastery of Notre-Dame d'Igny and his return to Roman Catholicism; *La Cathédrale* (1898; *The Cathedral*), basically a study of Nôtre-Dame de Chartres with a thin story attached; and *L'Oblat* (1903; *The Oblate*), set in the Benedictine abbey of Ligugé, near Poitiers, in the neighbourhood in which Huysmans lived in 1899–1901 as an oblate (lay monk).

The chief fascination of Huysmans' work lies in its autobiographical content. Together his novels tell the story of a protracted spiritual odyssey. In each the hero tries to find happiness in some kind of spiritual and physical escapism; each ends on a note of disappointment and revolt until, in *L'Oblat,* Huysmans and his hero acknowledge that escapism is not only futile but wrong. Huysmans exemplified his hard-won belief in the value of suffering in his courageous bearing during the months of pain that preceded his death from cancer.

Also a perceptive art critic, Huysmans helped win public recognition of the Impressionist painters (*L'Art moderne,* 1883; *Certains,* 1889). He was the first president of the Goncourt Academy, which annually awards a prestigious literary prize.

BIBLIOGRAPHY. Useful studies about him include Robert Baldick, *The Life of J.K. Huysmans* (1955); James Laver, *The First Decadent: Being the Strange Life of J.K. Huysmans* (1954); and George Ross Ridge, *Joris-Karl Huysmans* (1968).

Huysum, Jan van (b. April 15, 1682, Amsterdam, Neth.—d. Feb. 8, 1749, Amsterdam), Dutch painter known for his still lifes of flowers and fruits.

He was the eldest son of Justus van Huysum, a successful and versatile painter whose subjects included landscapes, seascapes, battle scenes, portraits, and flowers. Jan van Huysum studied under his father but soon surpassed him in skill. He specialized in exquisitely detailed, dramatically composed paintings of lavish flower arrangements. The precision and delicacy of his work were widely esteemed during his lifetime. His use of colour was especially fine, and he was one of the first artists to use a light-coloured background for his still lifes. He also painted landscapes, but these are uninspired and are not regarded as highly as his still lifes.

Jan van Huysum's younger brother Justus, who died at the age of 22, was also a noted painter. He is best known for his battle scenes.

Huyton-with-Roby, locality, Knowsley district, metropolitan area of Merseyside, England, on the eastern periphery of Liverpool. Although mentioned (as Hitune and Rabil) in Domesday Book (1086), the record of William I the Conqueror's land survey of England, the town was not important until its rapid development as a dormitory area for Liverpool. Although primarily residential in character, it has engineering, metal, and food-processing industries. Pop. (1981) 61,808.

Huzhou (China): *see* Wu-hsing.

Hvar, Italian LESINA, island in the Adriatic Sea, part of Croatia, Yugoslavia, 116 square miles (300 square km) in area and, at 43 miles (69 km) in length, the longest island in the Adriatic. A rocky island, it reaches 2,054 feet (626 m) in elevation at Mount Sveti Nikola and is separated from the island of Brač by a narrow channel. The Mediterranean climate is favourable to the production of various fruits, honey, lavender, rosemary, and wine, as well as to a prosperous tourist industry. Boatbuilding, fishing, and marble quarrying are other means of livelihood. The main towns are Hvar and Stari Grad.

Hvar has been continuously inhabited since early Neolithic times, and an ancient wall surrounds the old city of Hvar. In 385 BC Greek colonists founded Dimos (presently Hvar) and Pharos (Stari Grad), and in 219 the island became Roman. Slavs fleeing the mainland in the 7th century AD settled on the island. Through the European Middle Ages and into modern times, it has survived frequent changes of occupancy, serving as an outpost of Slav culture amid the constant struggle for dominance in the Adriatic. It became part of Yugoslavia after World War I. Both religious and military structures dating from the 12th to the 17th century are among the historic buildings. Pop. (1981 prelim.) 11,224.

hvarenah, in Zoroastrianism, the attribute of kingly glory. Introduced to the Persian religion from Iran as part of Mithraism, *hvarenah* is thought of as a shining halo that descends on a leader and makes him sacred. The king thus proclaims himself divine and can rule with absolute power in the name of God. The concept of *hvarenah* was especially popular with the Roman emperors, many of whom were Mithraic initiates.

Hveragerdhi, village, southwestern Iceland, midway between the lake of Thingvallavatn to the north and the Atlantic Ocean (south). The centre of Iceland's hothouse industry, it is noted for its fruit (especially tomatoes and even bananas), vegetables, and flowers, all of which are grown under glass. The hothouses are heated by steam from the numerous hot springs nearby. The national horticultural school is located there. Pop. (1988 est.) 1,572.

Hviezdoslav, pseudonym of PAVEL ORSZÁGH (b. Feb. 2, 1849, Vyšný Kubín, Slovakia, Austrian Empire [now in Dolny Kubin, Czech.]—d. Nov. 8, 1921, Dolny Kubin), one of the most powerful and versatile of Slovak poets.

Hviezdoslav was a lawyer until he became able to devote himself to literature. He originally wrote in Hungarian and was a Hungarian patriot, but in the 1860s he switched both activities to Slovak. By the time of his death the Slovaks already possessed an extensive poetic literature of a high order. Hviezdoslav's contribution to this development was of decisive importance. In his main epics—*Hájnikova žena* (1886; "The Gamekeeper's Wife") and *Ežo Vlkolinský* (1890)—he treated local themes in a style which combined realistic descriptive power with lyric echoes from folksong. In his voluminous lyric output he experimented with a variety of metrical forms and forged a characteristic style, interwoven with neologisms and dialect elements. Most memorable are his moving *Krvavé sonety* (1919; "Blood-Red Sonnets"), which embody his attitude toward World War I. He also translated much Hungarian, Russian, German, and English literature into Slovak.

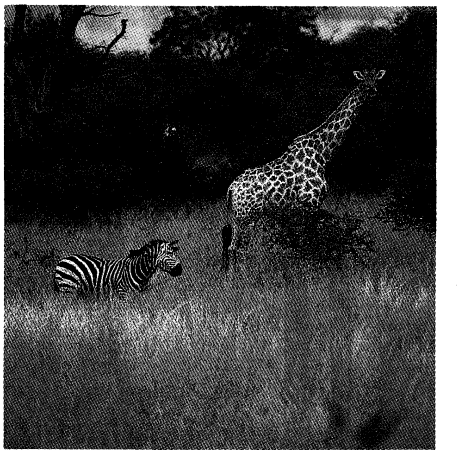
Hwai Ho (China): *see* Huai River.

Hwai-yin (China): *see* Ch'ing-chiang.

Hwang Ho (river, China): *see* Huang Ho.

Hwange, formerly WANKIE, town, western Zimbabwe. It was founded around 1900 after the discovery of coal in the vicinity and was named for a local chief, Whanga, who was the dynastic head of the Abananza people. By 1908 a brickyard was established, utilizing local clays, and the production of coke began in 1913. Located on road and rail lines to Bulawayo and Zambia, the coal-mining industry remains the dominant economic factor. An added source of income has been tourism, based on the nearby Hwange National Park, established in 1949, and the Deka and Matetsi safari areas. Pop. (1982) 39,036.

Hwange National Park, formerly WANKIE NATIONAL PARK, park in northwestern Zimbabwe, on the Botswana frontier. Established



Zebra and giraffe in Hwange National Park, Zimb.
© Brian A. Vikander/West Light

in 1928 as a game reserve, and as a park in 1949, its area of 5,634 square miles (14,592 square km) is largely flat and contains fine hardwood forests of mukwa and Zimbabwean teak. Hwange is one of Africa's largest elephant sanctuaries and is also the habitat of thousands of Cape buffalo as well as giraffes, koodoos, zebras, lions, leopards, wildebeests, and various species of antelope. Wildlife can be observed from platforms overlooking the water holes.

Hwarangdo (Korean: "Way of the Flower of Manhood"), unique military and philosophical code developed in the ancient Korean state of Silla around the 6th century AD. The Hwarangdo provided the basis of training for the elite society of youths known as the *hwarang;* this training placed almost equal emphasis on academic and martial skills.

The *hwarang* warriors played an instrumental role in Silla's conquest of the rest of the Korean peninsula and in the establishment of the Unified Silla dynasty (668–935). The *hwarang* organization was a survival of the youth bands of early Korean society. Each *hwarang* was composed of Sillan young men of aristocratic birth, sometimes numbering in the thousands, who grouped themselves under a single leader.

A spirit of chivalry resulted from the Hwarangdo training, and *hwarang* members frequently engaged in a kind of religious cult in which they prayed for the welfare of the state by visiting beautiful mountains and rivers and engaging in ritual songs and dances. They also chanted the *hyangga,* a special Silla poem with religious flavour.

The guiding principle of the Hwarangdo education can be seen in the *sesok o-kye* ("five commandments"). These norms of virtuous conduct, apparently derived from Confucian and Buddhist teachings, taught loyal service to the king, filial piety, faithfulness to friends, courage in battle, and the evil of indiscriminate killing.

The prominence of the Hwarangdo began to decline with the disintegration of Silla rule, and the *hwarang* were officially disbanded during the Yi dynasty (1392–1910). Interest in the Hwarangdo was renewed in the second half of the 20th century, and one style of modern Korean martial arts is known as hwarangdo.

Hwei (people): *see* Hui.

Hwicce, the inhabitants of one of the subkingdoms of Anglo-Saxon England that coincided with the medieval diocese of Worcester, a territory that then encompassed present Worcestershire, Gloucestershire, and southwest Warwickshire. The southern part had been wrested from the Britons by the West Saxons sometime after 577, and the northern part was probably settled by Anglian peoples from the east. The whole area, united under Mercia in the early 7th century, was ruled by subkings until the dissolution of the Mercian kingdom between 877 and 883.

Hwlffordd (Wales): *see* Haverfordwest.

hyacinth, any ornamental plant of the genus *Hyacinthus* of the family Liliaceae, consisting of about 30 species of bulbous herbs native primarily to the Mediterranean region and tropical Africa. The common garden hyacinths are derived from *H. orientalis.*

Most species have narrow, untoothed leaves at the base of the plant and fragrant flowers



Hyacinth (*Hyacinthus*)
Bruce Coleman—Bruce Coleman Inc.

that usually are blue but may be pink, white, or other colours in cultivated varieties. The flowers are borne in a cluster at the top of the leafless stems, and each flower stalk has a small bract (leaflike structure) below it.

hyacinth, also spelled JACINTH, a red, orange, or yellow variety of the gemstone zircon (*q.v.*).

Hyacinthus, in Greek legend, a young man of Amyclae in Laconia. According to the usual version, his great beauty attracted the love of Apollo, who killed him accidentally while teaching him to throw the discus; others related that Zephyrus (or Boreas) out of jealousy deflected the discus so that it hit Hyacinthus on the head and killed him. Out of his blood there grew the flower called *hyacinthos* (perhaps a fritillary; not the modern hyacinth), the petals of which were marked with the mournful exclamation AI, AI ("Alas"). The flower was also said to have sprung from the blood of Ajax, the son of Telamon.

The death of Hyacinthus was celebrated at Amyclae by the second most important of Spartan festivals, the Hyacinthia, in the Spartan month Hyacinthius. Probably an early summer festival, it lasted three days, the rites gradually passing from mourning for Hyacinthus to rejoicing in the majesty of Apollo. This festival was clearly connected with vegetation and marked the passage from the youthful verdure of spring to the dry heat of summer and the ripening of the grain.

Hyacinthus was undoubtedly a pre-Hellenic god. The precise relation that he bore to Apollo is obscure, but he was probably a subordinate. Certain aspects of his cult suggest that he was an underworld vegetation deity whose death was mourned like that of Adonis.

Hyades, in Greek mythology, the five (or more) sisters of the Pleiades who nursed the infant wine god, Dionysus, and as a reward were made the five stars in the head of the constellation Taurus, the bull. According to another version, they so bitterly lamented the death of their brother Hyas that Zeus, out of compassion, changed them into stars. Their name means the Rainers, since they rose in October and set in April.

Hyades, cluster of several hundred stars in the zodiacal constellation Taurus. As seen from Earth, the bright star Aldebaran appears to be a member of the cluster, but in fact Aldebaran is much closer to the Earth than the Hyades' distance of about 130 light-years. Five genuine members of the group are visible to the unaided eye. Their name (Greek: "the rainy ones") is derived from the ancient association of spring rain with the season of their heliacal (near dawn) rising.

hyaena: *see* hyena.

Hyaenodon, extinct genus of early, primitive mammalian carnivores that first appears in the fossil record in late Eocene time and persists through the Oligocene (the Oligocene Epoch, which followed the Eocene, began 38,000,000 years ago and lasted 12,000,000 years). *Hyaenodon,* a creodont (*see* Creodonta), was a large and efficient predator. Its skull was long and narrow, with teeth that were well adapted to a predaceous mode of life; they were large and able to bite or crush.

hyalophane, a barium-rich variety of potassium feldspar; *see* celsian.

hyalosiderite, silicate mineral, a member of the forsterite–fayalite series (*q.v.*) of olivines.

hyaluronidase, any of a group of enzymes that catalyze the hydrolysis (chemical decomposition involving the elements of water) of certain complex carbohydrates such as hyaluronic acid and chondroitin sulfates. The enzymes have been found in insects, leeches, snake venom, mammalian tissues (testis being the richest mammalian source), and in bacteria.

Hyannis, unincorporated village in Barnstable town (township), Barnstable County, southeastern Massachusetts, U.S., on the southern coast of Cape Cod. Its name is that of a local 17th-century Indian chief. A popular summer beach and yachting resort with ferryboat services to Nantucket Island and Martha's Vineyard, it is one of the cape's main business centres and a shipping point for fish and cranberries. The family home of the late president John F. Kennedy is in nearby Hyannis Port. Pop. (1980) 9,118.

Hyatt, Alpheus (b. April 5, 1838, Washington, D.C.—d. Jan. 15, 1902, Cambridge, Mass., U.S.), U.S. zoologist and paleontologist who achieved eminence in the study of invertebrate fossil records, contributing to the understanding of the evolution of the cephalopods (a class of mollusks including squids and octopuses) and of the development of primitive organisms.

He studied at Harvard (1858–62) under the Swiss–U.S. naturalist Louis Agassiz and in 1867 was appointed curator of the Essex Institute at Salem, Mass. He was professor of zoology and paleontology at the Massachusetts Institute of Technology from 1870 to 1888 and was curator of the Boston Society of Natural History from 1881 to 1902. In 1886 he was appointed assistant for paleontology in the Cambridge Museum of Comparative Zoology and in 1889 was attached to the United States Geological Survey as paleontologist. He rose to foremost rank among U.S. investigators in the field of invertebrate paleontology. He was a founder and editor (1867–71) of *The American Naturalist,* the first American journal devoted to biological sciences, and was the chief founder of the American Society of Naturalists, acting as first president in 1883. He also took a leading part in establishing the Marine Biological Laboratory at Woods Hole, Mass. (1888), and its predecessor at Annisquam, Mass.

Hyatt, John Wesley (b. Nov. 28, 1837, Starkey, N.Y., U.S.—d. May 10, 1920, Short Hills, N.J.), U.S. inventor who discovered the process for making celluloid.

In 1870, while searching for a substitute for ivory for making billiard balls, Hyatt combined nitrocellulose, camphor, and alcohol, heated the mixture under pressure to make it pliable for molding, and allowed it to harden under normal atmospheric pressure. His discovery opened the way for the development of the modern plastics industry. Hyatt also invented a filter that made possible the chemical purification of moving water, and he is credited with other inventions important in sugarcane refining and textile manufacturing.

hybrid, offspring of parents that differ in genetically determined traits. The parents may be of different species, genera, or (rarely) families. The term hybrid, therefore, has a wider application than the terms mongrel or crossbreed, which usually refer to animals or plants resulting from a cross between two races, breeds, strains, or varieties of the same species. There are many species hybrids in nature (in ducks, oaks, blackberries, etc.), and, although naturally occurring hybrids between two genera have been noted, most of these latter result from human intervention.

Because of basic biological incompatibilities, sterile hybrids (those incapable of producing living young) such as the mule (a hybrid between a jackass and a mare) commonly result from crosses between species. Some interspecific hybrids, however, are fertile and true breeding. These hybrids can be sources for the formation of new species. Many economically or aesthetically important cultivated plants (bananas, coffee, peanuts, dahlias, roses, bread wheats, alfalfa, etc.) have originated through natural hybridization or hybridization induced by chemical means, temperature changes, or irradiation.

The process of hybridization is important biologically because it increases the genetic variety (number of different gene combinations) within a species, which is necessary for evolution to occur. If climatic or habitat conditions change, individuals with certain combinations may be eliminated, but others with different combinations will survive. In this way, the appearance or behaviour of a species gradually may be altered. Such natural hybridization, which is widespread among certain species, makes the identification and enumeration of species very difficult.

hybrid vigour (biology): *see* heterosis.

hybris (Greek ethics and religion): *see* hubris.

Hydaspes, Battle of the (326 BC), fourth and last pitched battle fought by Alexander the Great during his campaign of conquest in Asia. It took place after Alexander's conquest of the Achaemenidian Empire and immediately before his army began the journey homeward to Macedonia. Porus, the Indian ruler of the territory between the Jhelum and the Chenāb rivers (in modern Pakistan), was his opponent. After facing the Indians for days across an unfordable river, Alexander, by using diversionary tactics, managed to cross the stream above their camp. More troublesome to Alexander than the numerical supe-

riority of Porus' 34,000-man army were the 200 elephants that threatened the effectiveness of the Macedonian cavalry. During the battle, Alexander overwhelmed Porus' left wing, forcing it back upon the elephants, which panicked and plunged riderless into the Indian ranks. The Macedonian phalanx then routed the enemy. Alexander made an alliance with Porus and allowed him to remain ruler in his kingdom.

hydatid disease: *see* echinococcosis.

hydatidiform mole, in human pregnancy, abnormal growth of the chorion, the outermost vascular membrane that in a normal pregnancy would enclose the embryo and ultimately give rise to the placenta. In the situation in which the hydatidiform mole develops, the embryo is usually either absent or dead. The mole, a collection of sacs (cysts) containing a jellylike substance, resembles clusters of grapes and can attain a great size. Most of the moles are expelled in about the 20th week of pregnancy. The moler pregnancy is usually terminated by suction curettage. In a few cases, the mole spreads into the muscle of the uterus and causes bleeding. If this is severe, the obstetrician may remove the mole by surgery. In extremely rare instances, hydatidiform moles develop into choriocarcinomas, which are highly malignant tumours.

Hyde, Charles Cheney (b. May 22, 1873, Chicago—d. Feb. 13, 1952, New York City), U.S. attorney and authority on international law who was an early advocate of vesting all military power in an international security organization.

Hyde taught at the law school of Northwestern University, Chicago (1907–25), and then became professor of international law and diplomacy at Columbia University (1925–45). He served as solicitor for the U.S. Department of State (1923–25) and was a member of the Permanent Court of Arbitration, The Hague (1951–52). In private practice he represented several governments. His best known publication is *International Law, Chiefly as Interpreted and Applied by the United States*, 2 vol. (1922; 2nd rev. ed., 3 vol., 1945).

Hyde, Douglas, Irish DUBHIGHLAS DE HIDE; pseudonym AN CRAOIBHÍN AOIBHINN (b. Jan. 17, 1860, Frenchpark, County Roscommon, Ire.—d. July 12, 1949, Dublin), distinguished Gaelic scholar and writer and first president of the Republic of Ireland (Éire). He was the outstanding figure in the struggle for the preservation and extension of the Irish language from 1893, when he founded the Gaelic



Douglas Hyde
By courtesy of the National Library of Ireland, Dublin

League (a nationalistic organization of Roman Catholics and Protestants), until 1922, when the founding of the Irish Free State accorded the Irish language equal status with English.

In 1884 Hyde was graduated from Trinity College in Dublin, where he first studied ancient Gaelic. He became the first professor of modern Irish at University College, Dublin, in 1909 and held the chair until his retirement in 1932. His most important works of scholarship are *The Love Songs of Connacht* (1893) and *A Literary History of Ireland* (1899). Other works include *The Bursting of the Bubble and Other Irish Plays* (1905) and *Legends of Saints and Sinners* (1915).

During this period of academic work, he largely avoided political activity. He resigned the presidency of the Gaelic League in 1915, when it became clear that it had become a separatist organization. Later, however, he served for a short time as a member of the Senate of the Irish Free State. In 1937, when a new constitution created the office of president of Ireland, Hyde was the unanimous choice of all parties and was elected unopposed for a seven-year term.

Hyde, Edward: *see* Clarendon, Edward Hyde, 1st earl of.

Hyde, Henry: *see* Clarendon, Henry Hyde, 2nd earl of.

Hyde, Henry Baldwin (b. Feb. 15, 1834, Catskill, N.Y., U.S.—d. May 2, 1899, New York City), U.S. founder of the Equitable Life Assurance Society.

In 1852, Hyde became a clerk at the Mutual Life Insurance Co. and, in the next seven years, learned the business, advancing to the post of cashier. In 1859, Hyde left Mutual Life, announcing his intention to start his own insurance company. In that year, he raised $100,000 as starting capital and rented an office on a floor above his former employer, putting up a sign that dwarfed Mutual Life's. He spent the next 40 years running his Equitable Life Assurance Society, holding the title of vice president until 1874 and president from 1874 until his death.

In the first year, he wrote policies worth a total of $1,144,000, and no death claims were presented. The year before Hyde's death, the company's insurance in force was worth $987,000,000. During his entire 40 years with the society, it paid out $307,000,000 in benefits.

Hyde determined all the company's policies and communicated with his field agents in a company newsletter, written largely by him. Instead of paying yearly dividends to his policyholders, Hyde in 1868 developed the Tontine plan, whereby benefits are disbursed when the insured reaches a certain age. The popularity of this plan increased the company's surplus from $7,000,000 in 1868 to $26,000,000 by 1874. Hyde himself prospered under this plan by allowing himself 2.5 percent of the surplus annually until 1875.

In 1877, New York state began investigating the mismanagement of surplus funds by insurance companies. These investigations were to lead to the passage, in 1906, of the Armstrong Bills reorganizing the insurance business and regulating its management of surplus funds.

Hyde, Lawrence: *see* Rochester, Lawrence Hyde, 1st earl of.

Hyde, Sir Nicholas, Hyde also spelled HIDE (d. Aug. 25, 1631), chief justice of England during the reign of Charles I.

Sir Nicholas entered Parliament in 1601 and soon became prominent as an opponent of the court of James I, though he does not appear to have distinguished himself in the law. Before long, however, he deserted the popular party, and in 1626 he was employed by George Villiers, duke of Buckingham, in his defense to impeachment by the House of Commons. In the following year he was knighted and appointed chief justice of the king's bench, in which office it fell to him to give judgment in the celebrated case of Sir Thomas Darnell and others who had been committed to prison on warrants signed by members of the privy council, which contained no statement of the nature of the charge against the prisoners. In answer to the writ of habeas corpus the attorney-general relied on the prerogative of the crown, supported by a precedent of Queen Elizabeth I's reign. Hyde, three other judges concurring, decided in favour of the crown, but without going so far as to declare the right of the crown to refuse indefinitely to show cause against the discharge of the prisoners.

In 1629 Hyde was one of the judges who condemned Eliot, Holles, and Valentine for conspiracy in Parliament to resist the King's orders; the judges refused to admit their plea that they could not be called upon to answer out of Parliament for acts done in Parliament.

Hyde de Neuville, Jean-Guillaume, Baron (b. Jan. 24, 1776, La Charité, Fr.—d. May 28, 1857, Paris), diplomat and one of the most consistent defenders of Bourbon Legitimism.

Devoted to Louis XVI, Hyde de Neuville remained a royalist agent after the outbreak of the Revolution. After taking part in a royalist insurrection in Berry (1796), he attempted first to discredit the Directory, then to convince Napoleon to reestablish the Bourbons

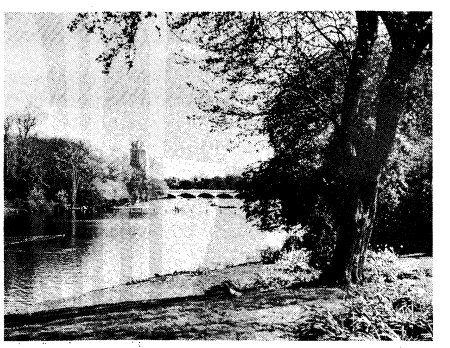


Hyde de Neuville, detail of a lithograph by Ducarme after a portrait by Legrand
By courtesy of the Bibliotheque Nationale, Paris

on the throne. He left France in 1804, reached the United States in 1806, and remained there until 1814.

Upon his return to France after the First Restoration, Hyde de Neuville was employed by Louis XVIII on a mission to Italy. He was elected to the Chamber of Deputies (1815), and he served as ambassador of France to the United States (1816–21) and to Portugal (1823–24). For his role in saving King John VI of Portugal from an attempted coup d'etat, he was named count of Bemposta in 1824. He returned to France again and sat in the Chamber of Deputies, and in 1828 he became minister of the navy. In 1830 he opposed the exclusion of the Duc de Bordeaux, the rightful Bourbon claimant, from succession to the throne; following the Duc's defeat Hyde de Neuville resigned his seat.

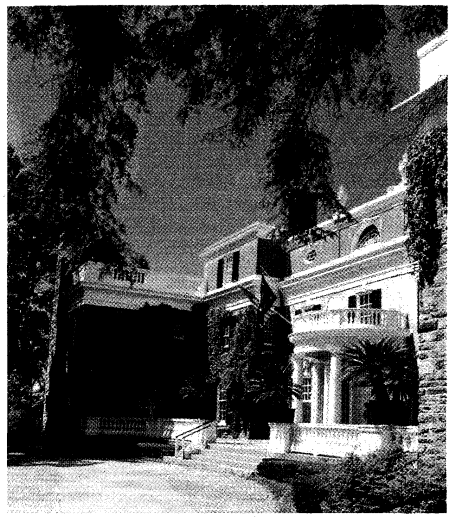
Hyde Park, park, largest of the Royal Parks in London. Hyde Park, together with contiguous Kensington Gardens, occupies an area of 615 ac (249 ha) and contains a lake known in its park portion as The Serpentine and in the gardens portion as The Long Water. At the



The Serpentine, Hyde Park, London
A.F. Kersting

park's northeastern corner, near Marble Arch, is "Speakers' Corner" which has long been known as a centre of free speech for soap-box orators.

Hyde Park, town (township) and unincorporated village, Dutchess County, eastern New York, U.S., on the east side of the Hudson River, 8 mi (13 km) north of Poughkeepsie. Both the village (settled as Stoutenburgh in 1741) and town (formed in 1821) bear the name of a local estate honouring Edward



The home of Pres. Franklin Delano Roosevelt, Hyde Park, N.Y.
By courtesy of the New York State Department of Commerce

Hyde, viscount Cornbury, governor of New York (1702–08). Primarily residential, Hyde Park was the birthplace and home of Pres. Franklin Delano Roosevelt, and he and his wife, Eleanor, are buried there at his family estate (264 ac [107 ha]), which has been a national historic site since 1944. The adjacent Franklin D. Roosevelt Library contains more than 30,000 books and houses the president's papers and memorabilia as well as a collection of material on U.S. and New York state history. Nearby is the Vanderbilt Mansion, which was designed in the Second Empire style for Frederick W. Vanderbilt, and was constructed (1896–98) on the grounds of the original Hyde Park estate. The mansion was dedicated as a national historic site in 1940. Hyde Park is the seat of the Culinary Institute of America (1946). Pop. (1980) 20,768.

Hyder Ali, also spelled HAIDAR ALI (b. 1722, Būdikote, India—d. Dec. 7, 1782, Chittoor), Muslim ruler of Mysore and military commander who played an important part in the wars in southern India in the mid-18th century.

After studying the military tactics of the Frenchman Joseph-François Dupleix, Hyder induced his older brother, a brigade commander in the Mysore army, to obtain military equipment from the Bombay government and to enroll 30 European sailors as gunners; thus was formed the first Indian-controlled corps of sepoys armed with firelocks and bayonets and backed by artillery served by Europeans. Hyder received an independent command in Mysore in 1749. Eventually, he displaced Nanjarāj, the prime minister, made the Raja a prisoner in his own palace, and around 1761 made himself ruler of Mysore. He then conquered Bednore (now Haidarnagar), Kanara, and the petty poligars (feudal chiefs) of southern India.

In 1766 the Marāthās, the Niẓām ʿAlī Khān of Hyderābād, and the British entered a triple alliance against Hyder, but he soon bought off the Marāthās, captured Mangalore, and defeated the Bombay army of the British. In April 1769 he secured from the British a promise of aid in an attack, but when the Marāthās invaded his territories in 1771, the British did not send assistance. Long offended by this failure, he in 1779 increased his army with French and European soldiers of fortune and joined in a confederacy with the Niẓām and the Marāthās against the British, who had further provoked him by capturing the French settlement of Mahé, which was within Hyder's territories. In 1780 he warred on the Karnatic, a region of southern India, destroyed a British detachment of 2,800 men, and seized Arcot. The British then succeeded in detaching the Niẓām and the Marāthās from Hyder and defeated him three times successively in 1781 at the battles of Porto Novo, Pollilur, and Sholinghur; Hyder lost more than 10,000 men at Porto Novo.

In early 1782 an army under Hyder's son Tippu, aided by 400 Frenchmen, defeated 100 British and 1,800 sepoys at the Coleroon River. That April, 1,200 French troops landed at Porto Novo and seized Cuddalore, while the British tried to drive Hyder and Tippu from the fort of Arni, their chief arsenal in the plains. On the arrival of George Macartney (later 1st Earl Macartney) as governor of Madras, the British fleet captured Nāgappattinam and convinced Hyder that he could not stop the British. In his dying words, Hyder implored Tippu to make peace with the British.

Hyderābād, former princely state of south central India, founded by Niẓām-ul-Mulk (Mīr Qamar-ud-Dīn), who was intermittently viceroy of the Deccan under the Mughal emperors from 1713 to 1721 and who resumed the post again under the title Āṣaf Jāh in 1724, at which time he became virtually independent. He founded the dynasty of the Niẓāms of Hyderābād. The British and the French participated in the wars of succession that followed his death in 1748. With the help of French troops, Ṣalābat Jang, the third son, gained the throne and leased the Northern Circars to the French.

Niẓām ʿĀlī, a younger brother, deposed Ṣalābat Jang in 1761 and threatened the Karnatic region. The British acquired a nominal title to the Circars in 1765, repulsed the Hyderābād forces, took Niẓām ʿĀlī under their protection, and recovered possession of the Circars. After temporarily siding with Hyder Ali, the ruler of Mysore, in 1767, the Niẓām accepted British ascendancy in the Treaty of Masulipatam (1768). From 1778 a British resident and subsidiary force were installed in his dominions.

In 1795 Niẓām ʿĀlī Khān lost territories, including parts of Berār, to the Marāthās. When he turned to the French, the British increased the subsidiary force; and, to meet the expense of that force, the Niẓām ceded his territorial gains in 1792 and 1799 to the British.

Surrounded, except in the west, by territory owned by or dependent upon the British, the Niẓām in 1798 was forced to enter into an agreement placing his country under British protection, becoming the first Indian prince to do so. His independence in internal matters, however, was confirmed.

As a British ally in the second and third Marāthā Wars (1803–05, 1817–19), he gained land in Berār. In 1853, however, the Niẓām Nāṣir-ud-Dawlah was obliged to assign Berār to the British East India Company to pay for the contingent of British troops in Hyderābād.

In 1918 Niẓām Mīr Uṣmān ʿĀlī was given the title "His Exalted Highness." The British government of India retained the right to intervene in case of misrule; and, though peaceful, Hyderābād remained generally underdeveloped.

When the Indian subcontinent was partitioned in 1947, the Niẓām elected to resume independent status. On Nov. 29, 1947, he signed a standstill agreement with India to last one year, and Indian troops were withdrawn. Difficulties persisted, however: India insisted that Hyderābād join India, and the Niẓām appealed to King George VI of Great Britain. On Sept. 13, 1948, Hyderābād was invaded by India, and within four days Hyderābād's accession to India was achieved. After a period of military and provisional civil government, a popular ministry and legislature were set up in March 1952.

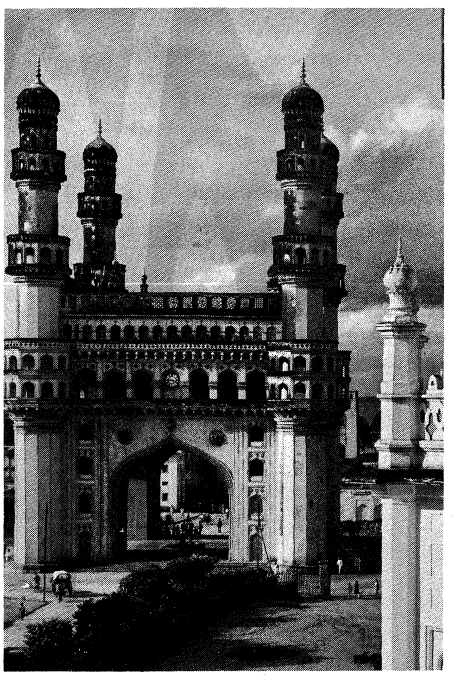
On Nov. 1, 1956, the state of Hyderābād ceased to exist. It was divided among the states of Andhra Pradesh, which took the Telangana districts; Mysore, which took the Kannada-speaking districts; and Bombay. Berār had already been merged with Madhya Pradesh.

The Niẓāms of Hyderābād comprised a Muslim dynasty that had ruled over a predominantly Hindu population, and it is a tribute to the dynasty's government that its Hindu subjects over the years had made no effort to evict the Muslim aristocracy by allying themselves with the Marāthās, with Mysore, or with the European powers.

Hyderābād, district, north central Andhra Pradesh state, southern India, located on the Deccan Plateau. The district (77 sq mi [200 sq km]) is mainly urban, the rural areas having become the separate K.V. Ranga Reddy district in 1978. The district has more than 200 industries, including textile mills and match, glass, and clay factories. Hyderābād city is the district's administrative headquarters. Pop. (1981) 2,187,262.

Hyderābād, capital of Andhra Pradesh state and of Hyderābād district, in southern India. It is located on the Deccan Plateau and Mūsi River.

Hyderābād was founded in about 1591 by Muḥammad Qulī Quṭb Shāh, the fifth of the Quṭb Shāhī sultans, as the new capital of the Golconda kingdom. The Chārmīnār, a grand architectural composition in Indo-Saracenic



The Chārmīnār in the old city at Hyderābād, Andhra Pradesh, India
Ewing Galloway

style with open arches and with four minarets, is regarded as the supreme achievement of the Quṭb Shāhī period. It formed the centrepiece around which the city was planned. The Mecca Masjid, a mosque, was built later. Hyderābād was known for its beauty and af-

fluence, but this glory lasted only as long as the Quṭb Shāhīs, for the Mughals conquered Hyderābād in 1685. The Mughal occupation resulted in plunder and destruction and was followed by the intervention of European powers in Indian affairs. In 1724 Āṣaf Jāh Niẓām-ul-Mulk, the Mughal viceroy in the Deccan, declared independence. This Deccan kingdom, with Hyderābād as its capital, came to be known as Hyderābād. The Āṣaf Jāhīs, during the 19th century, started to rebuild, expanding to the north of the old city across the Mūsi. Farther north, Secunderābād grew as a British cantonment, connected to Hyderābād by a mile-long bund (embankment) on the Husain Sāgar Lake. The bund serves as a promenade and is the pride of the city. Many new structures, reflecting a beautiful blend of Hindu and Muslim styles, were added.

Under the Niẓāms the Hindu and Muslim populations lived in amity, although immediately after Indian independence a fanatical Muslim faction, the Raẓākārs, fomented tensions in the state and the city. The Indian government intervened, and eventually the state of Hyderābād was acceded to India. In 1956 the state was split up; its Telugu-speaking areas were combined with the erstwhile Andhra state to form the state of Andhra Pradesh with Hyderābād as the capital.

Hyderābād has become a centre of trade and commerce. Cigarettes and textiles are manufactured, and the service industries have been expanded. The city also has good transport facilities. There are rail and air services to Delhi, Calcutta, Bombay, Madras, and Bangalore, as well as to historical places such as Ajantā and Ellora. Taxis, auto-rickshas, cycle rickshas, private vehicles, and suburban bus and rail services provide local transport.

Initially, Hyderābād was the location of two colleges of the University of Madras. In 1918, however, the Niẓām established Osmania University, and it is now one of the best universities in India. The University of Hyderābād was established in 1974; an agricultural university and a number of advanced research and training institutes are also located there, as are several nongovernmental institutions, such as the American Studies Research Centre and the German Institute of Oriental Research.

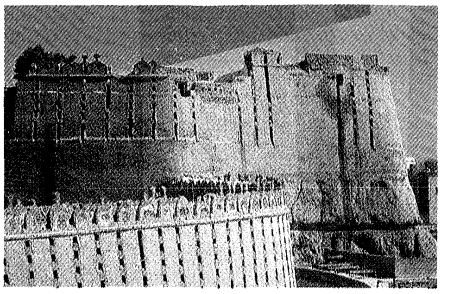
The city abounds in public and private cultural organizations, such as state-sponsored dramatic, literary, and fine arts academies. The public auditorium, Ravindra Bharati, provides a venue for dance and music festivals, and the Salar Jung museum has a unique collection of rare pieces, including jade, jewelry, paintings, and furniture.

The public gardens provide the main recreational facilities. Many parks and the large parade grounds in Secunderābād offer scope for play and relaxation. The zoological gardens and the university's botanical gardens are popular picnic spots. Hyderābād is reputed for its soccer and cricket. There is also a racecourse. Pop. (1981) city, 2,093,488; metropolitan area, 2,545,836.

Hyderābād, also spelled ḤAYDARĀBĀD, city, district, and division, Sind Province, Pakistan.

The city, administrative headquarters of the district, lies on the most northerly hill of the Ganjo Takkar ridge, just east of the Indus River. The third largest city in Pakistan, it is a communications centre, connected by rail with Peshāwar and Karāchi and with Indian railways via the border towns of Khokhropār and Munabao.

Founded in 1768 on the site of the ancient town of Nīrūn-Kot by Ghulām Shāh Kalhōṛā, the saintly ruler of Sind, it was named after the prophet Muḥammad's son-in-law, ʿAlī, also known as Ḥaydar. It remained the capital of Sind under the Tālpur rulers, who succeeded



The large fort, Hyderābād, Sind province, Pak.
Frederic Ohringer from the Nancy Palmer Agency—EB Inc.

the Kalhōṛās, till 1843 when, after the nearby battles of Miāni and Dabo, it surrendered to the British and the capital was transferred to Karāchi.

Incorporated as a municipality in 1853, it is an important commercial and industrial centre. Economic activities include textile, sugar, cement, and hosiery mills, manufacture of glass, soap, ice, paper, and plastics. There are hide tanneries and sawmills. Ornamented silks, silverwork and goldwork, and lacquerware are also produced. Noteworthy antiquities include the tombs of the Kalhōṛā and Tālpur rulers, palaces of the former *amīr*s of Sind, and a fort (built 1782). Newly developed settlements and industrial estates surround the congested old city area. Characteristic of the city are *bādgīr*s ("wind-catchers") fixed to housetops to catch sea breezes during the hot season. A hospital, municipal gardens, zoo, sports stadium, and several literary societies are in the city. The Ghulām Muḥammad (Kotri) Barrage, including a lock to facilitate river traffic, provides flood control. The University of Sind with 32 affiliated colleges, founded in 1947 in Karāchi and moved to Hyderābād in 1951, lies across the Indus. Other education needs are served by numerous government colleges, the Liaqat Medical College, and specialized vocational institutions.

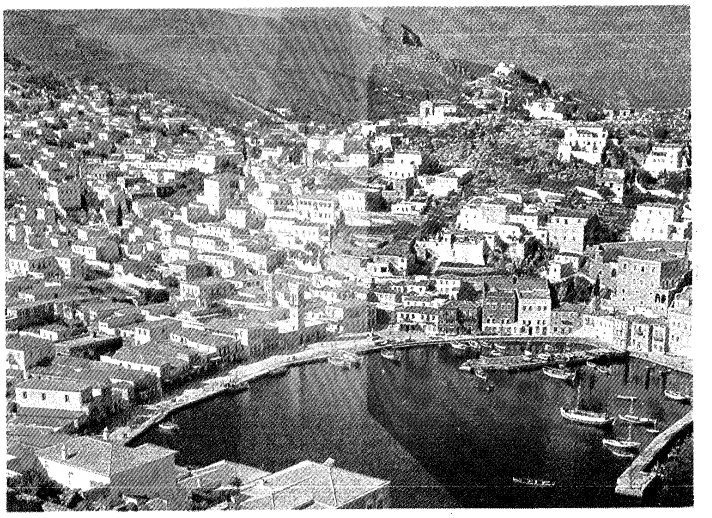
Hyderābād district is a vast fertile alluvial plain, excepting the hilly region of Hyderābād city, extending along the east bank of the Indus. Cultivation is dependent upon canal irrigation. Millet, *jowār* (sorghum), rice, wheat, cotton, oilseeds, and mangoes are the chief crops. Cottage handicrafts include leatherwork, glazed pottery and tiles, lacquerware and *susī* (striped cotton cloth) from Hāla (north of Hyderābād city), *khēs* (cotton blankets), *susī*s and *angūchah*s (cotton cloth) from Nāsirpur (northeast of Hyderābād). Historic sites include Bhit Shāh (4 mi [6 km] east of Hāla), containing the tomb of Shāh ʿAbd-ul-Laṭīf (d. 1753), the poet and Ṣūfī saint, and an ancient Buddhist *stūpa*.

Hyderābād division (area 34,257 sq mi) comprises Dādu, Hyderābād, Badīn, Sanghar, Thar Pārkar, and Tatta districts. The division includes the swampy delta of the Indus river on the Arabian Sea (southwest), the fertile alluvial plain of the Indus (north central), and part of the great Thar Desert (east). Pop. (1981 prelim.) city, 795,000; metropolitan area, 1,045,000; district, 2,080,000; division, 7,103,000.

hydnocarpus oil: *see* chaulmoogra oil.

Hydra, Modern Greek ÍDHRA, island of the Saronic group in the Aegean Sea, *nomós* (department) of Attica, Greece, just off the eastern tip of the Argolís peninsula of the Peloponnese. Its maximum length, northeast–southwest, is 13 mi (21 km), and it has an area of only 19.2 sq mi (49.6 sq km). The highest point, Mt. Ére, is 1,936 ft (590 m). Once quite wooded and well watered, as its Turkish name, Çamlıza ("place of pines"), shows, it is now denuded and dry, with almost no arable land. Water is collected from rain in cisterns and is also shipped from the mainland.

First prominent in the late 15th century under Turkish rule, it became a seafaring centre. In the 17th century the island received an influx of Albanian refugees from the Peloponnese; maritime trade then thrived. After an abortive insurrection against the Turks in 1770, Hydra received Greek refugees, who also concentrated their energies on commercial shipping. In 1821, at the outbreak of the War of Greek Independence, the island's population had risen to 30,000. With neighbouring Spétsai and Psará islands, the Greeks and Albanians of Hydra placed their considerable merchant fleets and fortunes at the disposal of the insurgents, and Hydriote sea captains commanded Greek ships in several successful encounters with the Turkish fleet.



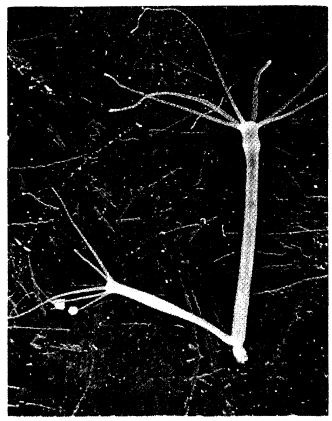
The port of Hydra, Greece
George Holton—Photo Researchers

With the advent of steamships, however, the maritime activities of the island declined. Industries now include sponge fishing, cotton weaving, shipbuilding, and international tourism. Ídhra, the chief town, on the north coast, is an artists' and writers' colony and the residence of a metropolitan bishop. Its narrow, rock-cut streets surround a sheltered harbour. Three other small ports on the north coast are Mandrákion, Mólos, and Panayía. Pop. (1971) 2,531.

Hydra, in Greek legend, the offspring of Typhon and Echidna, a gigantic monster with nine heads (the number varies), the centre one immortal. The monster's haunt was the marshes of Lerna near Argos. The destruc-

tion of Hydra was one of the 12 Labours of Heracles, which he accomplished with the assistance of Iolaus. As one head was cut off, two grew in its place; therefore, they finally burned out the roots with firebrands and at last severed the immortal head from the body. The arrows dipped by Heracles in the poisonous blood or gall inflicted fatal wounds.

Hydra, genus of invertebrate freshwater animals of the class Hydrozoa (phylum Cnidaria). The body of such an organism consists of a thin, usually translucent tube that measures up to about 30 millimetres (1.2 inches) long but is capable of great contraction. The body wall is comprised of two layers of cells separated by a thin, structureless layer of connective tissue called the mesoglea and the enteron, a cavity containing intestinal organs. The lower end of the body is closed, and an opening at the upper end both ingests food and ejects residue. Around this opening is a circlet of 4 to about 25 tentacles.



Hydra budding (magnified about 2.5 ×)
Roman Vishniac

Eggs and sperm appear in separate swellings (gonads) in the outer body layer, and individuals are usually hermaphroditic, (*i.e.,* functional reproductive organs of both sexes occur in the same individual). Gametes are released from the body, and fertilization takes place in the water. Vegetative reproduction by budding is also common. Finger-shaped outpushings of the wall develop mouth and tentacles and finally nip off at the base, forming separate new individuals. Locomotion is by creeping on the adhesive base, or by looping; *i.e.*, tentacles attach to the substrate, the base releases, and the whole body somersaults, enabling the base to attach in a new position.

The genus is represented by 20 to 30 species, which differ chiefly in colour, tentacle length and number, and gonad position and size. All *Hydra* species feed on other small invertebrate animals such as crustaceans.

Hydractinia, genus of marine hydrozoan polyps (phylum Cnidaria), a group of invertebrate animals with a thin tubelike body that attaches to a surface. Species of the *Hydractinia* are colonial and usually live on snail shells inhabitated by hermit crabs. The basal stolon (stemlike structure) of a *Hydractinia* colony is comprised of numerous perisarc-covered tubes coalesced into an encrusting layer. Over this layer is spread a sheet of living tissue supporting the individual polyps, which include feeding polyps (gastrozooids), reproductive polyps (gonozooids), and long, mouthless polyps probably protective in function (tentaculozooids). Under some conditions (*e.g.*, when freshwater is squirted over a colony), the tentaculozooids beat in unison, a degree of behavioural coordination unusual among hydrozoans. There is no medusa stage; the colony produces uniformly ciliated, or planula (*q.v.*), larvae directly. *Hydractinia* species occur nearly worldwide in shallow waters. Several related genera also encrust gastropod shells containing hermit crabs, and fossil representatives dating back to the Triassic Period (about 190,000,000 years ago) are known.

hydramnios, also called POLYHYDRAMNIOS, excess of amniotic fluid, the liquid that surrounds the fetus in the uterus. Chronic hydramnios, in which fluid accumulates slowly, is fairly common, occurring as often as once in 200 or 300 deliveries. Acute hydramnios, in which fluids collect quickly and cause rapid distention of the uterus, is rare. Hydramnios is more frequent among women who have had a number of pregnancies or who are diabetic. The chronic form of the disorder causes discomfort from enlargement of the abdomen; it also causes difficulty in breathing and collection of fluid (edema) in the legs. Acute hydramnios causes abdominal pain, severe difficulty in breathing, and edema in the legs, the vulva (external female genital organs), and the lower part of the abdomen. There may be abnormally rapid heartbeat, interference with heart function, nausea, vomiting, constipation, and abnormally frequent urination. If the hydramnios is mild, no treatment may be necessary. If it is severe, removal of excess fluid or even termination of pregnancy may be required.

hydrangea (*Hydrangea*), any of a genus of erect or climbing woody shrubs, in the family Hydrangeaceae, native to the Western Hemisphere and eastern Asia. About 23 species are known. Several species are grown in greenhouses and gardens for their showy, usually ball-like flower clusters.

Hills-of-snow, or wild hydrangea (*H. arborescens*), a shrub slightly more than 1 metre (4 feet) tall, has rounded clusters of white flowers. The French hydrangea, or hortensia (*H. macrophylla*), is widely cultivated in many varieties for its large globular flower clusters in colours of rose, lavender, blue, and, rarely, white. These cultivated varieties are the florist's hydrangeas, forced for holiday use. The flower colour is variable, depending on the acidity of the growing medium: rose-pink under neutral to low soil acidity and blue under conditions of stronger acidity. Blue flowers can be produced by the early addition of chemicals to increase the acidity of the growing medium.

Peegee hydrangea (*H. paniculata* 'Grandiflora'), growing to a height of 9 m, is a common landscape hydrangea, with tapering flower clusters, opening white and fading to pink, then to bronze. Oakleaf hydrangea (*H. quercifolia*), up to 2 m high, has white flower clusters and deep wine-red fall foliage. The climbing hydrangea (*H. anomala petiolaris*, or *H. petiolaris*), can reach up to 15 m, clinging to any solid support by means of aerial rootlets.

Hydrangeaceae, the hydrangea family of flowering plants, in the order Saxifragales, comprising 19 genera and about 260 species of woody ornamental trees, shrubs, vines, and herbs, native primarily to tropical, subtropical, and north temperate regions. Shrubs of the genera *Deutzia, Hydrangea* (hydrangea), and *Philadelphus* (mock orange or sweet syringa) are well-known garden ornamentals. Other ornamental genera include *Cardiandra, Carpenteria, Decumaria, Dichroa, Jamesia, Kirengeshoma, Pileostegia, Platycrater, Schizophragma,* and *Whipplea.*

hydrate, any compound containing water in the form of H_2O molecules. The best known hydrates are crystalline solids that lose their fundamental structures upon removal of the bound water. Exceptions to this are the zeolites, aluminum silicate minerals or their synthetic analogues that contain water in indefinite amounts; zeolites lose and regain water reversibly with little or no change in structure.

Examples of hydrates are: Glauber's salt (sodium sulfate decahydrate; $Na_2SO_4 \cdot 10H_2O$), washing soda (sodium carbonate decahydrate; $Na_2CO_3 \cdot 10H_2O$), borax (sodium tetraborate decahydrate; $Na_2B_4O_7 \cdot 10H_2O$), and also blue vitriol (copper sulfate pentahydrate; $CuSO_4 \cdot 5H_2O$).

A number of gases, notably the noble gases and simple hydrocarbon gases, form crystalline hydrates, called clathrate compounds, at relatively low temperatures and pressures. Clathrate crystals have a structure in which the water molecules form a loosely held framework surrounding the gas molecule.

hydraulic civilization, according to the theories of the German-American historian Karl A. Wittfogel, any culture having an agricultural system that is dependent upon large-scale government-managed waterworks—productive (for irrigation) and protective (for flood control). Wittfogel advanced the term in his book *Oriental Despotism* (1957). He believed that such civilizations—although neither all in the Orient nor characteristic of all Oriental societies—were quite different from those of the West.

Wittfogel believed that wherever irrigation required substantial and centralized control, government representatives monopolized political power and dominated the economy, resulting in an absolutist managerial state. In addition, there was a close identification of these officials with the dominant religion and an atrophy of other centres of power. The forced labour for irrigation projects was directed by the bureaucratic network. Among these hydraulic civilizations, Wittfogel listed ancient Egypt, Mesopotamia, China, and India and pre-Columbian Mexico and Peru.

The extreme importance of the role of irrigation in social development has been disputed by other writers. Not all of the features that Wittfogel linked are necessarily found together, and they also may appear without large-scale irrigation. The static nature of his model has also been criticized. The U.S. anthropologist Robert McCormick Adams suggested that archaeological evidence fails to support Wittfogel's contention that irrigation is the primary cause of the formation of coercive political institutions but conceded that, as part of a larger system of subsistence techniques, political structure, and economic relationships, it may help consolidate political control.

hydraulic equivalence, size–density relationship that governs the deposition of mineral particles from flowing water. Two particles of different sizes and densities are said to be hydraulically equivalent if they are deposited at the same time under a given set of conditions; the smaller particle will have the higher density. Thus, it is not uncommon to find sedimentary deposits containing coarse quartz particles together with fine particles of heavy minerals.

Heavy minerals have a size distribution similar to that of quartz; they occur in silt, sand, and even larger sizes. Because of this fact, it was possible for the U.S. geologist Gordon Rittenhouse to determine (1943) the hydraulic equivalence for various heavy minerals in terms of the Udden grade scale, which is based on the size of quartz grains (*see* grade scale); these equivalents express the number of Udden grades by which the heavy mineral particle is smaller than the equivalent quartz particle. In general order of increasing density, and thus hydraulic equivalence, some examples include tourmaline (0.2), amphibole (hornblende, 0.2), pyroxene (0.3), apatite (0.4), titanite (0.5), garnet (0.6), zircon (0.9), ilmenite (1.0), and magnetite (1.0).

hydraulic mining, use of a powerful jet of water to dislodge minerals present in uncon-

solidated ground. In the hydraulic mining of gold, the rebounding stream of water and mineral fragments is directed into sluices in which the gold settles behind baffles but the lighter waste matter is washed away. In hydraulic mining of coal, the water simply breaks the coal from the seam and washes it to a collecting point. *See also* placer mining.

hydraulic power, also called FLUID POWER, power transmitted by the controlled circulation of pressurized fluid, usually a water-soluble oil or water–glycol mixture, to a motor that converts it into a mechanical output capable of doing work on a load. Hydraulic power systems have greater flexibility than mechanical and electrical systems and can produce more power than such systems of equal size. They also provide rapid and accurate responses to controls. As a result, hydraulic power systems are extensively used in modern aircraft, automobiles, heavy industrial machinery, and many kinds of machine tools.

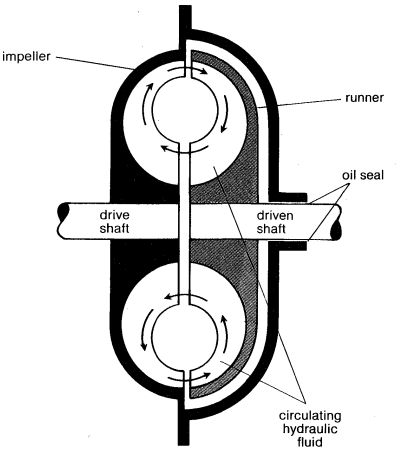
Motors in a hydraulic power system are commonly classified into two basic types: linear motors and rotational motors. A linear motor, also called a hydraulic cylinder, consists of a piston and a cylindrical outer casing. The piston constitutes the mechanical interface across which kinetic energy from the fluid is transferred to the motor mechanism. A piston rod serves to couple the mechanical force generated inside the cylinder to the external load. Hydraulic linear motors are useful for applications that require a high-force, straight-line motion and so are utilized as brake cylinders in automobiles, control actuators on aircraft, and in devices that inject molten metal into die-casting machines. A rotational motor, sometimes called a rotary hydraulic motor, produces a rotary motion. In such a motor the pressurized fluid supplied by a hydraulic pump acts on the surfaces of the motor's gear teeth, vanes, or pistons and creates a force that produces a torque on the output shaft. Rotational motors are most often used in digging equipment (*e.g.,* earth augers), printing presses, and spindle drives on machine tools.

hydraulic press, device consisting of a cylinder fitted with a sliding piston that exerts force upon a confined liquid, which, in turn, produces a compressive force upon a stationary anvil or baseplate. The liquid is forced into the cylinder by a pump. The hydraulic press is widely used in industry for forming metals and for other tasks where a large force is required. It is manufactured in a wide variety of styles and sizes and in capacities ranging from 1 ton or less to 10,000 tons or more.

hydraulic transmission, device employing a liquid to transmit and modify linear or rotary motion and linear or turning force (torque). There are two main types of hydraulic power transmission systems: hydrokinetic, such as the hydraulic coupling and the hydraulic torque converter, which use the kinetic energy of the liquid; and hydrostatic, which use the pressure energy of the liquid.

The hydraulic coupling is a device that links two rotatable shafts. It consists of a vaned impeller on the drive shaft facing a similarly vaned runner on the driven shaft, both impeller and runner being enclosed in a casing containing a liquid, usually oil (*see* figure). If there is no resistance to the turning of the driven shaft, rotation of the drive shaft will cause the driven shaft to rotate at the same speed. A load applied to the driven shaft will slow it down, and a torque, or turning moment, that has the same magnitude on both shafts will be developed. In a properly designed hydraulic coupling, under normal loading conditions, the speed of the driven shaft is about 3 percent less than the speed of the drive shaft. By means of a scoop tube, the quantity of liquid in a coupling and the speed of the driven shaft can be varied. Since there is no mechanical connection between the impeller and the runner, a hydraulic coupling does not transmit shocks and vibrations.

The hydraulic torque converter is similar to the hydraulic coupling, with the addition of a stationary vaned member interposed between the runner and the impeller. All three



Hydraulic coupling

elements are enclosed in a casing containing a liquid, usually oil. The effect of the stationary member is to make the torque, or turning moment, on the driven shaft greater than the torque on the drive shaft. When the driven shaft is stopped (stalled), the torque on it is a maximum and may be as much as 3.5 times the drive-shaft torque. A hydraulic torque converter acts like an infinitely variable speed transmission, delivering its higher torques when the output speed is low. In automatic transmissions for automobiles, it can be used as a partial or total substitute for a gearbox and clutch.

Hydraulic transmissions of the hydrostatic type are combinations of hydraulic pumps and motors and are used extensively for machine tools, farm machinery, coal-mining machinery, and printing presses. The motor and pump can be widely separated and connected by piping. Such a system, using pressurized water, was built in London in 1882 and is still used to drive machinery to lift bridges and operate hoists.

hydraulics, branch of science concerned with the practical applications of fluids, primarily liquids, in motion. It is related to fluid mechanics (*q.v.*), which in large part provides its theoretical foundation. Hydraulics deals with such matters as the flow of liquids in pipes, rivers, and channels and their confinement by dams and tanks. Some of its principles apply also to gases, usually in cases in which variations in density are relatively small. Consequently, the scope of hydraulics extends to such mechanical devices as fans and gas turbines and to pneumatic control systems.

Liquids in motion or under pressure did useful work for man for many centuries before French scientist-philosopher Blaise Pascal and Swiss physicist Daniel Bernoulli formulated the laws on which modern hydraulic-power technology is based. Pascal's law, formulated in about 1650, states that pressure in a liquid is transmitted equally in all directions; *i.e,* when water is made to fill a closed container, the application of pressure at any point will be transmitted to all sides of the container. In the hydraulic press, Pascal's law is used to gain an increase in force; a small force applied to a small piston in a small cylinder is transmitted through a tube to a large cylinder, where it presses equally against all sides of the cylinder, including the large piston.

Bernoulli's law, formulated about a century later, states that energy in a fluid is due to elevation, motion, and pressure, and if there are no losses due to friction and no work done, the sum of the energies remains constant. Thus, velocity energy, deriving from motion, can be partly converted to pressure energy by enlarging the cross section of a pipe, which slows down the flow but increases the area against which the fluid is pressing.

Until the 19th century it was not possible to develop velocities and pressures much greater than those provided by nature, but the invention of pumps brought a vast potential for application of the discoveries of Pascal and Bernoulli. In 1882 the city of London built a hydraulic system that delivered pressurized water through street mains to drive machinery in factories. In 1906 an important advance in hydraulic techniques was made when an oil hydraulic system was installed to raise and control the guns of the USS "Virginia." In the 1920s, self-contained hydraulic units consisting of a pump, controls, and motor were developed, opening the way to applications in machine tools, automobiles, farm and earth-moving machinery, locomotives, ships, airplanes, and spacecraft.

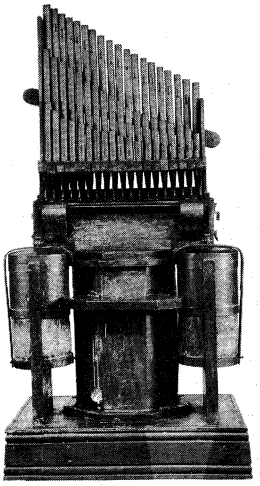
In hydraulic-power systems there are five elements: the driver, the pump, the control valves, the motor, and the load. The driver may be an electric motor or an engine of any type. The pump acts mainly to increase pressure. The motor may be a counterpart of the pump, transforming hydraulic input into mechanical output. Motors may produce either rotary or reciprocating motion in the load.

The growth of fluid-power technology since World War II has been phenomenal. In the operation and control of machine tools, farm machinery, construction machinery, and mining machinery, fluid power can compete successfully with mechanical and electrical systems (*see* fluidics). Its chief advantages are flexibility and the ability to multiply forces efficiently; it also provides fast and accurate response to controls. Fluid power can provide a force of a few ounces or one of thousands of tons.

Hydraulic-power systems have become one of the major energy-transmission technologies utilized by all phases of industrial, agricultural, and defense activity. Modern aircraft, for example, use hydraulic systems to activate their controls and to operate landing gears and brakes. Virtually all missiles, as well as their ground-support equipment, utilize fluid power. Automobiles use hydraulic-power systems in their transmissions, brakes, and steering mechanisms. Mass production and its offspring, automation, in many industries have their foundations in the utilization of fluid-power systems.

hydraulis, earliest known mechanical pipe organ. It was invented in the 3rd century BC by Ctesibius of Alexandria, culminating prior attempts to apply a mechanical wind supply to a large set of panpipes. Its pipes stood on top of a wind chest that was connected to a conical wind reservoir. The reservoir was supplied with air by one or two pumps. For the pipes to sound evenly, the wind chest needed steady air pressure. The open bottom of the cone was set in a tall outer container half filled with water. When air pressure in the cone was low, the water level rose inside it, compressing the air and restoring the former air pressure. The player operated keys or, on some instruments, sliders that let air into the pipes.

The hydraulis was used at outdoor public entertainments; its sound was loud and penetrating. Its use declined in the West by the 5th century AD, although Arab writers of the 9th century refer to it. Later medieval writers



Reconstruction of a Greco-Roman hydraulis, 1st-century type; in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston

thought the hydraulis was a steam-whistle organ such as the calliope.

hydrazine (N_2H_4), one of a series of compounds called hydronitrogens, a powerful reducing agent (one that serves as electron donor in oxidation–reduction reactions) used in the silvering of mirrors, formation of metal films on glass and plastics, and as a corrosion inhibitor. Hydrazine and some of its organic derivatives are used as rocket and jet-propulsion fuel. It is a colourless liquid (freezing point 1.4° C, boiling point 113.5° C) that readily absorbs moisture to form the hydrate $N_2H_4 \cdot H_2O$; hydrazine possesses an ammonia-like odour.

Hydrazine was first isolated from organic compounds in 1887. The common method of preparation is by oxidation of ammonia or urea with sodium hypochlorite in the presence of gelatin or glue, a process first developed in 1907.

Hydrazine reacts with acids and some metallic salts, and the products are used in the manufacture of certain explosives and agricultural fungicides. Hydrazine reacts with organic compounds to form alkyl hydrazines, used as fuel in rocket propulsion, and hydrazones and hydrazides, used as pharmaceuticals such as isoniazid (in the treatment of tuberculosis), and as chemical intermediates in the production of polymers and photographic chemicals.

hydria, large water vessel in Greek pottery of the Archaic period (*c.* 750–*c.* 480 BC) and the Classical Period (*c* 480–*c.* 330 BC). It is found in both the black-figure and the red-figure styles (*qq.v.*). The hydria is distinctive in having three handles: a pair of small, horizontal handles at the sides for lifting, and a large, vertical handle at the neck or shoulder for dipping and pouring.



Hydria by the Meidias Painter, *c.* 410 BC; in the British Museum

By courtesy of the trustees of the British Museum

hydride, any of a class of chemical compounds in which one or more hydrogen atoms are attached to a metal or metalloid (metal-like) atom. Several compounds of this class are useful as rocket fuels and as hydrogen sources for filling balloons, and others are of prime importance in nuclear fusion processes. The term hydride is also applicable to metallic phases the composition of which may vary within narrow limits; *e.g.,* palladium hydride, which has the approximate composition Pd_2H.

Four types of hydrides are distinguished in a classification based on the type of chemical bond involved:

1. Saline, or saltlike: hydrides in which hydrogen is present as a negatively charged ion, H^-. In these compounds, hydrogen displays a family resemblance to the halogens: fluorine, chlorine, etc. Saline hydrides react vigorously with water, giving off large volumes of gaseous hydrogen; this property renders them useful as light, portable sources of hydrogen. Examples of binary saline hydrides are sodium hydride, NaH, and calcium hydride, CaH_2. Examples of complex saline hydrides are lithium aluminum hydride, $LiAlH_4$, and sodium borohydride, $NaBH_4$, both of which are commercial chemicals used as reducing agents (substances that provide electrons).

2. Metallic (formerly termed interstitial): alloy-like hydrides that possess some of the characteristics of metals, such as lustre and strong electrical conductivity. They tend, however, to be more brittle and sometimes harder than the metals from which they are made. Such compounds are regarded as intermediate in nature between salts and alloys. Metallic hydrides have been regarded as made up of protons (positive hydrogen ions, H^+) and metal atoms in an electron sea. The lustre and electrical conductivity are attributed to the relative freedom of electron movement in the hydride. Examples are titanium hydride, TiH_2, thorium dihydride, ThH_2, and a higher hydride, Th_4H_{15}.

3. Dimeric or polymeric: hydrides in which hydrogen is presumed to have formed a connecting bridge between metal or metalloid atoms. Classical examples are furnished by the numerous hydrides of boron; *e.g.,* diborane, B_2H_6; pentaborane, B_5H_9; decaborane, $B_{10}H_{14}$; etc. When such hydrides burn, they give off considerably more energy than is provided by carbonaceous fuels and are of interest as high-energy fuels for rockets. Aluminum and, possibly, copper and beryllium hydrides are nonconductors that exist in solid, liquid, or gaseous forms. All are thermally unstable, and some explode on contact with air or moisture.

4. Covalent-volatile hydrides, in which the bonds are evidently electron pairs shared by atoms of comparable electronegativities. Examples are silane, SiH_4; arsine, AsH_3; germane, GeH_4; aluminum borohydride, $Al(BH_4)_3$; and digermane, Ge_2H_6. These hydrides are volatile and thermally unstable and usually have a strong odour. Some are exceptionally toxic (*e.g.,* arsine, AsH_3), and others may ignite on contact with air or moisture, such as $Al(BH_4)_3$.

hydrocarbon, any of a class of organic chemical compounds composed only of the elements carbon and hydrogen. The carbon atoms join together as the framework of the compound; the hydrogen atoms attach to them in many different configurations. Hydrocarbons are the principal constituents of petroleum and natural gas. They serve as fuels and lubricants as well as raw materials for the production of plastics, fibres, rubbers, solvents, explosives, and industrial chemicals.

A brief treatment of hydrocarbons follows. For full treatment, *see* MACROPAEDIA: Chemical Compounds.

Many hydrocarbons occur in nature. In addition to being the chemical basis of fossil fuels, they are present in trees and plants, as for example, in the form of pigments such as the carotenes that occur in carrots and green leaves. More than 98 percent of natural crude rubber is a hydrocarbon polymer, a chain-like molecule consisting of many units linked together.

Hydrocarbons are virtually insoluble in water and less dense than water, which is why they float on its surface. They are usually soluble in one another, however, as well as in certain organic solvents. All hydrocarbons are combustible. If burned completely with sufficient oxygen, they produce carbon dioxide and water. In the process they produce heat. If the oxygen is insufficient, the combustion gives off carbon monoxide.

The structures and chemistry of individual hydrocarbons depend in large part on the types of chemical bonds that link the atoms of their constituent molecules. A carbon atom has a maximum of four single bonds, but it can also form double or triple bonds. A hydrogen atom can form only one single bond.

Hydrocarbons are divided into several classes according to their structure. The two major categories are aliphatic and aromatic. Aliphatic hydrocarbons can be composed of molecules in which the carbon atoms are linked in chains. They are called acyclic. They also can be composed of carbon atoms joined in rings, in which case they are called alicyclic or carbocyclic. Aliphatic hydrocarbons are also categorized according to the types of bonds between the carbon atoms. If the bonds are all single, the compound is said to be saturated. Such compounds are classified as alkanes, or cycloalkanes. If two or more bonds connect any two carbon atoms, the hydrocarbon is called unsaturated. The bonds may be double, as in the alkenes or alkadienes, or triple, as in the alkynes. Some compounds contain both types of multiple bonds in the same molecule.

The simplest alkanes are methane (the most abundant hydrocarbon), ethane, and propane. These three compounds exist in only one structure. Higher members of the series, beginning with butane, may be constructed in two different ways, depending on whether the carbon chain is straight or branched. Such compounds are called isomers. The phenomenon of isomerism is one of the most important in organic chemistry. Isomers are molecules with the same composition but different structures. As a result, they usually have similar chemical properties.

Cycloalkanes are ring structures with two fewer hydrogen atoms in the molecule of the corresponding alkane. Many have more than one ring. Six-membered rings are of particular interest because they occur in many natural products, especially the steroids. Cyclic structures also can be isomers where two molecules differ only in the spatial arrangement of substituent groups.

The main commercial sources of alkanes are petroleum and natural gas. Individual higher alkanes and cycloalkanes usually are synthesized by reactions designed for a specific product. These saturated hydrocarbons can also be synthesized from corresponding unsaturated molecules, by hydrogenation (addition of hydrogen). Saturated hydrocarbons are relatively inert—*i.e.,* at room temperature they are unaffected by most acids, alkalies, and oxidizing or reducing agents.

The unsaturated alkenes, also called olefins, have two fewer hydrogens per molecule than do the alkanes. Their most common structural feature is a carbon–carbon double bond.

Generally there are more alkene isomers than alkane isomers. The first two members of the alkene series are ethylene and propylene. The double bond characteristic of the alkenes is of a type that is somewhat weaker and more easily broken than the alkane single bond. Thus, alkenes are much more reactive than alkanes.

Alkenes with low molecular weights are produced commercially by cracking natural gas or petroleum (the breaking of their chemical bonds) or from mixtures of hydrocarbons derived from them. Ethylene, by far the most important alkene industrially, is used to make several products, including polyethylene, polystyrene, and ethylene oxide (used to make glycol antifreeze and various other products). Propylene and butene are also manufactured on a large scale and used to produce chemicals for solvents or starting materials.

Alkenes are generally physically similar to alkanes or cycloalkanes with equal numbers of carbon atoms. However, while alkanes react mainly by substituting elements, alkenes react mainly by adding them. Alkenes are converted to alcohols by hydrogenation in the presence of an acid catalyst. Ethanol, for example, is produced this way from ethylene. Alcohols are also added to alkenes in the presence of acid to make ether from ethylene.

A very important alkene reaction takes place when one alkene molecule is added to the double bond of another. This process is used to synthesize polymers. Polymerization is one of the most important reactions used by the chemical industry. For example, it is the process for converting ethylene to polyethylene.

Other unsaturated aliphatic hydrocarbons include the alkynes that are characterized by a carbon–carbon triple bond. The simplest and commercially most important of the series is acetylene. Acetylene can be hydrated to make acetaldehyde, an important precursor of other chemicals, or added to hydrogen cyanide to produce acrylonitrile, a valuable monomer used to manufacture synthetic fibres. Alkynes also are useful as intermediates in organic chemistry.

Compounds with more than one carbon–carbon double bond are called dienes, or polyenes. They occur widely in nature and are commercially important. The physical properties of polyenes are similar to those of alkanes and alkenes with an equal number of carbon atoms. The outstanding characteristic is the intense colour of those which have alternating single and double bonds. The most important commercial diene is 1,3-butadiene, used to manufacture synthetic rubber.

The aromatic hydrocarbons have distinctly different properties from the aliphatic compounds. Some of these substances have pleasant aromas, which accounts for their name. Most aromatic substances can be derived from benzene, which is a six-ring hydrocarbon, by replacing one or more of the hydrogen atoms with other atoms or groups. The bonds between the carbon atoms are neither single nor double but are of a type called a resonance hybrid. There are a number of nonbenzenoid aromatic compounds, but the benzenoid compounds form a larger and more important class.

Aromatic-hydrocarbon production is usually based on petroleum. Most are produced by catalytic hydrogenation of alkanes. In addition, some aromatic hydrocarbons are synthesized.

The most characteristic reaction of aromatic hydrocarbons is substitution—*i.e.*, the replacement of the hydrogens by other atoms or groups. The reaction may be repeated several times to produce polysubstituted compounds.

There are many aromatic hydrocarbons with more than one benzene ring. Commercially important aromatic hydrocarbons have fused or condensed rings in which two or more carbon atoms are shared by several rings. Most condensed hydrocarbons are crystalline solids. Many are present in coal tar, of which naphthalene is the most common. One fused-ring system appears in many synthetic dyes; another is present in numerous natural products, including the steroid hormones.

hydrocele, excessive accumulation of fluids between the scrotal sac and the testes in the male reproductive tract. The testes are the male reproductive glands that produce sperm cells; they are suspended in the loose outer scrotal sac hanging down from the lower abdomen. Before a child is born the testes are inside the abdomen; later they descend into the scrotal sac.

There are many forms of hydrocele. The most common is chronic simple hydrocele, in which fluid accumulates gradually about the testes. It usually afflicts men past the age of 40, and its cause is usually unknown. In the congenital form, there is an opening between the scrotum and the abdominal cavity; fluids can fluctuate between the two spaces. Inguinal hydrocele is like the simple form except that the testes have not descended into the scrotum; hydroceles of this nature involve the intra-abdominal testes as well as the scrotal sac.

Hernial hydroceles involve projections of abdominal contents (intestines, bladder, etc.) and fluids into the scrotal sac from the abdominal floor. Usually the abdominal contents and fluids are enclosed in a pouch that descends into the scrotum, and the fluids are within the hernia rather than in the scrotal cavity proper. In congenital hernias there may be segments of intestine within the scrotum. Some hydroceles are combinations of these forms.

Hydroceles thought to be a result of other bodily disturbances are called symptomatic. Frequently this type arises in such conditions as orchitis, an inflammation and swelling of the testes, or as a complication of testicular tumours. Physical injury may cause a hydrocele; in newborn infants with difficult deliveries, there may be accumulation of fluid for several days or weeks. The fluid may disappear as the condition subsides, or it may be retained, causing a chronic symptomatic hydrocele.

The fluid in infected hydroceles can be brown or bloody. Normally, it is clear, amber in colour, and of a high specific gravity (weight). It contains proteins, water, fat, some white blood cells, and surface skin cells. If large amounts of fibrin are present, a solid or cystic wall may form between the scrotum and the testes. Tissue destruction may occur in all cases of moderate to large hydroceles because of the increased pressure on the cells and the impairment of blood circulation. Hydroceles may be painless when small, but, when they reach a sufficient size, their weight pulls on the spermatic cords, which can cause a dull aching pain. Large hydroceles can obstruct urination. Treatment may require surgical drainage and repair and administration of antibiotics.

Consult the INDEX *first*

hydrocephalus, accumulation of cerebrospinal fluid in the brain ventricles, causing seizures, mental retardation, and progressive enlargement of the head. The condition may result from an overproduction of the fluid, from a congenital malformation blocking normal drainage of the fluid, or from complications of head injuries or infections. Untreated hydrocephalus carries a high mortality, but most victims are successfully treated by surgery to drain the fluid into the blood or abdomen. *See also* neural tube defect.

Hydrocharitales, the frog's-bit order of monocotyledonous flowering plants comprising the family Hydrocharitaceae, with 16 genera of submerged and emergent, freshwater and saltwater aquatic herbs, mainly of warmer regions.

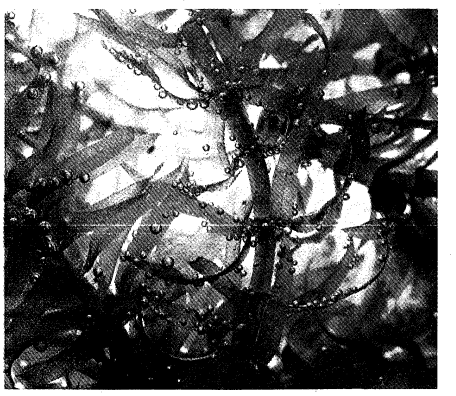
The plants are characterized by radially symmetrical, usually separate male and female



Eelgrass (*Vallisneria spiralis*)
Gretchen Garner—EB Inc.

flowers (rarely are they bisexual) that are produced on separate plants. The female flowers have an inferior ovary (*i.e.*, the ovule-bearing parts are positioned below the attachment point of the sepals and petals). The leaves are produced in whorls or clusters at numerous points along the stems, which may be horizontal, rootlike structures (rhizomes) or leafy erect or floating stems.

The largest genera are *Ottelia* (40 species), *Lagarosiphon* (15 species), *Elodea* (including *Anacharis*, 12 species), *Blyxa* (10 species),



Waterweed (*Elodea*); the bubbles attached to leaves and stem were generated by photosynthesis
Runk Schoenberger from Grant Heilman—EB Inc.

Halophila (10 species), and *Vallisneria* (8 to 10 species). *Thalassia* (2 species) and *Halophila* are marine. The rest are freshwater plants. The order is considered to have evolved from common ancestors with the order Alismales.

The order is notable for the unique pollination mechanism of some genera (*e.g.*, *Elodea, Enhalus, Hydrilla,* and *Vallisneria*). The male flowers become detached and float about until they encounter and transfer pollen to a female flower, which has reached the surface of the water by means of an elongated stalk. After pollination the developing fruit is drawn under the water, where it ripens.

Other genera are pollinated by wind, insects,

or water (by means of floating pollen in the last case). Many produce special stems with buds that drop off and spend the winter in the bottom mud (*Hydrocharis, Stratiotes,* and *Elodea*).

Several members of the order are cultivated or are otherwise economically important. *Elodea* (*q.v.*), for example, is used in aquariums as an ornamental plant and in schools as an experimental plant. The frog's-bit, for which the order receives its common name, is *Hydrocharis morsus-ranae,* a rootless water plant with round or heart-shaped floating leaves and small, attractive, three-petaled white flowers. The water soldier (*Stratiotes aloides*) bears floating rosettes of tough, sharp-edged leaves that float in summer but sink and decay in the autumn. The tape grass, or eelgrass, genus *Vallisneria* includes an important aquarium ornamental plant. Turtle grass (*Thalassia*) is often washed ashore in such quantities following storms at sea that it is collected and used as a fertilizer.

hydrochemistry: *see* chemical hydrology.

hydrochloric acid, corrosive, colourless acid prepared by dissolving gaseous hydrogen chloride in water (*see* hydrogen chloride).

Hydrocleys, genus of perennial aquatic plants of the family Limnocharitaceae, consisting of three or four species, all native to tropical America. The water poppy (*H. nymphoides*), which has yellow flowers about 5 cm (2 inches) across, is the only cultivated species and is grown in ponds and aquariums.

hydrocortisone (chemical): *see* cortisol.

Hydrodictyon (algae): *see* water net.

hydroelectric power, electricity produced from generators driven by water turbines that convert the potential energy in falling or fast-flowing water to mechanical energy.

A brief treatment of hydroelectric power follows. For full treatment, *see* MACROPAEDIA: Energy Conversion.

In the generation of hydroelectric power, water is collected or stored at a higher elevation and led downward through large pipes or tunnels (penstocks) to a lower elevation; the difference in these two elevations is known as the head. In the course of its passage down the steep pipes, the falling water rotates turbines. The turbines in turn drive generators, which convert the turbines' mechanical energy into electricity. Transformers change the alternating current produced by the generators into a very high-voltage current that is suitable for long-distance transmission. The structure that houses the turbines and generators, and into which the pipes or penstocks feed, is called the powerhouse.

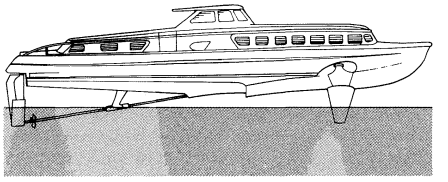
Hydroelectric power plants are usually emplaced in dams that impound rivers, thereby raising the level of the water behind the dam and creating a relatively high head. The potential power that can be derived from a volume of water is directly proportional to the working head, so that a high-head installation requires a smaller volume of water than a low-head installation to produce an equal amount of power. In some dams, the powerhouse is constructed on one flank of the dam; part of the dam itself is used as a spillway over which excess water is discharged in times of flood. Where the river flows in a narrow, steep gorge, the powerhouse may be in the dam itself.

In some areas where electric-power demand varies sharply at different times of the day, pumped-storage hydroelectric stations are used. During off-peak periods, some of the extra power available is used to pump water into a special reservoir. Then, during periods of peak demand when the power required by the system exceeds the base-load value, the water is allowed to flow down again to generate additional electrical energy. Pumped-storage systems are efficient and, in most cases, constitute the most economical way to meet peak loads.

In certain coastal areas, such as the Rance River estuary in Brittany, France, hydroelectric-power plants have been constructed to take advantage of the rise and fall of tides. When the tides come in, the water is impounded in special reservoirs. The water trapped in these basins is then released and the tidal flow used to power hydraulic turbines, which in turn drive electric generators (*see* tidal power).

Falling water is one of the three principal sources of energy used to generate electric power, the other two being fossil fuels and nuclear fuels. Hydroelectric power has certain advantages over these other sources: it is continually renewable owing to the recurring nature of the hydrologic cycle; and it produces neither thermal nor particulate pollution. Hydroelectric power is of varying importance in different countries. Nations such as Norway, Sweden, Canada, and Switzerland are able to rely heavily on hydroelectricity because they all have mountainous regions that are subject to heavy rainfall and that lie in close proximity to industrialized areas that require large amounts of electricity. These countries have built hydroelectricity-producing dams at many of the favourable sites within their borders. Hydroelectric power is utilized on a relatively large scale by various other countries, including the United States, the Soviet Union, China, India, and Brazil, but it contributes a much smaller proportion of these nations' total electric power.

hydrofoil, underwater fin with a flat or curved surface designed to lift a moving water vehicle by means of the reaction upon its surface from the water through which it moves. Seaplanes have retractable hydrofoils attached by struts.



Hydrofoil

From Bjorn Landstrom, *The Ship,* illustration Copyright © 1961 by Bjorn Landstrom; reproduced by permission of Doubleday & Company, Inc.

Speedboats have hydrofoils for lifting the hull clear of the water as speed increases.

Hydrofoil ships, moving with hulls raised clear of the water, are faster than ships of conventional design but are limited to moderate sizes. The first successful hydrofoil ship was probably built in Italy about 1900 by Enrico Forlanini. Hydrofoils were not widely used until the 1950s, when military and commercial ships were built and seaplane landing gears were foils in the form of hydro-skis. By the 1970s hydrofoil craft were in operation in many places, and speeds of up to 80 knots (nautical miles per hour) had been achieved. The name hydrofoil has come to be applied loosely to any craft using the hydrofoil device.

hydrogen (H), a colourless, odourless, tasteless, flammable gaseous substance that is the simplest member of the family of chemical elements. The hydrogen atom has a nucleus consisting of a proton bearing one unit of positive electrical charge; an electron, bearing one unit of negative electrical charge, is associated with this nucleus. Although on Earth hydrogen ranks ninth among the elements in abundance, making up 0.9 percent of the mass of the planet, it is by far the most abundant element in the universe, accounting for about 75 percent of the mass of all matter. Collected by gravitational forces in stars, hydrogen is converted into helium by nuclear fusion, a process that supplies the energy of the stars, including the Sun. Hydrogen is present in all animal and vegetable substances in the form of compounds in which it is combined with carbon and other elements. In the form of hydrocarbons, it is a constituent of petroleum and coal. It also constitutes nearly 11 percent of the mass of water. The hydrogen content of the Earth's atmosphere remains low because of the continual escape of the gas into space.

It appears that the German-Swiss alchemist Paracelsus in the 16th century had handled hydrogen, since he found that a flammable gas was produced when a metal was dissolved in an acid. However, hydrogen was then confused with other flammable gases such as hydrocarbons and carbon monoxide. In 1766 the English chemist Henry Cavendish showed that hydrogen, which was then called "inflammable air," or "phlogiston," was distinct from other combustible gases by measuring its density and the amount of gas evolved from a given amount of acid and metal. In 1776 J. Warltire noticed that water was formed when hydrogen burned. In 1781 Cavendish confirmed this observation, and the French chemist Antoine-Laurent Lavoisier subsequently coined the name hydrogen (Greek: "maker of water"). The two heavier isotopes of hydrogen, deuterium and tritium, were discovered in 1931 and 1935, respectively.

Hydrogen was used to fill balloons from 1783 until at least World War II, although, for passenger-carrying airships, helium has the advantage of nonflammability. The largest amounts of hydrogen are currently used in synthesizing ammonia and methanol, in desulfurizing petroleum fuels, and for producing stable, volatile products from certain oil-refinery by-products. Hydrogen also is used in the hydrogenation of organic compounds to make solvents and industrial chemicals, such as cyclohexane from benzene, and food products, such as margarine and shortenings from animal and vegetable fats and oils. Hydrogen reacts with chlorine or bromine to produce hydrogen chloride or hydrogen bromide. A few metals, particularly tungsten and molybdenum, are prepared by treating their oxides or salts with hydrogen.

Liquid hydrogen is used in the laboratory to produce extremely low temperatures and in bubble chambers for photographing the tracks of nuclear particles. Liquid hydrogen is of great importance in space-exploration programs as a rocket fuel with oxygen or fluorine as the oxidizer. The deuterium isotope of hydrogen is the key component of the thermonuclear bomb (*q.v.*).

The combustion of hydrogen with oxygen produces temperatures of about 2,600° C (4,700° F); even higher temperatures, above 3,400° C (6,150° F), result from the recombination of hydrogen atoms produced by the dissociation of hydrogen molecules by an electric arc or a heated tungsten filament.

Small quantities of hydrogen usually are produced by the action of zinc upon sulfuric acid. Industrial processes include the action of steam or oxygen on hydrocarbons such as methane. Hydrogen also results as a by-product in various fermentations, in petroleum-refining operations, and in the manufacture of caustic alkalies and chlorine by electrolytic reactions.

Hydrogen atoms are reactive and combine with one another in pairs, forming diatomic hydrogen molecules, represented by the formula H_2. In the molecular form known as orthohydrogen ("normal hydrogen"), the nuclear spins of both protons are oriented in the same direction, while, in the form known as parahydrogen, their spins are oriented in opposite directions. At ordinary temperatures, hydrogen consists of about 75 percent orthohydrogen and 25 percent parahydrogen, but as the temperature is lowered, a growing proportion of the orthohydrogen molecules are

converted to parahydrogen ones. Similarly, at elevated temperatures parahydrogen can be converted to normal hydrogen.

Hydrogen is the lightest chemical element, has the highest heat conductivity, and has the highest coefficient of diffusion of all the gases. Chemically, hydrogen resembles the elements of groups I and VII of the periodic classification. Under proper conditions, it combines directly with most of the lighter elements and with many of the heavier elements. In compounds with metals, the hydrogen atom acquires a second electron, forming the negatively charged hydride ion, H^-; with nonmetals, it shares its electron to form covalently bonded molecules such as methane, ammonia, water, and hydrogen chloride. In certain cases, the covalent bond is easily broken, forming the hydrogen ion, H^+, and a negative ion from the remainder of the original molecule. The properties of most acids, particularly in aqueous solutions, arise from the presence of the hydrogen ion. For additional information about the major hydrogen compounds, *see* alcohol; ammonia; hydride; hydrocarbon.

Hydrogen reacts violently with fluorine, even at extremely low temperatures; with many other elements, hydrogen reacts upon heating or in the presence of catalysts.

Naturally occurring hydrogen consists of three isotopes: hydrogen-1, or protium, 99.985 percent; hydrogen-2, or deuterium (*q.v.*), 0.015 percent; and hydrogen-3, or tritium (*q.v.*), a minute trace. Tritium can be produced artificially; it is radioactive, having a half-life of 12.26 years.

atomic number	1
atomic weight	1.00797
melting point	−259.2° C (−434.6° F)
boiling point	−252.8° C (−422.8° F)
density	0.08988 g/l (0° C, 1 atm)
oxidation states	−1, 1
electron config.	$1s^1$

hydrogen-3: *see* tritium.

hydrogen bomb: *see* thermonuclear bomb.

hydrogen chloride (HCl), a compound of the elements hydrogen and chlorine, a gas at room temperature and pressure. A solution of the gas in water is called hydrochloric acid.

Hydrogen chloride may be formed by the direct combination of chlorine (Cl_2) gas and hydrogen (H_2) gas; the reaction is rapid at temperatures above 250° C (482° F). The reaction, represented by the equation $H_2 + Cl_2 \rightarrow 2HCl$, is accompanied by evolution of heat and appears to be accelerated by moisture. Hydrogen chloride is commonly prepared both on a laboratory and on an industrial scale by the reaction of a chloride, generally that of sodium (NaCl), with sulfuric acid (H_2SO_4). It is also produced by the reaction of some chlorides (*e.g.,* phosphorus trichloride, PCl_3, or thionyl chloride, $SOCl_2$) with water and as a by-product of the chlorination of many organic substances (*e.g.,* methane, benzene).

Hydrochloric acid is prepared by dissolving gaseous hydrogen chloride in water. Because of the corrosive nature of the acid, ceramic, glass, or sometimes tantalum apparatus is commonly used. Hydrochloric acid is usually marketed as a solution containing 28–35 percent by weight hydrogen chloride, commonly known as concentrated hydrochloric acid. Anhydrous liquid hydrogen chloride is available, but because heavy and expensive containers are required to store it, the use of hydrogen chloride in this form is limited.

Hydrogen chloride is a colourless gas of strong odour; it condenses at −85° C (−121° F) and freezes at −114° C (−173° F). The gas is very soluble in water: at 20° C (68° F) water will dissolve 477 times its own volume of hydrogen chloride. Because of its great solubility, the gas fumes in moist air. A water solution containing 20.24 percent by weight hydrogen chloride boils at 110° C (230° F) without change in composition (azeotropic mixture). In aqueous solution the compound is extensively dissociated into a hydronium ion (H_3O^+) and chloride ion (Cl^-); in dilute solutions the dissociation is essentially complete. Thus, hydrochloric acid is a strong acid.

Gaseous hydrogen chloride reacts with active metals and their oxides, hydroxides, and carbonates to produce chlorides. These reactions occur readily only in the presence of moisture. Completely dry hydrogen chloride is very unreactive. The reactions of hydrochloric acid are those of typical strong acids, such as: reactions with metals in which hydrogen gas is displaced, reactions with basic oxides and hydroxides that are neutralized with the formation of a chloride and water, and reactions with salts of weak acids in which the weak acid is displaced. Hydrochloric acid also enters into chemical reactions characteristic of the chloride ion, such as reactions with various inorganic and organic compounds in which hydrochloric acid is used as a chlorinating agent and reactions with metals and their oxides in which complex chloride-containing ions are formed (*e.g.,* with platinum, $PtCl_6^{2-}$, with copper, $CuCl_4^{2-}$). The latter type of reaction accounts for the ease of solution of certain metals and metallic compounds in hydrochloric acid although they are slowly dissolved in other acids of equal strength (*e.g.,* sulfuric or nitric acid). For this reason hydrochloric acid is used extensively in the industrial processing of metals and in the concentration of some ores.

Hydrochloric acid is present in the digestive juices of the human stomach. Excessive secretion of the acid causes gastric ulcers; a marked deficiency of it impairs the digestive process and is sometimes the primary cause of deficiency anemias. Exposure to 0.1 percent by volume hydrogen chloride gas in the atmosphere may cause death in a few minutes. Concentrated hydrochloric acid causes burns and inflammation of the skin.

hydrogen cyanide, also called FORMONITRILE (HCN), a highly volatile, colourless, and extremely poisonous liquid (boiling point 26° C [79° F], freezing point −14° C [7° F]). A solution of hydrogen cyanide in water is called hydrocyanic acid, or prussic acid. It was discovered in 1782 by a Swedish chemist, Carl Wilhelm Scheele, who prepared it from the pigment Prussian blue. Hydrogen cyanide and its compounds are used for many chemical processes, including fumigation, the case hardening of iron and steel, electroplating, and the concentration of ores. It also is employed in the preparation of acrylonitrile, which is used in the production of acrylic fibres, synthetic rubber, and plastics.

Hydrogen cyanide is highly toxic because it inhibits cellular oxidative processes. An adult human can withstand 50–60 parts of hydrogen cyanide per million parts of air for an hour without serious consequences, but exposure to concentrations of 200–500 parts per million of air for 30 minutes is usually fatal. A method of inflicting capital punishment consists of administering a fatal dose of hydrogen cyanide gas.

Hydrogen cyanide may be isolated in small quantities from plants, where it occurs in combination with sugars. Large quantities of hydrogen cyanide for laboratory and commercial use are synthesized by three principal methods: (1) treatment of sodium cyanide with sulfuric acid; (2) catalytic oxidation of a methane–ammonia mixture; and (3) decomposition of formamide ($HCONH_2$).

Hydrogen cyanide is an excellent solvent for many salts, but it is not widely used as a solvent because of its toxicity. In pure form, hydrogen cyanide is a stable compound, but it polymerizes readily in the presence of basic substances, such as ammonia or sodium cyanide. The salts are used in the extraction of ores, in electrolytic processes, and in the treatment of steel. Among the important reactions with organic compounds are those with aldehydes and ketones, forming cyanohydrins, which serve as intermediates in many organic syntheses, and with ethylene oxide, forming an intermediate product that is converted to acrylonitrile ($CH_2 = CHCN$).

hydrogen ion, strictly, the nucleus of a hydrogen atom separated from its accompanying electron. The hydrogen nucleus is made up of a particle carrying a unit positive electric charge, called a proton (*q.v.*). The isolated hydrogen ion, represented by the symbol H^+, is therefore customarily used to represent a proton. Because the bare nucleus can readily combine with other particles (electrons, atoms, and molecules), the isolated hydrogen ion can exist only in a nearly particle-free space (high vacuum) and in the gaseous state.

In common usage, the term hydrogen ion is used to refer to the hydrogen ion present in water solutions, in which it exists as the combined molecule $H^+ \cdot H_2O$.

The formula $H^+ \cdot H_2O$ is also commonly written as H_3O^+ and denotes the hydronium or oxonium ion. The amount of hydrogen ion present in a water solution is used as a measure of the acidity of a substance; the higher the concentration of hydrogen ion the more acidic the solution and the lower the pH. *See also* pH.

hydrogen peroxide (H_2O_2), a colourless liquid usually produced as aqueous solutions of various strengths, used principally for bleaching cotton and other textiles and wood pulp, in the manufacture of other chemicals, as a rocket propellant, and for cosmetic and medicinal purposes. Solutions containing more than about 8 percent hydrogen peroxide are corrosive to the skin.

First recognized as a chemical compound in 1818, hydrogen peroxide is the simplest member of the class of peroxides (*q.v.*). Of the several processes of manufacture, the principal ones involve reactions of oxygen from the air with certain organic compounds, especially anthraquinone or isopropyl alcohol. Major commercial grades are aqueous solutions containing 35, 50, 70, or 90 percent hydrogen peroxide and small amounts of stabilizers (often tin salts and phosphates) to suppress decomposition.

Hydrogen peroxide decomposes into water and oxygen upon heating or in the presence of numerous substances, particularly salts of such metals as iron, copper, manganese, nickel, or chromium. It combines with many compounds to form crystalline solids useful as mild oxidizing agents; the best-known of these is sodium perborate ($NaBO_2 \cdot H_2O_2 \cdot 3H_2O$ or $NaBO_3 \cdot 4H_2O$). With certain organic compounds, hydrogen peroxide reacts to form hydroperoxides or peroxides, several of which are used to initiate polymerization reactions. In most of its reactions, hydrogen peroxide oxidizes other substances, although it is itself oxidized by a few compounds, such as potassium permanganate.

Pure hydrogen peroxide freezes at −0.43° C (+31.3° F) and boils at 150.2° C (302° F); it is denser than water and is soluble in it in all proportions.

hydrogen phosphide (gas): *see* phosphine.

hydrogen sulfate: *see* sulfuric acid.

hydrogen sulfide, colourless, extremely poisonous, gaseous compound formed by sulfur with hydrogen (*see* sulfur).

hydrogenation, chemical reaction between molecular hydrogen and an element or com-

pound, ordinarily in the presence of a catalyst. The reaction may be one in which hydrogen simply adds to a double or triple bond connecting two atoms in the structure of the molecule or one in which the addition of hydrogen results in dissociation (breaking up) of the molecule (called hydrogenolysis, or destructive hydrogenation). Typical hydrogenation reactions include the reaction of hydrogen and nitrogen to form ammonia and the reaction of hydrogen and carbon monoxide to form methanol or hydrocarbons, depending on the choice of catalyst.

Nearly all organic compounds containing multiple bonds connecting two atoms can react with hydrogen in the presence of a catalyst. The hydrogenation of organic compounds (through addition and hydrogenolysis) is a reaction of great industrial importance. The addition of hydrogen is used in the production of edible fats from liquid oils. In the petroleum industry, numerous processes involved in the manufacture of gasoline and petrochemical products are based on the destructive hydrogenation of hydrocarbons. In the late 20th century the production of liquid fuels by hydrogenation of coal has become an attractive alternative to the extraction of petroleum.

The catalysts most commonly used for hydrogenation reactions are the metals nickel, platinum, and palladium and their oxides. For high-pressure hydrogenations, copper chromite and nickel supported on kieselguhr (loose or porous diatomite) are extensively used.

hydrogeology: *see* geohydrology.

hydrography, the art and science of compiling and producing charts, or maps, of water-covered areas of the Earth's surface.

A brief treatment of hydrography follows. For full treatment, *see* MACROPAEDIA: Mapping and Surveying.

The terms *hydrography* and *hydrographer* are based on an analogy with *geography* and *geographer* and date from the mid-16th century. Hydrography ordinarily denotes only the study of ocean depths and of the directions and intensities of ocean currents; other facets—such as temperature profiles or mineral content—are covered by the sciences of hydrology and oceanography.

The British navy appointed its first hydrographer in 1795; and the United States established a naval observatory and hydrographical office in 1854. Since then many maritime nations have established hydrographic offices to furnish mariners with nautical charts and other publications necessary for navigation of their territorial waters and the oceans of the world. Hydrographic survey information is exchanged through the International Hydrographic Organization, chartered in 1970 under the auspices of the United Nations.

The earliest navigators sailed from headland to headland by always keeping the coastline within sight. Navigators did not require charts until the advent of the magnetic compass in 1187 made it possible to proceed directly from one port to another across open water. Early charts were hand-drawn and very expensive. They were based entirely on magnetic directions and on map projections that assumed a degree of longitude equal to a degree of latitude. The assumption was not significant in the Mediterranean, but it caused serious distortions in maps drawn of areas at higher latitudes.

Interest in the charting of the oceans away from seacoasts developed in the second half of the 19th century. A feature of marine science since the 1950s has been increasingly detailed bathymetric (water-depth measurement) surveys of selected portions of the seafloor.

A hydrographic survey consists of two operations: determining the horizontal coordinates of points on the surface of the body of water (position fixing) and determining the water's depth at those points.

The scale of a hydrographic chart expresses the relationship between a given distance on the chart and the actual distance it represents on the Earth's surface. Hydrographic charts are constructed on widely different scales; they range from ocean sailing charts drawn to a small scale of 1:5,000,000 (where 1 inch on the map represents 79 miles; or 1 cm = 50 km) to harbour charts, which are drawn to a scale of 1:50,000 (1 inch to 0.8 mile) or larger. Virtually all navigational charts, except for those made of the polar regions, represent the Earth's surface by the ordinary Mercator projection.

hydroid, any member of the invertebrate order Hydroida (class Hydrozoa, phylum Cnidaria). Hydroids have three basic life-cycle stages: (1) a tiny free-swimming planula larva about 1 mm (0.04 inch) long, which settles and grows into (2) a sessile (attached), usually colonial hydroid stage, which in turn liberates (3) medusae. This cycle is exemplified by the genus *Obelia (q.v.)*, whose members are widely distributed throughout the world. Many hydroids have, through evolution, suppressed the medusa by retaining it on the sessile hydroid colony. Colonies of hydroids are typically 5 to 500 mm (0.2 to 20 inches) or more high and are branched; the branches bear the individuals, or hydranths (hydroid polyps). Each hydranth consists of a tubular body that has two layers separated by a thin, jellylike mesoglea (layer of connective tissue), a terminal mouth, and surrounding circlet(s) of tentacles. The hydranths are joined basally to a common living tube called the coenosarc that runs the length of the colony. The living tube, which is assumed to permit the exchange of food between individuals, is protected within a tough, chitinous sheath, the perisarc. Colonies of hydroids grow vegetatively by increase in the number of hydranths, but sexual reproduction also occurs. Reproductive polyps (blastostyles) occur intermittently on the colony. They release either planula larvae or medusae, depending on the species. Some species can retract their polyps within a protective extension of the perisarc, the hydrotheca, but others lack such a structure. Most hydroids inhabit marine environments, but some have invaded freshwater habitats. An example is the *Hydra* (*q.v.*), which is further unusual in being solitary. There are about 2,000 species of hydroids.

hydrolase, any one of a class of more than 200 enzymes that catalyze the hydrolysis of several types of compounds. Esterases include lipases, which break ester bonds (between a carboxylic acid and an alcohol) in lipids, and phosphatases, which act analogously upon phosphates; a narrower category comprises the nucleases, which are phosphatases that hydrolyze nucleic acids. Glycosidases sever bonds between sugar molecules in carbohydrates. Peptidases hydrolyze peptide bonds (between the carboxylic acid group of one amino acid and the amino group of another) within protein molecules (*see* proteolytic enzyme). Specific hydrolases also catalyze reactions that break ether (C—O) bonds; carbon–nitrogen (C—N) bonds other than peptide bonds; acid anhydride bonds; carbon–carbon (C—C) bonds; or phosphorus–nitrogen (P—N) bonds.

hydrologic cycle, cycle that involves the continuous circulation of water in the Earth-atmosphere system. Of the many processes involved in the hydrologic cycle, the most important are evaporation, transpiration, condensation, precipitation, and runoff. Although the total amount of water within the cycle remains essentially constant, its distribution among the various processes is continually changing.

A brief treatment of the hydrologic cycle follows. For full treatment, *see* MACROPAEDIA: Hydrosphere, The.

Evaporation, one of the major processes in the cycle, is the transfer of water from the surface of the Earth to the atmosphere. By evaporation, water in the liquid state is transferred to the gaseous, or vapour, state. This transfer occurs when some molecules in a water mass have attained sufficient kinetic energy to eject themselves from the water surface. The main factors affecting evaporation are temperature, humidity, wind speed, and solar radiation. The direct measurement of evaporation, though desirable, is difficult and possible only at point locations. The principal source of water vapour is the oceans, but evaporation also occurs in soils, snow, and ice. Evaporation from snow and ice, the direct conversion from solid to vapour, is known as sublimation. Transpiration is the evaporation of water through minute pores, or stomata, in the leaves of plants. For practical purposes, transpiration and the evaporation from all water, soils, snow, ice, vegetation, and other surfaces are lumped together and called evapotranspiration, or total evaporation.

Water vapour is the primary form of atmospheric moisture. Although its storage in the atmosphere is comparatively small, water vapour is extremely important in forming the moisture supply for dew, frost, fog, clouds, and precipitation. Practically all water vapour in the atmosphere is confined to the troposphere (the region below 6 to 8 miles [10 to 13 km] altitude).

The transition process from the vapour state to the liquid state is called condensation. Condensation may take place as soon as the air contains more water vapour than it can receive from a free water surface through evaporation at the prevailing temperature. This condition occurs as the consequence of either cooling or the mixing of air masses of different temperatures. By condensation, water vapour in the atmosphere is released to form precipitation.

Precipitation that falls to the Earth is distributed in four main ways: some is returned to the atmosphere by evaporation, some may be intercepted by vegetation and then evaporated from the surface of leaves, some percolates into the soil by infiltration, and the remainder flows directly as surface runoff into the sea. Some of the infiltrated precipitation may later percolate into streams as groundwater runoff. Direct measurement of runoff is made by stream gauges and plotted against time on hydrographs.

Most groundwater is derived from precipitation that has percolated through the soil. Groundwater flow rates, compared with those of surface water, are very slow and variable, ranging from a few millimetres to a few metres a day. Groundwater movement is studied by tracer techniques and remote sensing.

Ice also plays a role in the hydrologic cycle. Ice and snow on the Earth's surface occur in various forms such as frost, sea ice, and glacier ice. When soil moisture freezes, ice also occurs beneath the Earth's surface, forming permafrost in tundra climates. About 18,000 years ago glaciers and ice caps covered approximately one-third of the Earth's land surface. Today, about 12 percent of the land surface remains covered by ice masses.

hydrological map, chart showing such hydrologic features as rivers and streams; the purpose and content of these maps vary according to the country of their origin. Some maps are used as supplements to a detailed written text, whereas others, such as the USGS Hydrologic Investigations Atlases series, provide only a brief and general discussion as the text. Since hydrology embraces the many

subsystems relating to water, the maps may be constructed for each individually or may combine the features of more than one subsystem.

hydrology, scientific discipline concerned with the waters of the Earth, including their occurrence, distribution, and circulation via the hydrologic cycle and interactions with living things. It also deals with the chemical and physical properties of water in all its phases.

A brief treatment of hydrology follows. For full treatment, *see* MACROPAEDIA: Earth Sciences, The.

Hydrology has as its primary objective the study of the interrelationship between water and its environment. As hydrology is mainly concerned with water close to the land surface, it focuses on those components of the hydrologic cycle that occur there—namely, precipitation, evapotranspiration, runoff, and groundwater. Its various subdisciplines deal with different aspects of these phenomena. Hydrometeorology, for example, concentrates on water in the lower boundary layer of the atmosphere, while hydrometry involves the measurement of surface water, especially precipitation and streamflow. Hydrography entails the description and mapping of large bodies of surface water, such as lakes, inland seas, and oceans. On the other hand, groundwater hydrology centres on subsurface water in the saturated zone, and soil-water physics on that in the unsaturated zone.

Hydrology draws upon the disciplines of geology, chemistry, soil science, and plant physiology, employing many of their principles and methods. Researchers in the field rely increasingly on computer simulations of natural hydrologic systems and remote-sensing techniques, as, for example, the use of Earth-orbiting satellites equipped with infrared cameras to detect bodies of polluted water or to trace the flow of hot springs.

Hydrologic research is important in the development, management, and control of water resources. Its applications are manifold and include irrigation-systems development, flood and land-erosion control, waste-water disposal and treatment, pollution abatement, recreational use of water, fish and wildlife preservation, hydropower generation, and the design of hydraulic structures.

hydrology, chemical: *see* chemical hydrology.

hydrology, groundwater: *see* geohydrology.

hydrolysis, in chemistry and physiology, a double decomposition reaction with water as one of the reactants. Thus, if a compound is represented by the formula AB in which A and B are atoms or groups and water is represented by the formula HOH, the hydrolysis reaction may be represented by the reversible chemical equation $AB + HOH \rightleftharpoons AH + BOH$. The reactants other than water, and the products of hydrolysis, may be neutral molecules—as in most hydrolyses involving organic compounds—or ionic molecules, as in hydrolyses of salts, acids, and bases.

Hydrolysis involving organic compounds may be illustrated by the reaction of water with an ester of a carboxylic acid; all such esters have the general formula $RCO{-}OR'$, in which R and R' are combining groups (for example, if R and R' both represent the methyl group, CH_3, the ester is methyl acetate). The hydrolysis involves several steps, of which the slowest is the formation of a covalent bond between the oxygen atom of the water molecule and the carbon atom of the ester. In succeeding steps, which are very rapid, the carbon–oxygen bond of the ester breaks and hydrogen ions become detached from the original water molecule and attached to the nascent alcohol molecule. The whole reaction is represented by the equation

$$RCO{-}OR' + H_2O \rightarrow RCO{-}OH + R'{-}OH,$$

in which $RCO{-}OH$ denotes a molecule of a carboxylic acid, $R'{-}OH$ denotes a molecule of an alcohol, and the dashes represent covalent bonds that are broken or formed during the reaction.

A characteristic feature of the hydrolysis of esters and of most other organic compounds is that a third substance, ordinarily an acid or a base, increases the rate at which the chemical change takes place. In the biochemical process of digestion, enzymes secreted by the digestive tract catalyze the hydrolysis of complex molecules into forms that the body organisms can assimilate. Proteins are decomposed to amino acids, fats to fatty acids and glycerol, and starches and complex sugars to glucose and other simple sugars; enzymes such as lipases, amylases, and proteinases catalyze the hydrolysis of fats, carbohydrates, and proteins, respectively.

Hydrolysis involving ionic compounds may be illustrated by the chemical changes occurring in an aqueous solution of the salt sodium acetate. In solution, the ionic constituents of the salt (the acetate ion and the sodium ion) separate; water molecules combine with the acetate ions to form acetic acid and hydroxide ions. Acetic acid dissociates reversibly into acetate ions and hydrogen ions, but only to a very small extent, so that the ionic content of the solution is largely sodium and hydroxide ions. Hence, the solution exhibits basic properties (*i.e.,* turns red litmus paper blue).

hydromagnetics (physics): *see* magnetohydrodynamics.

hydrometallurgy, extraction of metal from ore by preparing an aqueous solution of a salt of the metal and recovering the metal from the solution. The operations usually involved are leaching, or dissolution of the metal or metal compound in water, commonly with additional agents; separation of the waste and purification of the leach solution; and the precipitation of the metal or one of its pure compounds from the leach solution by chemical or electrolytic means. The most common leaching agent is dilute sulfuric acid.

Hydrometallurgy originated in the 16th century, but its principal development took place in the 20th century, stimulated partly by the desire to extract gold from low-grade ores. The development of ion exchange, solvent extraction, and other processes has led to an extremely broad range of applications of hydrometallurgy, now used to produce more than 70 metallic elements. Besides most gold and much silver, large tonnages of copper and zinc are produced by hydrometallurgy.

hydrometeor, any water or ice particles that have formed in the atmosphere or at the Earth's surface as a result of condensation or sublimation. Water or ice particles blown from the ground into the atmosphere are also classed as hydrometeors. Some well-known hydrometeors are clouds, fog, rain, snow, hail, dew, rime, glaze, blowing snow, and blowing spray.

hydrometeorology, branch of meteorology that deals with problems involving the hydrologic cycle, the water budget, and the rainfall statistics of storms. The boundaries of hydrometeorology are not clear-cut, and the problems of the hydrometeorologist overlap with those of the climatologist, the hydrologist, the cloud physicist, and the weather forecaster. Considerable emphasis is placed on determining, theoretically or empirically, the relationships between meteorological variables and the maximum precipitation reaching the ground. These analyses often serve as the bases for the design of flood-control and water-usage structures, primarily dams and reservoirs. Other concerns of hydrometeorologists include the determination of rainfall probabilities, the space and time distribution of rainfall and evaporation, the recurrence interval of major storms, snow melt and runoff, and probable wind tides and waves in reservoirs. The whole field of water quality and supply is of growing importance in hydrometeorology.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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hydrometer, device for measuring some characteristics of a liquid, such as its density (weight per unit volume) or specific gravity (weight per unit volume compared with water). The device consists essentially of a weighted, sealed, long-necked glass bulb that is immersed in the liquid being measured; the depth of flotation gives an indication of liquid density, and the neck can be calibrated to read density, specific gravity, or some other related characteristic.

In practice, the floating glass bulb is usually inserted into a cylindrical glass tube equipped with a rubber ball at the top end for sucking liquid into the tube. Immersion depth of the bulb is calibrated to read the desired characteristic. A typical instrument is the storage-battery hydrometer, by means of which the specific gravity of the battery liquid can be measured and the condition of the battery determined. Another instrument is the radiator hydrometer, in which the float is calibrated in terms of the freezing point of the radiator solution. Others may be calibrated in terms of "proof" of an alcohol solution or in terms of the percentage of sugar in a sugar solution.

The Baumé hydrometer, named for the French chemist Antoine Baumé, is calibrated to measure specific gravity on evenly spaced scales; one scale is for liquids heavier than water, and the other is for liquids lighter than water.

hydropathy, therapeutic system that professes to cure all disease with water, either by bathing in it or by drinking it. Although water therapy is currently used to treat certain ailments, its effectiveness is generally accepted to be limited. Most authorities agree that many disease and injury conditions are indirectly improved by the relaxing effect of the patient's immersion in water. Hydropathy as a formal therapeutic system came into vogue during the 19th century through the efforts of Vinzenz Priessnitz (1799–1851), a Silesian farmer who believed in the medicinal value of water from the wells on his land. *See also* hydrotherapy; spa.

hydrophobia (disease): *see* rabies.

hydrophone, device for converting sound waves into electrical signals, similar in operation to a microphone but used primarily for detecting sound waves from an underwater source, such as a submarine. Usually an array of hydrophones is employed to pinpoint the source: the array is connected to an electrical circuit that permits the phase differences of the sound waves at the various hydrophones to be compensated electrically. Thus, the whole array can be "steered" in the direction of the sound source without actual motion of the hydrophones.

Hydrophyllaceae, the waterleaf family, which contains about 18 genera and at least 250 species of plants richly represented in western North America and widespread in tropical and temperate areas. It is best-known for a few garden annuals. Most are herbs, but the family also contains a few shrubs. The species have alternate, often hairy leaves, regular flowers with five-lobed corollas (united petals) cut to the middle of the blossom, and a one- or two-celled ovary.

Hydrolea spinosa, one of a genus of about 20 tropical herbs, is a perennial that grows to 1 m (3.5 feet) tall, with sticky, hairy, oval leaves and wheel-shaped, blue flowers 1.3 cm (0.5 inch) across. It is native in the American tropics, as is the shrub *Wigandia caracasana. Wigandia,* growing to 3 m (10 feet) tall, bears stinging hairs on its large, oval leaves and produces spikelike clusters of blue flowers. The Virginia waterleaf (*Hydrophyllum virginianum*) has pale-violet or white flowers and may grow to 1 m tall.

hydroponics, also called AQUACULTURE, NUTRICULTURE, SOILLESS CULTURE, or TANK FARMING, the cultivation of plants in nutrient-enriched water, with or without the mechanical support of an inert medium such as sand or gravel.

Plants have long been grown with their roots immersed in solutions of water and fertilizer for scientific studies of their nutrition. Early commercial hydroponics (from Greek *hydro,* "water," and *ponos,* "labour") adopted this method of culture. Because of the difficulties in supporting the plants in a normal upright growing position and aerating the solution, however, this method was supplanted by gravel culture, in which gravel supports the plants in a watertight bed or bench. Various kinds of gravel and other materials have been used successfully, including fused shale and clay and granite chips. Fertilizer solution is pumped through periodically, the frequency and concentration depending on the plant and on ambient conditions such as light and temperature. The solution drains into a tank, and pumping is usually automatic.

The solution is composed of different fertilizer-grade chemical compounds containing varying amounts of nitrogen, phosphorus, and potassium—the major elements necessary for plant growth—and various trace, or minor, elements such as sulfur, magnesium, and calcium. The solution can be used indefinitely; periodic tests indicate the need for additional chemicals or water. The chemical ingredients usually may be mixed dry and stored. As the plants grow, concentration of the solution and frequency of pumping are increased.

A wide variety of vegetables and florist crops can be grown satisfactorily in gravel. The principal advantage is the saving of labour by automatic watering and fertilizing. The disadvantages are high installation costs and the need to test the solution frequently. Yields are about the same as for soil-grown crops.

hydroquinone, colourless, crystalline organic compound formed by chemical reduction of benzoquinone. *See* quinone.

hydrosphere, discontinuous layer of water at or near the Earth's surface. It includes all liquid and frozen surface waters, groundwater held in soil and rock, and atmospheric water vapour.

A brief treatment of hydrosphere follows. For full treatment, *see* MACROPAEDIA: Hydrosphere, The.

Current research strongly suggests that the total amount of water on the Earth has remained essentially constant for the past 1 billion years, notwithstanding changes in the volume content of the individual components of the hydrosphere over geologic time. Substantial quantities of oceanic water, for example, were transferred to continental ice sheets during the major glaciations.

The Earth's total budget of water is estimated at about 1.4 billion cubic km (336 million cubic miles). The oceans constitute about 97 percent of this amount; the polar ice caps and glaciers hold slightly more than 2 percent; and freshwater bodies (*e.g.,* lakes, streams, ponds), groundwater, vegetation, and atmospheric vapour account for the rest.

Virtually all of these waters of the hydrosphere are in constant circulation. They move through the hydrologic cycle (*q.v.*). Broadly speaking, this cycle involves the transfer of water from the oceans through the atmosphere to the continents and back to the oceans over and beneath the land surface by means of evaporation, transpiration, precipitation, interception, infiltration, subterranean percolation, overland flow, runoff, and other complex processes. Although the components of the hydrosphere are undergoing such a continuous change of state and location, the total water budget remains in balance.

The components of the hydrosphere and the hydrologic cycle itself have been seriously affected by the activities of modern society. The discharge of toxic chemicals and other industrial wastes have, for example, contaminated rivers and streams, while groundwater seepage of mineral fertilizers and dumping of sewage into lakes have caused eutrophication (*q.v.*), a gradual increase in the concentration of phosphorus, nitrogen, and other plant nutrients. The buildup of carbon dioxide and other so-called greenhouse gases in the atmosphere due to the burning of fossil fuels and the slash-and-burn activities attendant upon deforestation practices may cause global mean surface temperatures to rise by as much as 5° C (9° F) by the late 21st century. Such a temperature increase would accelerate the hydrologic cycle and thereby disrupt the water balance in various regions, particularly in the middle latitudes of the Northern Hemisphere. Global warming could further affect the hydrologic cycle by melting ice presently locked in the polar ice caps and mountain glaciers. The meltwater would be transferred to the oceans, possibly resulting in a substantial rise in sea level over several centuries. Melting of arctic sea ice might also occur; this would cause a northward shift in storm activity and a decrease in rainfall in the Northern Hemisphere during spring and autumn.

hydrotherapy, external use of water in the medical treatment of disease and injury. Its primary value is as a medium for application or reduction of heat. Wet heat helps relieve pain and improves circulation; it also promotes relaxation and rest and, in some mental disturbances, may be used to calm an agitated and hyperactive individual. Wet cold decreases body temperature, causing blood vessels to close and reducing blood flow. It thus reduces and helps to prevent swelling following injury and decreases the pain caused by bruises, sprains, and strains. Compresses of toweling, wool, and other cloth materials are effective for reducing headache pain, slowing blood flow of nosebleeds, relaxing muscle spasms, localizing infection and subcutaneous bleeding from contusion, and reducing body heat in feverish conditions.

Underwater exercise is used to strengthen weak muscles, restore joint motion following injury, clean and heal burned flesh, aid muscle function following cerebrovascular accident damage, and as a treatment for deformity and pain in arthritis and related ailments.

Whirlpool tubs and the Hubbard tank are forms of underwater massage in which the water swirls in constant motion over legs and arms or the entire body to promote healing. Likewise, the shower, a stream of water under pressure, can be directed to specific areas or may include the whole body, with the purpose of stimulating circulation.

Hydrotherapeutic methods are usually employed by specialists in physical medicine and rehabilitation and by physical therapists. *See also* physical medicine and rehabilitation.

hydrothermal ore deposit, any concentration of metallic minerals formed by the release of solids from hot mineral-laden water (hydrothermal solution). The solutions are thought to arise in most cases from the action of deeply circulating water heated by magma. Other sources of heating that may be involved include energy released by radioactive decay or by faulting of the Earth's crust.

The mineral deposit may be precipitated from the solution with or without demonstrable association with igneous processes. These waters may deposit their dissolved minerals in openings in the rock, thus filling the cavities, or they may replace the rocks themselves to form so-called replacement deposits. The two processes may occur simultaneously, the filling of an opening by precipitation accompanying the replacement of the walls of the opening.

Conditions necessary for the formation of hydrothermal ore deposits include (1) presence of hot water to dissolve and transport minerals, (2) presence of interconnected openings in the rock to allow the solutions to move, (3) availability of sites for the deposits, and (4) chemical reaction that will result in deposition. Deposition is most affected by changes in the temperature and pressure: the solubility decreases, hence precipitation occurs as the temperature and pressure decrease. Although hydrothermal ore deposits may form in any host rock, deposition is influenced or localized by certain kinds of rock. For example, lead-zinc-silver ores in some parts of Mexico occur in dolomitic rather than pure limestone; the reverse is true at Santa Eulalia, where massive sulfide deposits end abruptly at the limestone-dolomite contact.

hydrothorax, accumulation of watery fluid in the pleural cavity, between the membrane lining the thoracic cage and the membrane covering the lung. Hydrothorax occurs most commonly when fluid seeps from congested lungs into the pleural cavity as a result of impaired circulation of blood in the lungs, a complication of chronic heart failure. Hydropneumothorax denotes the presence of both fluid and air in the pleural cavity.

hydrous mica, also called HYDROMICA, any of the illite group of clay minerals, including illite, bramallite (a sodium illite), and glauconite. They are structurally related to the micas; glauconite is also a member of the common-mica group. The hydrous micas predominate in shales and mudstones, but they also occur in other sediments. They are present among the clay minerals in soils; they are essentially nonswelling and impart excellent tilth, but they bind both potassium and aluminum ions in forms that plants cannot feed upon. *See also* illite.

hydroxide, any chemical compound containing one or more groups, each comprising one atom each of oxygen and hydrogen bonded together and functioning as the negatively charged ion OH^-. The positively charged portion of the compound usually is the ion of a metal (*e.g.,* sodium, magnesium, or aluminum), although it may be an organic group (*e.g.,* guanidinium or tetramethylammonium). It is preferable to characterize the presence of the un-ionized, covalently bonded hydroxyl group OH by the prefix hydroxy, as in the organic compound hydroxyacetic acid, $CH_2OHCOOH$, or by the suffix ol, as in methanol, CH_3OH, and in coordination compounds by the prefix hydroxo, as in potassium tetrahydroxoaurate, $KAu(OH)_4$.

The hydroxides include the familiar alkalies of the laboratory and industrial processes. The hydroxides of the alkali metals, lithium, sodium, potassium, rubidium, and cesium, are the strongest bases and the most stable and most soluble of the hydroxides. Sodium hydroxide, NaOH, also known as caustic soda or lye, is of great industrial importance. Calcium, barium, and strontium—all alkaline earth metals—form soluble hydroxides that are strong bases but are less stable than the al-

kali hydroxides. Of these, calcium hydroxide, $Ca(OH)_2$, commonly known as slaked lime, is the most common. With the exception of thallium hydroxide (TlOH), the hydroxides of other metals, such as magnesium, iron, bismuth, nickel, cobalt, and copper, are only sparingly soluble in water but neutralize acids. The hydroxides of beryllium, lead, zinc, aluminum, chromium (trivalent), tin (divalent), gold (trivalent), and certain other metals show both acidic and basic properties; *i.e.,* they dissolve in water solutions of either bases or acids. Hydroxides and other substances, such as oxides and sulfides, with these dual properties are called amphoteric.

hydroxylamine (NH_2OH), an oxygenated derivative of ammonia, used in the synthesis of oximes from aldehydes and ketones. Oximes are reduced easily to amines, which are used in the manufacture of dyes, plastics, synthetic fibres, and medicinals; the oxime of cyclohexanone can be converted to its isomer epsilon-caprolactam, from which nylon-6 is made. Hydroxylamine and its inorganic salts are powerful reducing agents used in the preparation of polymers and as constituents of photographic developers.

Hydroxylamine may be prepared by several methods; of current technical importance are the hydrolysis of nitroalkanes (RCH_2NO_2) and the catalytic hydrogenation of nitric oxide (NO).

Pure hydroxylamine is a colourless, crystalline solid (melting point 33.05° C [91.49° F]). An unstable compound, decomposing to nitric oxide and hydrogen, it is usually handled in the form of salts.

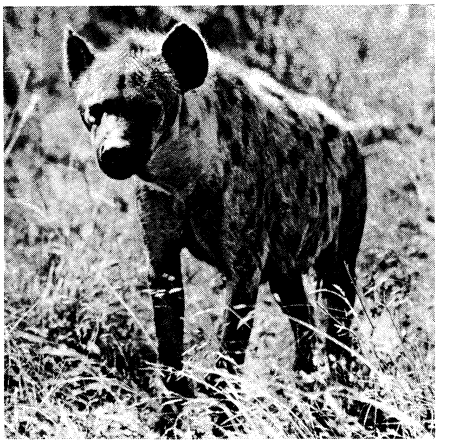
hydroxylapatite, phosphate mineral, calcium hydroxide phosphate [$Ca_5(PO_4)_3OH$], that forms glassy, often green crystals and masses. It is seldom pure in nature but often occurs mixed with fluorapatite, in which fluorine substitutes for the hydroxyl (OH) group in the molecule. This mixture, called a solid-solution series, is a continuous chemical variation between the two pure substances. Collophane, the apatite in fossil bone and phosphate rock belongs to the series. For physical properties, *see* phosphate mineral (table).

hydroxylysine, glycogenic amino acid uniquely found in collagen (*q.v.*), the chief structural protein of mammalian skin and connective tissue, and in some similar structural plant proteins. The hydroxyl group of hydroxylysine forms a chemical bond with sugars, attaching galactose monosaccharides and glucosyl-galactose disaccharides to the protein, thus contributing to collagen's unusual toughness and resiliency. Collagen is insoluable, but heat denaturation (boiling in water, dilute acids, or alkalies) yields digestible, soluble gelatin.

hydroxyproline, an amino acid formed upon hydrolysis of connective-tissue proteins such as collagen (about 14 percent by weight) and elastin but rarely from other proteins. The molecular structure of hydroxyproline contains a secondary amino group (>NH) rather than the primary amino group ($-NH_2$) characteristic of most amino acids. First isolated (1902) from gelatin, a breakdown product of collagen, hydroxyproline is one of several so-called nonessential amino acids; *i.e.,* animals can synthesize it from glutamic acid and do not require dietary sources. Excretion of abnormal quantities of hydroxyproline is a symptom of the connective-tissue disease called Marfan's syndrome.

Hyele (ancient city): *see* Elea.

hyena, also spelled HYAENA, any of three coarse-furred, doglike carnivores, family Hyaenidae, found in Asia and Africa and noted for their scavenging habits. Hyenas are distinguished by having four toes on each foot, comparatively long forelegs, nonretractile claws, and enormously strong jaws and



Spotted, or laughing, hyena (*Crocuta crocuta*)
N. Owen-Smith—Annan Photo Features

teeth that are capable of crushing large bones. They live alone or in packs and may be active by night or day. In many regions they depend for food on the remains of carcasses left by larger carnivores. Hyenas are generally quite retiring, but when carrion and small game are scarce they will attack helpless animals, such as sheep, goats, and young animals.

The spotted, or laughing, hyena (*Crocuta crocuta*) ranges through much of Africa south of the Sahara. Length is to about 2 m (6.6 feet) including the 30-centimetre (12-inch) tail; shoulder height, to about 90 cm (35 inches), and weight to about 80 kg (175 pounds). Colour is yellowish or grayish with dark spots.

The spotted hyena is the most robust and daring of the hyenas, and when food is scarce it has been known to attack sleeping people and to carry off young children. It produces both a wailing and a "laughing" call. Its litters usually contain one or two young; the gestation period is about three to three and one-half months.

The genus *Hyaena* includes the striped (*H. hyaena*) and brown (*H. brunnea*) hyenas. Smaller than the spotted hyena, these animals bear manes of coarse, erectile hair on the back and neck and grow to a length of from 0.9 to 1.2 m (2.9 to 3.9 feet), excluding the 30-centimetre tail, with a weight of 25–55 kg (55–120 pounds). The striped hyena occurs in southwestern Asia and in northern and eastern Africa. It is grayish or yellowish with vertical brown or black stripes. The brown hyena, found in southern Africa, is dark brown with a gray head and stripes on the legs. Litters of both species usually contain two to six young; gestation is about three months. Spotted hyenas feed mainly on carrion, and in some areas of Africa they are allowed to enter villages to consume refuse. The brown hyena, which sometimes preys upon livestock, has been greatly depleted and survives primarily in game parks and reserves.

The African hunting dog (*q.v.*) is sometimes called the hyena dog.

Hyenia, a genus of small fossil shrublike plants of the order Hyeniales, class (or subdivision) Sphenopsida, known from rocks of the Devonian period (408 to 360 million years ago). *Hyenia elegans* has numerous upright and rarely branched shoots that arose from an underground stem; it bore whorls of narrow, forked leaves. *H. vogtii* is of interest because its frequent, regular, and strictly lateral mode of branching suggests a possible origin of leaves.

Hyères, oldest and most southerly resort and spa on the French Riviera, in the Var *département,* Provence-Alpes-Côte-d'Azur *region,* east of Toulon. The new town of Hyères, sometimes called Hyères-les-Palmiers because of the beautiful palm trees in its wide avenues, is situated 3 miles (5 km) from the coast at the west end of the Riviera. It began to gain repute as a health resort in the 18th century. Sheltered from the mistral, a violent, cold, dry, northerly wind that blows in the region, it lies beneath a hill on the slopes of which the old feudal town is located. It belonged successively to the Greeks of Marseille, the Romans, the lords of Fos and Marseille, and the counts of Provence, and was given to the king of France in 1481. It was the residence of several kings of France. In the 13th century Louis IX (Saint Louis), returning to France from the Seventh Crusade, landed at Hyères when it was still a seaport. Hyères-Plage, 4 miles (6 km) south-southeast of the town, consisting of a sand beach on the border of a pine wood, is among the numerous seaside resorts located in the vicinity either on the coast or on the offshore islands, called the Hyères, including the islands of Porquerolles, Port-Cros, and the Levant. There is a local airport with direct connections to Paris. Pop. (1982) 31,890.

Hyesan, city, northern North Korea. As a frontier city lying on the upper stream of the Yalu River (Amnok-kang), it was a fortress during the Yi dynasty (1392–1910), under the name of Hyesanjin. In winter it is one of the coldest places in Korea; a temperature of −44° F (−42° C) was recorded in 1915. It is the starting point of water transportation on the Yalu. Logs from the nearby Paektu Mountain area, which contains the richest forest resources in the country, are rafted downstream from the city. Paektu itself, on the border with China, is 9,003 feet (2,744 m) high, the highest point in the country. Lumber and paper manufacturing are carried on.

Hygieia, in Greek religion, goddess of health. The oldest traces of her cult are at Titane, west of Corinth, where she was worshipped together with Asclepius, the god of medicine. At first no special relationship existed between her and Asclepius, but gradually she came to



Hygieia, classical bas-relief; in the British Museum
By courtesy of the trustees of the British Museum

be regarded as his daughter; later literature, however, makes her his wife. The cult of Hygieia spread concurrently with his and was introduced at Rome from Epidaurus in 293 BC, when she was gradually identified with Salus (*q.v.*). In later times, Hygieia and Asclepius became protecting deities. Hygieia's animal was a serpent, sometimes shown drinking from a saucer held in her hand.

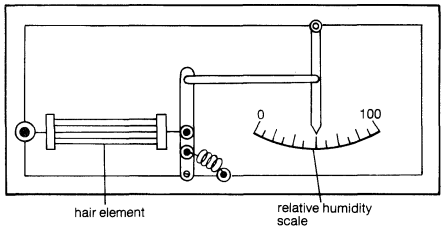
Hyginus, SAINT (b. Greece?—d. *c.* 140, Rome; feast day January 11), pope from about

136 to about 140. The *Liber Pontificalis* credits him with organizing the hierarchy (ranks of the ruling body of clergy), but the same claim is made for Hormisdas. His pontificate witnessed the beginning in Rome of the cults formed around belief as esoteric knowledge of spiritual truth, which came to be known as the Gnostic heresies.

Hyginus, Gaius Julius (fl. 1st century AD), Latin author and scholar who, according to Suetonius (*De Grammaticis,* 20), was appointed by Augustus superintendent of the Palatine library. He went to Rome from Spain or Alexandria as a slave or perhaps a prisoner of war and was freed by Augustus.

Hyginus was a pupil of the learned Cornelius Alexander Polyhistor and a friend of Ovid. Of his numerous works, including topographical and biographical treatises, commentaries on Helvius Cinna and the poems of Virgil, and disquisitions on agriculture and beekeeping, nothing has survived.

hygrometer, instrument used in meteorological science to measure the humidity, or amount of water vapour in the air. The hygrometer is especially important in the field of micrometeorology, in which it is necessary to make rapid measurements in thin layers of air of large changes in relative humidity. Three major types of hygrometers are used to indicate relative humidity. (Absolute humidity is determined from the relative humidity, if needed.)



Mechanical hygrometer that uses hair as the sensing element

From D.M. Considine, ed., *Process Instruments and Controls Handbook.* Copyright (1957). Used with permission of McGraw-Hill Book Company

Mechanical hygrometers make use of the principle that organic substances (particularly finer substances such as goldbeater's skin [ox gut] and human hair) contract and expand in response to the relative humidity. As the Figure above demonstrates, contraction and expansion of the hair element (blond hair is always used) causes the spring to move the needle on the dial.

Electrical hygrometers measure the change in electrical resistance of a thin layer of lithium chloride, or of a semiconductor device, as the relative humidity changes. Other hygrometers sense changes in weight, volume, or transparency of various substances that react to relative humidity.

Dew-point hygrometers typically consist of a polished metal mirror that is cooled at a constant pressure and constant vapour content until moisture just starts to condense on it. The temperature of the metal at which condensation begins is the dew point.

The psychrometer (*q.v.*) is a hygrometer that utilizes two thermometers—one wet-bulb and one dry-bulb—to determine humidity through evaporation.

Hyksos, group of mixed Semitic-Asiatics who settled in northern Egypt during the 18th century BC. In about 1630 they seized power, and Hyksos kings ruled Egypt as the 15th dynasty (*c.* 1630–1521 BC). The name Hyksos was used by the Egyptian historian Manetho (fl. 300 BC), who, according to the Jewish historian Josephus (fl. 1st century AD), translated the word as "king-shepherds" or "captive shepherds." Josephus wished to demonstrate the great antiquity of the Jews and thus identified the Hyksos with the Hebrews of the Old Testament. This view is not now supported by most scholars, though it is possible that Hebrews came into Egypt during the Hyksos period or that some Hyksos were the ancestors of some Hebrews. "Hyksos" was probably an Egyptian term for "rulers of foreign lands" (*heqakhase*), and it almost certainly designated the foreign dynasts rather than a whole nation. Although traditionally they also formed the 16th dynasty, those rulers were probably only vassals of the 15th-dynasty kings. They seem to have been connected with the general migratory movements elsewhere in the Middle East at the time. Although most of the Hyksos names seem to have been Semitic, there may also have been a Hurrian element among them.

The Hyksos introduced the horse and chariot, the compound bow, improved battle axes, and advanced fortification techniques into Egypt. At Avaris (modern Tall ad-Dab'a) in the northeastern delta, they built their capital with a fortified camp over the remains of a Middle Kingdom town that they had seized. Excavations since the 1960s have revealed a Canaanite-style temple, Palestinian-type burials, including horse burials, Palestinian types of pottery, and quantities of their superior weapons.

Their chief deity was the Egyptian storm and desert god, Seth, whom they identified with an Asiatic storm god. From Avaris they ruled most of Lower Egypt and Upper Egypt up to Hermopolis directly. South to Cusae, and briefly even beyond, they ruled through Egyptian vassals. When under Seqenenre and Kamose the Thebans began to rebel, the Hyksos pharaoh Auserre Apopi I tried unsuccessfully to make an alliance with the rulers of Cush who had overrun Egyptian Nubia in the later years of the 13th dynasty (*c.* 1650 BC).

The Theban revolt spread northward under Kamose, and in about 1521 Avaris fell to his successor, Ahmose, founder of the 18th dynasty, thereby ending 108 years of Hyksos rule over Egypt. Although vilified by the Egyptians starting with Hatshepsut, the Hyksos had ruled as pharaohs and were listed as legitimate kings in the Turin Papyrus. At least superficially they were Egyptianized, and they did not interfere with Egyptian culture beyond the political sphere.

Hylacomylus: *see* Waldseemüller, Martin.

Hylobatidae, family of arboreal apes, most notable among which are the gibbon and the siamang (*qq.v.*).

hylomorphism (from Greek *hylē,* "matter"; *morphē,* "form"), in philosophy, metaphysical view according to which every natural body consists of two intrinsic principles, one potential, namely, primary matter, and one actual, namely, substantial form. It was the central doctrine of Aristotle's philosophy of nature. Before Aristotle, the Ionian philosophers had sought the basic constituents of bodies; but Aristotle observed that it was necessary to distinguish two types of principles. On the one hand, one must look for the primordial elements—*i.e.,* for bodies that are not derived from others and of which all other bodies are composed. He found his solution to this question in Empedocles' doctrine of the four elements: earth, water, air, and fire. On the other hand, one must look for the intrinsic conditions whereby a body is or comes to be what it is understood to be, and to answer this question he proposed his hylomorphic doctrine. The primordial elements correspond in a sense to those of modern physics insofar as the single elements can have independent existence or activity of their own and can therefore be known directly by way of experiment. Matter and form, however, are not bodies or physical entities that can exist or act independently: they exist and act only within and by the composite. Thus, they can be known only indirectly, by intellectual analysis, as the metaphysical principles of bodies.

Aristotle based his argument chiefly on the analysis of "becoming," or substantial change. If a being changes into another being, something permanent must exist that is common to the two terms; otherwise there would be no transformation but merely a succession by the annihilation of the first term and the creation of the second. This permanent and common something cannot itself be strictly a being because a being already is and does not become, and because a being "in act" cannot be an intrinsic part of a being possessing a unity of its own; it must therefore be a being "in potency," a potential principle, passive and indeterminate. At the same time, in the two terms of the change, there must also be an actual, active, determining principle. The potential principle is matter, the actual principle, form. Phenomenological arguments for hylomorphism have also been proposed.

The hylomorphic doctrine was received and variously interpreted by the Greek and Arab commentators of Aristotle and by the Scholastic philosophers. Thomas Aquinas gave a full account of hylomorphism in his commentaries on Aristotle's *Physics* and *Metaphysics* and in his *De ente et essentia* ("Of Being and Essence"). Many medieval scholars, Ibn Gabirol (Avicebron) and Bonaventure among them, extended hylomorphism to all beings in creation—even to angels.

Opposed to hylomorphism are atomism, mechanism, and dynamism, all of which deny the intrinsic composition of metaphysical principles in bodies and recognize only physical principles, such as corpuscles, pure mathematical extension, or forces and energies. These theories agree also in denying the hylomorphist's claim that intrinsic change can occur in the ultimate realities of which the physical world is composed and, further, in reducing the phenomenon of becoming to a simple local movement or to purely accidental changes of a single selfsame reality.

A hylomorphic framework has been employed in theology in explaining the Eucharist and the relation of soul and body in man.

The science of physics, after having been dominated for 300 years by mechanism, atomism, and dynamism, has returned in the 20th century to a more naturalistic conception allowing the intrinsic transmutability of the physical elements—protons, neutrons, electrons, mesons, and other elementary particles—the transformation of mass into energy and vice versa, and the nonconservation of elementary particles. Physics thus poses again the problem that Aristotle's hylomorphism was designed to solve. Nevertheless, because for Aristotle matter and form were metaphysical principles, they must not be equated with any physical concept or entity.

hylozoism (from Greek *hylē,* "matter"; *zōē,* "life"), in philosophy, any system that views all matter as alive, either in itself or by participation in the operation of a world soul or some similar principle. Hylozoism is logically distinct both from early forms of animism, which personify nature, and from panpsychism, which attributes some form of consciousness or sensation to all matter.

Throughout the history of thought hylozoistic interpretations of nature have been common. Early Greek thinkers sought the beginning of all things in various material substances. Thus, Thales considered water as the primary substance and saw all things as "full of gods"; for Anaximenes, air was the universal animating principle of the world, and for Heracleitus it was fire. All of these elements were regarded as in some sense living, or even divine, and

taking an active part in the development of being. When the Peripatetic Straton reduced all of reality to matter and all psychic activity to motion, he likewise vitalized matter.

Modified forms of early hylozoism reappeared in medieval and Renaissance thought, though it is sometimes difficult to distinguish a hylozoist from a panpsychist. The word hylozoism was coined in the 17th century by Ralph Cudworth, a Cambridge Platonist, who with Henry More (also a Cambridge Platonist) spoke of "plastic nature," an unconscious, incorporeal substance that controls and organizes matter (somewhat like a plant soul in vegetation) and thus produces natural events as a divine instrument of change.

Denis Diderot, Pierre-Jean-Georges Cabanis, and J.B. Robinet, 18th-century Encyclopaedists, espoused a dynamic, materialistic view of nature (not unlike that of Straton), which was later adapted by 19th-century evolutionist philosophers. Ernst Haeckel, for example, maintained that all matter must contain life if life derives from matter—a position soon challenged by emergent evolutionism (*see also* emergence).

Hyman, Libbie Henrietta (b. Dec. 6, 1888, Des Moines, Iowa, U.S.—d. Aug. 3, 1969, New York City), U.S. zoologist and writer particularly noted for her widely used texts and reference works on invertebrate and vertebrate zoology.

Hyman received her Ph.D. degree from the University of Chicago (1915), where she had a research appointment (1916–31) under the distinguished zoologist Charles Manning Child. Much of her work during that period was on flatworms. She held an honorary research appointment (1937–69) to the American Museum of Natural History in New York City until her death.

Among her important works were *A Laboratory Manual for Elementary Zoology* (1919), *A Laboratory Manual for Comparative Vertebrate Zoology* (1922), *Comparative Vertebrate Anatomy* (1942), and *The Invertebrates*, 6 vol., (1940–68), a monumental work still incomplete at the time of her death. She served as editor of *Systematic Zoology* (1959–63) and as president of the Society of Systematic Zoology (1959).

Hymans, Paul (b. March 23, 1865, Ixelles, near Brussels—d. March 8, 1941, Nice, Fr.), Belgian statesman who, as Belgium's representative to the Paris Peace Conference after World War I, helped draft the covenant of the League of Nations.

While teaching parliamentary history at the Free University of Brussels (1898–1914), Hymans entered the Chamber of Deputies (1900) and soon became a leader of the Liberal Party. He served as minister to Great Britain from 1915 to 1917 and as minister of economic affairs (1917). As minister for foreign affairs (1918–20), he represented Belgium at the peace conference (1919–20) and served as president of the League of Nations' first assembly (1920) in Geneva.

After helping to form the customs union of Belgium and Luxembourg in 1921, Hymans played a leading part in negotiating the Dawes Plan (1924), which enabled Germany to resume reparations payments to the Allies. He then held a series of government posts: minister of justice (1926–27), minister for foreign affairs (1927–35), and member of the council of ministers (1935–36). His *Pages libérales* ("Liberal Notes") was published in 1936.

Hymen, also called HYMENAEUS, in Greek mythology, the god of marriage, whose name derives from the refrain of an ancient marriage song. He was usually held to be a son of Apollo by a Muse, perhaps Calliope; other accounts made him the son of Dionysus and Aphrodite, and as such he would have been a god of fruitfulness. In Attic legend he was a beautiful youth who rescued a group of women, including the girl he loved, from a band of pirates. As a reward he obtained the girl in marriage, and their happy life caused him ever afterward to be invoked in marriage songs.

hymenium, a spore-bearing layer of tissue in fungi (division Mycota) found in the classes Ascomycetes and Basidiomycetes. It is formed by end cells of hyphae—the filaments of the vegetative body (thallus).

Hymenogastrales, an order of fungi (division Mycota) of the class Basidiomycetes. It is a heterogenous group of about 225 species related to mushrooms and boletes. Genera include *Rhizopogon* (150 species widespread in North America) and 25 species of *Secotium* (*Endoptychum*), especially in Australasia.

hymenopteran, a member of the insect order Hymenoptera, the third largest of the insect orders with more than 110,000 species of bees, ants, sawflies, ichneumons, wasps, chalcids, and horntails. Because of the preponderance of plant pollinators and insect parasites in the group, it is probably the most economically important order of insects. Hymenopterans are found throughout the world except in the polar regions, and they are especially abundant in tropical and subtropical regions. The first hymenopterans appeared possibly as early as the end of the Permian Period (about 225,000,000 years ago), and were certainly in existence by the middle of the Jurassic Period (150,000,000 years ago). The first bees appeared during the Miocene epoch, which began some 26,000,000 years ago and lasted about 20,000,000 years.

A brief treatment of hymenopterans follows. For full treatment, *see* MACROPAEDIA: Insects.

Hymenopterans range in size from the fairyflies (Mymaridae), which are only 0.21 millimetre (0.008 inch) long, to the Pelecinidae, which can exceed 5 centimetres (2 inches), but most members of the order are under 2.5 cm long. The order is divided into two suborders, the Symphyta (sawflies and horntails) and the Apocrita, which consists of several superfamilies including the Chalcoidea (chalcids), Cynipoidea (gall wasps), Scolioidea (ants and parasite wasps), Vespoidea (paper and potter wasps), and Apoidea (bees).

As in other insects, the adult hymenopteran body includes three regions: head, thorax, and abdomen. Most hymenopterans have a narrow waist dividing the abdomen from the thorax. Membranous wings are present in most species; when they occur there are two pairs, and the anterior pair is the larger. The wings are interlocked by tiny hooklets along the anterior edge of the hindwings. The mouthparts are adapted for biting or for sucking. Two large compound eyes are present, as well as (usually three) simple eyes, or ocelli, located on top of the head. The structure of the antennae varies widely, but they are typically of moderate length or occasionally longer than the body. Various bees have pollen-carrying structures (scopa); these may be basket-like webs of long hairs on the legs or ventral abdomen. The ovipositor is at the tip of the abdomen. In sawflies it is sawlike, for slitting the plants in which these insects lay their eggs. In all remaining hymenopterans it is adapted for piercing or stinging. Many bees have wax glands on the ventral part of the abdomen. This wax is used to construct combs for housing the brood and storing nutrients.

In the hymenopterans the senses of vision and smell reach their most advanced development within the class Insecta. Bees are sensitive to light of various wavelengths, including ultraviolet. They are able to orient themselves by means of the Sun (even on cloudy days owing to their sensitivity to polarized light) and by various visible landmarks. The sense of smell is used by guard bees, which check every individual entering the hive to make sure it has the correct colony odour. Ants leave scent marks to find their way back to the nest. Many hymenopterans use scent to find mates.

Hymenopteran larvae generally have a head, a 3-segment thorax, and an abdomen composed of 9 or 10 segments. In the suborder Symphata the larvae are typically caterpillar-like, with six legs on the thorax and more on the abdomen, except for the wood- and stemboring forms, which lack abdominal legs. Larvae of the Apocrita typically lack legs and resemble maggots.

Bees and wasps can be found anywhere flowering plants occur. Few ant species are found in colder climates, but in the tropics there is a great abundance and diversity of ants. Some hymenopterans, such as sawflies and bees, are phytophagous (plant-eating). Others, including various wasps and ichneumons, are parasitic on other insects. South American army ants (Dorylinae) eat any plant or animal food that they find.

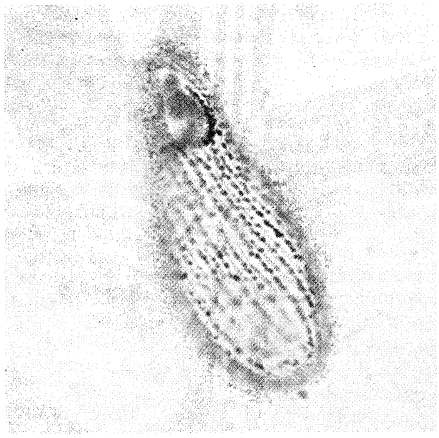
Some groups, including many wasps, sawflies, and some bees, are solitary. Others, including all the ants and many advanced bees, are among the most well-known social insects. Most solitary wasps, of which about 20,000 species are known, provision their nests with paralyzed insects or spiders. They place one in each cell containing an egg, and the larvae thus hatch with a ready food supply. Females of the parasitic superfamily Ichneumonoidea leave their eggs in or on the larvae of various insect hosts.

The social insects form colonies in which each individual has a well-defined role, and individuals of these species usually do not survive for long when separated from their colonies. The colonies of advanced species have a reproductive female, or queen, plus various other physiologically or behaviourally distinct types to maintain the colony. The majority of colony workers are nonreproductive females; males are necessary only for a brief mating period each year. The female workers build and defend the nest and care for and feed the brood; they may or may not be morphologically differentiated into builders, soldiers, inside workers, and outside workers. In the honeybee there are no different morphs (body types) for these jobs; rather, the division of labour is based on age group.

Honeybees have evolved a mode of communication by which they can pass information to their hive-mates through dance-like movements. The duration, angle, and direction of the dance can tell the other bees the quantity and quality of a new food source as well as its distance and direction. When a hive becomes overcrowded the old queen will take half of the population and seek a new nesting site. Scouts are sent out from the swarm, and when they return they use a similar dance to describe the location and potential of any sites they have found.

Various hymenopterans are important to man. Bees and other species are among the most important pollinators of flowering plants, and the honeybee has long been cultivated for both honey and beeswax. Various parasitic forms are valued as controls on insect pests: wood wasps, for example, parasitize wood-boring beetles; eulophids parasitize scale insects; and tiphiids parasitize Japanese beetles. The larch sawfly (*Pristiphora erichsonii*), European spruce sawfly (*Gilphinia*), and wheatstem sawflies (Cephidae) are among the few hymenopterans that are serious economic pests.

hymenostome, any member of the evenly ciliated protozoan order Hymenostomatida. Included in this order are the genus *Parame-*



Hymenostome (*Tetrahymena pyriformis*)
Albert Lastovica

cium, often used in laboratory studies, and the even more widely studied genus *Tetrahymena,* which can be easily cultured for biochemical and physiological research. The hymenostomes are characterized by a ventral mouth cavity, which is lined by three membranelles of fused cilia on one side and by an undulating membrane on the other side. In the genus *Pleuronema* the membrane is greatly enlarged to form a saclike food scoop. The order also contains parasites, such as the genus *Ichthyophthirius,* which attacks the skin of freshwater and aquarium fishes. The numerous, mostly marine species now known as the scuticociliates are classified here as well.

Hymettus, Mount, Modern Greek ÓROS, IMITTÓS, limestone mountain southeast of Athens, Greece. With a peak elevation of 3,366 ft (1,026 m), the 11-mi- (18-km-) long ridge is divided into two small series of peaks by the gorge of Pirnari in the southwest. The ancient quarries of Kara marble are located near the monastery of Karíais. The limestone is honeycombed with many ancient tombs between the villages of Kará, Trákhones, and Komniná. The aromatic plants and flowers of the mountainside, described by the Roman poet Ovid in *Ars amatoria* (*c.* 1 BC), have long since vanished, but there is beekeeping as in antiquity. An extensive reafforestation program after World War II produced some visible results. A small monastery, the Kaisarianí, stands on the site of a spring renowned in the ancient world for its curative properties.

hymn (Greek *hymnos:* "song of praise," in honour of gods, heroes, or famous men), strictly, a song used in Christian worship, usually sung by the congregation and characteristically having a metrical, strophic (stanzaic), non-biblical text. Similar songs, also generally termed hymns, exist in all civilizations—examples survive, for instance, from ancient Sumer and Greece.

Christian hymnody derives from the singing of psalms in the Hebrew Temple. The earliest fully preserved text (*c.* AD 200 or earlier) is the Greek "Phos hilarion" ("Go, Gladsome Light," translated by the 19th-century U.S. poet Henry Wadsworth Longfellow). Hymnody developed systematically, however, only after the emperor Constantine legalized Christianity (AD 313); and it flourished earliest in Syria, where the practice was possibly taken over from the singing by Gnostics and Manichaeans of hymns imitating the psalms. The Byzantine Church adopted the practice; in its liturgy, hymns maintain a much more prominent place than in the Latin liturgy; and Byzantine hymnody developed complex types such as the *kanōn* and kontakion (*qq.v.; see also* Byzantine chant). Saint Ephraem—a 4th-century Mesopotamian deacon, poet, and hymnist—has been called the "father of Christian hymnody."

In the West, St. Hilary of Poitiers composed a book of hymn texts in about 360. Not much later St. Ambrose of Milan instituted the congregational singing of psalms and hymns, partly as a counter to the hymns of the Arians, who were in doctrinal conflict with orthodox Christianity. In poetic form (iambic octosyllables in four-line stanzas), these early hymns—apparently sung to simple, possibly folk melodies—derive from Christian Latin poetry of the period. By the late Middle Ages trained choirs had supplanted the congregation in the singing of hymns. Although new, often more ornate melodies were composed and many earlier melodies were elaborated, one syllable of text per note was usual. Some polyphonic hymn settings were used, usually in alternation with plainchants, and were particularly important in organ music.

Congregational singing in the liturgy was reestablished only during the Reformation, by the Lutheran Church in Germany. The early chorale (*q.v.*), or German hymn melody, was unharmonized and sung unaccompanied, although harmonized versions, used by varying combinations of choir, organ, and congregation, appeared later. Some were newly composed, but many drew upon plainsong, vernacular devotional song, and secular song. The pattern of secular lyrics also influenced the hymn texts of Martin Luther and his contemporaries. Important early collections were those of Luther and Johann Walther (1524) and of Georg Rhau (1544). Pietism brought a new lyrical and subjective note into German hymnody in the 17th and 18th centuries, among both Lutherans and other groups, such as the Moravian Church.

Swiss, and later, French, English, and Scottish Calvinism promoted the singing of metrical translations of the psalter (*see* psalmody), austerely set for unaccompanied unison singing. English and Scottish Protestantism admitted only the singing of psalms. English metrical psalms were set to tunes adapted from the French and Genevan psalters. These were fairly complex melodies written on French metres. The English psalter used only a few metres, and the custom of singing each psalm to its "proper" tune was soon replaced by the use of a few common tunes. The common metre 8, 6, 8, 6 (the numbers give the number of syllables in each line), a form of English ballad metre, remains the archetypal English hymn metre.

The principal impetus to English hymnody came in the late 17th century from the Independent (Congregationalist) hymn writer Isaac Watts (*Hymns and Spiritual Songs;* 1705–19). The evangelical revival of the mid-18th century under John and Charles Wesley, founders of Methodism, finally established hymnody in England and America. Charles Wesley's many poems use a variety of experimental metres, and John Wesley's translations introduced many of the finest German hymns. The Wesleys also adopted many German tunes, and their later editions contain much music in the style of Handel.

The Church of England accepted hymn singing officially only in 1820, following a controversy arising from the singing of hymns at a Sheffield church. The Oxford (High Church) Movement, begun in 1833, stimulated new compositions, translations of medieval hymns, and use of plainsong melodies. The present era of English hymnody dates from the publication of *Hymns Ancient and Modern* (1861; last rev. ed., 1950), characterized by austerity of style, conformity to the Anglican Book of Common Prayer, and the setting of each hymn to its proper tune.

Two influential collections appeared around the turn of the 20th century: the *Yattendon Hymnal* (1899), by the English poet Robert Bridges, and *The English Hymnal* (1906), edited by Percy Dearmer and the composer Ralph Vaughan Williams; the latter includes many plainsong and folk melodies.

Continental hymnody has been largely influenced by Lutheran models, although in Italy the Waldensian church cultivates congregational hymnody influenced by local folk-song and operatic styles. The Counter-Reformation in the mid-16th century stimulated the composition of many fine Roman Catholic hymns, and a renewal of interest in the late 19th century eventually led, in England, to the *Westminster Hymnal* (1940). The reintroduction of congregational singing during mass in the late 1960s also proved a stimulus to the composition of new hymns and led to the adoption of many hymns from non-Catholic sources. *See also* Armenian chant; fuging tune; sequence; spiritual; Te Deum laudamus.

Hyndburn, district (borough), county of Lancashire, England. It lies between the denser urban areas of Blackburn and Burnley, with the moorlands of the Forest of Rossendale to the south and the agricultural Ribble Valley to the north. The district takes its name from the River Hyndburn, along whose valley the towns developed. The Leeds and Liverpool Canal winds through the middle of the district. The towns grew during the 19th century as the cotton textile industry developed, first using water power and later local coal. Among early industrialists was Robert Peel, grandfather of the prime minister, who lived near Oswaldtwistle; the inventor of the spinning jenny, James Hargreaves, lived at Stanhill. Engineering developed as a result of the textile industry and is still important. The area of the district is 28 sq mi (73 sq km). Pop. (1982 est.) 79,200.

Hyndman, Henry Mayers (b. March 7, 1842, London—d. Nov. 22, 1921, London), the first important British Marxist, who strongly influenced, especially in the 1880s, many other leading British Socialists, although his difficult personality antagonized most of them and lessened his political effectiveness.



Hyndman
Photo Beresford

Educated at Trinity College, Cambridge, Hyndman played cricket for Sussex in county competitions (1863–68), travelled extensively, and worked as a journalist in London (1871–80). Converted to Marxism on reading *Das Kapital* in 1880, he joined several other radicals in founding the Democratic Federation. For its first conference (June 1881) he wrote *England for All,* the first socialist book published in England since the decline of Robert Owen's reform movement in the 1830s. In this work he expounded the theories of Marx, who was offended, however, because in his view Hyndman did not make the necessary acknowledgment of this intellectual debt. Marx's chief associate, Friedrich Engels, who disliked Hyndman, deliberately widened the breach, and so the only articulate British-born Marxist of the time ceased to be on speaking terms with Marx.

In 1884 the Democratic Federation was

renamed the Social Democratic Federation (SDF). Within it many socialists, including William Morris, John Elliot Burns, and George Lansbury, were steered toward Marxism by Hyndman. With Engels' assistance, however, Morris and others soon broke away to form the Socialist League. Although Hyndman's control of British socialism was thereby weakened, he attained his greatest prominence in 1889, when it was widely though inaccurately believed that he directed the London dockworkers' strike.

Convinced of what he called "the German menace" to Great Britain, Hyndman took a patriotic and pro-French line when World War I began. As a result, the British Socialist Party (as the SDF had become) removed him in 1915. He then formed the National Socialist Party, which later revived for itself the name Social Democratic Federation. During the war Hyndman was an adviser to the Ministry of Food. Among his writings is *The Evolution of Revolution* (1920).

Hyōgo, *ken* (prefecture), western Honshu, Japan, bounded by the Sea of Japan (north) and the Inland Sea (south). Its area of 3,235 square miles (8,378 square km) includes Awajishima, the largest island of the Inland Sea. Hyōgo is dominated by its capital, Kōbe, and other southern coastal cities, that form part of the Ōsaka–Kōbe Metropolitan Area. Industries include the production of iron, steel, textiles, and lumber. Agriculture and forestry are also well-developed.

An ancient centre of communication with western Japan and continental Asia, Hyōgo is well-served by railways. Kōbe is Japan's leading port in foreign trade. Other important cities are Nishinomiya, Amagasaki, Akashi, and Takarazuka. Pop. (1986 est.) 5,302,000.

hyoscine (drug): *see* scopolamine.

Hypapante (Christianity): *see* Candlemas.

Hypatia (b. *c.* 370, Alexandria—d. March 415, Alexandria), Egyptian Neoplatonist philosopher who was the first notable woman in mathematics.

The daughter of Theon, also a mathematician and philosopher, she became the recognized head of the Neoplatonist school of philosophy at Alexandria, and her eloquence, modesty, and beauty, combined with her remarkable intellectual gifts, attracted a large number of pupils. Among them was Synesius of Cyrene, afterward bishop of Ptolemais (*c.* 410), several of whose letters to her are still extant.

Hypatia symbolized learning and science, which at that time in Western history were largely identified by the early Christians with paganism. As such, she was a focal point in the tension and riots between Christians and non-Christians that more than once racked Alexandria. After the accession of Cyril to the patriarchate of Alexandria in 412, Hypatia was barbarously murdered by the Nitrian monks and a fanatical mob of Cyril's Christian followers, supposedly because of her intimacy with Orestes, the city's pagan prefect. Whatever the precise motivation for the murder, the departure soon afterward of many scholars marked the beginning of the decline of Alexandria as a major centre of ancient learning.

According to the *Suda* lexicon, Hypatia wrote commentaries on the *Arithmetica* of Diophantus of Alexandria, on the *Conics* of Apollonius of Perga, and on the astronomical canon of Ptolemy. These works are lost, but their titles, combined with the letters of Synesius, who consulted her about the construction of an astrolabe and a hydroscope, indicate that she devoted herself particularly to astronomy and mathematics. The existence of any strictly philosophical works by her is unknown. Her philosophy was more scholarly and scientific in its interest and less mystical and intransigently pagan than the Athenian school and was the embodiment of Alexandrian Neoplatonism.

Hypecoaceae, family of the poppy order (Papaverales) intermediate in character between the other two families of the order, Papaveraceae and Fumariaceae. The 15 species of the only genus, *Hypecoum,* are herbs containing a watery sap. All species have alternate, glaucous (gray waxy-powdered), deeply divided leaves, and small regular flowers with four stamens and four petals in two whorls. The inner petals often are lobed. The plants occur in warm temperate areas from the Mediterranean to eastern Asia. One species, *H. procumbens,* from southern Europe, has been cultivated as a hardy garden annual for its dainty loose clusters of bright yellow, cupped blooms borne on 30-centimetre- (1-foot-) tall plants.

hyperactivity, also called HYPERKINESIS, a behavioural syndrome of children, so called because the typical symptoms are restlessness, inability to sit still, and difficulty concentrating on one thing for any period of time. The hyperactive child is impulsive, easily upset or excited, and may be more irritable and aggressive than other children. Hyperactivity can cause serious problems for children of school age, since they find it difficult to sit still at their desks and concentrate on lessons, and they may misbehave and be disruptive. The hyperactive child is not retarded, however, and his learning difficulties should not be confused with a deficient intelligence.

The cause of hyperactivity is not known and may be a combination of both inherited and environmental factors. The condition was once called "minimal brain dysfunction" (MBD), but this label has been replaced by the term hyperactivity because hyperactive children do not have the perceptual, emotional, and neurological disabilities that children with MBD have. Hyperactivity is three times more common in boys than in girls and occurs in roughly 5 to 10 percent of all schoolchildren. Stimulant drugs such as amphetamines have been found to slow down hyperactive children, in contrast to these drugs' usual effect on other people. The recommended treatment for hyperactivity, however, is not drug maintenance but that of simply helping a family to learn ways of coping with the child in a positive and helpful fashion. The short attention span and other negative symptoms of hyperactive children usually improve with age, although a tendency to be easily distracted may remain.

hyperbaric chamber, also called DECOMPRESSION CHAMBER, or RECOMPRESSION CHAMBER, sealed chamber in which a high-pressure environment is used to relieve symptoms of pressure-related diseases and other medical afflictions. Experimental recompression chambers first came into use in about 1860. In its simplest form, the hyperbaric unit is a cylindrical metal tube large enough to accommodate one or more persons. The outer door has rubber gaskets that permit high-pressure seals. The air or breathing mixture is pumped into the chamber by compressors; the pressure increases proportionally to the amount of air forced into the hyperbaric unit. Most chambers operate at air pressures three to six times greater than the atmospheric pressures ordinarily encountered.

As the air becomes more compressed, it increases in density and concentration. A person breathing air at six atmospheres (six times atmospheric pressure) is taking into his body six times the amount of oxygen with each breath that he would normally consume outside of the chamber. It is because of this increase in oxygen level that the chamber is valuable for certain medical problems. Some bacteria, such as those that cause tetanus (lockjaw) and gas gangrene, cannot grow in environments containing oxygen. Persons afflicted with these diseases have been successfully treated in hyperbaric chambers because of the increased amount of oxygen forced into the bodily tissues. Some forms of cancer cells have also been found to be more susceptible to X-ray treatment after they have first been saturated with oxygen by hyperbaric treatment. Babies born with certain heart defects (blue babies) have increased chances of survival during the delicate heart operation if they receive more oxygen by means of the hyperbaric chamber.

Another valuable function of the chamber is treatment of pressure-related diseases such as air embolism and decompression sickness. When an underwater diver or airplane pilot goes from an environment of high pressure to one of lower pressure, the air and gases inside the body begin to expand. If the transition is slow enough, the expanding gas is passed out of the lungs with no tissue damage. In rapid pressure changes, however, the trapped air expands in the tissue, causing bubbles to form. Bubbles may lodge in the joints, muscles, nervous system, lungs, or heart. The symptoms can range from pain, dizziness, joint stiffness, nausea, vomiting, and extreme fatigue to convulsions, visual and hearing abnormalities, speech difficulties, unconsciousness, and paralysis. The hyperbaric chamber returns the affected person to a high-pressure environment in which the bubbles are recompressed and allowed to be slowly assimilated back into the tissues. The gas then leaves the body through the respiratory tract as the pressure is slowly and gradually returned to normal.

hyperbola, two-branched open curve, a conic section, produced by the intersection of a circular cone and a plane that cuts both nappes (*see* cone) of the cone. As a plane curve it may be defined as the path (locus) of a point moving so that the ratio of the distance from a fixed point (the focus) to the distance from a fixed line (the directrix) is a constant greater than one. The hyperbola, however, because of its symmetry, has two foci. Another definition is that of a point moving so that the difference of its distances from two fixed points, or foci, is a constant. A degenerate hyperbola (two intersecting lines) is formed by the intersection of a circular cone and a plane that cuts both nappes of the cone through the apex.

A line drawn through the foci and prolonged beyond is the transverse axis of the hyperbola; perpendicular to that axis, and intersecting it at the geometric centre of the hyperbola, a point midway between the two foci, lies the conjugate axis. The hyperbola is symmetrical with respect to both axes.

Two straight lines, the asymptotes of the curve, pass through the geometric centre. The hyperbola does not intersect the asymptotes, but its distance from them becomes arbitrarily small at great distances from the centre. The hyperbola when revolved about either axis forms a hyperboloid (*q.v.*).

For a hyperbola that has its centre at the origin of a Cartesian coordinate system and has its transverse axis lying on the x axis, the coordinates of its points satisfy the equation $x^2/a^2 - y^2/b^2 = 1$, in which a and b are constants.

hyperbole, a figure of speech that is an intentional exaggeration for emphasis or comic effect. Hyperbole is common in love poetry, in which it is used to convey the lover's intense admiration for his beloved. An example is the following passage describing Portia:

> Why, if two gods should play some heavenly match
> And on the wager lay two earthly women,
> And Portia one, there must be something else
> Pawned with the other, for the poor rude world
> Hath not her fellow.
>
> (Shakespeare, *The Merchant of Venice*)

When hyperbole fails to create the desired dramatic effect, exaggeration may seem ridiculous. Examples of hyperbole occur in sagas recounting the heroic deeds of legendary kings and warriors, tall tales, Greek and Roman mythology, and, in a broader sense, in political rhetoric and advertising slogans.

hyperbolic function, also called HYPERBOLIC TRIGONOMETRIC FUNCTION, the hyperbolic sine of z (written sinh z); the hyperbolic cosine of z, written cosh z; the hyperbolic tangent of z, written tanh z; and the hyperbolic cosecant, secant, and cotangent of z. These functions are often defined in terms of the exponential function (*q.v.*), with $\sinh z = \frac{1}{2}(e^z - e^{-z})$ and $\cosh z = \frac{1}{2}(e^z + e^{-z})$ and with the other hyperbolic trigonometric functions defined in a manner analogous to ordinary trigonometry.

hyperbolic geometry, also called LOBACHEVSKIAN GEOMETRY, a non-Euclidean geometry that rejects the validity of Euclid's fifth, the "parallel," postulate. Simply stated, this Euclidean postulate is: through a point not on a given line there is exactly one line parallel to the given line. In hyperbolic geometry, through a point not on a given line there are at least two lines parallel to the given line. The tenets of hyperbolic geometry, however, admit the other four Euclidean postulates. *Compare* Riemannian geometry.

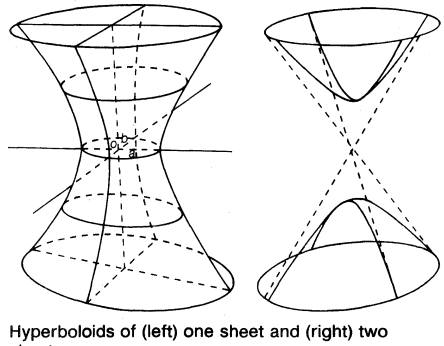
Although many of the theorems of hyperbolic geometry are identical to those of Euclidean, others differ. In Euclidean geometry, for example, two parallel lines are taken to be everywhere equidistant. In hyperbolic geometry, two parallel lines are taken to converge in one direction and diverge in the other. In Euclidean, the sum of the angles in a triangle is equal to two right angles; in hyperbolic, the sum is less than two right angles. In Euclidean, polygons of differing areas can be similar; and in hyperbolic, similar polygons of differing areas do not exist.

The first published works expounding the existence of hyperbolic and other non-Euclidean geometries are those of a Russian mathematician, Nikolay Ivanovich Lobachevsky, who wrote on the subject in 1829, and, independently, the Hungarian mathematicians Farkas and János Bolyai, father and son, in 1831.

hyperboloid, the open surface generated by revolving a hyperbola (*q.v.*) about either of its axes. If the tranverse axis of the surface lies along the x axis and its centre lies at the origin and if a, b, and c are the principal semiaxes, then the general equation of the surface is expressed as $x^2/a^2 \pm y^2/b^2 - z^2/c^2 = 1$.

Revolution of the hyperbola about its conjugate axis generates a surface of one sheet, an hourglass-like shape (*see* Figure, left), for which the second term of the above equation is positive. The intersections of the surface with planes parallel to the xz and yz planes are hyperbolas. Intersections with planes parallel to the xy plane are circles or ellipses.

Revolution of the hyperbola about its transverse axis generates a surface of two sheets, two separate surfaces (*see* Figure, right), for which the second term of the general equation is negative. Intersections of the surface(s) with planes parallel to the xy and xz planes produce hyperbolas. Cutting planes parallel to the yz plane and at a distance greater than the absolute value of a, $|a|$, from the origin produce circles or ellipses of intersection, respectively, as a equals b or a is not equal to b.



Hyperboloids of (left) one sheet and (right) two sheets

Hyperborean, in Greek religion, one of a mythical people intimately connected with the worship of Apollo at Delphi and of Artemis at Delos. The Hyperboreans were named with reference to Boreas, the north wind, and their home was placed in a paradisal region beyond the north wind. They lived for 1,000 years; if any desired to shorten that period, he decked himself with garlands and threw himself from a rock into the sea. According to Herodotus, several Hyperborean maidens had been sent with offerings to Delos, but, the offerings having been delivered, the maidens died. Thereafter the Hyperboreans wrapped their offerings in wheat straw and requested their neighbours to hand them on, from nation to nation, until they finally reached Delos.

Hyperborean languages: *see* Paleosiberian languages.

hyperfine structure (HFS), in spectroscopy, the splitting of a spectral line into a number of components. The splitting is caused by nuclear effects and cannot be observed in an ordinary spectroscope without the aid of an optical device called an interferometer. In fine structure (*q.v.*), line splitting is the result of energy changes produced by electron spin–orbit coupling (*i.e.*, interaction of forces from orbital and spin motion of electrons); but in hyperfine structure, line splitting is attributed to the fact that in addition to electron spin in an atom, the atomic nucleus itself spins about its own axis. Energy states of the atom will be split into levels corresponding to slightly different energies. Each of these energy levels may be assigned a quantum number, and they are then called quantized levels. Thus, when the atoms of an element radiate energy, transitions are made between these quantized energy levels, giving rise to hyperfine structure.

The spin quantum number is zero for nuclei of even atomic number and even mass number, and therefore no HFS is found in their spectral lines. The spectra of other nuclei do exhibit hyperfine structure. By observing HFS, it is possible to calculate nuclear spin.

A similar effect of line splitting is caused by mass differences (isotopes) of atoms in an element and is called isotope structure, or isotope shift. These spectral lines are sometimes referred to as hyperfine structure but may be observed in an element with spin-zero isotopes (even atomic and mass numbers). Isotope structure is seldom observed without true HFS accompanying it.

hyperfragment, also called HYPERNUCLEUS, atomic nucleus containing a lambda-zero (Λ^0) hyperon (subatomic particle more massive than a proton or neutron). A hydrogen hypernucleus (^{4}H), for example, consists of a lambda particle, a proton, and two neutrons. Study of this and similar short-lived hyperfragments, discovered (1953) by M. Danysz and J. Pniewski, gives information on nuclear structure, spin of the lambda-zero hyperon, and the nuclear force (or strong interaction) that binds the lambda particle to the protons and neutrons.

hyperglycemia, elevation of glucose levels in the blood beyond the normal range; it is the chief diagnostic laboratory symptom of diabetes mellitus (*q.v.*). Hyperglycemia results from a breakdown in the body's regulation of its metabolism of carbohydrates, and the condition is specifically due to a relative deficiency of the hormone insulin. Since insulin is important in the mechanism that removes glucose from the bloodstream and increases the storage of sugar in the liver, the relative lack of this hormone allows glucose circulating in the blood to accumulate. Sustained hyperglycemia in persons with diabetes causes the typical clinical symptoms of thirst and blurred vision in such patients. Excessive circulating glucose is directly toxic to the nervous system and causes numbness and tingling.

hyperhidrosis, also spelled HYPERIDROSIS, excessive sweating, either general or local. A person may sweat profusely in armpits and on palms, soles, and forehead when excited, afraid, or anxious. Inflammation of the sympathetic nerves can also cause local hyperhidrosis, as can trench or immersion foot (resulting from long periods when the feet are soaked and cold) and encephalitis. Generalized sweating can occur after a fever or when a person is overheated or has taken aspirin, alcohol, or a hot drink. Heavy general sweating may accompany malaria, typhoid fever, tuberculosis, brucellosis, diabetes mellitus, or hyperthyroidism. Encephalitis and diencephalic epilepsy can also cause this type of sweating.

Hyperides (b. 390 BC—d. 322), Athenian orator who led his city into the Lamian War (323), the final struggle of Athens against Macedonian domination.

A member of a wealthy family, Hyperides is thought to have been a pupil of Plato and of Isocrates. He began his career as a forensic speech writer. From 346 to some time before 324, Hyperides supported the anti-Macedonian statesman Demosthenes, but he was one of the 10 public prosecutors at Demosthenes' trial for embezzlement (323). During the Lamian War, Hyperides led the patriotic party, and after the Athenian defeat in Thessaly he was captured and put to death by the Macedonian general Antipater.

Of the 77 speeches attributed to this orator, only 6 survive, in fragments: "Against Philippides" (winter 336–335), "For Lycophron" (333), "For Euxenippus" (*c.* 330), "Against Athenogenes" (after 330), "Against Demosthenes" (323), and a funeral oration (322).

Hyperion, one of the smaller satellites of Saturn, discovered in 1848 independently by the astronomers William Bond and George Bond of the United States and William Lassell of England. Hyperion orbits Saturn once every 21.3 days at a distance of 1,482,000 km (918,840 miles), between the orbits of the major satellites Titan and Iapetus. Its orbit is unusual in that it is somewhat eccentric ($e = 0.°1$) yet uninclined ($i = 0°4$). Hyperion is an irregularly shaped body that measures $410 \times 260 \times 220$ km ($254 \times 161 \times 136$ miles). It has a moderately high reflectance of 30 percent, which is consistent with the presence of some water frost on its surface.

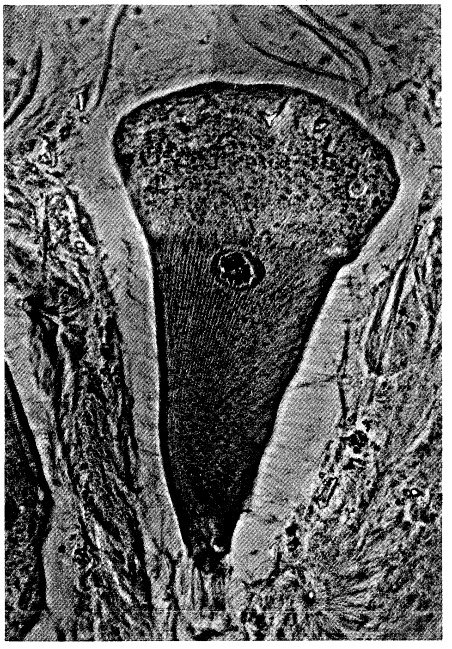
hyperkeratosis, also called X-DISEASE, in cattle, a disease characterized by inflammation and thickening of the horny covering of the epidermis, the outermost layer of the skin. Other symptoms include weight loss, wartlike swellings in the mouth, drooling, and a runny nose. Severely afflicted animals usually die. Although once attributed to a virus, the disease is now known to be caused by the ingestion of feed contaminated with chlorinated naphthalene, a lubricant used to grease feed mills. The term hyperkeratosis is also used to describe the hypertrophy of the corneous layer of the human skin.

hyperkinesia (disorder): *see* chorea.

hyperkinesis (childhood disorder): *see* hyperactivity.

hypermastigote, any member of the zooflagellate protozoan order Hypermastigida. Hy-

permastigotes are complex, uninucleate, multiflagellate organisms that are parasitic or symbiotic in the digestive systems of termites, cockroaches, and woodroaches. Hypermastigotes' flagella are arranged in tufts, spirals, or transverse rows. Feeding occurs by parasitic absorption through the body surface or the ingestion of wood, starch, or other food



Hypermastigote (*Trichonympha campanula*)
J.M. Langham

by cytoplasmic extensions (pseudopodia). Reproduction is asexual (by division) or sexual. Encystment sometimes occurs. In the genus *Trichonympha* encystment and sexual reproduction are initiated by the molting of the host woodroach.

Hypermastigotes are essential to termites' digestive processes, and the protozoans may account for half the total weight of the host. Representative genera are *Lophomonas* in the cockroach and *Holomastigotoides* (*q.v.*) in the termite. Some hypermastigotes are able to survive only in certain termite species.

hypernephroid tumour, also called HYPERNEPHROMA: *see* renal carcinoma.

hypernucleus: *see* hyperfragment.

hyperon, any member of a class of subatomic particles more massive than nucleons (protons and neutrons) and exhibiting half odd-integral spin (fermions). Hyperons, in order of increasing mass, include one lambda-zero, a triplet of sigmas, a doublet of xi particles, and the omega singlet. Each of the seven has an antiparticle. The different hyperons were detected during the period 1947–64; the discovery of the omega-minus hyperon was suggested by the Eightfold Way (*q.v.*) of classifying strongly interacting particles (hadrons). Hyperons are produced by strong interaction (a force holding the atomic nucleus together) in the time it takes for a particle traveling at nearly the speed of light to cross the diameter of a subatomic particle, but their decay by weak interaction (a force involved in radioactive decay) takes millions of millions of times longer. Because of this behaviour, they, along with K mesons (kaons), with which they are often produced, were named strange particles. One of the final decay products of hyperons is always a nucleon; hyperons may be thought of as higher energy states of the nucleon, produced when high-energy hadrons (*e.g.*, pi-mesons, K mesons, protons, sigmas) collide with nucleons.

hyperopia, also called FARSIGHTEDNESS, or HYPERMETROPIA, visual defect in which the cornea and lens of the eye focus the image of the visual field at a point behind the retina (the light-sensitive layer of tissue lining the back and sides of the eye). The retina thus receives an unfocused image of near objects, though distant objects may be in focus. Hyperopia frequently occurs when an eye is shorter than normal from front to rear; the lens is then unable to increase its convexity sufficiently to focus the images of close objects onto the retina. A corrective lens for hyperopia is convex on both its faces to supply the additional convexity needed for focusing.

hyperparathyroidism, abnormal increase in the secretion of parathyroid hormone by the parathyroid gland (*q.v.*). The oversecretion is usually caused by a tumour or enlargement of parathyroid tissue and results in elevated blood and urine calcium, elevated urine phosphorus, and low-to-normal blood phosphorus. The excess calcium is withdrawn from the bones, resulting in bone softening (osteomalacia) and an increased susceptibility to fracture. Other effects are kidney stones and decreased nervous and muscular excitability. Treatment is usually surgical removal of the tumour or excess parathyroid tissue, which may cause a transitory hypoparathyroidism (*q.v.*).

hypersensitivity, acquired bodily state in which the reaction to a stimulus (*e.g.*, a substance causing allergy or a physical agent such as light) is unusually prompt or excessive; the term hypersensitivity is often used as a synonym for allergy. *See* allergy.

hypersthene, silicate mineral belonging to the orthopyroxene (*q.v.*) series.

hypersthene granite, member of the charnockite (*q.v.*) series of metamorphic rocks.

hypertension, also called HIGH BLOOD PRESSURE, condition in which the blood pressure in either arteries or veins is abnormally high. Blood pressure is the force exerted by the blood against the walls of the blood vessels.

Normally, the pumping of the heart creates a rhythmic pulsing of blood along and against the walls of the blood vessels, which are flexible enough to dilate or contract and thus keep the pressure constant. Most physicians consider the blood pressure of a healthy adult to be in the neighbourhood of 120/80—*i.e.*, equivalent to the pressure exerted by a column of mercury 120 mm high during contraction of the heart (systole) and 80 mm high during relaxation (diastole). Sometimes, however, for a variety of reasons, the blood vessels may lose their flexibility, or the muscles surrounding them may force them to contract. As a result, the heart must pump more forcefully to move the same amount of blood through the narrowed vessels into the capillaries, thereby increasing the blood pressure. Over time, this higher pressure, or hypertension, can damage the arterioles (the small terminal twigs of an artery that end in capillaries) in such organs as the liver, kidney, or brain and can also weaken the overworked heart. The increased risk of death from congestive heart failure, kidney failure, or stroke is the chief danger of hypertension.

Known as the "silent killer" because it may be present for years with no perceptible symptoms, hypertension is usually detected by a routine blood-pressure test. In urbanized societies it can be quite common among the elderly. Despite its fatal consequences if untreated, the condition responds well to medical and other therapeutic measures.

Hypertension is usually classified by cause as either essential (of unknown origin) or secondary (the result of a specific disease or disorder). Secondary hypertension has a wide range of causes. Renal (kidney) hypertension affects the entire systemic circulation and arises from hypertension within the renal arteries, which branch from the aorta to supply blood to the kidneys. The underlying cause is disease of the kidneys or narrowing or blocking of the arteries, as by arteriosclerosis. Hypertension may also result from the excess hormones secreted during abnormal functioning of the outer substance, or cortex, of the adrenal glands (Cushing's syndrome; aldosteronism); from the excess hormones resulting from pheochromocytoma, which is a tumour of the inner substance (medulla) of the adrenal glands; or from the excess hormones secreted by pituitary tumours. Other causes of secondary hypertension are coarctation—localized narrowing—of the aorta, pregnancy, and the use of oral contraceptives. In all secondary cases, the hypertension is relieved by treating the underlying disease or disorder.

By far the most common form of hypertension (90 percent of cases) is essential, or idiopathic, hypertension. Although no specific cause can be determined in such cases, studies have pointed out several contributing factors. These include a family history of hypertension, obesity, high salt intake, smoking, and, most importantly, emotional and physical stress.

In its milder forms, essential hypertension is usually treated with a self-help regimen that includes a no-salt diet and perhaps a weight-reducing diet, a decrease in or cessation of smoking, mild exercise, and the avoidance of or more successful coping with stressful situations. If a self-help program does not help lower the patient's blood pressure, the physician will usually prescribe diuretics or sympathetic nerve blockers. The diuretics increase sodium excretion and thereby lower the volume of body water. Since diuretics may deplete the body of potassium, supplements or potassium-saving drugs may be used with the diuretic. The nerve blockers generally act by decreasing heart output and peripheral resistance to blood flow. Beta blockers are the most commonly used of these drugs and include metoprolol, nadolol, and propranolol.

More severe hypertension often requires the use of drugs called vasodilators, which dilate the arteries, thus lowering the blood pressure. Oral vasodilators, which include hydralazine and minoxidil, are often used in conjunction with a diuretic and a sympathetic nerve blocker to inhibit the body's natural tendency to increase fluid retention and increase blood flow in response to the arterial dilation. Once medical therapy for essential hypertension begins, it must continue for the rest of the patient's life.

Severe and immediately life-threatening hypertension, either secondary or essential, is called malignant hypertension and usually requires hospitalization and acute medical care. Treatment includes the intravenous administration of vasodilators such as diazoxide.

hyperthyroidism, abnormal bodily condition characterized by excessive secretion of thyroid hormones and caused by overactivity of the thyroid gland.

A brief treatment of hyperthyroidism follows. For full treatment, *see* MACROPAEDIA: Endocrine Systems.

The thyroid gland's oversecretion of hormones is usually accompanied by enlargement of the gland itself, thus forming the swelling, known as a goitre, in the neck region. The increased levels of thyroid hormones cause an increased metabolic rate and hyperactivity of the autonomic nervous system. These syndromes result in an increased heart rate, heart palpitations and fibrillations, and such symptoms as shortness of breath, excessive sweating, nervousness, excitability and hyperactive behaviour, tremors, and strange eye signs. The most common type of hyperthyroidism is Graves' disease (*q.v.*). This is an autoimmune

disorder caused by the body's production of antibodies to the thyroid gland. Another type of hyperthyroidism is toxic multinodular goitre, or Plummer's disease, which results from a benign tumour (adenoma) of the thyroid gland. Hyperthyroidism is treated by drugs that block or suppress the thyroid gland's production of hormones, or by surgical removal of part of the gland.

hypertrichosis, also called HIRSUTISM, excessive, abnormal hairiness that may be localized or cover the entire body. It is thought that hypertrichosis results either from persistence of the lanugo-vellus hairs covering the body of the fetus or from augmented development of hair follicles. Generalized hirsutism is a common side effect of hyperadrenal corticoidism (Cushing's disease) and has also been observed in hexachlorobenzene poisoning.

hyperventilation, rapid shallow breathing that provides the body with an excess of oxygen and a deficit of carbon dioxide. It most commonly occurs as a manifestation of anxiety or hysteria. It also occurs among pilots in unpressurized planes at high altitudes, who take short, rapid breaths rather than the normal slow, deep ones, in order to compensate for the smaller amount of available oxygen. Hyperventilation causes the body to expel more carbon dioxide than it does during normal breathing. When there are abnormally low levels of carbon dioxide in the blood the small arterial vessels tend to dilate, with a fall in blood pressure. The most apparent symptoms of hyperventilation are numbness or tingling of the hands, feet, and face. The person may also feel dizzy, giddy, or faint.

hypervitaminosis A: *see* vitamin A excess.

hypervitaminosis D: *see* vitamin D excess.

hypha, plural HYPHAE (fungi): *see* mycelium.

Hyphasis (India): *see* Beās River.

Hyphochytridiomycetes, a class of mostly marine fungi (division Mycota) containing 15 species. The class is distinguished by the asexual production of motile cells (zoospores) with a single, anterior, feathery, whiplike structure (flagellum). Sexual reproduction has not been found among these fungi.

Hypnos, Latin SOMNUS, Greco-Roman god of sleep. Hypnos was the son of Nyx (Night) and the brother of Thanatos (Death). He is variously described as living in the underworld, in the land of the Cimmerians, or in a dark, misty cave on the island of Lemnos. The waters of Lethe, the river of forgetfulness and oblivion, flowed through this chamber. Hypnos lay on his soft couch, surrounded by his many sons, who were the bringers of dreams. Chief among them were Morpheus, who brought dreams of men; Icelus, who brought dreams of animals; and Phantasus, who brought dreams of inanimate things.

In Homer's *Iliad,* Hypnos is enlisted by Hera to lull Zeus to sleep so that she can aid the Greeks in their war against Troy. As a reward for his services, Hypnos is given Pasithea, one of the Graces, to wed.

hypnosis, a special psychological state with certain physiological attributes, resembling sleep only superficially and marked by a functioning of the individual at a level of awareness other than the ordinary conscious state. This state is characterized by a degree of increased receptiveness and responsiveness in which inner experiential perceptions are given as much significance as is generally given only to external reality.

The hypnotized individual appears to heed only the communications of the hypnotist. He seems to respond in an uncritical, automatic fashion, ignoring all aspects of the environment other than those pointed out to him by the hypnotist. He sees, feels, smells, and otherwise perceives in accordance with the hypnotist's suggestions, even though these suggestions may be in apparent contradiction to the stimuli that impinge upon him. Even the subject's memory and awareness of self may be altered by suggestion, and the effects of the suggestions may be extended (posthypnotically) into the subject's subsequent waking activity.

The history of hypnosis is as ancient as that of sorcery, magic, and medicine, to whose methods it belonged. Its scientific history began in the latter part of the 18th century with Franz Mesmer (*q.v.*), a Viennese physician who used it in the treatment of patients. Because of his mistaken belief that it was an occult force, which he termed "animal magnetism," that flowed through the hypnotist into the subject, he was soon discredited; but hypnotism—or mesmerism, as it was named after him—continued to interest medical practitioners. A number of clinicians made use of it without adequate recognition of its nature until the middle of the 19th century, when the English physician James Braid (*q.v.*) studied its phenomena and coined the terms hypnotism and hypnosis.

Hypnosis attracted widespread scientific interest in the 1880s. Ambroise-Auguste Liébeault, an obscure French country physician who used mesmeric techniques, drew the support of Hippolyte Bernheim, professor of medicine at Strasbourg. Independently they wrote that hypnosis involved no physical forces and no physiological processes but was a combination of psychologically mediated responses to suggestions. At about the same time, the Austrian physician Sigmund Freud visited France and was impressed by the therapeutic potential of hypnosis for neurotic disorders. On his return to Vienna he used hypnosis to help neurotics recall disturbing events that they had apparently forgotten. As he began to develop his system of psychoanalysis, theoretical considerations, as well as the difficulty he encountered in hypnotizing some patients, led Freud to discard hypnosis in favour of free association. (Generally psychoanalysts have now come to view hypnosis as merely an adjunct to the free-associative techniques used in psychoanalytic practice.)

Despite Freud's influential adoption and then rejection of hypnosis, some use was made of the technique in the psychoanalytic treatment of soldiers with combat neuroses during World Wars I and II. Hypnosis subsequently acquired various other limited uses in medicine. Various researchers have put forth differing theories of what hypnosis is and how it could be understood, but there is currently still no generally accepted explanatory theory for the phenomenon.

The techniques used to induce hypnosis share common features. The most important consideration is that the person to be hypnotized (the subject) be willing and cooperative and that he trust in the hypnotist. The subject is invited to relax in comfort and to fix his gaze on some object. The hypnotist continues to suggest, usually in a low, quiet voice, that the subject's relaxation will increase and that his eyes will grow tired. Soon the subject's eyes do show signs of fatigue, and the hypnotist suggests that they will close. The subject allows his eyes to close and then begins to show signs of profound relaxation, such as limpness and deep breathing. He has entered the state of hypnotic trance. A person's responsiveness to being hypnotized is greatest when he believes that he can be hypnotized, that the hypnotist is competent and trustworthy, and that the undertaking is safe, appropriate, and congruent with his wishes. Therefore induction is generally preceded by the establishment of suitable rapport between subject and hypnotist.

Ordinary inductions of hypnosis begin with simple suggestions made by the hypnotist that will almost inevitably be accepted by all subjects. At this stage neither subject nor hypnotist can readily tell whether the subject's behaviour constitutes a hypnotic response or mere cooperation. Then, gradually, suggestions are given that demand increasing distortion of perception or memory (*e.g.,* that it is difficult or impossible for the subject to open his eyes). Other methods of induction may be used. The process may take considerable time or only a few seconds.

The resulting hypnotic phenomena differ from one subject to another and from one trance to another, depending upon the purposes to be served and the depth of the trance. Hypnosis is a phenomenon of degrees, ranging from light to profound trance states but with no fixed constancy. Ordinarily, however, all trance behaviour is characterized by a simplicity, a directness, and a literalness of understanding, action, and emotional response that are suggestive of childhood. The surprising abilities displayed by some hypnotized persons seems to derive partly from the restriction of their attention to the task or situation at hand and their consequent freedom from the ordinary conscious tendency to orient constantly to distracting, even irrelevant, events.

Suggestibility, a state of greatly enhanced receptiveness and responsiveness to suggestions and stimuli presented by the hypnotist, constitutes the central phenomenon of hypnosis. Appropriate suggestions by the hypnotist can induce a remarkably wide range of psychological, sensory, and motor responses from persons who are deeply hypnotized. By acceptance of and response to suggestions, the subject can become deaf, blind, paralyzed, hallucinated, delusional, amnesic, or impervious to pain or to uncomfortable body postures, or he can display various behavioral responses that he regards as reasonable or desirable in the given situation that has been suggested to him by the hypnotist.

One fascinating manifestation that can be elicited from a subject who has been in a hypnotic trance is that of posthypnotic suggestion and behaviour. By this is meant the subject's execution, at some later time, of instructions and suggestions that were given to him while he was in a trance. With adequate amnesia induced during the trance state, the individual will not be aware of the source of his impulse to perform the instructed act. Posthypnotic suggestion, however, is not a particularly powerful means for controlling behaviour when compared to a person's conscious willingness to perform actions.

Many subjects seem unable to recall what happened while they were in deep hypnosis. This posthypnotic amnesia, as it is called, can either result spontaneously from deep hypnosis or it can result from suggestion by the hypnotist during the trance state. The amnesia may include all the events of the trance state or only selected items, or it may be manifested in connection with matters unrelated to the trance. Posthypnotic amnesia may be successfully removed by appropriate hypnotic suggestions.

Conversely, hypermnesia, a memory capacity that transcends the everyday ability, is another aspect of hypnotic behaviour. For example, in the trance state, the subject, by virtue of an uncritical willingness to make the effort and a freedom from inhibitions deriving from preformed judgments, can vividly remember long-forgotten, even deeply repressed experiences, recount them in extensive detail and still maintain an amnesia for them at the ordinary level of consciousness. This remarkable ability permits the recovery of memories that are otherwise unavailable to conscious awareness, and it was thus of great usefulness to Freud as he embarked on his explorations of his patients' unconsciously held memories.

Hypnosis has been officially endorsed as a therapeutic method by medical, psychiatric, dental, and psychological associations throughout the world. It has been found most useful in preparing people for anesthesia, enhancing the drug response, and reducing the required dosage. In childbirth it is particularly helpful, because it is effective in alleviating the mother's discomfort while avoiding drug-induced impairment of the child's physiological function. Hypnosis is highly regarded in the management of otherwise intractable pain, including that of terminal cancer. It is valuable in reducing the widespread fear of dental procedures; the very people whom dentists find most difficult to treat frequently respond best to hypnotic suggestion. In the area of psychosomatic medicine, hypnosis has been used in a variety of ways. Patients have been trained to relax and to carry out, in the absence of the hypnotist, exercises that have had salutary effects on some forms of high blood pressure, headaches, and functional disorders. In psychotherapy, hypnosis has been used in a variety of ways. For example, the technique of revivifying traumatic events in order to produce an emotional catharsis continues to be a useful treatment in relieving neuroses with traumatic onset, such as those that develop in combat, among individuals with relatively stable prior adjustments.

Though the induction of hypnosis requires little training and no particular skill, when used in the context of medical treatment, it should never be employed by individuals who do not have the competence and skill to treat such problems without the use of hypnosis. Hypnosis has been repeatedly condemned by various medical associations when it is used purely for purposes of public entertainment, owing to the danger of persons suffering adverse posthypnotic reactions to the procedure. Indeed, in this regard, several nations have banned or limited commercial or other public displays of hypnosis on such grounds.

(M.T.O./A.G.H./Ed.)

hypocaust, in building construction, open space below a floor that is heated by gases from a fire or furnace below and that allows the passage of hot air to heat the room above. This type of heating was developed by the Romans, who used it not only in the warm and hot rooms of the baths but also almost universally in private houses in the northern provinces.

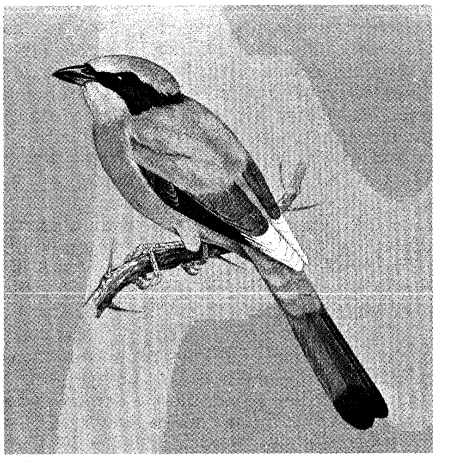
Many examples of such hypocausts exist in villa and house foundations in Roman centres in Germany and England. The usual custom was to lead the hot air from a hypocaust into a single vertical flue in the wall of the room to be heated, through which the hot air and smoke escaped into the open air. Where greater warmth was desired, several flues would lead up from the hypocaust in the side walls of the room; at times these wall flues consisted of hollow, oblong tiles, set close together, entirely around the room.

The usual construction of a basement hypocaust consisted of a layer of tiles laid continuously in a bed of concrete for the bottom surface. Piers approximately 8 inches (20 cm) square and about 2 feet apart were used as the supports for the hypocaust's internal space. The floor above was made of concrete or of large square tiles supporting a bed of concrete, on which the finished floor of marble or mosaic tessera was laid.

hypochondriasis, mental disorder characterized by an excessive preoccupation with one's own health and a tendency to fear or believe that one has a serious disease based on the presence of insignificant physical signs or symptoms. The hypochondriac may become convinced that he is ill even though such physical signs are completely absent, or he may exaggerate the medical significance of minor aches and pains, becoming morbidly and obsessively preoccupied with the thought of a life-threatening illness. His fears usually persist even after a thorough examination by a physician has established that no physical abnormality exists, and the doctor's reassurances have only a slight or temporary effect on such a person's apprehensions. The typical hypochondriac does not become delusional about his health, however; *i.e.,* he remains able to consider or admit the possibility that his fears are unfounded. Despite this, many hypochondriacs will go from doctor to doctor in their effort to enlist medical resources to deal with the imagined illness.

A hypochondriac's concern may focus on a supposed disease or diseases of the heart, gastrointestinal tract, or genital structures. The person may become fixated on one imagined disorder, or he may fasten on different ones as time goes by according to his own readings of medical literature, current public health concerns and fads, and so on. Hypochondriasis may exist by itself or it may be a secondary syndrome that occurs along with another mental disorder. Hypochondriasis usually firsts manifests itself in young adulthood and is equally common among males and females. In some cases it seems to represent a psychological coping mechanism that the person resorts to in order to deal with stressful life situations. Psychotherapy can be helpful in determining an underlying emotional cause, and behaviour therapy may also be helpful.

hypocoly (*Hypocolius ampelinus*), Middle Eastern songbird believed by some authorities to be related to the waxwing (family Bombycillidae) but often separated as the sole member of the family Hypocoliidae (order Passeriformes). The hypocoly is a slim grayish bird, about 18 cm (7 inches) long, with a black mask and a slight crest. The wings are black, tipped with white. The beak is short, thick, and fairly broad, the tail moderately



Hypocoly (*Hypocolius ampelinus*)
Painting by Richard Keane

long. The plumage, like that of the waxwings, is smooth, giving the bird a clean appearance. The hypocoly inhabits open semiarid or cultivated country in Iraq and neighbouring regions and during the nonbreeding season wanders widely, reaching India, southern Afghanistan, and probably Africa.

Hypodorian mode, in music, second of the eight medieval church modes. *See* church mode.

hypoglycemia, reduction of the concentration of glucose in the blood serum below normal levels, commonly occurring as a complication of treatment for diabetes mellitus. Even brief falls in serum glucose levels can produce severe brain dysfunction. In healthy individuals, an intricate glucoregulatory system acts rapidly to counter hypoglycemia by reducing insulin production (insulin is important in the mechanism that removes glucose from the bloodstream) and mobilizing energy reserves from the fat and liver. When this regulatory system does not operate, as in insulin-dependent diabetics, disproportionately large amounts of insulin in the blood result in sudden drastic falls in circulating glucose.

Fasting hypoglycemia can be a life-threatening problem; it occurs most often in diabetic patients who have accidentally overdosed on insulin by mistiming their therapy, missing meals, or exercising without compensating for increased glucose use. The condition also occurs in otherwise healthy individuals with insulin-producing tumours or as a late complication of starvation or other metabolic disorders. The symptoms of hypoglycemia result from energy starvation in the central nervous system and include mental impairment, confusion, lethargy, and seizures; in severe cases, hypoglycemia causes coma and death. Diagnosis is based on the concurrence of these neurological symptoms, low levels of circulating glucose, and the alleviation of the patient's symptoms upon the rapid oral or intravenous administration of glucose, which is the usual treatment for the condition.

Hypolydian mode, in music, sixth of the eight medieval church modes. *See* church mode.

Hypomixolydian mode, in music, last of the eight medieval church modes. *See* church mode.

hypoparathyroidism, inadequate secretion of parathyroid hormone, usually caused by accidental surgical removal of large amounts of parathyroid tissue (during thyroid surgery) or, less frequently, by defective action of the parathyroid gland. This deficiency results in low calcium and high phosphorus levels in the blood, often causing tetany (increased nervous and muscular excitability, leading to spasms).

hypophosphatemia, reduction in the concentration of phosphate in the blood serum, thus disrupting the body's energy metabolism and impairing the delivery of oxygen through the bloodstream to the tissues. Hypophosphatemia usually occurs in conjunction with other metabolic disturbances that affect the normal equilibrium between the blood circulation, the intestinal absorption of nutrients, the loss of phosphate through the kidneys, and the storage of phosphate in the bones and red blood cells. Defects in any one of these areas or, more often, in a combination of areas will reduce phosphate levels in the blood. Acute hypophosphatemia causes such neurological symptoms as weakness, tingling, depressed reflexes, tremors, and confusion. Chronic hypophosphatemia, in which a prolonged deficiency depletes the body's normal phosphate stores, causes generalized debility, weakness, and anorexia. Treatment in either case involves correction of the underlying metabolic disturbance and phosphate supplements to replenish the body's stores of that nutrient.

Familial hypophosphatemia is a sex-linked inherited disorder that is a principal cause of rickets (*q.v.*) in the developed nations. Familial hypophosphatemia is caused by a metabolic defect that leads to the loss of phosphate through the kidneys. The resulting low concentration of phosphate in the blood results in the reduced deposition in the bones of calcium phosphate, which is the substance responsible for the rigidity of bone. The result, in children, is the curved and stunted bones that are the chief symptoms of rickets.

Hypophrygian mode, in music, fourth of the eight medieval church modes. *See* church mode.

hypophysis (anatomy): *see* pituitary gland.

hypopituitarism, deficiency of pituitary secretions, caused by various forms of injury to or damage of the pituitary gland. Removal of the entire gland or deficiency of all pituitary secretions produces the condition known as panhypopituitarism, which is sometimes manifested as Simmonds' disease (*q.v.*).

hyposensitization (medicine): *see* desensitization.

hypostyle hall, in architecture, interior space whose roof rests on pillars or columns. The word means literally "under pillars," and the design allows for the construction of large spaces—as in temples, palaces, or public buildings—without the need for arches. It was used extensively in ancient Egypt—where the Temple of Amon at Karnak provides a good example—and in Persia—the ruins at Persepolis give evidence of outstanding examples of hypostyle construction.

Although the multiple, usually large, pillars naturally consumed much of the floor space of such halls, this drawback was turned to advantage when the columns were carved in heroic or religious motifs. The design has rarely been used in more recent architecture because of more effective means of roof support.

hyposulfite of soda, most important salt of thiosulfuric acid, an unstable compound of sulfur (*q.v.*).

hypotension, also called LOW BLOOD PRESSURE, condition in which the blood pressure is abnormally low, either because of reduced blood volume or because of increased blood-vessel capacity. Though not in itself an indication of ill health, it often accompanies disease conditions.

Extensive bleeding is an obvious cause of reduced blood volume that leads to hypotension. There are other possible causes. A person who has suffered an extensive burn loses blood plasma—the blood minus the red and white blood cells and the platelets. The blood volume is reduced in a number of conditions involving loss of salt and water from the tissues—as in excessive sweating and diarrhea—and its replacement with water from the blood. Loss of water from the blood to the tissues may also result from exposure to cold. Finally, a person who remains standing for as long as one-half hour may temporarily lose as much as 15 percent of the blood water into the tissues of the legs.

Orthostatic hypotension—low blood pressure upon standing up—seems to spring from a failure in the autonomic nervous system. Normally, when a person stands up, there is a reflex constriction of the small arteries and veins to offset the effects of gravity. Hypotension from an increase in the capacity of the blood vessels is a factor in fainting and in other forms of syncope (*q.v.*). Hypotension is also a factor in poliomyelitis, in shock, and in poisoning with a depressive drug, such as a barbiturate.

Consult the INDEX *first*

hypothalamus, region of the brain lying below the thalamus and making up the floor of the third cerebral ventricle. The hypothalamus contains a control centre for many functions of the autonomic nervous system, and it has important links with the endocrine system because of its complex interaction with the pituitary gland that lies beneath it.

The hypothalamus and pituitary gland are connected by both nervous and chemical pathways. Nerve tracts from the hypothalamus stimulate the posterior pituitary's release of oxytocin and vasopressin; these are hormones that cause smooth-muscle contractions in the circulatory and reproductive systems. Hormones secreted from the hypothalamus into a portal vein leading to the anterior pituitary trigger that gland's release of growth hormone, adrenocorticotropic hormone, luteinizing hormone, and other major pituitary products.

In addition to its effects on the endocrine system, the hypothalamus also influences the body's caloric intake and weight regulation, establishing a stable "set point" for individual weight gain. The hypothalamus also regulates body heat in response to variations in external temperature, contains a centre that determines wakefulness and sleep, and regulates fluid intake and feelings of thirst.

Injuries or diseases affecting the hypothalamus usually produce symptoms of pituitary dysfunction or of diabetes insipidus; in the latter disorder, the absence of antidiuretic hormone (a hormone that promotes the reabsorption of water in the kidneys) produced by the hypothalamus induces the rapid loss of water from the body through frequent urination. Hypothalamic disease can also cause insomnia and unusual fluctuations in body temperature.

hypothec, in Roman law, a type of security for a debt in which the creditor had neither ownership nor possession. It arose in cases in which a renter needed the use of the things that he pledged as security for his continued payment of rent, usually tools or equipment necessary for working the land he was renting. Possession could be taken by the creditor only when the debt, or, in this case, the rent, was not paid.

Modern hypothecs are found in civil-law countries such as France and Germany. They are similar in concept to a mortgage, except that they do not grant title or possession to the creditor. Although applied exclusively in the past to immovables, they may now apply in certain cases to movables. Hypothecs involve real rights but do not include ownership. The creditor may, in last resort, seize the property, regardless of who is holding it; further, he may sell under the authorization of the court. These rights become operative upon nonpayment of the debt.

In France there are three types of hypothecs: contractual, judicial, and legal. Contractual hypothecs are those made between individuals, and they must be notarized before witnesses. It is necessary to state the amount to be secured in the document. Judicial hypothecs are instituted by the court against all the property, present and future, of a debtor. Legal hypothecs are rights given to married women over the property of their husbands, and to children and incapacitated individuals over the property of their guardians. This is to protect them against any mismanagement by the husband or guardian of their own or common property.

hypothermia, abnormally low body temperature in a warm-blooded creature, associated with a general slowing of physiologic activity. Hibernating animals allow their body temperatures to fall to levels only slightly above ambient temperature, in a unique kind of hypothermia from which they can recover rapidly when necessary; similar temperatures would be fatal to nonhibernators.

In human beings, hypothermia may be artificially induced to decrease the metabolic need for oxygen during certain surgical procedures and for the control of some kinds of cancer. The lowering of body temperature in these cases is usually accomplished through the use of ice baths. Similarly induced hypothermia is employed to inhibit metabolic process in organs removed for transplantation, thus prolonging their viability.

Accidental hypothermia may be life-threatening and constitutes a medical emergency. Low environmental temperature alone may be sufficient to cause hypothermia, as from submersion in icy water or overexposure in heavy winter snows. In cases of hypothermia due to exposure, there is often an underlying condition—such as cerebrovascular disease, hypothyroidism, severe infection, or alcohol or drug intoxication—that predisposes to the drop in body temperature. Hypothermia is serious at body temperatures below 35°C (95° F); below 32.2° C (90° F), the point at which the normal shivering reaction ceases, the condition warrants emergency treatment. Because of the physiologic slowing, pulse, respiration, and blood pressure are depressed; in some cases the victim of hypothermia appears to be dead, although revival may still be possible with appropriate treatment.

Accidental hypothermia is treated by a slow, gradual rewarming of the victim, using blankets and other passive means rather than direct application of heat. The increase in body temperature must not exceed one or two degrees F per hour, as more rapid rewarming can cause the cardiovascular system to collapse.

hypothetico-deductive method, procedure for the construction of a scientific theory that will account for results obtained through direct observation and experimentation and that will, through inference, predict further effects that can then be verified or disproved by empirical evidence derived from other experiments.

Developed by Sir Isaac Newton during the late 17th century (but named at a later date by philosophers of science), the hypothetico-deductive method assumes that properly formed theories arise as generalizations from observable data that they are intended to explain. These hypotheses, however, cannot be conclusively established until the consequences that logically follow from them are verified through additional observations and experiments. In conformity with Descartes' rationalism, the hypothetico-deductive method treats theory as a deductive system in which particular empirical phenomena are explained by relating them back to general principles and definitions. The method, however, abandons the Cartesian claim that those principles and definitions are self-evident and valid; it assumes that their validity is determined only by the exact light their consequences throw on previously unexplained phenomena or on actual scientific problems.

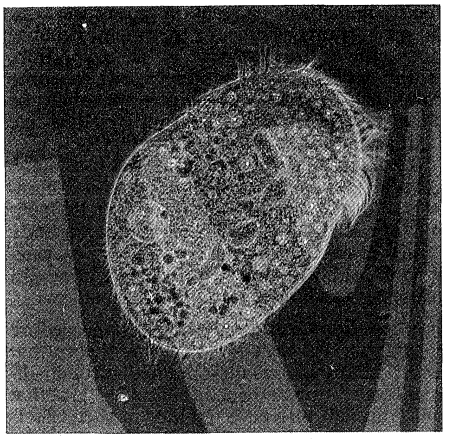
hypothyroidism, a deficiency in available thyroid hormone secreted by the thyroid gland.

A brief treatment of hypothyroidism follows. For full treatment, *see* MACROPAEDIA: Endocrine Systems.

Hypothyroidism may be caused by any of a number of factors, including inadequate iodine intake (iodine being a key constituent of thyroid hormone); a defect in the synthesis of thyroid hormone; excessive intake of agents that block iodine metabolism (*e.g.*, cobalt, resorcinol, cyanate); inborn errors of metabolism; inadequate secretion of thyroid stimulating hormone from the anterior pituitary; and thyroid antibodies (autoimmunity). If the thyroid gland grows abnormally large, in an attempt to compensate for iodine lack, the condition is termed endemic, or colloid, goitre. If the gland underfunctions from birth or infancy and there is no compensatory treatment, the result is cretinism, or juvenile myxedema; if the inadequacy occurs later in life the condition is myxedema. Hypothyroidism is treated by replacement therapy using synthetic or natural thyroid hormones. *See* cretinism; myxedema.

hypotrich, any dorsoventrally flattened, oval protozoan of the ciliate order Hypotrichida, very widely distributed in both fresh and salt

water. Instead of simple cilia (hairlike processes), the hypotrichs have groups of fused cilia (cirri) arranged on the ventral surface and used for crawling. The dorsal surface is often equipped with rows of short, presumably tactile, bristles. Hypotrichs reproduce by sexual conjugation (nuclear exchange) and by asexual binary division. In many cases they encyst. Representative genera are the ellipsoid



Hypotrich (*Onychodromus grandis*)
Walter Dawn

Oxytricha, the freshwater *Gonostomum,* the sometimes violet or rose-coloured *Uroleptus,* and best known of all, *Euplotes.*

hypoxia, condition of the body in which the tissues are starved of oxygen. In its extreme form, where oxygen is entirely absent, the condition is called anoxia. There are four types of hypoxia: (1) the hypoxemic type, in which the oxygen pressure in the blood going to the tissues is too low to saturate the hemoglobin; (2) the anemic type, in which the amount of functional hemoglobin is too small, and hence the capacity of the blood to carry oxygen is too low; (3) the stagnant type, in which the blood is or may be normal but the flow of blood to the tissues is reduced; and (4) the histotoxic type, in which the tissue cells are poisoned and are therefore unable to make proper use of oxygen. Diseases of the blood, the heart and circulation, and the lungs may all produce some form of hypoxia.

The hypoxemic type is encountered in pilots, mountain climbers, and people living at high altitudes, where the reduced barometric pressure results in a decrease in the amount of breathable oxygen (*see* altitude sickness).

In the case of anemic hypoxia either the total amount of hemoglobin is too small to supply the body's oxygen needs, as in anemia or after severe bleeding, or hemoglobin that is present is rendered nonfunctional. Examples of the later case are carbon monoxide poisoning and metho-globinuria, in both of which the hemoglobin is so altered by toxic agents that it becomes unavailable for oxygen transport, and thus of no respiratory value.

Stagnant hypoxia, in which blood flow through the capillaries is insufficient to supply the tissues, may be general or local. If general, it may result from heart disease that impairs the circulation, impairment of veinous return of blood, or trauma that induces shock. Local stagnant hypoxia may be due to any condition that reduces or prevents the circulation of the blood in any area of the body. Examples include Raynaud's disease and Buerger's disease, which restrict circulation in the extremities; the application of a tourniquet to control bleeding; ergot poisoning; and exposure to cold.

In histotoxic hypoxia the cells of the body are unable to use the oxygen, although the amount in the blood may be normal and under normal tension. Although characteristically produced by cyanide, any agent that decreases cellular respiration may cause it. Some of these agents are narcotics, alcohol, formaldehyde, acetone, and certain anesthetic agents.

Hypsipyle, in Greek legend, daughter of Dionysus' son Thoas, king of the island of Lemnos. She later became queen of the island and bore two sons to the Argonaut Jason, who was her lover. Not long afterward, pirates sold her to Lycurgus, king of Nemea, whose son Opheltes she nursed. The infant was killed by a poisonous snake while she was aiding the expedition of the Seven Against Thebes. Her sons, sent by Dionysus, rescued her from the ensuing danger, and the Nemean games were instituted in memory of the dead child.

Euripides' tragedy *Hypsipyle,* of which a fragment survives, was based on this legend.

Hypsithermal Climatic Interval, segment of the Holocene Epoch (the Holocene began about 10,000 years ago and continues to the present), dated on the basis of pollen studies. The Hypsithermal Climatic Interval began about 9,000 years ago and ended about 2,500 years ago. It has been divided into smaller units beginning with the Boreal. The Hypsithermal follows the Pre-Boreal and precedes the Sub-Atlantic intervals.

The Hypsithermal Climatic Interval was a period of comparatively warm climatic conditions. The warming trend of the Hypsithermal resulted in the elimination of many plant and animal refuges that were adjusted to cooler climate, and it has been tied to the extinction of some species. Before, after, and within the Hypsithermal, minor glacial readvances occurred; and these were sometimes of great regional significance, affecting plants, animals, and man. Mesolithic and Neolithic cultures are contemporaneous with Hypsithermal events in both the New and Old Worlds. In many parts of the world pine forests gave way to forests dominated by oak during the Hypsithermal.

hypsometric curve, also called HYPSOGRAPHIC CURVE, cumulative height frequency curve for the Earth's surface or some part thereof. A hypsometric curve is essentially a graph that shows the proportion of land area that exists at various elevations by plotting relative area against relative height. In the hypsometric curve of the total Earth surface there exist two maxima of frequencies—that at the 100-metre (109-yard) and the 4,700-m elevations, which correlate with the mean level of the lowland continental areas and the deep-sea floor. This aspect of the Earth's surface, revealed by hypsometric analysis, supports the theory of a crust consisting of simatic (peridotitic, specific gravity about 3.3) materials under the oceans and sialic (granitic to gabbroic, specific gravity about 2.7) materials of the continents.

hyrax, also called DASSIE, any of the small hoofed mammals of the order Hyracoidea. Both hyraxes and the unrelated pikas (order Lagomorpha) are also sometimes called rock rabbits; the term is misleading for hyraxes, which are neither rabbits nor exclusively rock dwellers. The term cony (coney) in the Bible actually refers not to the true cony (also a lagomorph) but to the hyrax.

Hyraxes, native to Africa and extreme southwestern Asia, are rodent-like animals with plump heads; short necks, ears, and tails; short, slender legs; and squat bodies. Anatomically, they are characterized by small hoofs on the first and third digits of the hind foot (the middle digit is clawed); a scent gland on the back; a pair of curved, continuously growing upper incisors; four chisel-like lower incisors; and rhinoceros-like molars. The rock



Rock hyrax (*Heterohyrax*)
Leonard Lee Rue III

hyraxes (*Heterohyrax*) and rock dassies, or conies (*Procavia*), are terrestrial animals that live in groups among rocks and are active by day. The tree, or bush, hyraxes (*Dendrohyrax*) are arboreal, solitary, and nocturnal.

Hyraxes are primarily vegetarian. As adults they are about 30 to 50 centimetres (12 to 20 inches) long and weigh about 4 to 5 kilograms (8 to 11 pounds). They are agile and climb well with the aid of special pads on their feet. One to three fully furred young are born after a gestation period of about seven or eight months. Natural enemies of hyraxes are pythons, eagles, and large cats.

Phylogenetic relationships of hyraxes are not clear. The fundamental characters indicate that the group may be an ancient and unprogressive offshoot derived from the ungulate (hoofed mammal) stem. Fossils are known from the mid-Oligocene (about 30,000,000 years ago); most of these early hyraxes were large, the largest perhaps as big as a modern horse.

Hyrcania, Old Persian VARKANA (Wolf's Land), ancient region located southeast of the Caspian Sea. Its capital was Zadracarta (Astrabad, modern Gorgān), and it formed part of the Median, Achaemenian, Seleucid, and Parthian empires, either as an independent province or joined with Parthia. In the list of Persian satrapies given by the Greek historian Herodotus, the Paricanians may have been the Hyrcanians.

Hyrcania was also the name of a town in Lydia, said by the Greek geographer Strabo to have derived its title from a colony of Hyrcanians settled there by the Persians.

Hyrcanus: *see* John Hyrcanus I; John Hyrcanus II.

Hyre, Laurent de La (French painter): *see* La Hire, Laurent de.

hyssop (*Hyssopus officinalis*), garden herb of the mint family (Lamiaceae, or Labiatae)



Hyssop (*Hyssopus officinalis*)
Walter Dawn

whose flowers and evergreen leaves have long been used as a flavouring for foods and beverages and as a folk medicine. The plant has a sweet scent and a warm, bitter taste. A strong tea made of the leaves and sweetened with honey is a traditional remedy for nose, throat, and lung afflictions and is sometimes applied externally to bruises. In the Middle Ages hyssop was a stewing herb; its modern uses are for flavouring meats, fish, vegetables, salads, sweets, and such liqueurs as absinthe. Honey made from hyssop pollen is considered especially fine. The leaves contain oil of hyssop, a volatile oil used by perfumers.

Hyssop is a small perennial plant about 1.5 feet (0.5 metre) high with slim, woody quadrangular stems and narrow, elliptical, dotted leaves, about 0.8 to 1.2 inches (2 to 3 centimetres) long and less than 0.4 in. wide, that grow in pairs on the stem. Long, leafy, half-whorled spikes of little flowers (coloured violet-blue, pink, red, or white) blossom from June to September. A native of the area ranging from southern Europe eastward to Central Asia, hyssop has become naturalized in North America.

The hedge hyssop comprises herbs of the genus *Gratiola,* belonging to the Scrophulariaceae family, that are native to marshy lands throughout Eurasia and North America. *Gratiola officinalis,* of Europe, has cylindrical stems and leaves twice the size of those of true hyssop. Its flowers are solitary and located in the axils of the leaves. The herb is almost odourless but has a bitter, nauseous taste. Small quantities taken internally act as a purgative, diuretic, and emetic. In Switzerland it grows abundantly in damp pastures and is dangerous to cattle.

Ezov, the hyssop of the Bible, a wall-growing plant used in ritual cleansing of lepers, is not *Hyssopus officinalis,* which is alien to Palestine; it may have been a species of caper or savory.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

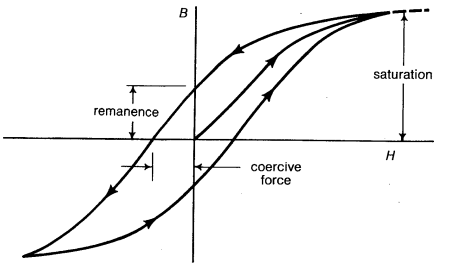
Hystaspes (Greek), Old Persian VISHTASPA (fl. 7th and 6th centuries BC), protector and follower of the Iranian prophet Zoroaster. Hystaspes (called Gushtasp in later Persian tradition) was a local ruler (*kavi*) in a country called in the Avesta (the Zoroastrian Bible) Aryana Vaejah, which may have been a Greater Chorasmian state abolished by the Achaemenid king Cyrus II the Great in the mid-6th century BC.

Hystaspes, Old Persian VISHTASPA (fl. late 6th century BC), son of Arsames, king of Parsa, and father of the Achaemenid king Darius I.

According to the 5th-century-BC Greek historian Herodotus, Hystaspes was governor of Persis under Cyrus II the Great and Cambyses II and accompanied Cyrus on his last campaign against the Massagetai in 530 BC. When Darius seized the throne in 522, Hystaspes was governor of Parthia and Hyrcania, where he suppressed a revolt in 521. Some authorities identify him with Hystaspes, the protector of the prophet Zoroaster.

hysterectomy, surgical removal of the complete uterus (total hysterectomy) or of the complete uterus except for the cervix (subtotal hysterectomy). The cervix is the outermost portion of the uterus, which projects into the vagina. Removal of the uterus is indicated in a number of abnormal situations, including the presence of a cancer or of a benign tumour of the type called myoma, or fibroid tumour, if the myoma is large or rapidly growing, causes excessive bleeding or discomfort, or seems to be breaking down. Hysterectomy may also be performed after cesarean section—delivery of an infant through the abdominal wall—if there are such complications as uncontrolled bleeding, gross infection, or cancer of the cervix.

hysteresis, lagging of the magnetization of a ferromagnetic material, such as iron, behind variations of the magnetizing field. When ferromagnetic materials are placed within a coil of wire carrying an electric current, the magnetizing field, or magnetic field strength *H,* caused by the current forces some or all of the atomic magnets in the material to align with the field. The net effect of this alignment is to increase the total magnetic field, or magnetic flux density *B.* The aligning process does not occur simultaneously or in step with the magnetizing field but lags behind it.



Magnetic hysteresis loop

From R.T. Weidner and R.L. Sells, *Elementary Classical Physics* (1965); Allyn and Bacon Publishing Company

If the intensity of the magnetizing field is gradually increased, the magnetic flux density *B* rises to a maximum, or saturation, value at which all of the atomic magnets are aligned in the same direction. When the magnetizing field is diminished, the magnetic flux density decreases, again lagging behind the change in field strength *H.* In fact, when *H* has decreased to zero, *B* still has a positive value called the remanence, residual induction, or retentivity, which has a high value for permanent magnets. *B* itself does not become zero until *H* has reached a negative value. The value of *H* for which *B* is zero is called the coercive force. A further increase in *H* (in the negative direction) causes the flux density to reverse and finally to reach saturation again, when all the atomic magnets are completely aligned in the opposite direction. The cycle may be continued so that the graph of the flux density lagging behind the field strength appears as a complete loop, known as a hysteresis loop. The energy lost as heat, which is known as the hysteresis loss, in reversing the magnetization of the material is proportional to the area of the hysteresis loop. Therefore, cores of transformers are made of materials with narrow hysteresis loops so that little energy will be wasted in the form of heat. *See also* magnetic field; magnetic flux.

hysteria, a type of psychiatric disorder in which a wide variety of sensory, motor, or psychic disturbances may occur. It is traditionally classified as one of the psychoneuroses and is not dependent upon any known organic or structural pathology. The term is derived from the Greek *hystera,* meaning "uterus," and reflects the ancient notion that hysteria was a specifically female disorder resulting from disturbances in uterine functions. Actually, hysterical symptoms may develop in either sex and may occur in children and elderly people, although they are observed most commonly in early adult life.

Hysteria, in its clinically pure form, seems to occur more often among the psychologically naive than among sophisticated persons. Hysterias tend to be more common among persons in the lower ranges of intelligence than among those in the higher ranges. The incidence of hysteria appears to have been diminishing over the years in many areas of the world, probably because of cultural factors such as increasing psychological sophistication, diminishing sexual prudery and inhibition, and a less authoritarian family structure. Cases of classical hysteria, such as those frequently described by 19th-century clinicians, have become rare. Most psychoneuroses encountered in actual clinical practice are apt to be "mixed" forms in which hysterical symptoms may be found interspersed with other varieties of neurotic disturbances. Isolated hysterical symptoms may also occur in conjunction with psychotic disorders.

The sensory and motor manifestations of hysteria take many forms and are designated conversion reactions because the underlying anxiety is assumed to have been "converted" into a physical symptom. Sensory disturbances may range from paresthesias ("peculiar" sensations) through hyperesthesias (hypersensitivity) to complete anesthesias (loss of sensation). They may involve the total skin area or any fraction of it, but the disturbances generally do not follow any anatomic distribution of the nervous system. In medieval times and as late as the end of the 17th century, the finding of such discrete areas of anesthesia on the body of a person was considered proof that the person was a witch. Other hysterical sensory disturbances may encompass the special senses of vision, hearing, taste, or smell; or they may involve the experiencing of severe pain for which no organic cause can be determined.

Motor symptoms vary from complete paralysis to tremors, tics, contractures, or convulsions (hystero-epilepsy). In each instance neurological examination of the affected part of the body reveals an intact neuromuscular apparatus with normal reflexes and normal electrical activity and responses to electrical stimulation. Other motor disturbances that are at times hysterical in origin are loss of speech (aphonia), coughing, nausea, vomiting, or hiccupping.

Psychic symptoms may be equally varied and are usually classified under the broad heading of dissociative reactions. Attacks of amnesia, in which the person is unable to remember who he is or anything about himself, are among the more striking of these. Sleepwalking (somnambulism) is also considered to be a hysterical dissociative reaction, as are also the occasional dramatic cases of multiple personality.

hystero-epilepsy, hysterical seizures that resemble epilepsy and, in diagnosis, must be distinguished from it. In hystero-epilepsy the reflexes and responses to stimulation in the part of the body affected are normal, and the electroencephalogram shows no significant abnormality in the brain waves. Usually the person affected can be roused by painful stimuli and is never completely unconscious. The convulsion usually takes place when others are present, and, in contrast to epileptic episodes, the person affected rarely injures himself or is incontinent. *See also* epilepsy.

Hythe, parish (town), Shepway district, county of Kent, England, on the English Channel coast at the eastern end of Romney Marsh and on the Royal Military Canal, which was built as a defensive moat when Napoleon threatened invasion of Britain. The old town lies on the hillside inland from the canal, and the modern town, a seaside resort, lies between the canal and the coast. When the mouth of the River Rother was blocked and diverted eastward by shingle, the medieval port of Hythe replaced the Roman Portus Lemanis, where Lympne and West Hythe now stand, 2 mi (3 km) west of Hythe. Lympne Church has a Norman tower with Roman material in its walls. Hythe (Landing Place) was

a port already in Saxon times, and its royal charter of 1205 confirmed earlier privileges. The port flourished for a time as one of the original Cinque Ports (*q.v.*), but it declined as the shingle drift encroached further. The town also suffered from French raids. Pop. (1981 prelim.) 12,723.

Hyundai Group, major diversified corporation in South Korea. The international company supplies a product line that ranges from ships to stereo equipment. Headquarters are in Seoul.

Hyundai began as a construction firm founded by Chung Ju Yung in 1947. The company operated within South Korea until 1965, when it initiated a road building project in Thailand that marked the beginning of its growth into a multinational conglomerate.

In the firm's first move outside the construction field, Hyundai in 1967 formed Hyundai Motor Company, which grew to become the country's largest producer of automobiles. It exports cars and trucks throughout the Far East. The company moved into the shipbuilding market in 1973 with the formation of Hyundai Heavy Industries, which produces a variety of vessels, ranging from custom yachts to supertankers. The Hyundai Group also includes divisions that build and export diesel and electric locomotives, freight cars, and passenger coaches for the railroad industry, and offshore drilling and extraction equipment to the oil industry.

International exports range from heavy industrial equipment to consumer products, and include cement, pianos, military uniforms, and consumer electronics products. Hyundai is represented on all continents but Australia, and has a number of international subsidiaries under its control.

Hyvinkää, Swedish HYVINGE, city, Uudenmaan *lääni* (Uusimaa province), southern Finland, north of Helsinki. It is the centre of Finland's woollen industry, and is an important rail junction with direct lines to the ports of Hangö (Hanko, the southernmost in Finland), Helsinki, and Porvoo (Borgå). The city also has railway workshops, a granite quarry, and a rubber-products plant. Because of its fine climate and timbered surroundings, Hyvinkää has become a winter resort and health spa popular among the inhabitants of Helsinki, 35 mi (55 km) south. Pop. (1983 est.) mun., 37,965.

Hywel AB OWAIN GWYNEDD (d. 1170), Welsh warrior-prince and lyric poet whose eight extant compositions include the only love poems found in the works of the early Welsh court poets. Also included among the eight are poems expressing love of country, perhaps the first such works in Welsh literature. The son of Owain Gwynedd, Hywel played a major part in the occupation of Ceredigion (Cardiganshire) by the house of Gwynedd (*c.* 1153). He probably died in battle against his half brothers near Pentraeth, Anglesey; he was buried at Bangor, Wales.

Hywell THE GOOD (Welsh king): *see* Howel Dda.

I Am movement, religious movement in the United States that taught that the Mighty I Am is the source of power and of all things necessary for everyone. It was begun in the 1930s by Guy Ballard (1878–1939), a mining engineer, and his wife, Edna (1886–1971). The name of the movement came from the Bible verse (Exodus 3:14) in which God replies to Moses, "I am who I am."

Although not consistent in their teachings, the Ballards essentially taught that the power of the Mighty I Am was available to individuals through many Ascended Masters, the principal ones being Jesus and St. Germain. The Ascended Masters spoke through their special representatives on earth, the Accredited Messengers, who were Edna and Guy Ballard and their son, Donald.

Guy Ballard's first meeting with St. Germain, reported to have taken place in 1930 at Mt. Shasta in northern California, was recounted in Ballard's book, *Unveiled Mysteries* (1934). St. Germain was said to have lived on earth and been reincarnated several times before reaching the desired state of an Ascended Master. He had been Samuel in the Old Testament, Francis Bacon of England, and, apparently, Comte de St. Germain, an 18th-century Frenchman who was involved in politics and interested in the occult. According to Ballard, St. Germain took him backward in time and revealed many of Ballard's previous lives (he had been George Washington) and those of his wife and son. Ballard was introduced to many mysteries, and it was revealed to him how the Ascended Masters would work through the Accredited Messengers on earth.

Unveiled Mysteries was sold extensively throughout the United States. In 1934 the Ballards began holding classes in Chicago in which messages were given through the Ballards from the Ascended Masters. The Ballards began travelling to other cities to conduct classes and meetings. In the early part of the movement their religious presentations and life-style were quite simple, but as the movement gained followers and financial success, more elaborate meetings were developed. During the most successful period, in 1938, the movement was estimated to have from 1,000,000 to 3,000,000 members, but no official statistics were available. It was true, however, that thousands of people filled the largest auditoriums in the large cities of the United States to see and hear the Ballards. Local organizations were formed to carry on the movement, and a monthly periodical, *The Voice of the I Am,* was published. Headquarters were in Chicago.

The Ballards were increasingly criticized by the press and were accused of fraud. In 1939 Guy Ballard announced that he had been instructed by St. Germain to suspend all public meetings. In the future, meetings and classes were to be open only to those accepted into the movement.

A major reversal occurred when Guy Ballard died on Dec. 29, 1939. Mrs. Ballard had his body cremated and on Jan. 1, 1940, announced in a class that Ballard had ascended and was now an Ascended Master. News of his death, however, led many followers to leave the movement, since the Ballards had taught that the ascension, the liberation forever from the physical body and from reincarnation, would come without the experience of physical death. Edna Ballard carried on as leader of the movement and often reported messages from her late husband.

Another crisis occurred in 1940 when Edna, Donald, and several other leaders in the movement were indicted for fraudulently obtaining money from believers by deceptive means. The trial, long and sensational, led to the conviction of Edna and Donald on several counts. After various appeals, the U.S. Supreme Court in 1946 set aside the indictment because of a technicality. The use of the mails, however, was denied to the Ballards. The vitality of the movement declined, but at the time of Mrs. Ballard's death in 1971 there were still some faithful followers.

I-ch'ang, Pinyin YICHANG, city in Hupeh Province (*sheng*), China. A county-level municipality (*shih*), it is the administrative centre of I-ch'ang Prefecture (*ti-ch'ü*), which includes several counties in the Yangtze River and Ch'ing Chiang (river) valleys below the Yangtze Gorges. I-ch'ang stands on the left bank of the Yangtze, immediately below the entrance to the gorges, and has a harbour formed by the small island of Hsia-pa. The level of the river, which has a violent current, varies enormously—sometimes by as much as 50 ft (15 m) between high and low water. Despite these drawbacks I-ch'ang has always been an important river port, much of the traffic from Szechwan Province being transshipped onto larger vessels there.

I-ch'ang is an ancient city, which underwent many changes of name, and was constantly disputed during periods when China was politically divided, being the key gateway to the rich province of Szechwan. Until the 17th century it was usually known either as I-ling Chün or as Shan Chou. It received the name I-ch'ang only under the Ch'ing dynasty (1644–1911). It was opened to foreign trade as a treaty port in 1877. A Western quarter then grew up alongside the ancient walled city, and its trade grew rapidly; many Western commercial firms established branches there.

In 1914 the first section of a railway from I-ch'ang to Ch'ung-ch'ing (Chungking) was laid as part of a projected line from Han-k'ou to Ch'ung-ch'ing, but the project was abandoned in the political chaos of the day, and the track was torn up in 1915. I-ch'ang is connected by a spur to a line that runs from Hsiang-fan to I-tu, about 15 mi (25 km) to the southeast on the Yangtze. In the 1930s, I-ch'ang also became an air service stop on the route from the coast to Szechwan, and roads were built to provide good local communications. After 1938, during the Sino-Japanese War (1937–45), when the Japanese began to drive up the Yangtze from Han-k'ou, I-ch'ang was badly damaged by repeated bombing and eventually fell to the Japanese Army in 1940. I-ch'ang was as far as the Japanese got, and until 1945 its commerce virtually was at a standstill. Not until the 1950s did shipping begin to recover.

Although it is the collecting and distribution centre for the commerce of the surrounding counties, and although it is on a highway running from Han-k'ou into Szechwan, most of its trade still consists of the transshipment of rice, oils, timber, and natural products from Szechwan, and of manufactured goods from the north and from the coastal provinces destined for Szechwan. Before World War II it had only a few small rice mills and some engineering facilities connected with shipping. After 1949, however, it was fairly extensively industrialized. The city now has flour, textile, and paper mills, oil-extraction plants, and a chemical industry producing industrial chemicals, fertilizers, and pharmaceuticals. The ship-repair yards have also been rebuilt and extended. Pop. (mid-1970s est.) 100,000–300,000.

I Ching, also spelled YI CHING (Chinese: "Classic of Changes"), an ancient Chinese text, one of the Five Classics (*Wu Ching*) of Confucianism that has long fascinated Chinese and Westerners alike. Though the book was originally used for divination, its influence on Chinese minds and its universal popularity is due to a system of cosmology that involves man and nature in a single system. The uniqueness of the *I Ching* consists in its presentation of 64 symbolic hexagrams that, if properly understood and interpreted, are said to contain profound meanings applicable to daily life. Throughout the ages, *I Ching* enthusiasts have claimed that the book is a means of understanding, and even controlling, future events.

The *I Ching* hexagrams are formed by joining in pairs, one above the other, eight basic trigrams (*pa kua*). Each trigram has a name, a root meaning, and a symbolic meaning. The legendary emperor Fu Hsi (24th century BC) is said to have discovered these trigrams on the back of a tortoise. Wen Wang (12th century BC) is generally credited with having formed the hexagrams.

In practice, one "creates" a hexagram by casting lots in one of several ways. The hexagram is built up from the bottom, line by line, by successive lots. Solid lines have the number nine, broken lines have the number six. Solid lines represent *yang* (the cosmic male principle), while broken lines represent *yin* (the female cosmic principle). These two principles explain all being and all change by their ceaseless interaction.

Individual lines of a hexagram have been compared to single notes of music. Though each note has a quality and significance in itself, its truest significance depends on its place in a musical score. Since the same principle applies to individual lines of a hexagram, the *I Ching* text first explains each line separately, then gives an overall interpretation of the unit. The text is often expressed in cryptic, thought-provoking language, thus allowing the user great leeway in interpreting its significance for him.

Scholars have been troubled by the inclusion of the *I Ching* among the Confucian classics, for Confucius (551–479 BC) seems to have deliberately avoided speaking of anything that smacked of esoteric doctrines. The answer seems to be that Han dynasty Confucianists (*c.* 2nd century BC), influenced by the Taoist quest for immortality, justified their use of *I Ching* by attributing certain of its commentaries to the ancient sage Confucius. It was then a natural step to include the book among the Five Classics of antiquity.

I-ch'un, Pinyin YICHUN, city, central Heilungkiang Province (*sheng*), China. It is a county-level municipality (*shih*) and the administrative centre of I-ch'un Prefecture (*ti-ch'ü*). I-ch'un is situated in the densely forested area of the Hsiao Hsing-an Ling (Lesser Khingan Range), at the intersection of the I-ch'un Ho (river), from which it takes its name, and the T'ang-wang Ho, a tributary of the Sungari River. Until 1949 it was a minor market town under T'ang-yuan County (*hsien*). Since 1949 it has grown at an astonishing rate as a major centre of the lumber industry. It is situated in the mountains among virgin forests, and at first its population had to be supported by importing foodstuffs; only in the late 1950s did local agriculture begin to develop. Almost the entire industrial output of the city consists of timber and timber products. Most of the timber produced locally is sent to Harbin (Ha-erh-pin) or to the south by rail. Pop. (1980 UN est.) 376,000.

I-go (board game): *see* Go.

I-hsin (1833–98): *see* Kung, Prince.

I-lan, *hsien* (county), northeastern Taiwan, occupying an area of 825 sq mi (2,137 sq km) and bordered by the *hsien*s of T'ai-pei (north), T'ao-yüan and Hsin-chu (west), and T'ai-chung and Hua-lien (south) and by the Philippine Sea (east). The Chung-yang Shan-mo (Central Range) extends over the southern part and the Hsüeh-shan Shan-mo (mountain range) borders the northwestern part of I-lan *hsien.* In the northeast, the I-lan Ch'uan (river) has formed a fertile triangular basin, where paddy rice, sugarcane, peanuts

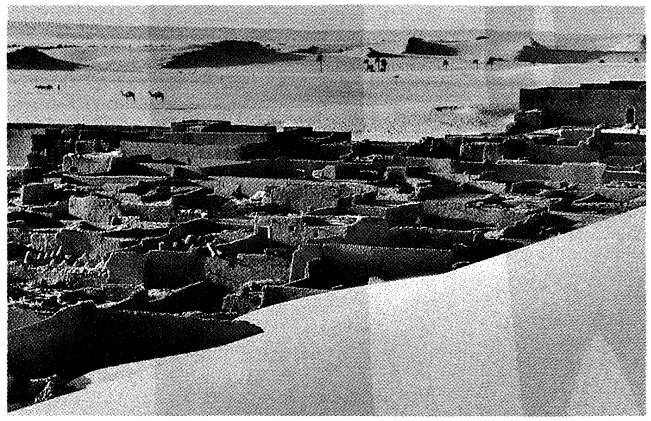
(groundnuts), and sweet potatoes are grown. Sulfur, manganese, mica, copper, talc, marble, and iron ore are worked or mined. The major industries include rice, sugar, and saw milling; fish processing; and fertilizer, cement, chemical, and paper manufacturing. T'ai-p'ing Mountain, in the south-central part of the county, is one of the three biggest logging stations in Taiwan; it is also being developed as a major tourist resort. The *hsien* produces the greatest amount of *pan-ya* (smoked and salted ducks) in Taiwan. Su-ao, an important harbour on Taiwan's eastern coast, is connected by railway with the cities of Hua-lien to the south and Chi-lung (Keelung) to the north; the harbour is also connected by the Lang-yang Tunnel to the Lung-te Industrial District, site of export–import industries. I-lan city, the administrative seat, is the largest rice market in Taiwan. Pop. (1987 est.) 448,418.

I-lan, *shih* (municipality) and seat of I-lan *hsien* (county), northeastern Taiwan, the centre of the only sizable alluvial basin on the island's mountainous eastern coast. The basin itself was largely formed as the delta of the Cho-Shui River and is about 30 miles (50 km) from north to south. I-lan city lies in the centre of this plain on the Lan River. The plain is a fertile rice-producing region, and I-lan is a major rice market. A railway connects the city with Chi-lung (Keelung) and Taipei to the north and also runs southward to Su-ao. Built under the Japanese occupation (1895–1945), the line once extended farther south to Hua-lien and T'ai-tung, but the section south of Su-ao was demolished during World War II. The I-lan area was largely settled by Chinese. There is some minor industry, mainly papermaking (using wood from the forests in the surrounding mountains) and the manufacture of fertilizers. Pop. (1987 est.) 85,234.

I li (Chinese: "Ceremonies and Rituals"), Pinyin YI LI, collection of Chinese rituals probably compiled during Western Han times (206 BC–AD 8) and listed, along with two other ritual texts (*Li chi,* "Collection of Rituals"; *Chou li,* "Rites of Chou"), among the Nine, Twelve, and Thirteen Classics of Confucianism. Its subject matter is somewhat different from the other ritual classics in that it gives special emphasis to such events as weddings, funerals, religious sacrifices, festivals, and official audiences.

I-li River, Wade–Giles romanization I-LI HO, Pinyin YILI HE, river in western Uighur Autonomous *ch'ü* (region) of Sinkiang, China. It is 870 miles (1,400 km) long and drains the basin between the Tien Shan ("Celestial Mountains") and the P'o-lo-k'o-nu Mountains to the north. Both ranges are extremely high. The drainage basin of the I-li and its principal tributaries—the K'a-shih, K'ung-chi-ssu, and T'e-k'o-ssu rivers—is rugged and mountainous, the axes of the mountain systems running approximately west–east. Just within the Chinese frontier the valley broadens out to form a fertile plain around I-ning (Kuldja). The I-li River flows westward into the Soviet Union, to the north of Alma-Ata, and eventually discharges into Lake Balkhash. The I-li Valley is much wetter than most of Chinese Central Asia and has a large settled farming population, mainly engaged in cultivating wheat. The uplands support flocks of sheep, goats, and horses.

I-n-Salah, also spelled AÏN SALAH, oasis town, central Algeria, on the southern edge of the arid Tademaït Plateau. At the crossing of ancient trans-Saharan caravan routes, it was once an important trade link between northern and central Africa but has declined in modern times owing to high transportation costs and the exodus of workers to the developing gas fields 60 miles (100 km) southwest. Mainly visited by the nomadic Tuareg, it remains dependent upon the exportation of dates. The oasis has four red or violet clay brick *ksar*s (walled villages), each with a citadel. Of these, the Ksar el-Arab oasis is inhabited by an entirely black African group. Palm groves and fruit and vegetable gardens surround the villages, irrigated by artesian wells and protected by hedges from the encroaching sand. Southwest of I-n-Salah (meaning "good well") are two *sebkha*s (large, enclosed basins), fed in the winter by underground drainage. Pop. (1987 prelim.) mun., 20,733.



Ksar (walled village) at I-n-Salah, Alg.
Victor Englebert—De Wys, Inc.

I-ning, Pinyin YINING, conventional KULDJA, city in western Uighur Autonomous *ch'ü* (region) of Sinkiang, China. It is the chief city, agricultural market, and commercial centre of the I-li River Valley, the principal route from the southern Dzungarian and Sinkiang regions into Soviet Central Asia. It is far wetter than any other part of Sinkiang and has rich grazing land. I-ning has been a strategic centre since early times, being known to the T'ang dynasty (618–907) by the name K'ung-yüeh and to the Mongols as Almarikh, under which name it became the capital of the 13th-century Mongol conqueror Jagatai Khan. It first came under direct Chinese control in 1755–57, during the wars with the Dzungars. The Chinese subsequently established several forts in the vicinity of the I-li River. In the 1870s the area figured in a prolonged border dispute between China and Russia. The valley is largely under cultivation, though the uplands still support large flocks of sheep, cattle, and horses. The population is mostly Kazakh, but around I-ning there are a large settlement of Sibo (Tungusic) people and some Mongols. Pop. (1982) city, 160,000; mun., 225,024.

I novel, Japanese WATAKUSHI SHŌSETSU, or SHISHŌSETSU, form or genre of 20th-century Japanese literature that is characterized by self-revealing narration, with the author usually as the central character.

The I novel grew out of the naturalist movement that dominated Japanese literature during the early decades of the 20th century. The term is used to describe two different types of novel, the confessional novel (characterized by prolonged, often self-abasing, revelation) and the "mental attitude" novel (in which the writer probes innermost thoughts or attitudes toward everyday events in life). Notable I novelists include Kasai Zenzō, Uno Kōji, Kamura Isota, Amino Kiku, Takii Kōsaku, and Ozaki Kazuo.

I-pin, Pinyin YIBIN, city in southern Szechwan *sheng* (province), China. It is situated at the junction of the Min and the Yangtze rivers at the southwestern corner of the Szechwan Basin. Above I-pin the Yangtze is called the Chin-sha River. Junk traffic can reach Le-shan, to the north on the Min, and P'ing-shan, to the south on the Chin-sha, and there is heavy river traffic with Ch'ung-ch'ing (Chungking) downstream. It has traditionally also been a staging post of the main route from Ch'eng-tu to K'un-ming in Yunnan province and a commercial and collecting centre for goods from northern Yunnan and southwestern Szechwan. The city stands in a good defensive position on a high bluff above the river.

A county administration was set up there in the 2nd century BC, and it first received the name I-pin in 742. Until the Sung dynasty (960–1279) the minor frontier prefecture there was called Jung, but, with the rapid expansion of Szechwan in Sung times it grew rapidly, receiving its modern county name and becoming the seat of the prefecture of Hsü. In Ming (1368–1644) and Ch'ing (1644–1911) times it became Hsü-chou superior prefecture, known to Europeans as Suifu. In 1912 it reverted to the status of a county as I-pin. In 1913 steamship communication with Ch'ung-ch'ing was opened, and it subsequently grew into a major collection and distribution centre dependent upon Ch'ung-ch'ing. Its commercial development progressed during World War II, when there was an influx of eastern merchants; some industry was also founded.

From 1949, I-pin's importance as a communication centre has increased. A railway joins it to Nei-chiang, on the Ch'ung-ch'ing–Ch'eng-tu railway; the highways of the region have also been improved. Industry has been greatly expanded. The area has been known at least since the 7th century AD as a source of subterranean salt, which now supplies a large chemical plant. There is also a large paper mill. Pop. (1982) 245,064.

I-Thou, theological doctrine of the full, direct, mutual relation between beings, as conceived by Martin Buber and some other 20th-century philosophers. The basic and purest form of this relation is that between man and God (the Eternal Thou), which is the model for and makes possible I-Thou relations between human beings. The relation between man and God, however, is always an I-Thou one, whereas that between man and man is very frequently an I-It one, in which the other being is treated as an object of thought or action. According to Buber, man's relation to other creatures may sometimes approach or even enter the I-Thou realm. Buber's book *Ich und Du* (1923; *I and Thou*) is the classic work on the subject.

I-ti (Chinese emperor): *see* T'ung-chih.

I-ti (Chinese emperor): *see* Cheng-te.

I-tsung (Chinese emperor): *see* Ch'ung-chen.

I-yang, Pinyin YIYANG, city, northern Hunan *sheng* (province), China. The city is situated approximately 47 miles (75 km) northwest of Ch'ang-sha on the Tzu River, to the

south of the Tung-t'ing Hu (lake), on the main highway from Ch'ang-sha to Ch'ang-te. An ancient county, it was established in the 2nd century BC. Its seat was originally sited northeast of the present city, but it moved in T'ang (618–907) times. From 589 it was a county subordinate to Ch'ang-sha. Briefly an independent prefecture (*chou*) under the name T'ing in Sung times (960–1279), it again had that status under Mongol rule (1279–1368). In 1368, however, it again became a subordinate county under Ch'ang-sha. It has traditionally been a collecting centre for agricultural and other products from the Tzu Shui Basin, and until recent times most of its population engaged in the transport of timber, coal, mineral ores, and grain. A long-established handicraft tradition was mostly based on local wood and bamboo. In recent years I-yang has also developed industrially, producing iron and steel, as well as electrical equipment. Pop. (mid-1970s est.) 100,000–300,000.

IAAF: *see* International Amateur Athletic Federation.

Iacchus, also spelled IAKCHOS, minor deity associated with the Eleusinian Mysteries, the best known of the ancient Greek mystery religions. On the day preceding the commencement of the mysteries, Iacchus' name was invoked with the names of the earth goddess Demeter and her daughter Kore (Persephone) during the procession from Athens to Eleusis, a city in Attica. Probably originally a personification of the ritual invocation (*Iakch' ō Iakche*), Iacchus was variously identified. According to some sources he was synonymous with Bacchus (a title of the wine god Dionysus), whose name was similar to his. Iacchus was also regarded as the son of Zeus and Demeter (or sometimes as her consort) and differentiated from the Theban Bacchus (Dionysus), who was the son of Zeus and Semele. Still other traditions identified Iacchus as the son of Kore or of Dionysus. In art Iacchus was portrayed holding a torch and leading the celebrants.

Iacocca, Lee, byname of LIDO ANTHONY IACOCCA (b. Oct. 15, 1924, Allentown, Pa., U.S.), American automobile executive who, as president and chairman of the board of the foundering Chrysler Corporation, secured the largest amount of federal financial assistance ever given to a private corporation at that time.

The son of an Italian immigrant, Iacocca graduated from Lehigh University, Bethlehem, Pa., in 1945 and received a master's degree in engineering from Princeton University in 1946. Hired as an engineer by the Ford Motor Company, he quickly proved that he was better suited for sales. By 1960 he had become general manager of the Ford division and a vice-president of the company. Iacocca's increasing influence at Ford was hastened by his successful promotion of the sporty yet inexpensive Mustang. He was named president of Ford in 1970, but his brash, unorthodox manner led to his dismissal in 1978.

The following year Iacocca was hired by the Chrysler Corporation, which, having accumulated a huge inventory of low-mileage cars at a time of rising fuel prices, faced bankruptcy. Iacocca appealed to the federal government for aid, gambling that it would not allow Chrysler to fail when the national economy was already depressed. Although his request sparked intense debate over the role of government in a market economy, Congress in 1980 agreed to guarantee $1,500,000,000 in loans if the company could raise another $2,000,000,000 on its own. Iacocca responded by finding new sources of credit and by trimming operations, closing plants, and persuading labour unions to accept layoffs and wage cuts. He then shifted the company's emphasis to fuel-efficient models and undertook an aggressive advertising campaign that included personal appearances on television commercials. By 1981 Chrysler showed a small profit, and three years later it announced record profits of more than $2,400,000,000. Iacocca became a national celebrity. His autobiography, *Iacocca,* with William Novak, appeared in 1984.

IADB: *see* Inter-American Development Bank.

IAEA: *see* International Atomic Energy Agency.

iamb, metrical foot consisting of one short syllable (as in classical verse) or one unstressed syllable (as in English verse) followed by one long or stressed syllable, as in the word ˘ ´ be|cause. Considered by the ancient Greeks to approximate the natural rhythm of speech, iambic metres were used extensively for dramatic dialogue, invective, satire, and fables. Also suited to the cadence of the English language, iambic rhythms, especially iambic tetrameter and pentameter, are the preeminent metres of English verse. Substitution of other types of feet to add variety is common in basically iambic verse. An example of iambic metre is the English ballad, composed of quatrains written in alternating lines of iambic tetrameter and iambic trimeter. For example:

˘ ´ ˘ ´ ˘ ´ ˘ ´
There lived | a wife | at Ush | er's Well,
˘ ˘ ´ ˘ ´ ˘ ´
And a weal | thy wife | was she:
˘ ´ ˘ ´ ˘ ´ ˘ ´
She had | three stout | and stal | wart sons,
˘ ´ ˘ ´ ˘ ´
And sent | them o'er | the sea.

Iamblichus (b. *c.* 250, Chalcis, Coele-Syria—d. *c.* 330), Syrian philosopher, a major figure in the philosophical school of Neoplatonism and the founder of its Syrian branch.

Though only his minor philosophical works have survived, the basic elements of Iamblichus' system can be understood from the references to his teachings in the writings of the 5th-century philosopher Proclus. He wrote, in Greek, the treatise known under the Latin name *De Mysteriis* (*On the Egyptian Mysteries,* 1821). English translations of his other works include: *On the Pythagorean Life* (1937); *The Exhortation to Philosophy,* or *Protrepticus* (1888); *On the General Science of Mathematics* (1891); *On the Arithmetic of Nicomachus* (1894); and *Theological Principles of Arithmetic* (1922).

Iamblichus, more than any other single philosopher, has generally been credited with the transformation of the Neoplatonism advocated by Plotinus earlier in the 3rd century into the stiff and complicated, yet often profound, pagan religious philosophy, best known from the works of Proclus. Attempting to develop a theology encompassing all of the rites, myths, and divinities of syncretistic paganism, he was the first Neoplatonist to displace Plotinus' purely spiritual and intellectual mysticism in favour of theurgy, the magical conjuration of the gods. Beyond the One of Plotinus, identical with the Good, Iamblichus asserted that a higher One exists outside the range of human knowledge and qualifications. To the three existing ethical virtues of Neoplatonism—political, purifying, and exemplary—he added the contemplative virtue and placed above all four the priestly, or unifying, virtues by which men obtain ecstatic union with the One. For his stress on theurgy and his elevation of the nonintellectual virtues, Iamblichus was known for the next two centuries as "the divine" or "inspired."

Iangiiul (Uzbek S.S.R.): *see* Yangiyul.

Iao, valley, Maui County, northwestern Maui Island, Hawaii, U.S., on the eastern slope of Puu Kukui Mountain. Formed by erosion of the caldera whose volcano created the island's western peninsula, the valley comprises a deep, narrow gorge 5 mi (8 km) long and flanked by heavily forested walls almost a mile in height. Iao Needle, a volcanic monolith 2,251 ft (686 m) high, soars nearly straight up from the valley floor. A bronze tablet at its base commemorates the bloody 1790 battle of Kepaniwai (meaning "dammed stream," referring to the blockage of the torrent by the bodies of Maui warriors), which added Maui to the Kingdom of Kamehameha the Great.

Kepaniwai State Parks, a 7-ac (3-ha) area near the valley entrance, has landscaped gardens representing Hawaii's various cultures. Iao Stream is dammed there to provide wading and swimming pools.

Iapetus, exterior moon in the Saturn system, extraordinary because of its surface markings. Discovered by Giovanni Domenico Cassini in 1671, Iapetus orbits Saturn once every 79.33 Earth days at a distance of 3,561,000 kilometres (2,212,800 miles). The satellite's radius and mass are, respectively, 730 ± 10 km (454 ± 6 mi) and $1.88 \pm 0.12 \times 10^{24}$ grams, implying a bulk density of 1.16 ± 0.09 grams per cubic centimetre. A solid object with so low a density must be composed mainly of ices. The period of rotation of Iapetus is observed to equal its period of revolution, as is the case with the Earth's Moon, and for the same reason—namely, tides exerted on the solid body of the satellite by the gravity of the larger nearby planet. As a result, one face of Iapetus is always leading in its orbital motion and the other always trailing. Remarkably, the leading hemisphere is extremely dark, reflecting only a small percentage of the sunlight incident upon it, while the trailing hemisphere is as much as 10 times a better reflector. This corresponds to the greatest variation in brightness across any object known in the solar system.

Impact craters were discovered during the early 1980s by the Voyager spacecraft in the trailing hemisphere but not in the leading one. The surface material in the bright trailing hemisphere is almost certainly water ice, possibly with an admixture of methane and other ices. The dark material at the surface of the leading hemisphere is thought to be complex organic molecules, perhaps supplied by Saturn's outermost satellite, Phoebe, or produced *in situ* by solar ultraviolet irradiation of the methane component of the ice. In the latter case, the rapid evaporation of methane ice and ballistic transport of material from the leading to the trailing hemisphere by micrometeorite impact are invoked to explain the brightness asymmetry between the hemispheres.

Iarmhí, An (Ireland): *see* Westmeath.

Iaşi, *judeţ* (district), northeastern Romania, occupying an area of 2,111 sq mi (5,469 sq km), bounded on the east by the Moldavian S.S.R. of the Soviet Union. The southward-flowing Prut River marks the district's eastern border with the U.S.S.R., and the Siret River drains the hilly terrain of the district to the south. Iaşi district was a part of feudal Moldavia. Iaşi city is the district capital and has chemical, textile, and food industries. Building materials are produced in Ciurea and Hirlău, and machinery factories operate in Paşcani. Agricultural activities consist of cereal cultivation and livestock raising. Ciric, located north of Iaşi, is a boating resort. A fortified monastery, situated south of Iaşi city, was founded by Prince Duca in 1672. Răducăneni, Mădirjac, and Sipote are other towns. Bîrnova Forest and the natural monument of Repeden Hill, containing fossiliferous rocks, are notable features of the area. A university and several technical and professional institutes are found in Iaşi. Highways and railway connections extend through Iaşi, Tîrgu Fru-

mos, and Paşcani. An airport is located near Iaşi city. Pop. (1982 est.) 765,791.

Iaşi, German JASSY, city, capital of Iaşi *judeţ* (district), northeastern Romania. It is situated on the Bahlui River near its confluence with the Prut, in the Moldavian plain, 8 mi (13 km) west of the U.S.S.R. border and 200 mi northeast of Bucharest.

There were recognizable settlements at the site in the 7th century. The town received its German name (perhaps from the Cuman *jagers,* or bowmen) in the late 14th and early 15th centuries, when it became a fortified customs post on the trade routes along the Prut Valley. In the mid-15th century it became a residence of the prince of Moldavia. From 1565 to 1862, after the union of the Romanian principalities, it was the capital of Moldavia.

Iaşi was sacked several times by Turks, Tatars, and Poles, was burned to the ground on one occasion, and suffered a plague in 1734; but it endured as a cultural and economic centre. In 1641, Prince Vasile Lupu established a school and set up a printing press in the Byzantine church of the Trei Ierarhi (Three Hierarchs), built 1635–39, from which the first book printed in Moldavia was issued.

Other historical buildings include the Alexandru Ioan Cuza University (founded 1860), the church of St. Nicholas built by Stephen (Ştefan) the Great in the 15th and 16th centuries, the Vasile Alecsandri National Theatre (1894), and the flamboyant neo-Gothic Palace of Cul-



Alexandru Ioan Cuza University, Iaşi, Romania
By courtesy of Editura Encyclopedica Romana

ture (finished 1929). The city has several educational and research institutes and a branch of the Academy of Romania. It has good road and rail connections and an expanding industry, including chemicals, pharmaceuticals, plastics, and textiles. Pop. (1982 est.) 256,042.

Iasion, also called IASIOS, in Greek mythology, Cretan youth loved by Demeter, the corn goddess, who lay with him in a fallow field that had been thrice plowed. Their son was Plutus (*q.v.*), the wealth within the soil. According to another version, Iasion attempted to ravish the goddess and was struck by lightning hurled by Zeus. Iasion perhaps originated as an ancient agricultural deity associated with a fertility rite. *See also* Demeter.

Ibadan, capital city of Oyo state, Nigeria, located on seven hills (average elevation 700 ft [200 m]), 100 mi (160 km) from the Atlantic coast. It is the nation's second largest city (after Lagos).

Ibadan's beginnings are shrouded in mystery; they were recorded only in oral tradition. It is said that the earliest group of settlers at Ibadan were fugitives from justice who were expelled from nearby villages. This small group later swelled with the arrival of immigrants from all over Yorubaland (now western Nigeria).

Recorded history begins in 1829, after the region had been convulsed by extended intertribal wars. In that year, the victorious armies of the Ife, Ijebu, and Oyo kingdoms camped at Ibadan and formed the nucleus of the modern city. The British colonial government assumed control of the city in 1893. After the railway arrived from Lagos (1901), the line was extended northward to Kano (1912), thus ensuring the city's continuing economic importance.

The economic activities of Ibadan include agriculture, commerce, handcrafts, manufacturing, and service industries. Although the city's farming population is still large for an urban area, it has declined. Many cultivators are part-time farmers who augment their earnings with other work.

Ibadan is also an important commercial centre. Virtually every street and corner in the traditional core and the inner suburbs of the city is a market square or stall. Within the city there are two eight-day periodic markets—Ibuko (Bode) and Oje—and many daily markets. The largest daily market stretches in a belt from the railway station in the west to the centre of the city and is Ibadan's commercial core.

Some local crafts still flourish. These include weaving, spinning and dyeing, pottery making, and blacksmithing. The *adire* ("tie-dye") cloth dyed locally in large pots of indigo is popular. The small businesses in the city engage in corn milling, leather working, wood and steel furniture making, printing, photography, hotel management, and motor and other repairing. There are, however, few modern manufacturing industries. Ibadan is well served by roads. The city has a fleet of privately owned taxi cabs and minibuses, and regular bus services are operated within the city and its suburbs.

The University of Ibadan and a technical institute are located in the city, and there are many specialized institutions. The university library maintains the largest collection of books in the country. There is also a branch of the National Archives on the university campus.

Of the city's six parks, the most important is Agodi Garden. There are also zoological and botanical gardens, two main stadiums, and a large number of athletic facilities. Pop. (1979 est.) city, 936,000; (1970 est.) metropolitan area, 1,496,115.

Ibagué, capital of Tolima department, central Colombia, on the eastern slopes of the Andean Cordillera Central (Central Mountains). Founded as San Bonifacio de Ibagué in 1550 on the site of an Indian village, it was moved to its present location, on a plain 4,216 ft (1,285 m) above sea level, because of Indian attacks. It was the capital of the republic for a short time in 1854. The rapid expansion of coffee planting on the slopes above the city contributed to its growth, especially after 1890.

The plain and the neighbouring valleys produce cacao, tobacco, rice, and sugarcane. Tolima University in Ibagué (founded in 1945) was given university status in 1954. The city is situated on the road that crosses the Boquerón del Quindío (Quindío Pass) into the Cauca Valley. This road connects Armenia and Bogotá, and Ibagué's location along this route has made the city an important commercial centre. Pop. (1979 est.) 272,625.

Ibáñez, Vicente Blasco: *see* Blasco Ibáñez, Vicente.

Ibáñez del Campo, Carlos (b. Nov. 3, 1877, Chillán, Chile—d. April 28, 1960, Santiago), Chilean president from 1927 to 1931 and from 1952 to 1958. Although by preference Ibáñez was aligned with foreign reactionaries, he made many constructive domestic reforms.

After a military career of 30 years, Ibáñez participated in a revolt in September 1924 against the government of Arturo Alessandri Palma. From 1925 to 1927 Ibáñez in effect controlled Chile while serving as minister of war and then as minister of the interior. In 1927 he forced the resignation of President Emiliano Figueroa Larraín and until 1931 held office as chief executive. Backed by the army, he exiled or jailed all opposition. His regime was directed to material development, especially of the ailing nitrate industry, which he sought to rescue through the creation of a monopoly corporation, Compañía de Salitre



Carlos Ibáñez
By courtesy of the Organization of American States

de Chile (Cosach), heavily dependent upon U.S. capital. When Cosach failed and the world depression put an end to the influx of foreign capital, the Chilean economy crumbled. Discontent with Ibáñez' authoritarianism became overt, and in July 1931 he fled across the Andes into exile in Argentina.

The former dictator returned from exile in May 1937 and in September of the following year, with the support of Chilean Nazis, attempted an armed revolt that promptly failed. In August of 1939 he led another uprising that was again quickly crushed. His propensity for unsuccessful coups coupled with his reactionary views and Nazi associations caused his defeat when he ran for the presidency in 1942. In 1952, however, the 75-year-old Ibáñez again ran for the presidency with arch-reactionary support (he was closely aligned with Argentina's President Juan Perón) but won the election through an appeal directed to the depressed urban elements and the rural workers. His presidency was in marked contrast to his dictatorship in the 1920s, for he now demonstrated an ability to conciliate opposition, reorganized government departments to promote efficiency, and encouraged industrial growth. Despite his efforts, however, the Chilean economy was in desperate straits when he left office at the age of 81.

Ibani (Nigeria): *see* Bonny.

Ibar River, river in south central Yugoslavia, rising in the Mokra Planina (mountains) and flowing eastward to Kosovska Mitrovica, then northward to join the Zapadna Morava River. Its length is 171 mi (276 km), and it has a drainage area of 3,100 sq mi (8,000 sq km). Major tributaries are the Raška, Studenica, and Sitnica. The adjacent upland is forested, but there are croplands in the stream valleys, where the settlement pattern is frequently one of tightly grouped hamlets.

Ibara (people): *see* Bara.

Ibara Saikaku: *see* Ihara Saikaku.

Ibaraki, prefecture (*ken*), central Honshu, Japan, facing the Pacific Ocean. It occupies 2,351 sq mi (6,090 sq km) of the northeastern Kantō Plain. Ibaraki is bordered (south) by the Tone-gawa (Tone River) and contains part of Suigo-Tsukuba Quasi-national Park. Main features of this section of the park include Ka-



Harvesting rice at Itako in Ibaraki prefecture, Japan
Takayuki Toyama—Bon

sumiga-ura (Lake Kasumi), the second largest Japanese lake after Lake Biwa; the canals and creeks of the Tone River delta; the ancient Shintō Kashima Shrine; and the tourist centre of Itako town.

Ibaraki is basically agricultural, producing cereals, potatoes, and tobacco. Coal is mined at Ibaraki town and copper at Hitachi. Industry increased in the prefecture during the 1960s, while production in the Tokyo–Yokohama Metropolitan Area declined. There are petrochemical works at Kashima and Kasumi, and electric machinery is built. The first Nuclear Energy Research Institute was founded in Tōkaimura in 1956. Many of the cities were castle towns. Mito, the prefectural capital, was developed under the Mito branch of the Tokugawa Shogunate; its Kairaku Garden is one of the most celebrated in Japan. Pop. (1987 est.) 2,769,000.

Ibarbourou, Juana de, original name JUANITA FERNÁNDEZ MORALES (b. March 8, 1895, Melo, Uruguay—d. July 1979), Uruguayan poet, one of the most famous South American women poets.

Ibarbourou's poetry, rich in sensual images and expressed in simple language, deals with the themes of love and nature. A note of narcissism and eroticism present in her early works, such as *Los lenguas de diamante* (1919; "Tongues of Diamond") and *Raiz salvaje* (1922; "Savage Root"), gave way later, in *La rosa de los vientos* (1930; "The Rose of the Winds"), to a sense of declining beauty and vitality and, finally, in *Perdida* (1950; "Lost"), to an expression of despair in old age. Although her later poetry lacked the passion and feeling of her earlier work, she remained one of the most popular poets of South America. She was elected president of the Sociedad Uruguaya de Escritores (Society of Uruguayan Writers) in 1950.

Ibarra, in full SAN ANTONIO DE IBARRA, city, north-central Ecuador, situated in an Andean valley at an elevation of 7,300 feet (2,200 m), within the Ecuadorian Lake District. It was founded in 1606 by the soldier Cristóbal Torre, a representative of Miguel de Ibarra, the president of the royal *audiencia* of Quito (a judicial–legislative body), and was named for him. Though largely destroyed by an earthquake in 1868, it has retained much of its colonial architecture and atmosphere.

Ibarra is the trade centre for the region's agricultural products, including cotton, sugarcane, coffee, cereals, and livestock. It has a large sugar refinery and is famous for its wood carvings and native textiles and silverwork.

Landmarks include Our Lady of Mercy colonial shrine; the nearby ruins of Caranqui, where the last Inca emperor, Atahuallpa, was supposedly born; and Laguna de Yaguarcocha ("Lake of Blood"), named after a battle between the Caras and the Incas in which the slain were thrown into the lake. Ibarra is a Roman Catholic episcopal see. The Pan-American Highway and the railway to Quito pass through the city. Pop. (1989 est.) 72,016.

Ibarra, José María Velasco: *see* Velasco Ibarra, José María.

Ibárruri (Gómez), (Isidora) Dolores, pseudonym LA PASIONARIA (Spanish: "The Passionflower") (b. Dec. 9, 1895, Gallarta, near Bilbao, Spain—d. Nov. 12, 1989, Madrid), Spanish Communist leader, who earned a legendary reputation as an impassioned orator during the Spanish Civil War, coining the Republican battle cry, "*No pasarán!*" ("They shall not pass!").

Born the eighth of 11 children of a Viscayan miner, Ibárruri was compelled by poverty to quit school at age 15 to work as a seamstress and later as a cook. Becoming radicalized, she published in 1918 an article in a newspaper called *El Minero Vizcaino,* using for the first time the pseudonym La Pasionaria. Two years later she joined the newly formed Spanish Communist Party. After a turbulent



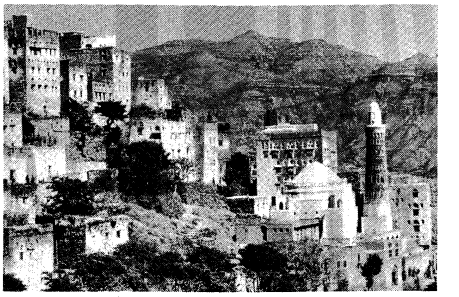
Ibárruri
© Lapi-Viollet

career, in which she was jailed several times for political activities, she emerged as one of the Communist deputies in the Republican parliament and, by the outbreak of the Civil War in 1936, had become a national figure. A sometimes violent radio and street orator, she made such famous exhortations as "It is better to die on your feet than to live on your knees" (July 1936).

With Francisco Franco's victory in 1939 she escaped by plane to the Soviet Union, where over the years she represented her party at Kremlin congresses, until Santiago Carrillo succeeded her as secretary-general in 1960. Though reputed to be an old-line Stalinist, she protested the Soviet invasion of Czechoslovakia in 1968. She returned to Spain on May 13, 1977, some 18 months after Franco's death and 34 days after the Spanish government again legalized the Communist Party. She was reelected to her deputy seat in the Spanish parliament that year but later resigned because of ill heath. She remained honorary president of the Spanish Communist Party until her death. Throughout her career Ibárruri almost always appeared dressed in black.

She married Julián Ruiz in 1915 and separated from him in the 1930s. Only two of her six children survived childhood; a son, Rubén, was killed at Stalingrad as an officer in the Red Army. In 1962 she published her memoirs, *El único camino* ("The Only Way"; Eng. trans., *They Shall Not Pass*).

Ibb, city, southwestern Yemen, lying in the Yemen Highlands on a spur of the rugged Mount Shamaḥī, at 6,725 feet (2,050 m) above sea level. The city's origins, according to Arab myth, date to biblical times. The area became important in the Middle Ages, when the Ṣulayḥid princess Sayyidah Arwā ruled over much of Yemen from her capital at nearby Jiblah (11th century AD). Long an administrative capital, Ibb in the 20th century was the seat of a semiautonomous emirate, abolished by an administrative reform of the monarchy in the 1940s.



The highland city of Ibb, Yemen, on a spur of Mount Shamaḥī; at right, the Jāmiʿ Mosque
Claude Deffarge

Ibb is the centre of a fertile agricultural region. Elevations vary from 4,000 to 6,000 feet (1,200 to 1,800 m), and most of the cultivated area is terraced. Crops grown on the rich volcanic soil include grains (wheat, barley, millet), fruits and vegetables, coffee, and kat (a mild narcotic). Livestock, mainly sheep, are extensively grazed.

The city is one of the most picturesque in Yemen; it is surrounded by a thick wall, inset with tall houses. There are about 60 mosques in Ibb; the twin-minareted Muẓaffarīyah Mosque is particularly fine. Well-built multistory houses, typical of Yemeni urban architecture, are numerous. An aqueduct from the nearby mountains, supplemented by a small-scale modern distribution system, supplies running water to many of the houses—an unusual feature for the country.

The *sūq* ("marketplace") in Ibb is the trade centre for the agricultural and pastoral products of the region; the city also has some small handicraft industries. Ibb is an important way station on the north–south highway from the old port of Mocha (al-Mukhā), via Taʿizz and Dhamār, to the national capital of Ṣanʿā'. Ibb suffered an earthquake in 1982. Pop. (1980 est.) 34,289.

IBEC: *see* International Bank for Economic Cooperation.

To make the best use of the Britannica, consult the INDEX *first*

Iberia, in full COMPAÑÍA MERCANTIL ANÓNIMA IBERIA (Spanish: "Iberia Commercial Limited-liability Company"), Spanish state-owned airline created by law on June 7, 1940, and given rights to the air transport of persons and cargo within Spain. It took control of a privately owned company established in 1937, which in turn had revived the name of a company called Iberia, Compañía Aérea de Transportes, founded June 28, 1927. The current name was adopted Sept. 5, 1941.

In the beginning, Iberia's service was entirely within Spain (including service to the resort of Majorca). After World War II, beginning in 1946, Iberia developed services to London and Latin America. Direct service to New York City was opened in 1954. Iberia now flies to various points in Europe, Africa, and North and South America.

Iberian, Spanish IBERO, one of a prehistoric people of southern and eastern Spain who later gave their name to the whole peninsula. The waves of migrating Celtic peoples from the 8th to 6th century BC onward settled heavily in northern and central Spain, penetrated

Portugal and Galicia, but left the indigenous Bronze Age Iberian people of the south and east intact. Greek geographers give the name Iberian, probably connected with that of the Ebro (Iberus) River, to tribes settled on the southeastern coast, but, by the time of the ancient Greek historian Herodotus (mid-5th century BC), it applied to all the peoples between the Ebro and Huelva rivers, who were probably linguistically connected and whose material culture was distinct from that of the north and west. There were, however, areas of overlap between the Iberian and Celtic peoples, as in the Celtiberian tribes of the northeastern Meseta Central and in Catalonia and Aragon.

Of the Iberian tribes mentioned by classical authors, the Bastetani were territorially the most important and occupied the Almería region and mountainous Granada region. The tribes to the west of the Bastetani are usually grouped together as "Tartessian," after the name Tartessos given to the region by the Greeks. The Turdetani of the Guadalquivir Valley were the most powerful of this group. Culturally the tribes of the northeast and of the Valencian coast were greatly influenced by the Greek settlements at Emporion (modern Ampurias) and in the Alicante region, those of the southeast by influences from the Phoenician trading colonies at Malaca (Málaga), Sexi (Almuñéca), and Abdera (Adra), which later passed to the Carthaginians.

On the east coast the Iberian tribes appear to have been grouped around independent city-states. In the south there were monarchies, and the treasure of El Carambolo, near Seville, has been thought to be that of a ruler of Tartessos. Religious sanctuaries have yielded bronzes and terra-cotta figures, especially in mountainous areas. There is a wide range of ceramics in the distinctive Iberian styles. Exported pottery has been found in southern France, Sardinia, Sicily, and Africa; and Greek imports were frequent. The splendid "Lady of Elche," a bust with characteristic headdress and ornaments, also shows classical influence. The Iberian economy had a rich agriculture and mining and metallurgy.

The Iberian language, a non-Indo-European tongue, continued to be spoken into early Roman times. Along the east coast it was written in Iberian script, a system of 28 syllabic and alphabetic characters, some derived from Greek and Phoenician systems but most of unknown origin. Many inscriptions in the script survive. Few words, however, except place-names on the coinage struck by many cities in the 3rd century BC, can be understood. The Iberians retained their writing system until the Roman conquest, when the Latin alphabet came into use. Although the modern Basque language was formerly thought to be the descendant of Iberian, many scholars now believe the two languages to be separate.

Iberian Peninsula, peninsula in southwestern Europe, occupied by Spain and Portugal. Its name derives from its ancient inhabitants whom the Greeks called Iberians, probably after the Ebro (Iberus), the peninsula's second longest river (after the Tagus). The Pyrenees form an effective land barrier in the northeast from the rest of Europe, and in the south at Gibraltar the peninsula is separated from North Africa by a narrow strait. The Atlantic Ocean washes the western and northern coasts, and the Mediterranean Sea the eastern. Cape da Roca, in Portugal, is the most westerly point of continental Europe.

Ibero-Maurusian industry, also called ORANIAN INDUSTRY, North African stone-tool industry dating from the late Würm (last) Glacial Period, about 16,000 years ago. The former presumption that the industry extended into Spain explains the prefix "Ibero-" in the name. The industry does bear a close resemblance to the late Magdalenian culture in Spain, which is broadly contemporary (*c.* 15,000 BC). Later study, however, suggests that the Ibero-Maurusian industry is derived from a Nile valley culture known as Halfan, which dates from about 17,000 BC. Human remains are rather frequently associated with Ibero-Maurusian artifacts, and it appears that the industry belonged to a group of people known as the Mechta-el-Arbi race, considered a North African branch of Cro-Magnon man.

The Ibero-Maurusian industry, much more widespread than the Mesolithic Capsian industry (8000–2700 BC), is found along the entire coastline of North Africa and inland as well in Morocco, Tunisia, and the Cyrenaica (Barqah) region of Libya. It is characterized by a great many small-backed blades and, unlike the Capsian, an absence of burins (a sort of chisel, probably used for working wood).

Ibert, Jacques(-François-Antoine) (b. Aug. 15, 1890, Paris—d. Feb. 5, 1962, Paris), French composer whose music is admired for its colourful, technically polished, and often witty neoclassical style.

Ibert studied at the Paris Conservatory and in 1919 won the Prix de Rome for his cantata *Le Poète et la fée.* In Rome he composed his most popular work, the symphonic suite *Escales* (1922). From 1937 until 1960 Ibert was director of the Académie de France in Rome; during 1955–56 he also administered the Réunion des Théâtres Lyriques Nationaux. He wrote for almost every genre. Of his seven operas the most successful was *Angélique* (1926). The brilliantly witty *Divertissement* (1930) was a popular orchestral piece.

Iberus River (Spain): *see* Ebro River.

Iberville, town, *municipalité régionale* of Le Haut-Richelieu county, Montréal region, southern Quebec province, Canada, on the east bank of the Richelieu River, opposite Saint-Jean. Originally called Christieville, it was renamed in 1854 for the French explorer Pierre Le Moyne d'Iberville. The town is a rail and highway hub and a residential district of Saint-Jean. Economic activities include woodworking, dairying, sawmilling, quarrying, iron founding, and the manufacture of chemicals and pottery. Pop. (1986) 8,547.

Iberville (et d'Ardillières), Pierre Le Moyne d' (baptized July 20, 1661, Ville-Marie de Montréal [now Montreal]—d. July 9, 1706, Havana), French-Canadian naval hero and explorer, noted for his exploration and battles on behalf of the French in Hudson Bay and in the territory of Louisiana.

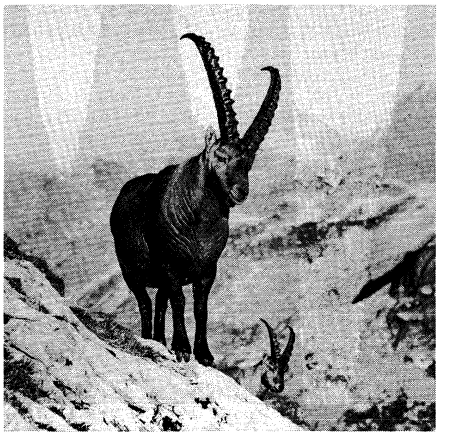
Son of prominent Montreal fur trader Charles Le Moyne, Iberville spent his young manhood in raids against English trading posts on Hudson Bay. In 1686 he joined the expedition of Pierre de Troyes to the James Bay region, capturing three forts over which he was made commander. Over the next decade, Iberville distinguished himself in numerous actions against the English, notably at Schenectady, N.Y. (1690), Pemaquid, Maine (1696), and St. John, Newfoundland (1696). His most brilliant foray was the Hudson Bay campaign of 1697, which success made him, at age 36, New France's most celebrated hero.

After the Treaty of Rijswijk (1697) temporarily settled the dispute between the English and the French over Hudson Bay, Iberville was commissioned to fortify the mouth of the Mississippi in order to secure the claim made on Louisiana by Cavelier de La Salle. In January 1699 Iberville explored the northern coast of the Gulf of Mexico, rediscovering the mouth of the Mississippi. Later he established a temporary fort, Fort Maurepas, on Biloxi Bay (now Ocean Springs, Miss.) and then sailed for France. The following year he returned and established a second fort, Fort La Boulaye, just below present-day New Orleans and in 1702 constructed a new post, Fort Louis, on the Mobile River. The success of these defense projects by Iberville persuaded Louis XIV to begin colonizing Louisiana.

In subsequent years the War of the Spanish Succession (1701–14) turned Iberville's attention toward the English, hampering his plans to develop Louisiana. In early 1706, commanding a French fleet in the West Indies, he sacked the islands of Nevis and St. Christopher, forcing the English to surrender 24 ships and capturing 6,000 slaves and 1,700 settlers. On the eve of a major expedition against the English in Carolina, Iberville died suddenly.

(Ja.H.)

ibex, any of several surefooted, sturdy wild goats of the genus *Capra,* family Bovidae (order Artiodactyla), found in the mountains of Europe, Asia, and northeastern Africa. The European, or Alpine, ibex (*C. ibex ibex*) is typical. It stands about 90 cm (3 feet) at the shoulder and has brownish gray fur, darker on the underparts. The male has a beard and large, semicircular horns with broad, transversely ridged front surfaces. The European ibex inhabits the line of perpetual snow and lives in herds, except for the old males, which are usually solitary. Formerly common throughout the higher ranges of the Alps, this ibex is now greatly reduced in numbers. It is protected locally in the Italian Alps and has been reintroduced elsewhere.



Pyrenean ibex (*Capra pyrenaica*)
Tierbilder Okapia, Frankfurt am Main

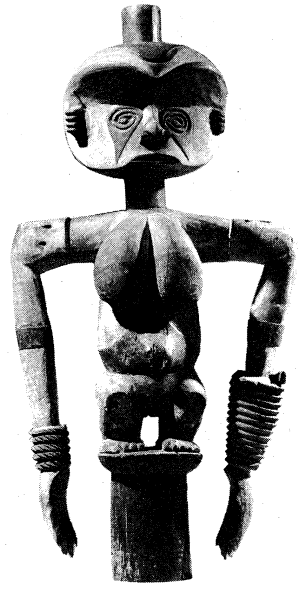
Among the subspecies closely related to the European ibex are the Siberian, or Asiatic, ibex (*C. i. sibirica*), which is larger and has longer horns, and the nubian ibex (*C. i. nubiana*), which is smaller and has long, slender horns. Other ibexes include the Abyssinian, or walia, ibex (*C. i. walie,* or *C. walie,* depending on the authority) and the Pyrenean, or Spanish, ibex (*C. pyrenaica*). For the Nilgiri ibex (*Hemitragus hylocrius*), *see* tahr.

Ibi, town and river port, Gongola state, east-central Nigeria, on the south bank of the Benue River, opposite the mouth of the Shemankar River. Founded in the 1850s by a slave of Hamman, the Fulani emir of Muri (to the northeast), it became a post for slave traders from Muri, known as the *bayin Fulani.* In the late 19th century British merchants of the Royal Niger Company observed Ibi's Hausa traders marketing tin products and thereupon prospected for and found in 1904 the vast tin deposits on the Jos Plateau.

Modern Ibi is a collecting point for sesame seeds and soybeans. Salt extraction, a traditional occupation of the women in the vicinity, has been eclipsed by imported European salt. Local trade among the predominantly Jukun population is in sorghum, millet, yams, rice, and beans. Ibi has a government dispensary. It serves as the port for Wukari 23 miles (37

km) south, to which it is linked by road. Pop. (1983 est.) 27,759.

Ibibio, people of the southeastern area of Nigeria, mainly in the Cross River state; they



Carved figure from a male dancer's headdress, Ibibio people, Nigeria, in the Metropolitan Museum of Art, New York City

By courtesy of the Metropolitan Museum of Art, New York City, The Michael C. Rockefeller Memorial Collection, gift of the Matthew J. Mellon Foundation, 1960 (1978. 412.403A-C)

speak dialects of Efik-Ibibio, a language of the Kwa branch of the Niger-Congo family. They comprise the following major divisions: Efik (*q.v.*), Northern (Enyong), Southern (Eket), Delta (Andoni-Ibeno), Western (Anang), and Eastern (Ibibio proper).

The Ibibio are mainly rain forest cultivators of yams, taro, and cassava; their major export products are palm oil and kernels. The Ibibio are noted for their skillful wood carving.

Their villages consist of compounds of rectangular buildings, each with several rooms, arranged around a courtyard. Villages, numbering about 500 persons, are divided into wards and sometimes into physically distinct hamlets, occupied by separate patrilineages. Wards are governed internally by a council consisting of heads of households and the secular head of the ward. The lineage head is a moral authority who has ritual duties and serves as guardian for ancestral shrines; he may also be the secular leader. Groups of villages form larger territorial units united by traditions of descent from a single parent village or village group and by the possession of a common tutelary spirit and a common totem. Secret societies, both male and female, are prominent in Ibibio village organization. Membership in the *ekpo* society, for example, available to wealthy men who can meet the expense involved, confers high social status and political authority; these men participate in ceremonies concerned with ancestral spirits and are believed to protect the community through magic and religious ritual.

ibis, any of about 20 species of medium-sized wading birds constituting the subfamily Threskiornithinae of the family Threskiornithidae (order Ciconiiformes), which also includes the spoonbills. Ibises occur in all warm regions except on South Pacific islands. They wade in shallow lagoons, lakes, bays, and marshes, using their slender, down-curved bills to feed on small fishes and soft mollusks. They range in length from about 55 to 75 centimetres (22 to 30 inches). They fly with neck and legs extended, alternately flapping and sailing.

Ibises usually breed in vast colonies, building compact stick nests low in bushes or trees and laying three to five eggs, usually dull white or mottled with brown.

The glossy ibis (*Plegadis falcinellus*) and its close relative the white-faced ibis (*P. chihi*) are small forms with dark reddish brown and glossy purplish plumage. As a group they are found throughout the warmer regions of the world.

The hadada ibis, or hadada (*Hagedashia hagedash*), of Africa, is a greenish ibis known for its loud call.

The straw-necked ibis (*Threskiornis spinicollis*) is unknown outside Australia. It is less aquatic than the other species; its principal food is grasshoppers.

The hermit ibis (*Geronticus eremita*), an endangered species, inhabits northern Africa and the Middle East. Its bill and the bare skin on its head are reddish. Breeding colonies once existed in central and southern Europe, Syria, and Algeria but are now known only in Turkey and Morocco.

The Japanese ibis (*Nipponia nippon*) is white with a red face. Also an endangered species, it was considered to be on the verge of extinction in the late 20th century.

The sacred ibis (*Threskiornis aethiopica*), of southern Arabia and Africa south of the Sahara (and formerly of Egypt), was sacred to the ancient Egyptians. It is about 75 cm (30



Sacred ibis (*Threskiornis aethiopica*)

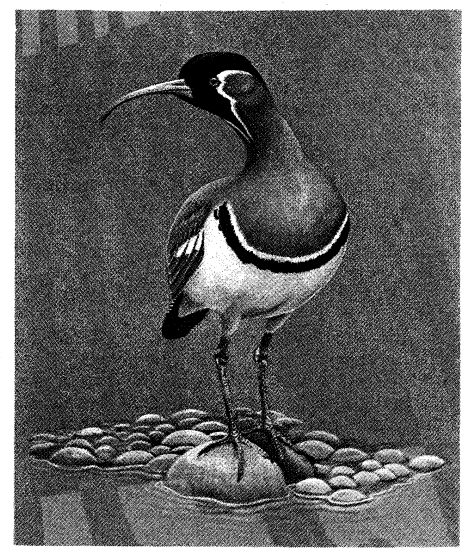
M.P. Kahl

in.) long, white with black in its wings, dark plumes on the lower back, and a bare black head and neck.

The scarlet ibis (*Eudocimus ruber*) inhabits northern South America; the white ibis (*E. albus*) ranges Central and North America.

For wood storks, sometimes called wood ibises, *see* stork.

ibisbill (*Ibidorhyncha struthersii*), Asian bird named for its long, red, down-curved bill (similar to that of an ibis), which it uses to probe for food under stones along streams and ponds. Rather heavyset birds about 40 centimetres (16 inches) long, ibisbills have



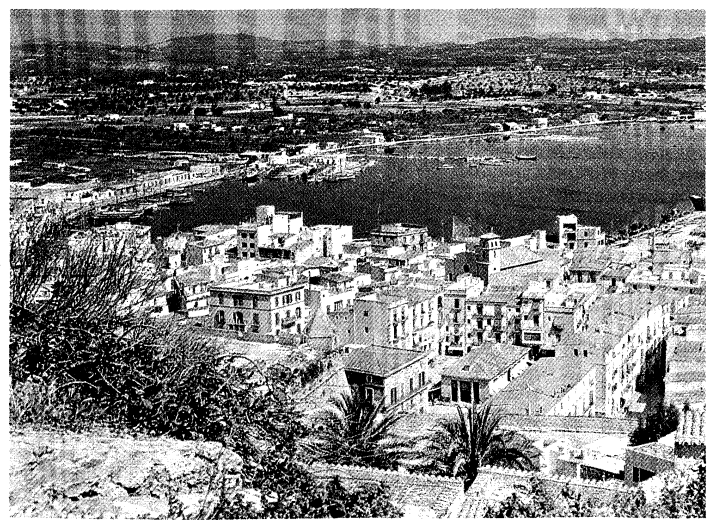
Ibisbill (*Ibidorhyncha struthersii*)

Painting by H. Douglas Pratt

shorter legs than their familial relatives the avocets and stilts (family Recurvirostridae, order Charadriiformes). The body is gray, with a black breast band and facial mask.

Ibisbills nest at 3,000 metres (9,840 feet) or higher in the Himalayas; they winter in the foothills.

Ibiza, also spelled IVIZA, or IVICA, island, Baleares province, Spain, one of the Balearic Islands in the western Mediterranean. It lies 50 mi (80 km) southwest of Majorca and has an area of 221 sq mi (572 sq km). A strategic point of great importance in ancient times, the island was inhabited by the Phoenicians and Carthaginians and has some notable archaeological sites, relics from which are housed in the Archaeological Museum at Ibiza city. The island's hilly relief, culminating in La Atalaya (1,558 ft [475 m]), is truncated in the central northern coast to form a *costa brava* ("rugged coast") with cliffs exceeding 800 ft in height and penetrated by *calas* (small coves). There are several irrigated lowlands (*huertas*), and the hillsides are intensively terraced. Agriculture is mainly of a subsistence nature, but



Ibiza city and port, Spain

Josef Muench

almonds, dried figs, and apricots are exported. Salt produced by the evaporation of seawater has been the main export for centuries (about 70,000 tons annually). Fish and charcoal, surplus to local needs, are also sent to the mainland. Because of its mild winter climate and its beaches, the island enjoys a substantial tourist trade. Most of the inhabitants live on farms and small villages scattered throughout the island, Ibiza city being the main centre and the only urban settlement. Pop. (1970) city, 16,943; island (1981), 60,937.

Iblīs, in Islām, the personal name of the devil, probably derived from the Greek *diabolos.* Iblīs, the counterpart of the Jewish and Christian Satan, is also referred to as *ʿadūw Allāh* (enemy of God), *ʿadūw* (enemy), or, when he is portrayed as a tempter, *ash-Shayṭān* (demon).

At the creation of man, God ordered all his angels to bow down in obedience before Adam. Iblīs refused, claiming he was a nobler being since he was created of fire, while man came only of clay. For this exhibition of pride and disobedience, God threw Iblīs out of heaven. His punishment, however, was postponed until the Judgment Day, when he and his host will have to face the eternal fires of hell; until that time he is allowed to tempt all but true believers to evil. As his first demonic act, Iblīs, referred to in this context as *shayṭān,* entered the Garden of Eden and tempted Eve to eat of the tree of immortality, causing both Adam and Eve to forfeit paradise. Disguised as the *hātif,* the mysterious voice of Arab mythology, Iblīs also tempted ʿAlī, Muḥammad's son-in-law, unsuccessfully trying to keep him from performing the ritual washing of the Prophet's dead body.

Iblīs has long been a figure of speculation among Muslim scholars, who have been trying to explain the ambiguous identification of Iblīs in the Qurʾān as either angel or *jinnī,* a contradiction in terms, as angels are created of light (*nūr*) and are incapable of sin, while *jinn* are created of fire (*nār*) and can sin. Traditions on this point are numerous and conflicting: Iblīs was simply a *jinnī* who inappropriately found himself among the angels in heaven; he was an angel sent to Earth to do battle with the rebellious *jinn* who inhabited the Earth before man was created; Iblīs was himself one of the terrestrial *jinn* captured by the angels during their attack and brought to heaven. *See also* shayṭān.

IBM: *see* International Business Machines Corporation.

Ibn ʿAbbād, in full ABŪ ʿABD ALLĀH MUḤAMMAD IBN ABĪ ISḤĀQ IBRĀHĪM AN-NAFZĪ AL-ḤIMYARĪ AR-RUNDĪ (b. 1333, Ronda, Spain—d. 1390, buried Bāb al-Futūḥ, Mor.), Islāmic theologian who became the leading mystical thinker of North Africa in the 14th century.

Attracted to Morocco by the famous *madrasah*s (religious colleges), Ibn ʿAbbād emigrated there at an early age. He abandoned legal studies in a quest for mystical knowledge. In 1359 he settled in the town of Salé and became an adherent of the Shādhilīyah order of mystics, which emphasized a personal commitment to Ṣūfism (Islāmic mysticism) and institutionalized spiritual asceticism. The order's spread and popularity in North Africa owed much to Ibn ʿAbbād's teachings and writings. Because the order and Ibn ʿAbbād represented moderate mystical tendencies, there was no conflict between them and the traditional theologians of Morocco, and in 1375 he was appointed an *imām* (leader of public prayers) by the ruler of Morocco.

As a scholar, Ibn ʿAbbād was especially noted for two collections of his correspondence, *Rasāʾil kubrā* ("Major Correspondence") and *Rasāʾil ṣughrā* ("Minor Correspondence"), which contained spiritual directions and instructions to his followers.

Ibn Abbās: *see* ʿAbd Allāh ibn al-ʿAbbās.

Ibn Abī ar-Rijāl, Aḥmad (ibn Ṣāliḥ) (b. July 1620, ash-Shabaṭ, Arabia—d. March 1681, Ṣanʿā'), Yemeni scholar and theologian, who is the best source of historical information on the little-known sect of Shīʿī Muslims in Yemen called the Zaydīs.

After completing his education, Ibn Abī ar-Rijāl joined the religious-bureaucratic establishment and reached the important rank of secretary and court orator under the rule of Ismāʿīl al-Mutawakkil, the Zaydī spiritual and temporal ruler of Yemen.

Ibn Abī ar-Rijāl was a scholar of some renown; most of his works are lost, however, and only their titles remain. Of special note among his surviving works is a biographical dictionary of 1,300 Zaydī leaders of Yemen and Iraq, his *Maṭlaʿ al-budūr wa-majmaʿ al-buḥūr* ("Rising of the Moons and Meeting of the Seas"). The *Maṭlaʿ,* now a standard source, is particularly important because the Zaydīs were extremely secretive about their beliefs.

Ibn Abī ʿAṣrūn, in full SHARAF AD-DĪN ABŪ SAʿD ʿABD ALLĀH IBN MUḤAMMAD IBN HIBAT ALLĀH IBN MUṬAHHAR AT-TAMĪMĪ AL-MAWṢILĪ IBN ABĪ ʿAṢRŪN, also called AL-ḤALABĪ, or AD-DIMASHQĪ (b. February 1099/1100, Ḥadīthah, Baghdad Caliphate—d. October/November 1189, Damascus), scholar who became a leading Shāfiʿī (one of the four schools of Islāmic law) theologian and the chief judicial officer of the Ayyūbid caliphate.

After completing his theological training, Ibn Abī ʿAṣrūn held various religious and judicial posts in Iraq. In 1154 he was invited to Damascus by its ruler; he taught religious subjects there and became the administrator of the *waqf*s (religious endowments). He held numerous other judicial appointments in Syria, Iraq, and Turkey, until in 1177/78 the famous Saladin, the Ayyūbid sultan, appointed him as the Shāfiʿī *qāḍī* ("judge") of Syria, the highest judicial appointment in the realm.

Ibn Abī ʿAṣrūn had to retire because of blindness in 1179/80. During his lifetime six *madrasah*s (religious colleges) were built in his honour. He wrote a number of works on religious subjects, none of which is extant.

Ibn al-Abbār, in full ABŪ ʿABD ALLĀH MUḤAMMAD AL-QUDĀʿĪ (b. February 1199, Valencia, Emirate of Balansiya [Valencia]—d. Jan. 6, 1260, Tunis), historian, theologian, and humorist who became one of the most famous students of Islāmic Spain.

Ibn al-Abbār began his official career as a secretary to the Muslim governor of the Emirate of Balansiya. After the fall of Valencia (September 1238), he settled in Tunisia and was employed as the head of the chancellery by the Ḥafṣid ruler Abū Zakarīyāʾ Yaḥyā and his successor, al-Mustanṣir.

While in Tunisia Ibn al-Abbār engaged in scholarly pursuits. His *Tuḥfat al-qadīm,* a major study of the Islāmic poets of Muslim Spain, is particularly important. He was also a humorist and a satirist of considerable ability. Ibn al-Abbār's alleged disrespectful attitude toward al-Mustanṣir angered the ruler. The scholar's fall from power and subsequent execution may have resulted from a satirical poem that he directed against al-Mustanṣir.

Ibn al-ʿArabī, in full MUḤYI AD-DĪN ABŪ ʿABD ALLĀH MUḤAMMAD IBN ʿALĪ IBN MUḤAMMAD IBN AL-ʿARABĪ AL-ḤĀTIMĪ AṬ-ṬāʾĪ IBN AL-ʿARABĪ, also called ASH-SHAYKH AL-AKBAR (b. July 28, 1165, Murcia, Valencia—d. Nov. 16, 1240, Damascus), celebrated Muslim mystic-philosopher who gave the esoteric, mystical dimension of Islāmic thought its first full-fledged philosophic expression. His major works are the monumental *al-Futūḥāt al-Makkīyah* ("The Meccan Revelations") and *Fuṣūṣ al-ḥikam* (1229; "The Bezels of Wisdom").

Ibn al-ʿArabī was born in the southeast of Spain, a man of pure Arab blood whose ancestry went back to the prominent Arabian tribe of Ṭāʾī. It was in Seville, then an outstanding centre of Islāmic culture and learning, that he received his early education. He stayed there for 30 years, studying traditional Islāmic sciences; he studied with a number of mystic masters who found in him a young man of marked spiritual inclination and unusually keen intelligence. During those years he travelled a great deal and visited various cities of Spain and North Africa in search of masters of the Ṣūfī (mystical) Path who had achieved great spiritual progress and thus renown.

It was during one of these trips that Ibn al-ʿArabī had a dramatic encounter with the great Aristotelian philosopher Ibn Rushd (Averroës; 1126–98) in the city of Córdoba. Averroës, a close friend of the boy's father, had asked that the interview be arranged because he had heard of the extraordinary nature of the young, still beardless lad. After the early exchange of only a few words, it is said, the mystical depth of the boy so overwhelmed the old philosopher that he became pale and, dumfounded, began trembling. In the light of the subsequent course of Islāmic philosophy the event is seen as symbolic; even more symbolic is the sequel of the episode, which has it that, when Averroës died, his remains were returned to Córdoba; the coffin that contained his remains was loaded on one side of a beast of burden, while the books written by him were placed on the other side in order to counterbalance it. It was a good theme of meditation and recollection for the young Ibn al-ʿArabī, who said: "On one side the Master, on the other his books! Ah, how I wish I knew whether his hopes had been fulfilled!"

In 1198, while in Murcia, he had a vision in which he felt he had been ordered to leave Spain and set out for the East. Thus began his pilgrimage to the Orient, from which he never was to return to his homeland. The first notable place he visited on this journey was Mecca (1201), where he "received a divine commandment" to begin his major work *al-Futūḥāt al-Makkīyah,* which was to be completed much later in Damascus. In 560 chapters, it is a work of tremendous size, a personal encyclopaedia extending over all the esoteric sciences in Islām as Ibn al-ʿArabī understood and had experienced them, together with valuable information about his own inner life.

It was also in Mecca that he became acquainted with a young girl of great beauty who, as a living embodiment of the eternal *sophia* (wisdom), was to play in his life a role much like that which Beatrice played for Dante. Her memories were eternalized by Ibn al-ʿArabī in a collection of love poems (*Tarjumān al-ashwāq;* "The Interpreter of Desires"), upon which he himself composed a mystical commentary. His daring "pantheistic" expressions drew down on him the wrath of Muslim orthodoxy, some of whom prohibited the reading of his works at the same time that others were elevating him to the rank of the prophets and saints.

After Mecca, he visited Egypt (also in 1201) and then Anatolia, where, in Qunya, he met Ṣadr ad-Dīn al-Qūnawī, who was to become his most important follower and successor in the East. From Qunya he went on to Baghdad and Aleppo. By the time his long pilgrimage had come to an end at Damascus (1223), his fame had spread all over the Islāmic world. Venerated as the greatest spiritual master, he spent the rest of his life in Damascus in peaceful contemplation, teaching, and writing. It was during his Damascus days that one of the most important works in mystical philosophy in Islām, *Fuṣūṣ al-ḥikam,* was composed in 1229, about 10 years before his death. Con-

sisting only of 27 chapters, the book is incomparably smaller than *al-Futūḥāt al-Makkīyah,* but its importance as an expression of Ibn al-ʿArabī's mystical thought in its most mature form cannot be overemphasized. (T.I.)

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Ibn al-Ashʿath, in full ʿABD AR-RAḤMĀN IBN MUḤAMMAD IBN AL-ASHʿATH (d. 704), Umayyad general who became celebrated as leader of a revolt (AD 699–701) against the governor of Iraq, al-Ḥajjāj.

A member of the noble tribe of Kindah of the old aristocracy, Ibn al-Ashʿath was at first friendly toward the Umayyad authorities but then began to smart under the governance of the plebeian administrators. Styling himself Nāṣir al-mu'minīm (Helper of the Believers) in opposition to the Umayyad and other "bad" Muslims, he slowly became so estranged from al-Ḥajjāj that a clash of wills led to open revolt.

In 699 al-Ḥajjāj dispatched a crack force of Kūfans and Basrans, known as the Peacock Army, to put down a rebellion in Kābulistān (in present Afghanistan). After an initial invasion of Kābulistān, Ibn al-Ashʿath, the commanding general, decided to wait until spring before continuing his campaign. Al-Ḥajjāj pressed for immediate action, and the dispute led to a revolt by Ibn al-Ashʿath and his troops.

Ibn al-Ashʿath moved slowly westward into Iraq, gathering support from both Arabs and non-Arabs along the way and engaging in two battles, one a victory and one a mild setback, forcing him to withdraw from Basra to Kūfah.

Al-Ḥajjāj, having received in the meantime a steady stream of Syrian reinforcements from the caliph ʿAbd al-Malik ibn Marwān, confronted Ibn al-Ashʿath's superior army of 200,000 at Dayr al-Jamājim, outside Kūfah. Negotiations were initiated by the caliph's agents, who offered the rebels the dismissal of al-Ḥajjāj, equal pay with their Syrian counterparts, and a governorship for Ibn al-Ashʿath. The Iraqis, however, rejected the proposals and were defeated in battle in September 701. The last of the rebellion was finally put down in October, when al-Ḥajjāj destroyed the Iraqi army in a violent battle at Maskin, on the Shaṭṭ ad-Dujaylah. The defeated Iraqis fled to Sijistān, eventually surrendering to the Syrians, while Ibn al-Ashʿath took refuge in Kābul; he either was murdered or committed suicide in 704.

Ibn al-Athīr, in full ABŪ AL-ḤASAN ʿALĪ ʿIZZ AD-DĪN IBN AL-ATHĪR (b. May 12, 1160, Jazīrat Ibn ʿUmar, Jazira, Emp. of the Caliphate—d. 1233, Mosul), influential Arab historian.

Ibn al-Athīr spent a scholarly life in Mosul, but often visited Baghdad. He was for a time with Saladin's army in Syria and later lived in Aleppo and Damascus. His chief work was a history of the world, *al-Kāmil fī at-tārīkh* ("The Complete History"), starting with the creation of Adam. Long a standard work, this history has been criticized in the 20th century for being somewhat derivative. He also wrote a history of the atabegs (former Seljuq army officers who founded dynasties) of Mosul called *al-Bāhir,* which was drawn from his own experience and from that of his father, who held office under the Zangids of Mosul. Among his other works were compilations of biographical and genealogical material of earlier authors.

Ibn al-Athīr's older brother, Majd ad-Dīn ibn al-Athīr (1149–1210), who worked in Mosul for its ruler and was a scholar of note, made a collection of the sayings and acts of the Prophet Muḥammad and a dictionary of obscure terms in Ḥadīth (accounts of Muḥammad and his followers) collections. The youngest brother, Ḍiyāʾ ad-Dīn ibn al-Athīr (1163–1239), was a noted author and literary critic who worked for Saladin and became vizier to Saladin's son, al-Malik al-Afḍal.

Ibn al-ʿAwwām (fl. second half of 12th century, at Seville), agriculturist who wrote the Arabic treatise on agriculture, *Kitāb al-filāḥah,* the outstanding medieval work on the subject. The Spanish translation, published in the early 1800s, consists of 35 chapters dealing with agronomy, cattle and poultry raising, and beekeeping. It deals with 585 plants; explains the cultivation of more than 50 fruit trees; and includes many valuable observations on soils, manures, plant grafting, and plant diseases. Much of the material was derived from Greek and Arabic literature, especially from the treatise on Nabatean agriculture of Ibn Waḥshiyah, but Ibn al-ʿAwwām made many additions to the accumulated knowledge and experience of his Moorish contemporaries.

Ibn al-Bawwāb, in full ABŪ AL-ḤASAN ʿALĪ IBN HILĀL IBN AL-BAWWĀB, also called IBN AS-SITRĪ (b. late 10th century, Iraq—d. 1022 or 1031, Baghdad), Arabic calligrapher of the ʿAbbāsid Age (750–1258) who reputedly invented the cursive *rayḥānī* and *muḥaqqaq* scripts. He refined several of the calligraphic styles invented a century earlier by Ibn Muqlah, including the *naskhī* and *tawqī* scripts, and collected and preserved for his students numerous original manuscripts of that master.

Ibn al-Bawwāb was from a poor family: the name he is known by means literally "son of the doorkeeper." Nevertheless, he received a thorough education in law and is said to have known the Qurʾān by heart. Ibn al-Bawwāb's interest in calligraphy was inspired by Muḥammad ibn Asad and was developed under Muḥammad ibn Samsamānī, both of whom were students of Ibn Muqlah. Altogether, Ibn al-Bawwāb reputedly produced 64 copies of the Qurʾān by hand. One of the most beautiful in the *rayḥānī* script is in the Laleli Mosque in Istanbul, a gift of the Ottoman Sultan Selim I (1470–1512). Ibn al-Bawwāb was recognized as a master in his own time; his school of calligraphy lasted until Baghdad fell to the Mongol invaders more than two centuries after his death.

Ibn al-Fāriḍ, in full SHARAF AD-DĪN ABŪ ḤAFṢ ʿUMAR IBN AL-FĀRIḌ (b. March 22, 1181 or March 11, 1182, Cairo—d. Jan. 23, 1235, Cairo), Arab poet whose expression of Ṣūfī mysticism is regarded as the finest in the Arabic language.

Son of a Syrian-born inheritance-law functionary, Ibn al-Fāriḍ studied for a legal career but abandoned law for a solitary religious life in the Muqaṭṭam hills near Cairo. He spent some years in or near Mecca, where he met the renowned Ṣūfī as-Suhrawardī of Baghdad. Venerated as a saint during his lifetime, Ibn al-Fāriḍ was buried in the Muqaṭṭam hills, where his tomb is still visited.

Many of Ibn al-Fāriḍ's poems are *qaṣīdah*s ("odes") on the lover's longing for reunion with his beloved. He expresses through this convention his yearning for a return to Mecca and, at a deeper level, a desire to be assimilated into the spirit of Muḥammad, first projection of the Godhead. He developed this theme at length in *Naẓm as-sulūk* (Eng. trans. by A.J. Arberry, *The Poem of the Way,* 1952). Almost equally famous is his "Khamrīyah" ("Wine Ode"; Eng. trans., with other poems, in Reynold Alleyne Nicholson's *Studies in Islamic Mysticism* [1921] and in *The Mystical Poems of Ibn al-Fāriḍ,* translated by A.J. Arberry [1956]). This long *qaṣīdah* describes the effects of the wine of divine love. Although Ibn al-Fāriḍ's poetry is mannered in style, with rhetorical embellishments and conventional imagery, his poems contain passages of striking beauty and deep religious feeling.

Ibn al-ʿIbrī (medieval Syrian scholar): *see* Bar Hebraeus.

Ibn al-Jawzī, in full ʿABD AR-RAḤMĀN IBN ʿALĪ IBN MUḤAMMAD ABŪ AL-FARASH IBN AL-JAWZĪ (b. 1126, Baghdad—d. 1200, Baghdad), jurist, theologian, historian, preacher, and teacher who became an important figure in the Baghdad establishment and a leading spokesman of traditionalist Islām.

Ibn al-Jawzī received a traditional religious education, and, upon the completion of his studies, he chose a teaching career, becoming by 1161 the master of two religious colleges. A fervent adherent of Ḥanbalī doctrine (one of the four schools of Islāmic law), he was a noted preacher whose sermons were conservative in viewpoint and supported the religious policies of the Baghdad ruling establishment. In return he was favoured by the caliphs, and by 1178/79 he had become the master of five colleges and the leading Ḥanbalī spokesman of Baghdad.

In the decade 1170–80, he attained the height of his power. Becoming a semi-official inquisitor, he constantly searched for doctrinal heresies. He attacked and instigated persecutions against those who he felt had deviated from strict traditionalist Islām. He was particularly critical of Ṣūfīs (Muslim mystics) and of theologians who practiced Shīʿī Islām (one of the two major branches of Islām). His zeal antagonized many liberal theologians. His power within the Baghdad establishment owed a great deal to his excellent relations with successive caliphs and their advisers. The arrest in 1194 of Ibn Yūnus, his old friend and patron, marked the end of Ibn al-Jawzī's career and his close links with governmental circles. In that year he was arrested and exiled to the city of Wāsiṭ. He was partially rehabilitated on the eve of his death and allowed to return to Baghdad.

Ibn al-Jawzī's scholarly works reflected his adherence to Ḥanbalī doctrine. Much of his work was of a hagiographical and polemical nature. Of particular interest was his *Ṣifat aṣ-Ṣafwah* ("Attributes of Mysticism"), an extensive history of mysticism, which argued that the true mystics were those who modelled their lives on the Companions of the Prophet.

Ibn an-Nafīs, in full ʿALĀʾAD-DĪN ABŪ AL-ʿALĀʾ ʿALĪ IBN ABĪ AL-ḤARAM AL-QURAYSHĪ AD-DIMASHQĪ IBN AN-NAFĪS (d. 1288), Arab physician who first described the pulmonary circulation of the blood. In finding that the wall between the right and left ventricles of the heart is solid and without pores, he disputed Galen's view that the blood passes directly from the right to the left side of the heart. Ibn an-Nafīs correctly stated that the blood must pass from the right ventricle to the left ventricle by way of the lungs. But the significance of his statement remained unheeded, and, in fact, was probably unknown by physicians in western countries. It was only in the 20th century that his work was brought to light. Ibn an-Nafīs studied in Damascus under the physician ad-Dakhwār and went to Egypt to take charge of the Nāṣirī Hospital in Cairo. He wrote treatises on eye diseases and diet and commentaries on medical writings of Hippocrates, Avicenna, and Ḥunayn ibn Isḥāq.

Ibn ʿAqīl, in full ABŪ AL-WAFĀʾ ʿALĪ IBN ʿAQĪL IBN MUḤAMMAD IBN ʿAQĪL IBN AḤMAD AL-BAGHDĀDĪ AZ-ẒAFARĪ (b. 1040, Baghdad—d. 1119), Islāmic theologian and scholar of the Ḥanbalī school, the most traditionalist of the schools of Islāmic law. His thoughts and teachings represent an attempt to give a somewhat more liberal direction to Ḥanbalism.

In 1055–66 Ibn ʿAqīl received instruction in Islāmic law according to the tenets of the Ḥanbalī school. During these years, however, he also became interested in liberal theological ideas that were regarded as reprehensible by his orthodox Ḥanbalī teachers. These ideas represented two diverse trends within Islāmic thought—that of the Muʿtazilites, those who sought to understand and interpret religion according to the canons of logical inquiry and reason, and that of the teachings of the mystic al-Ḥallāj, especially his concept of *waḥdat ash-shuhūd* (unity of phenomena), a doctrine that attempted to accommodate the idea of unity (*tawḥīd*) of Ṣūfism (Islāmic mysticism) and the orthodox theologians' concern with the revealed law (*sharʿ*).

Ibn ʿAqīl's attraction to these ideas weakened his standing in the conservative Ḥanbalī community of Baghdad. He aroused further animosity when in 1066, at the relatively young age of 26, he attained a professorship at the important mosque of al-Manṣūr, at least partly as a result of patronage. The professional jealousy of those theologians who had been passed over, coupled with his espousal of innovative and controversial doctrines, led to Ibn ʿAqīl's persecution. After the death of his influential patron, Abū Manṣūr ibn Yūsuf, in 1067 or 1068, he was forced to retire from his teaching position. Until 1072 he lived in partial retirement under the protection of Abū Manṣūr's son-in-law, a wealthy Ḥanbalī merchant. The controversy over his ideas came to an end in September 1072, when he was forced to retract his beliefs publicly before a group of orthodox theologians. This retraction may have been based on expediency and was in keeping with the recognized practice of *taqīyah* (precautionary dissimulation).

Ibn ʿAqīl spent the rest of his life in the pursuit of scholarship. His most famous work was the *Kitāb al-funūn* ("Book of Sciences"), an encyclopaedia of knowledge dealing with a large variety of subjects. This work was said to have included between 200 and 800 volumes, all but one of which have been lost.

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Ibn as-Sitrī: *see* Ibn al-Bawwāb.

Ibn Bābawayh, also spelled IBN BABŪYĀ, in full ABŪ JAʿFAR MUḤAMMAD IBN ABŪ AL-ḤASAN ʿALĪ IBN ḤUSAYN IBN MŪSĀ AL-QUMMĪ, also called AṢ-ṢADŪQ (b. *c.* 923, Khorāsān province, Iran—d. 991, Rayy), Islāmic theologian, author of one of the "Four Books" that are the basic authorities for the doctrine of Twelver (Ithnā ʿAshārī) Shīʿah.

Little is known about Ibn Bābawayh's life. According to legend he was born as the result of special prayers to the *mahdī* (the expected one). In 966 he left Khorāsān for Baghdad, possibly attracted by the Shīʿī inclination of the Būyid dynasty that ruled there. Within a short time he was recognized as the spokesman and leading intellectual figure of Twelver Shīʿah.

More than 200 separate works have been attributed to Ibn Bābawayh, although only a few are now extant. His *Risālat al-ʿitiqādāt* (*Shīʿite Creed,* 1942) is important for the study of the doctrinal development of Shīʿah. His works are still widely used wherever Twelver Shīʿī are found.

Ibn Babūyā (Muslim theologian): *see* Ibn Bābawayh.

Ibn Bājjah (Arab philosopher): *see* Avempace.

Ibn Baṭṭūṭah, in full ABŪ ʿABD ALLĀH MUḤAMMAD IBN ʿABD ALLĀH AL-LAWĀTĪ AṬ-ṬANJĪ IBN BAṬṬŪṬAH (b. Feb. 24, 1304, Tangier, Morocco—d. 1368/69, Mor.), the greatest medieval Arab traveller and the author of one of the most famous travel books, the *Riḥlah* (*Travels*), which describes his extensive travels covering some 75,000 miles (more than 120,000 km) in trips to almost all the Muslim countries and to regions as far as China and Sumatra.

Life and travels. Ibn Baṭṭūṭah was from a family that produced a number of Muslim judges (*qāḍīs*). He received the traditional juristic and literary education in his native town of Tangier. In 1325, at the age of 21, he started his travels by undertaking the pilgrimage to Mecca. At first his purpose was to fulfill this religious duty and to broaden his education by studying under famous scholars in the Near East (Egypt, Syria, and Hejaz). That he achieved his objectives is corroborated by long enumerations of scholars and Ṣūfī (Islāmic mystic) saints whom he met and also by a list of diplomas conferred upon him (mainly in Damascus). These studies qualified him for judicial office, whereas the claim of being a former pupil of the then-outstanding authorities in traditional Islāmic sciences greatly enhanced his chances and made him thereafter a respected guest at many courts.

But this was to follow later. In Egypt, where he arrived by the land route via Tunis and Tripoli, an irresistible passion for travel was born in his soul, and he decided to visit as many parts of the world as possible, setting as a rule "never to travel any road a second time." His contemporaries travelled for practical reasons (such as trade, pilgrimage, and education), but Ibn Baṭṭūṭah did it for its own sake, for the joy of learning about new countries and new peoples. He made a living of it, benefitting at the beginning from his scholarly status and later from his increasing fame as a traveller. He enjoyed the generosity and benevolence of numerous sultans, rulers, governors, and high dignitaries in the countries he visited, thus securing an income that enabled him to continue his wanderings.

From Cairo, Ibn Baṭṭūṭah set out via Upper Egypt to the Red Sea but then returned and visited Syria, there joining a caravan for Mecca. Having finished the pilgrimage in 1326, he crossed the Arabian Desert to Iraq, southern Iran, Azerbaijan, and Baghdad. There he met the last of the Mongol khans of Iran, Abū Saʿīd (1316–36), and some lesser rulers. Ibn Baṭṭūṭah spent the years between 1327 and 1330 in Mecca and Medina leading the quiet life of a devotee, but such a long stay did not suit his temperament.

Embarking on a boat in Jidda, he sailed with a retinue of followers down both shores of the Red Sea to Yemen, crossed it by land, and set sail again from Aden. This time he navigated along the eastern African coast, visiting the trading city-states as far as Kilwa (modern Tanzania). His return journey took him to southern Arabia, Oman, Hormuz, southern Persia, and across the Persian Gulf back to Mecca in 1332.

There a new, ambitious plan matured in his mind. Hearing of the sultan of Delhi, Muḥammad ibn Tughluq (1325–51), and his fabulous generosity to Muslim scholars, he decided to try his luck at his court. Forced by lack of communications to choose a more indirect route, Ibn Baṭṭūṭah turned northward, again passed Egypt and Syria, and boarded ship for Asia Minor in Latakia. He crisscrossed this "land of the Turks" in many directions at a time when Anatolia was divided into numerous petty sultanates. Thus, his narrative provides a valuable source for the history of this country between the end of the Seljuq power and the rise of the House of Ottoman. Ibn Baṭṭūṭah was received cordially and generously by all the local rulers and heads of religious brotherhoods (*ākhīs*).

His journey continued across the Black Sea to the Crimea, then to the northern Caucasus and to Saray on the lower Volga, capital of the khan of the Golden Horde, Muḥammad Özbeg (1312–41). According to his narrative, he undertook an excursion from Saray to Bulgary on the upper Volga and Kama, but there are reasons to doubt his veracity on this point. On the other hand, the narrative of his visit to Constantinople in the retinue of the Khan's wife, a Byzantine princess, seems to be an eyewitness record, although there are some minor chronological discrepancies. Ibn Baṭṭūṭah's description of the Byzantine capital is vivid and, in general, accurate. Although he shared the strong opinions of his fellow Muslims toward unbelievers, his account of the "second Rome" shows him as a rather tolerant man with a lively curiosity. Nevertheless, he always felt happier in the realm of Islām than in non-Muslim lands, whether Christian, Hindu, or pagan.

After his return from Constantinople through the Russian steppes, he continued his journey in the general direction of India. From Saray he travelled with a caravan to Central Asia, visiting the ancient towns of Bukhara, Samarkand, and Balkh, all of these still showing the scars left by the Mongol invasion. He took rather complicated routes through Khorāsān and Afghanistan, and, after crossing the Hindu Kush (mountains), he arrived at the frontiers of India on the Indus River on Sept. 12, 1333, by his own dating. The accuracy of this date is doubtful, as it would have been impossible to cover such enormous distances (from Mecca) in the course of only one year. Because of this discrepancy, his subsequent dating until 1348 is highly uncertain.

At this time he was already a man of some importance and fame, with a large train of attendants and followers and also with his own harem of legal wives and concubines. India and its ruler, Muḥammad ibn Tughluq, lived up to Ibn Baṭṭūṭah's expectations of wealth and generosity, and the traveller was received with honours and gifts and later appointed grand *qāḍī* of Delhi, a sinecure that he held for several years.

Though he had apparently attained an easy life, it soon became clear that his new position was not without danger. Sultan Muḥammad, an extraordinary mixture of generosity and cruelty, held sway over the greater part of India with an iron hand that fell indiscriminately upon high and low, Muslim and Hindu alike. Ibn Baṭṭūṭah witnessed all the glories and setbacks of the Sultan and his rule, fearing daily for his life as he saw many friends fall victim to the suspicious despot. His portrait of Muḥammad is an unusually fine piece of psychological insight and mirrors faithfully the author's mixed feelings of terror and sympathy. Notwithstanding all his precautions, Ibn Baṭṭūṭah at last fell into disgrace, and only good fortune saved his life; gaining favour again, he was appointed the Sultan's envoy to the Chinese emperor in 1342.

He left Delhi without regrets, but his journey was full of other dangers: not far away from Delhi his party was waylaid by Hindu insurgents, and the traveller barely escaped with his life. On the Malabar Coast he became involved in local wars and was finally shipwrecked near Calicut, losing all his property and the presents for the Chinese emperor. Fearing the wrath of the Sultan, Ibn Baṭṭūṭah chose to go to the Maldive Islands, where he spent nearly two years; as a *qāḍī,* he was soon active in politics, married into the ruling family, and apparently even aspired to become sultan.

Finding the situation too dangerous, he set out for Ceylon, where he visited the ruler as well as the famous Adam's Peak. After a new shipwreck on the Coromandel Coast, of eastern India, he took part in a war led by his brother-in-law and went again to the Maldives and then to Bengal and Assam. At this time he decided to resume his mission to China and sailed for Sumatra. There he was given a new ship by the Muslim sultan and started for China; his description of his itinerary contains some discrepancies.

He landed at the great Chinese port Zaytūn (identified as Ch'üan-chou near Amoy) and then travelled on inland waterways as far as Peking and back. This part of his narrative is rather brief, and the itinerary, as well as the chronology, presents many problems and difficulties, not yet surmounted, that cast shadows of doubt on his veracity.

Equally brief is his account of the return voyage via Sumatra, Malabar, and the Persian Gulf to Baghdad and Syria. In Syria he witnessed the ravages of the Black Death of 1348, visited again many towns there and in Egypt, and in the same year performed his final pilgrimage to Mecca. At last he decided to return home, sailing from Alexandria to Tunisia, then to Sardinia and Algiers, finally reaching Fès, the capital of the Mārinid sultan, Abū 'Inān, in November 1349.

But there still remained two Muslim countries not yet known to him. Shortly after his return he went to the kingdom of Granada, the last remnant of Moorish Spain, and two years later (in 1352) he set out on a journey to the western Sudan. His last journey (across the Sahara to West Africa) was taken unwillingly at the command of the Sultan. Crossing the Sahara, he spent a year in the Empire of Mali, then at the height of its power under Mansa Sulaymān; his account represents one of the most important sources of that period for the history of that part of Africa.

Toward the end of 1353 Ibn Baṭṭūṭah returned to Morocco and, at the Sultan's request, dictated his reminiscences to a writer, Ibn Juzayy (died 1355), who embellished the simple prose of Ibn Baṭṭūṭah with an ornate style and fragments of poetry. After that he passes from sight, and it is known only that he died in 1368 or 1369, holding the office of *qāḍī* in a town in Morocco, and that he was buried at his native town of Tangier.

Assessment. The claim of Ibn Baṭṭūṭah to be "the traveller of Islām" is well-founded: it is estimated that the extent of his wanderings was 75,000 miles, a figure hardly surpassed by anyone before the age of steam. He visited, with few exceptions (central Persia, Armenia, and Georgia), all Muslim countries, as well as many adjacent non-Muslim lands. While he did not discover new or unknown lands, and his contribution to scientific geography was minimal, the documentary value of his work has given it lasting historical and geographical significance. He met at least 60 rulers and a much greater number of viziers, governors, and other dignitaries; in his book he mentioned more than 2,000 persons who were known to him personally or whose tombs he visited. The majority of these persons are identifiable by independent sources, and there are surprisingly few errors in names or dates in Ibn Baṭṭūṭah's material.

His *Riḥlah*, as his book is commonly known, is an important document shedding light on many aspects of the social, cultural, and political history of a great part of the Muslim world. A curious observer interested in the ways of life in various countries, he describes his experiences with a human approach rarely encountered in official historiography. His accounts of his travels in Asia Minor, East and West Africa, the Maldives, and India form a major source for the histories of these areas, whereas the parts dealing with the Arab and Persian Near East are valuable for their wealth of detail on various aspects of social and cultural life.

On the whole, Ibn Baṭṭūṭah is reliable; only his alleged journey to Bulgary was proved to be invented, and there are some doubts concerning the Far Eastern part of his travels. A few grave and several minor discrepancies in the chronology of his travels are due more to lapses in his memory than to intentional fabrication. A number of formerly uncertain points (*e.g.*, travels in Asia Minor and the visit to Constantinople) have been cleared away by recent research and the discovery of new corroborative sources.

Another interesting aspect of the *Riḥlah* is the gradual revealing of the character of Ibn Baṭṭūṭah himself; in the course of the narrative the reader may learn the opinions and reactions of an average middle-class Muslim of the 14th century. He was deeply rooted in orthodox Islām but, like many of his contemporaries, oscillated between the pursuit of its legislative formalism and an adherence to the mystic path and succeeded in combining both. He did not offer any profound philosophy but accepted life as it came to him, leaving to posterity a true picture of himself and his times. (I.Hr.)

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ibn Daud, Abraham ben David Halevi, also called RABAD I (b. *c.* 1110, Toledo, Castile—d. *c.* 1180, Toledo), physician and historian who was the first Jewish philosopher to draw on Aristotle's writings in a systematic fashion. He is probably more esteemed today for his history *Sefer ha-kabbala* ("Book of Tradition") than for his major philosophic work, *Sefer ha-emuna ha-rama* ("Book of Sublime Faith"), extant only in Hebrew and German translations.

Ibn Daud wrote the former work in answer to an attack on rabbinic authority by the Karaites, a heretical Jewish sect that considered only Scripture as authoritative, not the Jewish Oral Law as embodied in the Talmud, the rabbinic compendium of law, lore, and commentary. Thus, he attempted to demonstrate the unbroken chain of rabbinic tradition from Moses, providing much valuable information about contemporary Spanish Jewry, their synagogues, and their religious practices.

Deriving his Aristotelianism from the 11th-century physician and philosopher Avicenna and other Islāmic writers, Ibn Daud intended the *Emuna ha-rama* as a solution to the problem of free will. Divided into three sections dealing with physics and metaphysics, religion, and ethics, the *Emuna ha-rama* was eclipsed by the more precise Aristotelian writings of the 12th-century rabbi Maimonides.

Ibn Durayd, in full ABŪ BAKR MUḤAMMAD IBN AL-ḤASAN AL-AZDĪ IBN DURAYD (b. 837/838, Basra, Iraq—d. Aug. 13, 933, Baghdad), Arab philologist who wrote a large Arabic dictionary, *Jamharat al-lughah* ("Collection of Language").

Ibn Durayd traced his descent to an Arab tribe of Oman, and in 871, to avoid the Zanj (black African) slave rebellion, during which Basra was sacked, he moved to Oman. He stayed there more than a decade. After returning to Basra and later living in Fārs (southwestern Iran), Ibn Durayd settled in Baghdad in 920. He was given a pension there by the 'Abbāsid caliph al-Muqtadir. The anthologist Abū al-Faraj al-Iṣbahānī was his student at this time.

Ibn Durayd's dictionary was written in Fārs and was inspired in part by the earlier dictionary *Kitāb al-'ayn* of the grammarian al-Khalīl. Words are listed alphabetically in *Jamharat al-lughah,* but all permutations of the root letters are given together. Among Ibn Durayd's other works are *Kitāb al-ishtiqāq* ("Book of Derivation"), on the etymology of Arab names, and *al-Malāḥin* ("Ambiguities of Speech"), a book of ambivalent words for the use of persons forced to swear. Ibn Durayd was also a gifted poet.

ibn Ezra, Abraham ben Meir (b. 1092/93, Tudela, Emirate of Saragossa—d. 1167, Calahorra, Spain), poet, grammarian, traveller, Neoplatonic philosopher, and astronomer, best known as a biblical exegete whose commentaries contributed to the Golden Age of Spanish Judaism.

As a young man, he lived in Muslim Spain. Not much is known about his early life. He was on friendly terms with the eminent poet and philosopher Judah ha-Levi, and he travelled to North Africa and possibly to Egypt. Primarily known as a scholar and poet up to that point, in about 1140 Ibn Ezra began a lifelong series of wanderings throughout Europe, in the course of which he produced distinguished works of biblical exegesis and disseminated biblical lore.

His biblical commentaries include expositions of the Book of Job, the Book of Daniel, Psalms, and, most importantly, a work produced in his old age, a commentary on the Pentateuch, the five books of Moses. Although his exegeses are basically philological, he inserted enough philosophical remarks to reveal himself to be a Neoplatonic pantheist. At the same time, he believed that God gave form to uncreated, eternal matter, a concept somewhat at odds with his Neoplatonic emanations doctrine. Ibn Ezra, in his departure from orthodox biblical interpretation (although he extolled such orthodoxy), is sometimes held to be a precursor of the great 17th-century philosopher Spinoza. His commentary on the Pentateuch is sometimes ranked with the classic 11th-century commentaries by Rashi on the Talmud, the rabbinic compendium of law, lore, and commentary.

Ibn Ezra also translated the Hispano-Hebrew grammarians who had written in Arabic and wrote grammatical treatises. He also had a good knowledge of astronomy and cast horoscopes, and he believed in numerological mysticism as well.

ibn Ezra, Moses (ben Jacob ha-Sallaḥ) (b. *c.* 1060, Granada, Spain—d. *c.* 1139), Hebrew poet and critic, one of the finest poets of the golden age of Spanish Jewry (900–1200). He was one of the first Jewish poets to write secular verse; his surname, "ha-Sallaḥ" (Hebrew: Writer of Penitential Poems), however, was bestowed because of his penitential prayers (*seliḥot*).

Known in Arabic as Abū Hārūn Mūsā, he belonged to a prominent Hispano-Hebrew family (his three brothers were eminent scholars) and was related to the poet and biblical interpreter Abraham ibn Ezra. He fell deeply in love with a niece, the daughter of one of his older brothers, and she requited his love. His brother, however, refused his suit, giving her hand to a younger brother. This episode affected Ibn Ezra deeply, not only estranging him from his brothers and driving him from

Granada but also influencing his subsequent poetry.

Both his sacred and his secular poetry are generally considered to be unsurpassed in mastery of the Hebrew language and poetic structure and style. Much of his secular poetry is found in the cycle *Tarshish.* In it, he celebrates love, the pleasures of wine, and the beauty of birdsong and bemoans faithlessness and the onset of old age.

His later works were mostly penitential prayers of an introspective, melancholy cast; many of them are included in the liturgy of the Sefardim (Jews of Spanish or Portuguese descent) for the New Year and the Day of Atonement. He also wrote a moving elegy when his former love died in childbirth.

Ibn Ezra wrote, in Arabic, an important treatise on the poetic art, *Kitāb al-muḥāḍarah wa al-mudhākarah* ("Conversations and Recollections"; translated into Hebrew as *Shirat Yisra'el,* or "Song of Israel," in 1924 by B. Halper). Dealing with Arabic, Castilian, and Jewish poetry, the work is an important Spanish literary history.

Also in Arabic, Ibn Ezra wrote a philosophical treatise, sections of which were translated into Hebrew as *'Arugat ha-bosem* ("The Bed of Spices"). It deals with such problems as the attributes of God and the microcosmic nature of man and is largely a compilation of the thoughts of other philosophers.

Ibn Falaquera, in full SHEMTOB BEN JOSEPH IBN FALAQUERA, Falaquera also spelled PALQUERA (b. *c.* 1225—d. *c.* 1295), Spanish-born Jewish philosopher and translator who propagated a reconciliation between Jewish Orthodoxy and philosophy and defended Maimonides' *Guide of the Perplexed* against the attacks of the traditionalists.

His numerous works include *Dialogue Between a Philosopher and a Man of Piety;* an ethical treatise known as *The Balm of Sorrow;* an introduction to the study of the sciences entitled *Reshit ḥokhma* ("The Beginning of Wisdom"), which reproduces al-Farabi's *Aims of the Philosophy of Plato and Aristotle* and which was translated into Latin at the end of the 15th century; *Sefer ha-ma'alot* ("Book of Degrees"), which advocates the Neoplatonic ideal of the contemplative life; a commentary on Maimonides' *Guide* under the title *More ha-more* ("Guide of the Guide"); and an abstract of Ibn Gabirol's influential *Fons vitae* in Hebrew.

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Ibn Gabirol, in full SOLOMON BEN YEHUDA IBN GABIROL, Arabic ABŪ AYYŪB SULAYMĀN IBN YAḤYĀ IBN GABIRŪT, Latin AVICEBRON, or AVENCEBROL (b. *c.* 1022, Málaga, Caliphate of Córdoba—d. *c.* 1070, Valencia, Kingdom of Valencia), one of the outstanding figures of the Hebrew school of religious and secular poetry during the Jewish Golden Age in Moorish Spain. He was also an important Neoplatonic philosopher.

Early life and career. Born in Málaga about 1022, Ibn Gabirol received his higher education in Saragossa, where he joined the learned circle of other Cordoban refugees established there around famed scholars and the influential courtier Yekutiel ibn Ḥasan. Protected by this patron, whom Ibn Gabirol immortalized in poems of loving praise, the 16-year-old poet became famous for his religious hymns in masterly Hebrew. The customary language of Andalusian literature had been Arabic, and Hebrew had only recently been revived as a means of expression for Jewish poets. At 16 he could rightly boast of being world famous:

> . . . My song is a crown for kings
> and mitres on the heads of governors.
> My body walks upon the earth,
> while my spirit ascends to the clouds.
> Behold me: at sixteen my heart
> like that of a man of eighty is wise.

He made, however, the mistake of lampooning Samuel ha-Nagid, a rising Jewish statesman and vizier in the Berber kingdom of Granada, who was also a talented poet, Talmudist, strategist, and model writer of letters. After making poetical amends, Ibn Gabirol seems to have been admitted to the favour of this vizier, whose main court encomiast he subsequently became.

This happened while the poet was involved (on the Saragossan side) in the disproportionate strife between the grammarians of Saragossa and those of Granada concerning Hebrew linguistics. Being an emancipated Cordoban, he offended the orthodox with heresies such as recommending childlessness, denunciation of the "world," Neoplatonism, and an almost insane self-aggrandizement (coupled with the use of animal epithets for his opponents). He apparently had to flee from Saragossa; the circumstances leading to his departure are described in his "Song of Strife":

> Sitting among everybody crooked and foolish
> his [the poet's] heart only was wise.
> The one slakes you with adder's poison,
> the other, flattering, tries to confuse your head.
> One, setting you a trap in his design
> will address you: "Please, my lord."
> A people whose fathers I would despise
> to be dogs for my sheep . . . .

His "Song of Strife" and other poems show that his being a synagogal poet did not protect him against the hatred of his co-religionists in Saragossa, who called him a Greek because of his secular leanings.

Against all warnings by his patron Yekutiel, Ibn Gabirol concentrated on Neoplatonic philosophy, after having composed a non-offensive collection of proverbs in Arabic, *Mukhtār al-jawāhir* ("Choice of Pearls"), and a more original, though dated, ethical treatise (based on contemporary theories of the human temperaments), also in Arabic, *Kitāb iṣlāḥ al-akhlāq* ("The Improvement of the Moral Qualities"). The latter contains chapters on pride, meekness, modesty, and impudence, which are linked with the sense of sight; and on love, hate, compassion, and cruelty, linked with hearing and other senses.

In need of a new patron after the execution of Yekutiel in 1039 by those who had murdered his king and taken over power, Ibn Gabirol secured a position as a court poet with Samuel ha-Nagid, who, becoming the leading statesman of Granada, was in need of the poet's prestige. Ibn Gabirol composed widely resounding poems with a messianic tinge for Samuel and for Jehoseph (Yūsuf), his son and later successor in the vizierate of Granada. All other biographical data about Ibn Gabirol except his place of death, Valencia, must be extrapolated from his poetry.

Poetry. The Jewish subculture of Moorish Andalusia (southern Spain) was engendered by the cultural "pressure" of the Arab peers. Ibn Gabirol's dual education, typical for the Jewish intelligentsia in the larger cities, must have encompassed both the entire Hebrew literary heritage—the Bible, Talmud, and other rabbinic writings and, in particular, Hebrew linguistics—and the Arabic, including the Qur'ān, Arabic secular and religious poetry and poetics, and the philosophical, philological, and possibly medical literature.

His poetry, like that of the entire contemporary Hebrew school, is modelled after the Arabic. Metrics, rhyme systems, and most of the highly developed imagery follow the Arabic school, but the biblical language adds a particular tinge. Many of Ibn Gabirol's poems show the influence of the knightly Arab bard al-Mutanabbī and the pessimistic Abū al-'Alā' al-Ma'arrī.

His secular topics included exaggerated, Arab-inspired self-praise, justified by the fame of the child prodigy; love poems (renouncing yet keenly articulate); praise of his noble and learned protectors, together with scathingly satirical reproach of others; dirges (the most moving of which are linked with the execution of the innocent Yekutiel); wine songs (sometimes libertine); spring and rain poems; flower portraits; the agonizingly realistic description of a skin ailment; and a long didactic poem on Hebrew grammar. Ibn Gabirol's long poetic description of a castle led to the discovery of the origins of the first Alhambra palace, built by the above-mentioned Jehoseph. Of a very rich production, about 200 secular poems and even more religious ones were preserved, though no collection of his poems survived. Many manuscript fragments of the former came to light only recently, preserved in synagogue attics by his co-religionists' respect for the Hebrew letter. Many of his religious poems were included in Jewish prayer books throughout the world.

His religious poems, in particular the poignant short prayers composed for the individual, presuppose the high degree of literacy typical of Moorish Spain, and they, too, show Arabic incentive. His famed rhymed prose poem "Keter malkhut" ("The Crown of the Kingdom"), a meditation stating the measurements of the spheres of the universe, jolts the reader into the abject feeling of his smallness but, subsequently, builds him up by a proclamation of the divine grace.

The following morning meditation exemplifies his religious poetry:

> See me at dawn, my Rock;
> my Shelter, when my plight
> I state before Thy face
> likewise again at night,
> Outpouring anguished thought—
> that Thou behold'st my heart
> and what it contemplates
> I realise in fright.
> Low though the value be
> of mind's and lip's tribute
> to Thee (accomplishes aught
> my spirit with its might?).
> Most cherish'st Thou the hymn
> we sing before Thee. Thus,
> while Thou support'st my breath,
> I praise Thee in Thine height.
> Amen.

Philosophy. His *Fountain of Life,* in five treatises, is preserved in toto only in the Latin translation, *Fons vitae,* with the author's name appearing as Avicebron or Avencebrol; it was re-identified as Ibn Gabirol's work by Salomon Munk in 1846. It had little influence upon Jewish philosophy other than on León Hebreo (Judah Abrabanel) and Benedict de Spinoza, but it inspired the Kabbalists, the adherents of Jewish esoteric mysticism. Its influence upon Christian Scholasticism was marked, although it was attacked by St. Thomas Aquinas for equating concepts with realities. Grounded in Plotinus and other Neoplatonic writers yet also in Aristotelian logic and metaphysics, Ibn Gabirol developed a system in which he introduced the conception of a divine will, like the Logos (or divine "word") of Philo. It is an essential unity of creativity of and with God, mutually related like sun and sunlight, which mediates actively between the transcendent deity and the cosmos that God created out of nothingness (to be understood as the potentiality for creation). Matter emanates directly from the deity as a prime matter that supports all substances and even the "intelligent" substances, the sphere-moving powers and angels. This concept was accepted by the Franciscan school of Scholastics but rejected by the Dominicans, including St. Thomas,

for whom form (and only one, not many) and not matter is the creative principle. Since matter, according to Aristotle and Plotinus, "yearns for formation" and, thus, moving toward the nearness of God, causes the rotation of the spheres, the finest matter of the highest spheres is propelled by the strongest "yearning," which issues from God and returns to him and is active in man (akin to the last line of Dante's *Divine Comedy:* "The love which moves the sun and the other stars").

Yet, the dry treatise does not betray the passionate quest of the Neoplatonist author. A philosophical poem, beginning "That man's love," reveals the human intent. Therein, a disciple asks the poet-philosopher what importance the world could have for the deity (to be understood in Aristotelian terms as a deity that only contemplates its own perfection). The poet answers that all of existence is permeated, though to different degrees, by the yearning of matter toward formation, and he declares that this yearning may give God the "glory" that the heavens proclaim, as the Bible teaches. (F.P.B.)

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ibn Ḥayyān, Jābir (alchemist): *see* Jābir ibn Ḥayyān, Abū Mūsā.

Ibn Ḥazm, in full ABŪ MUḤAMMAD ʿALĪ IBN AḤMAD IBN SAʿĪD IBN ḤAZM (b. Nov. 7, 994, Córdoba, Caliphate of Córdoba—d. Aug. 15, 1064, Manta Līsham, near Seville), Muslim litterateur, historian, jurist, and theologian of Islāmic Spain, famed for his literary productivity, breadth of learning, and mastery of the Arabic language. One of the leading exponents of the Ẓāhirī (literalist) school of jurisprudence, he produced some 400 works, covering jurisprudence, logic, history, ethics, comparative religion, and theology, and *The Ring of the Dove,* on the art of love.

Life. Ibn Ḥazm was born into a notable family that claimed descent from a Persian client of Yazīd, the brother of Muʿāwiyah, the first of the Umayyad dynasty rulers in Syria. Muslim families of Iberian (Spanish) background commonly adopted genealogies that identified them with the Arabs; scholars therefore tend to favour evidence suggesting that Ibn Ḥazm was a member of a family of Iberian Christian background from Manta Līsham (west of Seville). Ḥazm, his great-grandfather, probably converted to the Islāmic faith, and his grandfather Saʿīd moved to Córdoba, the capital of the caliphate. Aḥmad, his father, a devout and learned man, held a high position under al-Manṣūr and his successor, al-Muẓaffar, a father and son who ruled efficiently in the name of the caliph Hishām II. Living in the circles of the ruling hierarchy provided Ibn Ḥazm, an eager and observant student, with excellent educational opportunities. Experiences in the surroundings of the harem made an indelible impression upon him.

Circumstances for Ibn Ḥazm changed drastically upon the death of al-Muẓaffar in AD 1008, when the stability that the Umayyads had provided for more than two and one-half centuries collapsed. A bloody civil war ensued and continued until 1031, when the caliphate was abolished and a large number of petty states replaced any semblance of a centralized political structure. The family was uprooted, and Aḥmad died in 1012; Ibn Ḥazm continued to boldly and persistently support Umayyad claimants to the office of caliph, for which he was frequently imprisoned.

By 1031 he began to express his convictions and activistic inclinations through literary activity, becoming a very controversial figure. With the exception of a short stay on the island of Majorca, he apparently spent most of his time on the family estate in Manta Līsham. According to one of his sons, he produced some 80,000 pages of writing, comprising about 400 works. Less than 40 of these works are still extant.

Literary activities. The varied character of his literary activity covers an impressive range of jurisprudence, logic, history, ethics, comparative religion, and theology. His appreciation of the resources of the Arabic language and his skillful use of poetry and prose are evident in all his works. One delightful example is *The Ring of the Dove* (*Ṭawq al-ḥamāmah*), on the art of love. Probably best known for his work in jurisprudence and theology, for which the basic qualification was a thorough knowledge of the Qurʾān (the Islāmic scripture) and Ḥadīth (Tradition), he became one of the leading exponents of the Ẓāhirī school of jurisprudence. The Ẓāhirī principle of legal theory relies exclusively on the literal (*ẓāhir*) meaning of the Qurʾān and Tradition. Though his legal theories never won him many followers, he creatively extended the Ẓāhirī principle to the field of theology. He made a comparative study on the religious pluralism of his day, which is among the earliest of such studies and is highly regarded for its careful historical detail.

An activist by nature with a deep sense of the reality of God, Ibn Ḥazm lived very much in the political and intellectual world of his times; in spite of his activism, however, he was very much a nonconformist and a loner. He conversed and debated with the leading contemporaries of his area, to whom he exhibited an insatiable thirst for knowledge as well as uncompromising convictions. Most observant, careful in analysis, meticulous in detail, and devoted to the clarity of his positions, he demanded the same of others. According to a saying of the period, the tongue of Ibn Ḥazm was a twin brother to the sword of al-Ḥajjaj, a famous 7th-century general and governor of Iraq. He attacked, in his writings, deceit, distortion, and inconsistency; but at the same time Ibn Ḥazm exhibited a sensitive spirit and expressed profound insights about the dimensions of human relationships.

He was shunned and defamed for his political and theological views. When some of his writings were burned in public, he said that no such act could deprive him of their content. Although attacks against him continued after his death, various influential defenders appeared. Though he apparently was easy to despise, Ibn Ḥazm could hardly be ignored. He was frequently and effectively quoted, so much so that the phrase "Ibn Ḥazm said" became proverbial. (J.W.F.)

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Ibn Isḥāq, in full MUḤAMMAD IBN ISḤĀQ IBN YASĀR IBN KHIYĀR (b. *c.* 704, Medina, Arabia—d. 767, Baghdad), Arab biographer of the Prophet Muḥammad whose book, in a recension by Ibn Hishām, is one of the most important sources on the Prophet's life.

Ibn Isḥāq was the grandson of an Arab prisoner captured by Muslim troops in Iraq and brought to Medina, where he was freed after accepting Islām. Ibn Isḥāq's father and two uncles collected and transmitted information about the Prophet in Medina, and Ibn Isḥāq soon became an authority on the Prophet's campaigns.

He studied in Alexandria and subsequently moved to Iraq, where he lived in the Jazīrah and Ḥīrah regions, and finally in Baghdad. Informants met on these travels furnished him with much of the information for his *Sīrah,* or life, of Muḥammad. Ibn Hishām, who died some 60 years after Ibn Isḥāq, made the revision through which it is known today (complete Eng. trans. by A. Guillaume, *The Life of Muḥammad,* 1955, and partial trans. by Edward Rehatsek as edited by Michael Edwardes, *The Life of Muhammad Apostle of Allah,* 1964). This extensive biography covers Muḥammad's genealogy and birth, the beginning of his mission and of the revelation of the Qurʾān, his migration to Medina and campaigns of conquest, and concludes with his death. Citations from the *Sīrah* also appear in the works of Arabic historians such as aṭ-Ṭabarī.

Ibn Isḥāq was criticized by some Muslim scholars, including the theologian and jurist Mālik ibn Anas. Ibn Ḥanbal accepted Ibn Isḥāq as an authority for the campaigns but not for traditions about the Prophet having legal force, on the grounds that he was not always exact enough in naming his authorities.

Ibn Janāḥ, also called IBN JONAH, ABU AL-WALĪD MARWĀN, bynames RABBI JONAH and RABBI MARINUS (b. *c.* 990, Córdoba—d. *c.* 1050, Zaragoza, Spain), perhaps the most important medieval Hebrew grammarian and lexicographer. Known as the founder of the study of Hebrew syntax, he established the rules of biblical exegesis and clarified many difficult passages.

Trained as a physician, Ibn Janāḥ practiced medicine, but, out of profound religious conviction, he also devoted much time to the scientific investigation of Hebrew so as to place biblical exegesis on a firm linguistic basis. His first work, *al-Mustalha* ("The Complement"), like his other works, was written in Arabic. It was a criticism of and a supplement to the verb studies of Judah ben David Ḥayyuj, the founder of scientific Hebrew grammar.

The critical aspect of Ibn Janāḥ's study embroiled him in a long and bitter dispute with the partisans of Ḥayyuj. Though his polemics against them have been lost, their substance has been preserved in his principal work, *Kitāb at-tanqiḥ* ("Book of Exact Investigation"). In the first of its two parts, *Kitāb al-luma* ("Book of the Many-Coloured Flower Beds"), Ibn Janāḥ dealt in large measure with grammar proper and included discussions of parts

of speech and prefixes and provided a detailed outline of noun declensions. Particularly important was the section on syntax, which has scarcely been surpassed.

The second part of the *Tanqiḥ, Kiṭāb al-uṣūl* ("Book of the Roots"), is a Hebrew lexicon in which Ibn Janāḥ showed the nuances of word roots and illustrated them with examples. He made extensive comparisons of Hebrew and Arabic and thereby managed to clarify the meaning of many words. His comments facilitated the exegesis of many abstruse biblical passages, and the origin of various corrections by modern textual critics can be found in his work.

Ibn Jubayr, in full ABŪ AL-ḤUSAYN MUḤAMMAD IBN AḤMAD IBN JUBAYR (b. 1145, Valencia, Emirate of Balansiya [Valencia]—d. Nov. 29, 1217, Alexandria), Spanish Muslim known for a book recounting his pilgrimage to Mecca.

The son of a civil servant, Ibn Jubayr became secretary to the Almohad governor of Granada, but he left that post for his pilgrimage, which was begun in 1183 and ended with his return to Granada in 1185. He wrote a lively account of this journey, *Riḥlah* (Eng. trans. by R.J.C. Broadhurst, *The Travels of Ibn Jubayr,* 1952; French trans. by Maurice Gaudefroy-Demombynes, *Voyages,* 1949–56).

It is a valuable source for the history of the time, containing memorable descriptions of his voyages across the Mediterranean in Genoese ships, his unhappy encounters with both Christian and Muslim customs collectors, the Cairo of Saladin, his trip up the Nile to Upper Egypt, and across the Red Sea to Jidda, Mecca, and Medina, and of his return by way of Iraq, Syria, and Sicily. Ibn Jubayr journeyed east twice more without recording his travels. The second trip lasted from 1189 to 1191; the third, begun in 1217, was ended by his death in Egypt.

Ibn Kathīr, in full ʿIMĀD AD-DĪN ISMĀʿĪL IBN ʿUMAR IBN KATHĪR (b. *c.* 1300, Bursa, Byzantine Empire—d. February 1373, Damascus), Muslim theologian and historian who became one of the leading intellectual figures of 14th-century Syria.

Ibn Kathīr was educated in Damascus and upon completion of his studies obtained his first official appointment in 1341, when he joined an inquisitorial commission formed to determine certain questions of heresy. Thereafter he received various semi-official appointments, culminating in June/July 1366 with a professorial position at the Great Mosque of Damascus.

As a scholar, Ibn Kathīr is best remembered for his 14-volume history of Islām, *al-Bidāyah wa an-nihāyah* ("The Beginning and the End"), a work that utilized nearly all the available sources and formed the basis of a number of writings by later historians. Ibn Kathīr was also a noted student of Ḥadīth (the transmitted chain of sayings traced back to the Prophet Muḥammad); his *Kitāb al-jāmiʿ* is an alphabetical listing of the Companions of the Prophet and the sayings that each transmitted, thus reconstructing the chain of authority for each *ḥadīth.*

ibn Kemal Paşa, Şemseddin Ahmet ibn Süleyman: *see* Kemalpaşazâde.

Ibn Khaldūn, in full WALĪ AL-DĪN ʿABD AR-RAḤMĀN IBN MUḤAMMAD IBN MUḤAMMAD IBN ABĪ BAKR MUḤAMMAD IBN AL-ḤASAN IBN KHALDŪN (b. May 27, 1332, Tunis—d. March 17, 1406, Cairo), the greatest Arab historian, who developed one of the earliest nonreligious philosophies of history, contained in his masterpiece, the *Muqaddimah* ("Introduction to History"). He also wrote a definitive history of Muslim North Africa.

Background and early life. Ibn Khaldūn was born in Tunis in 1332; the Khaldūnīyah quarter in Tunis still stands almost unchanged and, in it, the house where he is believed to have been born.

As Ibn Khaldūn relates in his autobiography (*at-Taʿrīf bi-Ibn Khaldūn*), the family claimed descent from Khaldūn, who was of South Arabian stock, came to Spain in the early years of the Arab conquest, and settled in Carmona. The family subsequently moved to Seville, played an important part in the civil wars of the 9th century, and was long reckoned among the three leading houses of that city. In the course of the next four centuries, the Ibn Khaldūns successively held high administrative and political posts under the Umayyad, Almoravid, and Almohad dynasties; other members of the family served in the army, and several were killed at the Battle of az-Zallāqah (1086), which temporarily halted the Christian reconquest of Spain. But the respite thus won proved short, and in 1248, just before the fall of Seville and Córdoba, the Ibn Khaldūns and many of their countrymen judged it prudent to cross the Straits of Gibraltar and landed at Sabtah (now Ceuta, a Spanish exclave), on the northern coast of Morocco.

There the refugees from Spain were of a much higher level of socio-economic status than the local North Africans, and the family was soon called to occupy the leading administrative posts in Tunis. The historian's father also became an administrator and soldier but soon abandoned his career to devote himself to the study of theology, law, and letters. In Ibn Khaldūn's words:

> He was outstanding in his knowledge of Arabic and had an understanding of poetry in its different forms and I can well remember how the men of letters sought his opinion in matters of dispute and submitted their works to him.

In 1349, however, the Black Death struck Tunis and took away both his father and his mother.

Education and diplomatic career. Ibn Khaldūn gives a detailed account of his education, listing the main books he read and describing the life and works of his teachers. He memorized the Qurʾān, studied its principal commentaries, gained a good grounding in Muslim law, familiarized himself with the masterpieces of Arabic literature, and acquired a clear and forceful style and a capacity for writing fluent verse that was to serve him well in later life when addressing eulogistic or supplicatory poems to various rulers. Striking by their absence are books on philosophy, history, geography, or other social sciences; this does not mean that he did not study these subjects—scholars know that he wrote summaries of several books by the 12th-century Arab philosopher Averroës—but it is to be presumed that Ibn Khaldūn acquired most of his very impressive knowledge in these fields after he had completed his formal education.

This came at the age of 20, when he was given a post at the court of Tunis, followed three years later by a secretaryship to the Sultan of Morocco in Fez. By then he was married. After two years of service, however, he was suspected of participation in a rebellion and was imprisoned. Released after nearly two years and promoted by a new ruler, he again fell into disfavour, decided to leave Morocco, and crossed over to Granada, for whose Muslim ruler he had done some service in Fez and whose prime minister, the brilliant writer Ibn al-Khaṭīb, was a good friend. Ibn Khaldūn was then 32 years old.

The following year he was sent to Seville to conclude a peace treaty with Pedro I the Cruel of Castile. There he saw "the monuments of my ancestors." Pedro "treated me with the utmost generosity, expressed his satisfaction at my presence and showed awareness of the preeminence of our ancestors in Seville." Pedro even offered him a post in his service, promising to restore his ancestral estates, but Ibn Khaldūn politely declined. He gladly accepted the village that the Sultan of Granada bestowed on him, however, and, feeling once more secure, brought over his family, which he had left in safety in Constantine. But, to quote him once more, "enemies and intriguers" turned the all-powerful prime minister, Ibn al-Khaṭīb, against him and raised suspicions regarding his loyalty; it can be conjectured that the task of these enemies must have been greatly facilitated by the apparent jealousy between the two most brilliant Arab intellectuals of the age. Once more, Ibn Khaldūn found it necessary to take his leave, and he returned to Africa. The following 10 years saw him change employers and employment with disconcerting rapidity and move from Bejaïa (Bougie) to Tilimsān (Tlemcen), Biskra, Fez, and once more to Granada, where he made an unsuccessful effort to save his old rival and friend, Ibn al-Khaṭīb, from being killed by order of its ruler.

During this period Ibn Khaldūn served as prime minister and in several other administrative capacities, led a punitive expedition, was robbed and stripped by nomads, and spent some time "studying and teaching." This extreme mobility is partly explained by the instability of the times. The Almohad Empire, which had embraced the whole of North Africa and Muslim Spain, had broken down in the middle of the 13th century, and the convulsive process from which Morocco, Algeria, and Tunisia were subsequently to emerge was under way; wars, rebellions, and intrigues were endemic, and no man's life or employment was secure. But in Ibn Khaldūn's case two additional factors might be suspected—a certain restlessness and a capacity to make enemies, which may account for his constant complaints about the "intriguers" who turned his employers against him.

The Muqaddimah: Ibn Khaldūn's philosophy of history. In 1375, craving solitude from the exhausting business of politics, Ibn Khaldūn took the most momentous step of his life: he sought refuge with the tribe of Awlād ʿArīf, who lodged him and his family in the safety of a castle, Qalʿat ibn Salāmah, near what is now the town of Frenda, Alg. There he spent four years, "free from all preoccupations," and wrote his massive masterpiece, the *Muqaddimah* (an introduction to history). His original intention, which he subsequently achieved, was to write a universal history of the Arabs and Berbers, but before doing so he judged it necessary to discuss historical method, with the aim of providing the criteria necessary for distinguishing historical truth from error. This led him to formulate what the 20th-century English historian Arnold Toynbee has described as "a philosophy of history which is undoubtedly the greatest work of its kind that has ever yet been created by any mind in any time or place," a statement that goes even beyond the earlier eulogy by Robert Flint:

> As a theorist on history he had no equal in any age or country until Vico appeared, more than three hundred years later. Plato, Aristotle and Augustine were not his peers . . . .

But Ibn Khaldūn went even further. His study of the nature of society and social change led him to evolve what he clearly saw was a new science, which he called *ʿilm al-ʿumrān* ("the science of culture") and which he defined thus:

> This science . . . has its own subject, viz., human society, and its own problems, viz., the social transformations that succeed each other in the nature of society.

Indeed it is not too much to claim, as did a contemporary Arab scholar, Sāṭiʿ al-Ḥuṣrī, that in Book I of the *Muqaddimah,* Ibn Khal-

dūn sketches a general sociology; in Books II and III, a sociology of politics; in Book IV, a sociology of urban life; in Book V, a sociology of economics; and in Book VI, a sociology of knowledge. The work is studded with brilliant observations on historiography, economics, politics, and education. It is held together by his central concept of *ʿaṣabīyah,* or "social cohesion." It is this cohesion, which arises spontaneously in tribes and other small kinship groups, but which can be intensified and enlarged by a religious ideology, that provides the motive force that carries ruling groups to power. Its inevitable weakening, due to a complex combination of psychological, sociological, economic, and political factors, which Ibn Khaldūn analyzes with consummate skill, heralds the decline of a dynasty or empire and prepares the way for a new one, based on a group bound by a stronger cohesive force.

It is difficult to overstress Ibn Khaldūn's amazing originality. Muhsin Mahdi, a contemporary Iraqi-American scholar, has shown how much his approach and fundamental concepts owe to classical Islāmic theology and philosophy, especially Averroism. And, of course, he drew liberally on the historical information accumulated by his predecessors and was doubtless influenced by their judgments. But nothing in these sources or, indeed, in any known Greek or Latin author can explain his deep insight into social phenomena, his firm grasp of the links binding the innumerable and apparently unrelated events that constitute the process of historical and social change.

One last point should be made regarding his basic philosophy of history. Clearly, for Ibn Khaldūn, history was an endless cycle of flowering and decay, with no evolution or progress except for that from primitive to civilized society. But, in brief descriptions of his own age, which have not received as much attention as they deserve, he showed that he could both visualize the existence of sharp turning points in history and recognize that he was witnessing one of them: "When there is a general change of conditions . . . as if it were a new and repeated creation, a world brought into existence anew." The main cause he gives for this great change is the Black Death, with its profound effect on Muslim society, but he was fully aware of the impact of the Mongol invasions, and he may also have been impressed by the development of Europe, the merchants and ships of which thronged the seaports of North Africa and some of the soldiers of which served as mercenaries in the Muslim armies.

Journey to Egypt. During his stay in Qalʿat ibn Salāmah, Ibn Khaldūn not only completed the first draft of the *Muqaddimah* but he also wrote part of his massive history, *Kitab al-ʿibar,* a work that is not of such universal significance but which does constitute the best single source on the history of Muslim North Africa. Such a task, however, required frequent reference to other books and archives; this, together perhaps with nostalgia for the more active world of politics, drew him back to city life. A severe illness finally convinced him to leave his refuge; he secured permission to return to Tunis, where he "engaged exclusively in scholarly work," completing much of his history. But once more he aroused both the jealousy of a prominent scholar and the suspicion of the ruler, and in 1382, at the age of 50, he received permission to sail to Egypt, ostensibly for the purpose of performing the pilgrimage to Mecca.

After 40 days he landed in Alexandria and shortly afterward was in Cairo, then, as now, by far the largest and most opulent city in the Arab world. Its impact on him was profound: "I saw the metropolis of the ear, the garden of the world, the gathering place of the nations . . . the palace of Islām, the seat of dominion . . . ." His curiosity about Cairo was evidently of long duration, for he quotes the replies several eminent North Africans had made to his enquiries on their return from that city, including: "He who has not seen it does not know the power of Islām."

Within a few days "scholars thronged on me, seeking profit in spite of the scarcity of merchandise [!] and would not accept my excuses, so I started teaching at al-Azhar," the famous Islāmic university. Shortly afterward, the new Mamlūk ruler of Egypt, Barqūq, with whom he was to remain on good terms except for one or two brief periods of misunderstanding, appointed him to a professorship of jurisprudence at the Quamḥīyah college and, within five months, made him chief judge of the Mālikī rite, one of the four recognized rites of Sunnī Islām. Barqūq also successfully interceded with the ruler of Tunis to allow Ibn Khaldūn's family to rejoin him, but the ship carrying them foundered in the port of Alexandria, drowning all on board.

Later years. Ibn Khaldūn took his judicial duties quite seriously; he claimed to have been guided in his judgments solely by the merits of each case and attempted to reform the numerous abuses that had developed in the administration of justice. He must have struck the tolerant and easy-going Egyptians as somewhat dour and puritanical, and his own opinion is recorded by one of his students: "These Egyptians behave as though the Day of Judgement would never come!" At any rate, "trouble gathered against me from every quarter and darkened the atmosphere between me and the rulers"; he was dismissed and served again as chief judge only for one year, toward the end of his life. But he was given another professorship—he pointed out that endowed chairs were plentiful in Cairo—and spent his time teaching, writing, and revising his *Muqaddimah.* He was also able to perform the pilgrimage to Mecca, sailing from aṭ-Ṭawr, near Suez, and returning by way of Upper Egypt. Some years later he went to Damascus and the Holy Cities of Palestine, thus further widening his knowledge of the eastern Arab world. It is interesting to note that he visited the tomb of Abraham in Hebron and the Church of the Nativity in Bethlehem, both Abraham and Jesus being honoured prophets, but he refused to enter the Holy Sepulchre, "the site of what they claim to be the Crucifixion," an event that Muslims deny occurred.

Ibn Khaldūn was forced to play a minor part in the palace revolt of 1389, but he apparently did so under duress, and Barqūq seems to have borne him no grudge. Otherwise, one gets the impression of a ripe, wise, and respected scholar, surrounded by admirers, sought out by visitors, peacefully enjoying the calm pleasures of old age. He had every reason to expect this state of affairs to continue, but fate had reserved for him one more encounter, the most dramatic of all.

Rescue by Timur. In 1400 Timur and his victorious Tatar horde invaded Syria, and the new sultan of Egypt, Faraj, went out to meet them, taking Ibn Khaldūn and other notables with him. Shortly thereafter, the Mamlūk army returned to Egypt, leaving Ibn Khaldūn in besieged Damascus. The situation soon becoming hopeless, the civilian notables of the city started negotiations with Timur, during the course of which he asked to meet Ibn Khaldūn. The latter was thereupon lowered over the city wall by ropes and spent some seven weeks in the Tatar camp, of which he has given a detailed description in his autobiography.

Timur treated him with respect, and the historian used all his accumulated worldly wisdom and courtly flattery to charm the ferocious world conqueror. Probably dreaming of further conquests, Timur asked for a detailed description of North Africa and got not only a short lecture on that subject, on the caliphate, and on *ʿasabīyah* but also an extensive written report. Ibn Khaldūn took advantage of Timur's good mood to secure a safe-conduct for the civilian employees left in Damascus and permission for himself to return to Egypt but not before he witnessed the sack of the city and the burning of its great mosque.

After an exchange of gifts with Timur, he headed southward but was robbed and stripped by a band of Bedouins and only with difficulty made his way to the coast. There a "ship belonging to Ibn Osman, the sultan of Rum, stopped, carrying an ambassador to the sultan of Egypt" and took him to Gaza, establishing his only contact with what was soon to become the dominant power in the Middle East—the Ottoman dynasty. The rest of his journey to Cairo was uneventful, as indeed were the remaining years of his life. He died in 1406 and was buried in the cemetery outside Bāb an-Naṣr, one of Cairo's main gates.

Significance. Just as Ibn Khaldūn had no known predecessors in the history of Muslim thought, so he had no worthy successors. But he did make an impact on his students in Cairo, one of whom, al-Maqrīzī, showed an insight worthy of his master in analyzing the inflation that was rampant in his time and was the author of several voluminous works that cast much light on contemporary social conditions. Indeed, it is perhaps not too fanciful to attribute to Ibn Khaldūn's influence the remarkable revival of historical writing in 15th-century Egypt. Later, several distinguished 16th- and 17th-century Ottoman scholars and statesmen took a keen interest in Ibn Khaldūn's work, and a partial translation of the *Muqaddimah* into Turkish was made in the 18th century. But it was only after the 1860s, when a complete French translation of the *Muqaddimah* appeared, that Ibn Khaldūn found the worldwide audience his incomparable genius deserved. (C.I.)

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Ibn Khallikān, in full SHAMS AD-DĪN ABŪ AL-ʿABBĀS AḤMAD IBN MUḤAMMAD IBN KHALLIKĀN (b. Sept. 22, 1211, Irbil, Iraq—d. Oct. 30, 1282, Damascus), Muslim judge and author of a classic Arabic biographical dictionary. Ibn Khallikān studied in Irbīl, Aleppo, and Damascus.

Ibn Khallikān was an assistant to the chief judge of Egypt until 1261, when he became *qāḍī al-quḍāt* (chief judge) of Damascus. He adhered to the Shāfiʿī branch of Muslim law, and for the first years had deputy judges of the other three main branches. In 1271 he was dismissed. He taught in Cairo until he regained his judgeship and returned to Damascus in 1278.

Ibn Khallikān's fame rests on his biographical dictionary *Wafayāt al-aʿyān wa-anbāʾ abnāʾ az-zamān* ("Deaths of Eminent Men and History of the Sons of the Epoch"; trans. by Baron de Slane, *Ibn Khallikan's Biographical Dictionary,* 1842–74). He began arranging material for it in 1256 and worked on it until 1274, continuing to improve it with marginal notes. He excluded the Prophet Muḥammad, the caliphs, and other subjects about whom adequate information already existed. Ibn Khallikān selected factual material for his biographies with intelligence and scholarship and rounded them out with poetry and anecdotes. His book is a valuable source for his contemporaries and contains excerpts from earlier biographies no longer extant.

Ibn Miskawayh, in full ABŪ ʿALĪ AḤMAD IBN MUḤAMMAD IBN YAʿQŪB IBN MISKAWAYH (b. *c.* 930—d. 1030, Rayy, Iran), Persian scientist, philosopher, and historian whose scholarly works became models for later generations of Islāmic thinkers.

Little is known of Ibn Miskawayh's personal life. It is believed he converted to Islām from Zoroastrianism, the religion of pre-Islāmic Iran. His interests included alchemy and poetry, and some 20 works are attributed to him. His most notable contributions, however, were in ethics and history. His moral treatise *Tahdhīb al-akhlāq,* influenced by the Aristotelian concept of the mean, is considered one of the best statements of Islāmic philosophy. The Islāmic philosopher Naṣīr ad-Dīn Ṭūsī (died 1274) modelled his *Akhlāq Naṣīrī* ("The Naṣīrī Ethics") on the *Tahdhīb al-akhlāq.*

As a historian Ibn Miskawayh is noted for his Persian "nationalist" bias and his conviction that the history of peoples offers moral instruction, as well as his abandonment of legends as a source. His universal history *Kitāb tajarīb al-umam wa ta'aqub al-ḥimam* (7 vol.; Eng. trans. by D.S. Margoliouth, *The Eclipse of the Abbasid Caliphate,* 1921), was noted for its use of all available sources and greatly stimulated the development of Islāmic historiography.

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Ibn Muqlah, in full ABŪ ʿALĪ MUḤAMMAD IBN ʿALĪ IBN MUQLAH (b. 886, Baghdad—d. 940, Baghdad), one of the foremost calligraphers of the ʿAbbāsid Age (750–1258), reputed inventor of the first cursive style of Arabic lettering, the *naskhī* script, which replaced the angular Kūfic as the standard of Islāmic calligraphy. In the *naskhī* script Ibn Muqlah introduced the rounded forms and curved lines that in later styles were refined to give Arabic writing the flowing beauty for which it is renowned. Although *naskhī* was originally intended for use in copying the Qur'ān, by the 11th century it was used widely for royal and common correspondence and as architectural decoration.

Among the other scripts invented by Ibn Muqlah were the *tawqī* and the more elegant *thuluth.* In addition to his calligraphic work, Ibn Muqlah led a colourful political life. He was appointed vizier three times, and three times he lost that office for being involved in political intrigue. The third time, he was sentenced to life in prison, where he died in 940.

ibn Palquera, Shemtob ben Joseph: *see* Ibn Falaquera.

ibn Paquda, Bahya ben Joseph: *see* Bahya ben Joseph ibn Pakuda.

Ibn Qutaybah, in full ABŪ MUḤAMMAD ʿABD ALLĀH IBN MUSLIM AD-DĪNAWARĪ IBN QUTAYBAH (b. 828, al-Kūfah, Iraq—d. 889, Baghdad), writer of *adab* literature—that is, of literature exhibiting wide secular erudition and also of theology, philology, and literary criticism. He introduced an Arabic prose style outstanding for its simplicity and ease, or "modern" flavour.

Little is known of Ibn Qutaybah's life. Of Khorāsānian stock, he was *qāḍī* (religious judge) of Dinawar (*c.* 851–870). From *c.* 871 until his death he taught at Baghdad.

The 14 surviving volumes definitively ascribed to Ibn Qutaybah include the *Kitāb adab al-kātib* ("Secretary's Guide"), a compendium of Arabic usage and vocabulary; *Kitāb al-ʿArab* ("Arab Book"), a defense of Arab rather than Iranian cultural preeminence in the caliphate; *Kitāb al-maʿārif* (Book of Knowledge"), a handbook of history; *Kitāb ash-shiʿr wa ash-shuʿarā'* ("Book of Poetry and Poets"), a chronological anthology of early Arabic poetry, with an introduction that presented Ibn Qutaybah's canons of literary criticism; and *Kitāb ʿuyūn al-akhbar* ("Book of Choice Narratives"), a collection of *adab* studies dealing with the authority of the overlord, the conduct of war, nobility, character, eloquence, and friendship, valued for its wealth of examples from history, poetry, and proverbs.

Ibn Rushd (Islāmic philosopher): *see* Averroës.

Ibn Saʿūd, in full ʿABD AL-ʿAZĪZ IBN ʿABD AR-RAḤMĀN IBN FAYṢAL IBN TURKĪ ʿABD ALLĀH IBN MUḤAMMAD ĀL SAʿŪD (b. *c.* 1880, Riyadh, Arabia—d. Nov. 9, 1953, aṭ-Ṭā'if, Saudi Arabia), tribal and Muslim religious leader who formed the modern state of Saudi Arabia and initiated the exploitation of its oil.

The young leader. The Saʿūds ruled much of Arabia from 1780 to 1880; but, while Ibn Saʿūd was still an infant, his family, driven out



Ibn Saʿūd
Camera Press

by their rivals, the Rashīds, became penniless exiles in Kuwait. In 1901 Ibn Saʿūd, then 21, set out from Kuwait with 40 camelmen in a bold attempt to regain his family's lands.

Reaching their old family capital, Riyadh, the little group slipped into the town by night (January 1902). The Rashīdī governor slept in the castle but came out every morning after dawn. Ibn Saʿūd lay hidden until the governor emerged. Then, rushing forward with his men, he killed him and seized the castle. This exploit roused the former supporters of his dynasty. They rallied to so magnetic a leader, and in two years of raids and skirmishes Ibn Saʿūd reconquered half of central Arabia.

Ibn Rashīd, however, appealed for help to the Turks, who sent troops; Ibn Saʿūd suffered a defeat at their hands on June 15, 1904. But he was not driven from central Arabia and soon reconstituted his forces, the years 1907 to 1912 being passed in desultory fighting. The Turks eventually left, unable to supply their troops.

Role of religion in Ibn Saʿūd's policy. Ibn Saʿūd decided, in the years before World War I, to revive his dynasty's support for Wahhābism, an extremist Muslim puritan revival. Ibn Saʿūd was in fact a devoted puritan Muslim—to him the Qur'ān was literally the word of God, and his life was regulated by it. Yet he was also aware that religious fanaticism could serve his ambition, and he deliberately fostered it, founding a militantly religious tribal organization known as the Ikhwān (Brethren). This fanatical brotherhood encouraged his followers to fight and to massacre their Arab rivals, and it helped him to bring many nomadic tribesmen under more immediate control.

He was able to persuade the religious leaders to declare it a religious duty of all Wahhābīs to abandon nomadism and to build houses at the desert wells. Thus settled, they could more easily be levied into his army. But the scheme was unrealistic: nomads who sold their flocks were often unable to cultivate and were reduced to penury. The destitution of the more fanatical tribes, however, made them more eager to raid, and Ibn Saʿūd was not slow to suggest that they plunder the subjects of Ibn Rashīd.

During World War I Ibn Saʿūd entered into a treaty with the British (December 1915), accepting protectorate status and agreeing to make war against Ibn Rashīd, who was being supported by the Turks. But despite British arms and a subsidy of £5,000 a month from the British government (which continued until 1924) he was inactive until 1920, arguing that his subsidy was insufficient. During 1920–22, however, he marched against Ibn Rashīd and extinguished Rashīdī rule, doubling his own territory but without significantly increasing his meagre revenue.

Ibn Saʿūd now ruled central Arabia except for the Hejaz region along the Red Sea. This was the territory of Sharīf Ḥusayn of Mecca, who had become king of the Hejaz during the war and who declared himself caliph (head of the Muslim community) in 1924. Sharīf Ḥusayn's son ʿAbd Allāh had become ruler of Ṭransjordan in 1921, and another son, Fayṣal, king of Iraq. Ibn Saʿūd, fearing encirclement by this rival dynasty, decided to invade the Hejaz. He was then at the height of his powers; his strong personality and extraordinary charm had won the devotion of all his subjects. A skillful politician, he worked closely with the religious leaders, who always supported him. Relying on the Ikhwān to eliminate his Arab rivals, he sent them to raid his neighbours, then cabled the British, whose imperial interests were involved, that the raid was against his orders. In 1924 the Ikhwān took Mecca, and the Hejaz was added to his dominions.

At this point, there were no more rivals whom Ibn Saʿūd could conquer, for those remaining had treaties with Britain. But the Ikhwān had been taught that all non-Wahhābī Muslims were infidels. When Ibn Saʿūd forbade further raiding, they charged him with treachery, quoting his own words against him. In 1927 they invaded Iraq against his wishes. They were repulsed by British aircraft, but Ibn Saʿūd's authority over them had vanished, and on March 29, 1929, the Ikhwān, the fanatics whom he himself had trained, were crushed by Ibn Saʿūd himself at the Battle of Sibilla.

Foundation of Saudi Arabia. This battle opened a new era; thereafter Ibn Saʿūd's task was government, not conquest. In 1932 he formally unified his domains into the Kingdom of Saudi Arabia. An absolute monarch, he had no regular civil service or professional administrators. All decisions were made by him or by those he personally delegated for a particular task. There was little money, and he himself was not interested in finance. In May 1933 Ibn Saʿūd signed his first agreement with an American oil company. Not until March 1938 did the company strike oil, and work virtually ceased during World War II, so that Ibn Saʿūd was again nearly penniless.

Saudi Arabia took no part in the war, but toward its end the exploitation of oil was resumed. By 1950 Ibn Saʿūd had received a total of about $200,000. Three years later, he was getting some $2,500,000 a week. The effect was disastrous on the country and on Ibn Saʿūd. He had no idea of what to do with all the money, and he watched helplessly the triumph of everything he hated. His austere religious views were offended. The secluded, penurious, hard, but idealistic, life of Arabia was vanishing. Such vast sums of money drew half the swindlers in the Middle East to this puritan religious sanctum. Ibn Saʿūd was unable to cope with financial adventurers. His last years were marked by severe physical and emotional deterioration. He died at aṭ-Ṭā'if in 1953. (J.B.Gl.)

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Ibn Shaddād, in full ABŪ AL-MAḤĀSIN YŪSUF IBN RĀFIʿ IBN SHADDĀD BAHĀʾ AD-DĪN (b. 1145, Mosul, Iraq—d. 1234, Aleppo, Syria), Arab writer and statesman, author of the *Sirat Salāḥ ad-Dīn* ("Life of Saladin"). He was first a teacher at Baghdad and then professor at Mosul.

In 1187, after making the pilgrimage to Mecca, Ibn Shaddād entered the service of Saladin, who was waging war against the Christians in Palestine. Ibn Shaddād sought Saladin's favour by urging him to the vigorous prosecution of this war and presented him with his treatise on the laws and discipline of sacred war. He remained constantly devoted to Saladin and was employed on various embassies and in departments of the civil government, being appointed judge of the army and judge of Jerusalem. After Saladin's death Ibn Shaddād remained the friend of his son Malik aẓ-Ẓāhir, who appointed him judge of Aleppo. There he employed some of his wealth in the foundation of colleges. When Malik aẓ-Ẓāhir died, his son Malik al-ʿAzīz was a minor, and Ibn Shaddād had the chief power in the regency, using it for the patronage of learning. He lived in retirement after the abdication of Malik al-ʿAzīz.

ibn Shem Tov, Joseph ben Shem Tov (b. *c.* 1400—d. *c.* 1460), Jewish philosopher and Castilian court physician who attempted to mediate the disdain shown for philosophy by contemporary Jewish scholars by undertaking a reconciliation of Aristotelian ethical philosophy with Jewish religious thought, best exemplified by his influential *Kevod Elohim* (written 1442; "The Glory of God"). Here he expounded his belief that answers sought through philosophical inquiry can be valuable in one's quest for religious knowledge and that even religious principles should be subjected to such inquiry. Although as a philosopher he advocated intellectual pursuits, Joseph maintained that the immortality of the soul was assured not by intellectual development but by conscientious religious observance. He also upheld the value of mysticism and intuition in the understanding of religious precepts.

Ibn Sīnā (Persian physician): *see* Avicenna.

Ibn Taymīyah, in full TAQĪ AD-DĪN ABŪ AL-ʿABBĀS AḤMAD IBN ʿABD AS-SALĀM IBN ʿABD ALLĀH IBN MUḤAMMAD IBN TAYMĪYAH (b. 1263, Harran, Mesopotamia—d. Sept. 26, 1328, Cairo), one of Islām's most forceful theologians who, as a member of the Pietist school founded by Ibn Ḥanbal, sought the return of the Islāmic religion to its sources: the Qur'ān and the *sunnah*, revealed writing and the prophetic tradition. He is also the source of the Wahhābīyah, a mid-18th-century traditionalist movement of Islām.

Ibn Taymīyah was born in Mesopotamia. Educated in Damascus, where he had been taken in 1268 as a refugee from the Mongol invasion, he later steeped himself in the teachings of the Pietist school. Though he remained faithful throughout his life to that school, of whose doctrines he had an unrivalled mastery, he also acquired an extensive knowledge of contemporary Islāmic sources and disciplines: the Qur'ān (Islāmic scripture), the Ḥadīth (sayings attributed to the Prophet Muḥammad), jurisprudence (*fiqh*), dogmatic theology (*kalām*), philosophy, and Ṣūfī (Islāmic mystical) theology.

His life was marked by persecutions. As early as 1293 Ibn Taymīyah came into conflict with local authorities for protesting a sentence, pronounced under religious law, against a Christian accused of having insulted the Prophet. In 1298 he was accused of anthropomorphism (ascribing human characteristics to God) and for having criticized, contemptuously, the legitimacy of dogmatic theology.

During the great Mongol crisis of the years 1299 to 1303, and especially during the occupation of Damascus, he led the resistance party and denounced the suspect faith of the invaders and their accomplices. During the ensuing years Ibn Taymīyah was engaged in intensive polemic activity: either against the Kasrawān Shīʿah in the Lebanon; the Rifāʿīyah, a Ṣūfī religious brotherhood; or the *ittiḥādīyah* school, which taught that the Creator and the created become one, a school that grew out of the teaching of Ibn al-ʿArabī (died 1240), whose monism he denounced.

In 1306 he was summoned to explain his beliefs to the governor's council, which, although it did not condemn him, sent him to Cairo; there he appeared before a new council on the charge of anthropomorphism and was imprisoned in the citadel for 18 months. Soon after gaining his freedom, he was confined again in 1308 for several months in the prison of the *qāḍī*s (Muslim judges who exercise both civil and religious functions) for having denounced the worship of saints as being against religious law (Sharīʿah).

He was sent to Alexandria under house arrest in 1309, the day after the abdication of the sultan Muḥammad ibn Qalāwūn and the advent of Baybars II al-Jāshnikīr, whom he regarded as a usurper and whose imminent end he predicted. Seven months later, on Ibn Qalāwūn's return, he was able to return to Cairo. But in 1313 he left Cairo once more with the Sultan, on a campaign to recover Damascus, which was again being threatened by the Mongols.

Ibn Taymīyah spent his last 15 years in Damascus. Promoted to the rank of schoolmaster, he gathered around him a circle of disciples from every social class. The most famous of these, Ibn Qayyim al-Jawzīyah (died 1350), was to share in Ibn Taymīyah's renewed persecutions. Accused of supporting a doctrine that would curtail the ease with which a Muslim could traditionally repudiate a wife and thus ease the ill effects of the practice, Ibn Taymīyah was incarcerated on orders from Cairo in the citadel of Damascus from August 1320 to February 1321.

In July 1326 Cairo again ordered him confined to the citadel for having continued his condemnation of saint worship, in spite of the prohibition forbidding him to do so. He died in prison, deprived of his books and writing materials, and was buried in the Ṣūfī cemetery amid a great public gathering. His tomb still exists and is widely venerated.

Ibn Taymīyah left a considerable body of work—often republished in Syria, Egypt, Arabia, and India—that extended and justified his religious and political involvements and was characterized by its rich documentation, sober style, and brilliant polemic. In addition to innumerable *fatwā*s (legal opinions based on religious law) and several professions of faith, the most beautiful of which is the *Wāsiṭīyah,* two works merit particular attention. One is his *As-Siyā-sat ash-sharʿīyah* ("Treatise on Juridical Politics"), available in French and English translations. The other, *Minhāj as-sunnah* ("The Way of Tradition"), is the richest work of comparative theology surviving from medieval Islām.

Ibn Taymīyah desired a return to the sources of the Muslim religion, which he felt had been altered too often, to one extent or another, by the different religious sects or schools. The sources were the Qur'ān and the *sunnah:* revealed writing and the prophetic tradition. The *ijmāʿ*, or community consensus, had no value in itself, he insisted, unless it rested on those two sources. His traditionalism, however, did not prevent Ibn Taymīyah from allowing analogical reasoning (*qiyās*) and the argument of utility (*maṣlaḥah*) a large place in his thought, on the condition that both rested on the objective givens of revelation and tradition. Only such a return to sources, he felt, would permit the divided and disunited Muslim community to refind its unity.

In theodicy (the justification of God as good when evil is observable in the world), Ibn Taymīyah wished to describe God as he is described in the Qur'ān and as the Prophet did in the *sunnah,* which led him to side with theological schools in disagreement with contemporary opinion. This position was the point of departure for a critique, often conducted with very subtle argument, of the ideas of such dogmatic theologians as al-Ashʿarī or Fakhr ad-Dīn ar-Rāzī, such philosophers as Avicenna and Averroës, or such mystics as Ibn al-ʿArabī.

Concerning praxes (practices), Ibn Taymīyah believed that one could only require, in worship, those practices inaugurated by God and his Prophet and that one could only forbid, in social relations, those things forbidden by the Qur'ān and the *sunnah.* Thus, on the one hand, he favoured a revision of the system of religious obligations and a brushing aside of condemnable innovations (*bidʿah*), and, on the other, he constructed an economic ethic that was more flexible on many points than that espoused by the contemporary schools.

In politics Ibn Taymīyah recognized the legitimacy of the first four caliphs, but he rejected the necessity of having a single caliphate and allowed for the existence of many emirates. Within each emirate he demanded that the prince apply the religious law strictly and rely on it for his legal opinion, and Ibn Taymīyah demanded from those under the prince's jurisdiction that they obey the established authority except where it required disobedience to God, every Muslim being required to "will the good and forbid the bad" for the benefit of the common welfare.

Though Ibn Taymīyah had numerous religious and political adversaries in his own time, he has strongly influenced modern Islām for the last two centuries. He is the source of the Wahhābīyah, a strictly traditionist movement founded by Muḥammad ibn ʿAbd al-Wahhāb (died 1792), who took his ideas from Ibn Taymīyah's writings. Ibn Taymīyah also influenced various reform movements that have posed the problem of reformulating traditional ideologies by a return to sources. (H.L.)

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ibn Tibbon, Jacob ben Machir, also called DON PROFIAT (b. *c.* 1236, Marseille—d. *c.* 1312, Montpellier, Fr.), French Jewish physi-

cian, translator, and astronomer whose work was utilized by Copernicus and Dante. He was highly regarded as a physician and served as regent of the faculty of medicine at the University of Montpellier. He was the grandson of the renowned translator Samuel ben Judah ibn Tibbon.

Jacob translated into Hebrew a large number of works, including Arabic versions of Euclid's *Elements* and Ptolemy's encyclopaedic work on astronomy, the *Almagest*. He also translated Arabic works by al-Ghazālī (1058–1111) and Averroës.

As a student of astronomy, Jacob described a quadrant of his own invention. Adapted by mariners, it came to be known as "Quadrans Judaicus." His book on astronomical tables, *Luḥot* ("Tables"), was utilized by Dante in his *Divine Comedy*.

He joined his cousin Judah ben Moses ibn Tibbon, who was a rabbi in Montpellier and also a translator, in actively supporting the followers of Maimonides; the Maimonists interpreted the Bible allegorically and studied science and philosophy.

ibn Tibbon, Judah ben Saul (b. 1120, Granada, Spain—d. *c.* 1190, Marseille), Jewish physician and translator of Jewish Arabic-language works into Hebrew; he was also the progenitor of several generations of important translators.

Persecution of the Jews forced Judah to flee Granada in 1150, and he settled in Lunel, in southern France, where he practiced medicine, according to an account in 1160 by a contemporary traveller, Benjamin of Tudela.

In his Hebrew versions, which became standard, Judah made accessible various classic philosophic works by Arabic-speaking Jews who had frequently utilized the concepts of both Muslim and Greek philosophers. Thus, Judah's translations served to disseminate Arabic and Greek culture in Europe. In addition he often coined Hebrew terms to accommodate the ideas of the authors he was translating. Among his outstanding renditions from Arabic into Hebrew are the following:

1. *Amanat wa-i'tiqadat* of Sa'adia ben Joseph (882–942), a major rabbinic authority, translated as *Sefer ha-emunot we-ha-de'ot* (1186; *Beliefs and Opinions*, 1948). It is a Jewish philosophical classic discussing the relationship between reason and divine revelation.
2. *Al-Hidayah ilā farā'id al-qulūb* of Bahya ben Joseph ibn Pakuda, a rabbinic judge, translated as *Ḥovot ha-levavot* (*Duties of the Heart*, 1925–47). This work, which became a widely read classic of Jewish devotional literature, examines the ethics of a man's acts and the intentions that give the acts meaning.
3. *Sefer ha-Kuzari* ("Book of the Khazar") by the Spanish Hebrew poet Judah ha-Levi (*c.* 1085–*c.* 1141), which recounts in dialogue form the arguments presented before the king of the Khazars by a rabbi, a Christian, a Muslim scholar, and an Aristotelian philosopher, with the subsequent conversion of the king to Judaism.

Judah ben Saul ibn Tibbon also translated the grammar of Abū al-Walīd Marwān ibn Janāḥ (*c.* 990–*c.* 1050), which became a basis for the work of future Hebrew grammarians. In addition, he wrote a well-known ethical will, *Musar Ab* (about 1190; "A Father's Admonition"), to his son Samuel ben Judah ibn Tibbon, who subsequently also became a noteworthy translator.

ibn Tibbon, Moses ben Samuel (b. Marseille, fl. 1240–83), Jewish physician like his father, Samuel ben Judah ibn Tibbon, and his paternal grandfather, Judah ben Saul ibn Tibbon, and an important translator of Arabic-language works into Hebrew. His translations served to disseminate Greek and Arab culture throughout Europe. Besides original works, which included commentaries with an allegorical bias on the Pentateuch, the Song of Songs, and Haggadic passages (those not dealing with Jewish law) in the Talmud, he also translated Arabic-language works by Jews and Arabs dealing with philosophy, mathematics, astronomy, and medicine.

Following the family tradition, he translated from the Arabic a number of works by the medieval Jewish philosopher Maimonides (1135–1204), notably portions of Maimonides' commentary on the Mishna (one of two parts of the Talmud), his treatises on hygiene, poisons, and logic, and his *Sefer ha-mitzwot*, an analysis of the 613 commandments of the Pentateuch.

Among the Arabic writings, Moses translated the commentaries on Aristotle by Averroës (1126–98), a philosopher who later had a marked influence on Christian theologians; a medical digest by the Persian philosopher and physician Avicenna (980–1037); and a philosophical work (known in English as the "Book of Principles") by the Muslim philosopher and Aristotelian disciple al-Fārābī (878–950). Moses also translated Euclid's *Elements*.

ibn Tibbon, Samuel ben Judah (b. *c.* 1150, Lunel, Fr.—d. *c.* 1230, Marseille), Jewish translator and physician whose most significant achievement was an accurate and faithful rendition from the Arabic into Hebrew of Maimonides' classic *Dalālat al-ḥā'irīn* (Hebrew *More nevukhim*; English *The Guide of the Perplexed*).

From his father, Judah ben Saul ibn Tibbon, Samuel received a thorough grounding in medicine, Jewish law and lore, and Arabic. Like his father, Samuel earned his living as a physician; he also travelled extensively in France, Spain, and Egypt.

After corresponding with Maimonides to elucidate difficult passages in the *Guide*, in about 1190 Samuel published his translation. This work, which interprets scripture and rabbinic theology in the light of Aristotelian philosophy, has influenced both Jewish and Christian theologians. In the translating process, he enriched the Hebrew language through the borrowing of Arabic words and the adoption of the Arabic practice of forming verbs from substantives.

He also translated Maimonides' treatise on resurrection and his commentary on *Pirqe avot* ("Sayings of the Fathers"), which appears in the Talmud; in addition, he translated the works of several Arabic commentators on the writings of Aristotle and Galen. Samuel ibn Tibbon was the father of the eminent translator Moses ben Samuel ibn Tibbon.

Ibn Ṭufayl, in full MUḤAMMAD IBN 'ABD AL-MALIK IBN MUḤAMMAD IBN MUḤAMMAD IBN ṬUFAYL AL-QAYSĪ, also called ABŪ BAKR MUḤAMMAD IBN 'ABD AL-MALIK IBN MUḤAMMAD IBN MUḤAMMAD IBN ṬUFAYL AL-QAYSĪ (b. 1109/10, Guádix, Spain—d. 1185/86, Marrakech, Mor.), Moorish philosopher and physician who is known for his *Ḥayy ibn yaqẓan* (*c.* 1175; Eng. trans. by L.E. Goodman, *Ḥayy ibn Yaqẓan by Ibn Ṭufayl*, 1972), a philosophical romance in which he describes the self-education and gradual philosophical development of a man who passes the first 50 years of his life in complete isolation on an uninhabited island. Ibn Ṭufayl also wrote a number of medical treatises in Arabic and served as the court physician and general adviser to the Almohad ruler Abū Ya'qūb Yūsuf from 1163 to 1184.

Ibn Tūmart, in full ABŪ 'ABD ALLĀH MUḤAMMAD IBN TŪMART (b. *c.* 1080, Anti-Atlas Mountains, Mor.—d. August 1130), Berber spiritual and military leader who founded the al-Muwaḥḥidūn confederation in North Africa (*see* Almohads). The doctrine he taught combined a strict conception of the unity of God with a program of juridical and puritanical moral reform, based on a study of the Qur'ān and of tradition.

Ibn Waḥshīyah (fl. *c.* 900), Middle Eastern agriculturist and toxicologist alleged to have written *al-Fillāḥah an-Nabaṭīyah* ("Nabatean Agriculture"), a major treatise dealing with plants, water sources and quality, weather conditions, the causes of deforestation, soils and their improvement, crop cultivation, and other similar subjects. The Arabic text, although not original, having been derived mainly from Greek sources, especially from the *Geoponics*, became a basic resource for later treatments such as that by the Muslim agriculturalist, Ibn al-'Awwām, who flourished in the second half of the 12th century.

Ibn Zuhr, in full ABŪ MARWĀN 'ABD AL-MALIK IBN ABĪ AL-'AʿLA' ZUHR, also called AVENZOAR or ABUMERON (b. *c.* 1090, Seville—d. 1162, Seville), one of medieval Islām's foremost thinkers and the greatest medical clinician of the western caliphate.

An intensely practical man, he disliked medical speculation; for that reason, he opposed the teachings of the Persian master physician Avicenna. In his *at-Taysīrfi al-mudāwāt wa at-tadbīr* ("Practical Manual of Treatments and Diet"), later translated into Hebrew and Latin, he described serious pericarditis (inflammation of the membranous sac surrounding the heart) and mediastinal abscesses (affecting the organs and tissues in the thoracic cavity above the diaphragm, excluding the lungs) and outlined surgical procedures for tracheotomy, excision of cataracts, and removal of kidney stones. He also discussed excessive contraction and dilation of the pupil (miosis and mydriasis) and advocated use of the narcotic plant *Mandragora* for treatment of ocular disease.

A teacher of the prominent Muslim physician Averroës, Ibn Zuhr had great influence on medical practice in Christian Europe.

Ibo (people): *see* Igbo.

ibogaine, hallucinogenic drug and the principal iboga alkaloid, found in the stems, leaves, and especially in the roots of the African shrub *Tabernanthe iboga*. Ibogaine was isolated from the plant in 1901 and was synthesized in 1966. In small doses it acts as a stimulant; in large doses it has been used as a narcotic. In West Africa and the Congo, tribesmen have used iboga extracts or chewed the root of the plant in order to remain calm, but alert, while stalking game.

Chemically, ibogaine is an indole hallucinogen that can block the action of serotonin (the indole amine transmitter of nerve impulses) in brain tissue. Ibogaine occurs as a crystalline solid and is soluble in alcohol and other organic solvents. Ibogaine hydrochloride is a crystalline salt, soluble in alcohol and in water. It was proposed for medical use as an antidepressant, but it was rejected in favour of more practical and less toxic drugs.

İbrahim (b. Nov. 4, 1615, Constantinople—d. Aug. 18, 1648, Constantinople), Ottoman sultan whose unstable character made him prey to the ambitions of his ministers and relatives and to his own self-indulgence; as a consequence, the Ottoman state was weakened by war, misrule, and rebellion during his reign (1640–48).

Early in his reign under the guidance of the able but ambitious grand vizier Kemankeş Kara Mustafa Paşa, İbrahim established peaceful relations with Persia and Austria (1642) and recovered the Sea of Azov hinterland from the Cossacks. After the execution of Kara Mustafa (1644), İbrahim, acting on the advice of his new ministers, sent an expedition to Crete; thus began the long war with Venice (1645–69). Having spent his early life in confinement, Ibrahim was mentally unsta-

ble and came increasingly under the influence of the women of the harem and his court ministers. His eccentricities and extravagance necessitated imposition of new taxes, arousing discontent in Constantinople and the outlying provinces. He was deposed on Aug. 8, 1648, by a Janissary uprising supported by the *'ulamā'* (religious notables), and was executed 10 days later.

Ibrāhīm, Tall (Iraq): *see* Cuthah.

Ibrāhīm al-Ḥāqilānī, Latinized form ABRAHAM ECCHELLENSIS (b. Feb. 18, 1605, Ḥāqil, Syria—d. July 15, 1664, Rome), Maronite Catholic scholar noted for his Arabic translation of books of the Bible.

Ordained a deacon, Ibrāhīm taught Arabic and Syriac first at Pisa, then in Rome, and in 1628 he published a Syriac grammar. In 1640 he began collaborating on the Le Jay Polyglot Bible, publishing the Book of Ruth in Arabic, Syriac, and Latin and III Maccabees in Latin and Arabic. In 1646 he became professor at the Collège de France, Paris, but in 1652 he returned to Rome to work on preparation of the Arabic version of the Bible, published in 1671. Among his Latin translations were a history of the patriarchs of Alexandria (1653) and three books of the *Conics* by the geometrician Apollonius of Perga (1661).

Ibrāhīm ibn ʿAbd Allāh: *see* Burckhardt, Johann Ludwig.

Ibrāhīm Lodī (d. April 21, 1526, Pānīpat, India), last Afghān sultan of Delhi of the Lodī dynasty, a suspicious tyrant who increasingly alienated his nobles during his reign.

The son of Sikandar, Ibrāhīm succeeded to the throne on his father's death (Nov. 21, 1517) and was quickly faced with continuing disputes between the royal family and Afghāni nobles. One noble, Dawlat Khān Lodī, governor of the Punjab, fearing for his own safety, called in the Mughal king of Kābul, Bābur, who advanced toward Delhi and defeated and killed Ibrāhīm in the first battle of Pānīpat. This victory lead to the founding of the Mughal Empire in India.

İbrahim Müteferrika (b. *c.* 1670, Kolozsvár, Transylvania—d. 1745, Constantinople), Ottoman diplomat known for his contributions to the 18th-century reform movement in the Ottoman Empire; he sponsored the introduction of printing into the Turkish domains.

A Hungarian by origin, İbrahim converted to Islām and entered the Ottoman diplomatic service. He took part in negotiations with Austria and Russia and was active in promoting the Ottoman–French alliance (1737–39) against Austria and Russia and Ottoman–Swedish action against Russia.

İbrahim established a printing press in 1727 on which he printed works on language, history, geography, and the natural and physical sciences. In 1731 he wrote a treatise that showed the causes of Ottoman decline, described European forms of government and military organization, and proposed reforms in the Ottoman system.

İbrahim Paşa (b. *c.* 1493, Párga, Greece—d. March 15, 1536, Constantinople), Ottoman grand vizier (1523–36) who played a decisive role in diplomatic and military events during the reign of Süleyman I (1520–66).

İbrahim's first military expedition was to Egypt (1524), where he reestablished order and introduced administrative and fiscal measures that solidified Ottoman authority there. After his Egyptian success, he was appointed commander in chief of the Danubian campaigns of 1526, 1529 (siege of Vienna), and 1532. In 1533, invested with full powers, he represented the Sultan in negotiations with the emperor Charles V over the Hungarian question that established most of Hungary as tributary to the Ottomans and confirmed the extraordinary powers of the Grand Vizier.

In the eastern provinces, İbrahim, as early as 1526, had put down a revolt of the Turkmen tribes in Anatolia (Asia Minor). At the outbreak of war with the Ṣafavids of Iran, as commander of the Ottoman army he occupied Tabriz, Iran, in August 1534. Five months later Baghdad was taken. In Constantinople (January 1536) he conducted preliminary negotiations with the representative of the French king for capitulations (a commercial treaty). Alarmed by his usurpation of the titles of sovereignty and fearing for his own throne, Süleyman had him executed.

Ibrahim Pasha (b. 1789, Kavalla, Rumelia—d. Nov. 10, 1848, Cairo), viceroy (*vali*) of Egypt under Ottoman rule and a general of outstanding ability.

A son, or adopted son, of the famous *vali* Muḥammad ʿAlī, in 1805 he joined his father in Egypt, where he was made governor of Cairo. During 1816–18 he successfully commanded an army against the Wahhabite rebels in Arabia. When the Ottoman sultan Mahmud II asked for Egyptian assistance to crush the Greek revolt, an expedition commanded by Ibrahim landed in Greece in 1824 and subdued the Morea (Peloponnese), but a combined British, French, and Russian squadron eventually compelled the Egyptian force to withdraw.

It was in Syria that Ibrahim and his French chief of staff, O.J.A. Sève (Suleiman Pasha al-Faransawi), won military fame. In 1831–32 Ibrahim led an Egyptian army through Palestine, forced the Bailan Pass, and crossed the Taurus, gaining a final victory at Konya on Dec. 21, 1832. By the Convention of Kütahya, signed on May 4, 1833, Syria and Adana were ceded to Egypt, and Ibrahim became governor general of the two provinces.

Ibrahim's administration was relatively enlightened. At Damascus he created a consultative council of notables and suppressed the feudal regime. But his measures were harshly applied and roused sectarian opposition. Sultan Mahmud resented the Egyptian occupation, and in 1839 an Ottoman army invaded Syria. At Nizip on June 24, Ibrahim won his last and greatest victory; the Ottoman fleet deserted to Egypt. Fearing the disintegration of the Ottoman Empire, the European powers negotiated the Treaty of London in July 1840, by which Muḥammad ʿAlī forfeited Syria and Adana in return for the hereditary rule of Egypt. British naval forces threatened the Egyptians, who evacuated the occupied territories in the winter of 1840–41. By 1848 Muḥammad ʿAlī had become senile, and Ibrahim was appointed viceroy but ruled for only 40 days.

İbrahim Şinasi Efendi: *see* Şinasi, İbrahim.

Ibsen, Henrik (Johan) (b. March 20, 1828, Skien, Nor.—d. May 23, 1906, Kristiania), Norwegian poet and playwright, creator of modern realistic drama. His major works include *Peer Gynt* (1867), *A Doll's House* (1879), *Ghosts* (1881), and *Hedda Gabler* (1890).



Ibsen, 1890

By courtesy of the Teaterhistorisk Museum, Copenhagen

Early years. Ibsen was the second child of a prosperous businessman. In an unfinished autobiographical fragment written in 1881, Ibsen described how as a boy he saw from his window "only buildings, nothing green"—he remembered particularly the church, the pillory, the jail, and the madhouse—and remarked how the many sawmills filled the air all day with a sound like the noise of whining, moaning, shrieking women. When, in the mid-1830s, his father went bankrupt, the Ibsens moved to nearby Venstøp, where they remained for the next eight years. This move away from familiar surroundings, together with the disgrace attached to it, led the already introverted young Ibsen to find comfort in daydreams, in reading, and in his puppet theatre. Impressions and memories from these early years are found in many of his later plays: Skien provided the small-town background of *The League of Youth;* the attic at Venstøp suggested the Ekdals' attic in *The Wild Duck* (published in 1884); and members of his family often served as models for his characters.

Progressive separation and alienation from "home"—his childhood home, his hometown, and his home country—is an obvious pattern in Ibsen's life. At the age of 15, he left Skien behind with the same feelings of release, the same sense of escape, that filled him 20 or so years later when he left Norway to live abroad. Even as an old man nearing 70 and recently returned to Norway, he could still write to a friend: "Up here by the fjords is my native land, but . . . where do I find my homeland?" In 1844 he went to Grimstad—later to form the background of *The Pillars of Society*—where he was apprenticed to a chemist. When he was no more than 18, one of the servant girls in the house where he lived, who was a good 10 years older, bore him an illegitimate child; for 14 years he supported his son, but the incident was kept as one of the darker secrets of his life. In spare hours he studied for his matriculation examination and also found time for writing. His first drama, *Catilina,* was in part inspired by the revolution throughout Europe in 1848 and in part by the Latin texts set for his examination. It created little sensation when it was published, but, as Ibsen himself explained in the preface to the second edition of 1875, it treated a theme he would return to frequently: "the clash of ability and aspiration, of will and possibility, at once the tragedy and the comedy of mankind and of the individual."

In April 1850 he moved to Christiania, the capital, stopping on the way at Skien to take final leave of his family; in Christiania, he lived for 18 rather frugal months. He studied at a crammer's, but he was not wholly successful at his examination in August (he failed in arithmetic, Greek, and oral Latin) so that he never became a fully matriculated student, although he participated in a number of ways in student life. In particular, he contributed to and helped to edit a periodical called *Andhrimner.* On Sept. 26, 1850, the first performance of an Ibsen play took place: *The Burial Mound,* a historical play, strongly nationalistic in style. It was unsuccessful, and for the rest of the year he earned a meagre living by journalism.

Association with the Norwegian theatre. In 1851 he was offered a job with the recently established Norwegian Theatre in Bergen, primarily as "dramatic author," in which capacity he had to write one new play a year to be performed on January 2, the anniversary of the founding of the theatre. Almost imme-

diately, however, he was also drawn into the production of the plays. He was too reserved by temperament ever to be a good producer. A contemporary described him as a quiet, taciturn, withdrawn, and not particularly prepossessing young man who suffered acute embarrassment whenever he had to rebuke or even correct the players:

> A man who found difficulty or reluctance in forming close or intimate or confidential relations with anybody, preferring to walk alone. . . . As he "padded about" back-stage in his peculiar, shapeless and shabby greatcoat, he was respected but he aroused little fellow-feeling.

Ibsen later described his life in the theatre as "a daily abortion." Nevertheless, the experience of these early years—including the study tour he undertook in 1852 of theatres in Denmark and Germany—greatly enriched his later writing. In these years, he had some part in the production of no fewer than 145 different plays. Between 1851 and 1857, five of his own plays were produced in Bergen; some were disasters, none achieved any significant success. In 1856 he became engaged to Suzannah Thoresen, but it was another two years before they could afford to marry; their son and only child, Sigurd, was born on Dec. 23, 1859.

In September 1857 he returned to Christiania to become artistic director of the Norwegian Theatre there. The theatre, never very sound financially, was forced by economic circumstances to include a great deal of farce and vaudeville in its repertory, which gave little scope to an ambitious artist. When in 1862 the theatre finally went bankrupt, Ibsen found a temporary, abysmally paid job as literary adviser to another, the Christiania Theatre. To these disappointments were added many other frustrations—mounting debts, attacks of depression, public indifference and even hostility—which brought him almost to the point of despair. Admittedly, the three dramas he completed in Christiania between 1857 and 1864—*The Vikings at Helgeland, Love's Comedy,* and *The Pretenders*—are on an altogether higher level than anything he had written previously; but, when in 1863 he was awarded a small state grant, he paid what he could of his debts, and in April 1864 he left Norway for Italy. For the next 27 years he lived abroad, mainly in Rome, Dresden, and Munich, and only twice during this time, in 1874 and 1885, did he return to Norway for short visits.

Mature drama. The next few years saw a breakthrough in his career. *Brand* (first performed 1885), first conceived as a narrative poem and then recast as a verse drama, was completed near Rome in the summer of 1865 and published in Copenhagen the following year. It was an immediate artistic and commercial success in Scandinavia. Thereafter he astonished his friends in Rome by the new elegance of his dress, the new cut of his beard, the new dignity of his manner, and even the new firmness of his handwriting. *Brand* was followed in 1867 by *Peer Gynt* (first performed 1876). Both plays are in a sense polemic pieces directed against what Ibsen felt was the narrowness of Norwegian life and the complacency of the Norwegian character.

After nearly four years in Rome, he moved in 1868 to Dresden, where he remained until 1875. After the publication in 1871 of his *Digte* ("Poems"), Ibsen went on to complete his enormous "double" drama in 10 acts, *Emperor and Galilean* (published 1873; first performed 1896), a work based on the career of Julian the Apostate; in following the conflict between paganism and Christianity, the play puts forward the concept of "the third realm," where man may bridge the gap between his passions and his spirit. Although it was generally regarded as one of his weakest plays, Ibsen seems to have considered it his greatest achievement.

In 1875 he moved to Munich, but by late autumn of 1878 he was back in Rome, where—apart from a short period of residence in Munich in 1879–80—he made his home until 1885; between 1885 and 1891 he was again living in Munich. *Pillars of Society,* which appeared in 1877, marks the end of his poetic period and the first of the so-called social satires for which Ibsen became generally known. The play properly established his wider fame in Germany; within two months of its original publication, by February 1878, it was being played at five different theatres in Berlin alone, in three quite different translations. It was followed by *A Doll's House* in 1879, a play that created a major scandal. In it Ibsen exposes the individual's loss of freedom and expression as he conforms to society's conventions by observing how a husband brings about, although unwittingly, his wife's intellectual and financial enslavement. At its London production in 1889, *A Doll's House* touched off the vehement debates about "Ibsenism" that characterized literary controversy in the 1890s.

Ghosts (published 1881)—on its author's admission a more "extreme" play than its two predecessors, although they acted as a kind of introduction or preparation—came to be linked with the establishment of Europe's "independent" theatres: the Freie Bühne in Berlin (1889), the Théâtre-Libre in Paris (1887), and the Independent Theatre in London (1891); the Berlin and London theatres selected *Ghosts* for their opening productions. The play uses the problem of congenital venereal disease as a symbol for the moral diseases inherited from the past that kill the living. The hostile reception given to this play by the Norwegian public and critics (though mild in comparison with the vitriolic comments of the majority of the London press in 1891) can be seen as an inspiration for Ibsen's next three plays: *An Enemy of the People* (1882), *The Wild Duck* (1884), and *Rosmersholm* (1886). All these plays deal with the varying destinies of those who dare, who cannot forbear, or who fear to tell the truth.

Last years. It was Ibsen's habit in the years before his return to Norway in 1891 to spend the summer months away from his residence, usually at his favourite spot of Gossensass (Colle Isarco) in the Tirol. It was there in 1889 that he met both the young Helene Raff from Munich, who became a frequent guest in the Ibsen household, much to the jealous irritation of his wife, and also Emilie Bardach, an 18-year-old Viennese girl, whom he later described as his "May sun in a September life." These relationships with younger, attentive women, the precise significance of which for Ibsen is difficult to define, left their mark both on *Hedda Gabler,* one of his greatest plays, and on *The Master Builder.* In 1891, by now a world-famous author, Ibsen returned to Norway and took up residence in Christiania. In the years that followed, the person probably closest to him was the daughter of one of his friends, Hildur Andersen, who was studying to be a concert pianist; it was with her that he seemed able to discuss his literary plans most freely.

On Oct. 11, 1892, Ibsen's son married Bergliot Bjørnson, daughter of Norway's other great realistic poet and playwright of these years, Bjørnstjerne Bjørnson. Ibsen's attitude toward Bjørnson had for nearly 40 years been a mixture of admiration, envy, contempt, and affection; when the two young people married, Ibsen had a diplomatic illness and did not attend the ceremony.

The shift of emphasis in Ibsen's last plays from *The Lady from the Sea* (1888) onward is clear. *Hedda Gabler* (1890), *The Master Builder* (1892), *Little Eyolf* (1894), and *John Gabriel Borkman* (1896) mark a development away from an expressly social, moralist, or problematical mode of drama to a more psychological, more visionary, and more symbolic style. *When We Dead Awaken* (1899), "a dramatic epilogue" as its author subtitled it, incorporated in the figure of Rubek a final and merciless piece of self-analysis and brought Ibsen's creative career to a close. A stroke in 1900 and another a year later left him an almost helpless invalid; he died in Kristiana (former Christiania) in 1906.

Ibsen was a most meticulous artist; his usual practice in later life was to allot two years to each play, working it out by way of preliminary notes, scenarios, and repeatedly revised draft versions until it reached its final form; these drafts, many of which have survived, not only provide a fascinating account of the genesis of the plays but also uniquely document the nature of dramatic composition.

Assessment. Although honoured (and in some quarters vilified) during his own lifetime as the source of what George Bernard Shaw termed "Ibsenism" (*i.e.,* a critique in dramatic form of contemporary morality), he first achieved recognition as the creator of modern, realistic prose drama. More recent criticism esteems other qualities in his work: his supreme technical mastery, his penetrating psychological insight, his symbolism, and the bleak poetry of his dramatic prose. The more controversial dramas of his later years—works that explore the nature of reality and illusion, what is genuine and what spurious in the individual and in society—contributed much to the development and enrichment of prose drama in general. (J.W.McF.)

MAJOR WORKS. *Plays. Catilina* (1850; *Catiline*); *Kjaempehøjen* (first version 1850, second version 1854; *The Burial Mound*); *Norma, eller en politikers kjaerlighed* (1851; *Norma, or a Politician's Love*); *Sankthansnatten* (1853; *St. John's Night*); *Fru Inger til Østeraad* (1855; *Lady Inger*); *Gildet paa Solhoug* (1856; *The Feast at Solhoug*); *Olaf Liljekrans* (1857); *Haermaendene paa Helgeland* (1858; *The Vikings at Helgeland*); *Kjaerlighedens komedie* (1862; *Love's Comedy*); *Kongsemnerne* (1863; *The Pretenders*); *Brand* (1866); *Peer Gynt* (1867); *De unges forbund* (1869; *The League of Youth*); *Kejser og Galilaeer* (1873; *Emperor and Galilean*); *Samfundets støtter* (1877; *Pillars of Society*); *Et dukkehjem* (1879; *A Doll's House*); *Gengangere* (1881; *Ghosts*); *En folkefiende* (1882; *An Enemy of the People*); *Vildanden* (1884; *The Wild Duck*); *Rosmersholm* (1886); *Fruen fra havet* (1888; *The Lady from the Sea*); *Hedda Gabler* (1890); *Bygmester Solness* (1892; *The Master Builder*); *Lille Eyolf* (1894; *Little Eyolf*); *John Gabriel Borkman* (1896); *Naar vi døde vaagner* (1899; *When We Dead Awaken*).

Poetry. "Paa vidderne" (1859; "On the Heights"); "Terie Vigen" (1862); *Episke Brand* (written 1864–65, pub. 1907, ed. by K. Larsen; *Epic Brand*); *Digte* (1871).

Other works. The letters were collected in *Breve fra Henrik Ibsen,* 2 vol., ed. by H. Koht and J. Elias (1904); the unpublished papers in *Efterladte skrifter,* 3 vol., ed. by H. Koht and J. Elias (1909).

Translations. William Archer's influential edition of *The Collected Works of Henrik Ibsen,* 12 vol. (1906–12), contains all but five of the plays listed above, along with a selection from the unpublished papers. *The Oxford Ibsen,* ed. and trans. by James McFarlane, 8 vol. (1960–77), is a scholarly edition that includes all the plays, the *Episke Brand,* a large selection from the unpublished papers, a number of Ibsen's critical essays, and critical commentaries. Modern translations of many individual plays by Ibsen have also been prepared in English, notably for the "Everyman Library," the "Penguin Classics," the "Bantam Classics," and the "Signet Classics" series. Michael Meyer has translated 15 of the plays specifically for modern stage performance. A full selection of the poems has been translated by F.E. Garrett in *Lyrics and Poems from Ibsen* (1912). *The Correspondence of Henrik Ibsen,* trans. and ed. by Mary Morison (1905, reprinted 1970), offers a selection of the letters; Evert Sprinchorn included

also some of the speeches in his *Ibsen: Letters and Speeches* (1964).

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ibuprofen, nonsteroidal antiinflammatory drug often used to treat dysmenorrhea and the symptoms of rheumatoid arthritis. Like aspirin, ibuprofen is effective against minor pain, fever, and tissue-swelling and works by inhibiting prostaglandin synthesis. (Prostaglandins are diverse and potent body chemicals that, among other effects, aid blood clotting and work to sensitize nerve endings.)

Ibuprofen may irritate the gastrointestinal tract, and other ill effects may result if the drug is combined with certain other drugs. Allergy to aspirin may indicate a similar reaction to ibuprofen. The drug is not recommended for use by children under age 12, and, like aspirin and acetaminophen, it should not be used during pregnancy except under medical supervision. Ibuprofen is marketed under such trade names as Advil and Nuprin.

Ibuse Masuji (b. Feb. 15, 1898, Kamo, Hiroshima Prefecture, Japan), Japanese novelist noted for sharp but sympathetic short portraits of the foibles of ordinary people.

Ibuse was first interested in poetry and painting but was encouraged to write fiction when he entered Waseda University in 1918. His greatest popularity came after World War II, but he was already known in the 1930s for such stories as the satirical *Sanshōuo* (1929; *The Giant Salamander*) and the historical novel *Jon Manjiro hyōryūki* (1937; *John Manjiro, the Castaway: His Life and Adventures*).

Ibuse's wide interests led him to deal with many kinds of themes, particularly intellectual fantasies employing animal allegories, historical fiction, and tales of country life. His sharp eye for satire and subtle sense of humour prevent his evident compassion from lapsing into sentimentality. After the war, *Honjitsu kyūshin* (1949; *No Consultations Today*), characterizing a town by the patients who come to the doctor's office, and *Yōhai taichō* (1950; *A Far-Worshiping Commander*), an antimilitary satire, were especially well received. Ibuse received a National Culture Award for the novel *Kuroi ame* (1966; *Black Rain*), which deals with the long-lasting social effects of the bombing of Hiroshima.

Ibycus (fl. 6th century BC, Samos, Ionia), lyric poet from the Greek colony of Rhegium in Italy, one of the nine lyric poets recognized by later Greek criticism.

Ibycus left Sicily for the Aegean island of Samos, where the tyrant Polycrates became his patron. Ancient authorities found it hard to distinguish his early work from that of Stesichorus, but even in the few surviving fragments of Ibycus' lyrics there are signs of marked individuality. The most prominent fragments describe the charms of handsome youths and reveal the aging poet's fear of falling in love. Cicero regarded him as more devoted to love poetry than Alcaeus and Anacreon. A late legend relates how he called a flock of cranes passing overhead to witness as he was being murdered by robbers near Corinth. One of the robbers later saw the cranes over Corinth and involuntarily referred to them as the avengers of Ibycus, a remark that led to the unmasking of the murderers. This provided Schiller with the subject of his poem "Die Kraniche des Ibykos."

IC analysis (linguistics): *see* immediate constituent analysis.

Ica, department (formed 1866) of southern Peru, composed of the western slope of the Andes, the arid Pacific coast, the northern end of the coastal range, and the Chincha Islands. Ica occupies an area of 8,139 square miles (21,079 square km) and is sparsely inhabited, except in irrigated areas such as the Chincha and Ica valleys. Cotton cultivation is widespread; the white, long-stapled cotton that has been grown successfully in the irrigated lands of the Peruvian coast originated in the Pisco Valley. Grapes and other fruits are also important products; at Ica city, the departmental capital, the well-known brandy named for the port of Pisco (through which it is exported) is made. Iron ore from Marcona is transported to Puerto de San Juan for shipment to a steel plant at Chimbote. Fishing is important at Pisco and San Andrés. Pop. (1986 est.) 497,200.

Ica, city, capital of Ica department, central Peru. It is located about 30 miles (48 km) from the Pacific Ocean and 170 miles southeast of Lima in the extremely arid and intensively irrigated coastal valley of the Río Ica. Situated at an elevation of 1,332 feet (406 m), Ica city is within a wide expanse of high plains that border the Andean foothills to the east. A town (originally called Valverde) established nearby in 1563 on the orders of the viceroy, Conte de Nieva, was moved to the present site of Ica after being destroyed by an earthquake in 1569. It was officially renamed San Jerónimo de Ica in 1640 by a royal proclamation of King Philip IV. The region has long been known for the cultivation and processing of cotton and grapes.

A university was established in the city in 1961, and the Museo Cabrera (founded in 1966) has a significant collection of engraved stones and pottery of the nearby Nazca culture (*c.* 200 BC–AD 600). Ica city is connected by rail and road to the port of Pisco 40 miles northwest. Pop. (1985 est.) 131,900.

Icacinaceae, family of tropical trees, shrubs, and woody climbers, belonging to the order Celastrales, comprising more than 55 genera. The alternate leaves usually are simple in outline and leathery; the flowers are small, whitish or greenish, clustered, and either unisexual or bisexual. Several species of *Pennantia* and *Villaresia* are cultivated as ornamental plants. The tropical American *Calatola costaricensis* provides a nut that is roasted and eaten whole or ground into tortilla meal.

icaco (tree): *see* coco plum.

Icarus, in Greek mythology, son of the inventor Daedalus who perished by flying too near the Sun with waxen wings. *See* Daedalus.

Icarus, asteroid that has a more eccentric orbit and also approaches nearer the Sun (within 30,000,000 kilometres [19,000,000 miles]) than does any other known body in the solar system except comets. It was discovered in 1949 by Walter Baade of Palomar Mountain (now Hale) Observatory, California. Its orbit extends from beyond Mars to within that of Mercury; it can approach within 6,400,000 kilometres (4,000,000 miles) of the Earth. In June 1968 Icarus, the first asteroid to be examined by radar, proved to have a diameter of about 0.8 kilometre (about 0.5 mile), considerably smaller than previous estimates, and a rotation period of about 2.5 hours.

Icauna (France): *see* Yonne River.

Icaza (Coronel), Jorge (b. July 10, 1906, Quito, Ecuador—d. May 26, 1978, Quito), Ecuadorean novelist and playwright whose brutally realistic portrayals of the exploitation of his country's Indians brought him international recognition as a spokesman for the oppressed.

Icaza started writing for the theatre, but when he was censured for a 1933 dramatic script, *El dictador,* he turned his attention, and his indignation, to the novel. He scored immediately, gaining fame and generating much controversy with his first novel, *Huasipungo* (1934; rev. ed., 1951; Eng. trans. of 1951 ed. *Huasipungo: The Villagers;* U.S. trans., *The Villagers*). The title is an Indian term for the small plot of land given the Indian worker by a landowner in return for the worker's labour on the estate. The book depicts the manner in which the Indians are deprived of their *huasipungo* and then slaughtered when they rebel against their oppressors. It was greeted with outrage by the upper classes in Ecuador and with quiet disapproval by the church. It quickly became a radical propaganda implement and was translated into many languages, including Russian and later Chinese. Some critics have called the work mere propaganda, and others fault its construction. But its powerful language has led many critics to acclaim it as a masterpiece of realism; the term infrarealistic was coined to describe its prose.

Icaza continued to dramatize the struggles of the poor in novels, and he never stopped writing for the theatre. His further writings include *En las calles* (1934; "In the Streets"), *Media vida deslumbrados* (1942; "Half a Life Amazed"), *Huairapamushcas* (1948, 1973), *Seis veces la muerte* (1954; "Death Six Times"), and *El chulla Romero y Flores* (1958; "The Loner Romero y Flores"). Over the same period Icaza also wrote numerous plays. *Obras escogidas* ("Selected Works") was published in Mexico in 1961.

After 1973 Icaza served as ambassador to Peru and the Soviet Union. His themes as well as his realistic style influenced a generation of writers in Ecuador and throughout Latin America.

ice, solid substance produced by the freezing of water vapour or liquid water. At temperatures below 0° C (32° F), water vapour develops into frost at ground level and snowflakes (each of which consists of a single ice crystal) in clouds. Below the same temperature, liquid water forms a solid, as, for example, river ice, sea ice, hail, and ice produced commercially or in household refrigerators. *See also* glacier; pack ice; permafrost.

A brief treatment of ice follows. For broader treatment, *see* MACROPAEDIA: Ice and Ice Formations.

Ice consists of compact aggregates of many crystals. This fact, however, is not readily apparent, because ice crystals grown from liquid water, unlike those from water vapour, do not develop crystal faces. Typical specimens of ice derived from liquid water have crystals that measure roughly 1 to 20 mm (0.04 to 0.78 inch) in size. In old glacier ice, the constituent crystals have grown larger by long-continued recrystallization and reach about 50 cm (20 inches) in diameter.

To melt one gram (0.04 ounce) of ice, 79.8 calories of heat—*i.e.,* the latent heat of fusion—must be supplied. This is high compared with the latent heat of most substances and makes ice useful as a refrigerating agent or heat sink. Melting ice remains at a constant temperature of 0° C.

Ice has a density of 0.919 g/cm^{-3}, as opposed to 0.9998 g/cm^{-3} for water. Consequently, a mass of ice occupies 9 percent more volume than an equal mass of water at 0° C. This condition accounts for the bursting of water pipes on freezing and for the fact that ice floats in water, with about 1/10 of its volume

above the surface. Because of the increase in volume on freezing, the melting point of ice decreases under pressure. It falls by 0.0075° C per atmosphere of applied pressure. The low sliding friction of ice surfaces, as witnessed in ice skating and in the skidding of automobiles on icy roads, results from melting and the consequent lubrication that occurs where the sliding object increases the pressure on the ice.

Structure. An ice crystal is composed of water molecules linked together by hydrogen bonds, which form as a result of the attraction between the hydrogen atoms of each molecule and the oxygen atoms of other molecules. Each of the molecules forms bonds to four neighbouring molecules at the corners of a tetrahedron around it. The tetrahedral arrangement gives rise to puckered hexagonal rings of water molecules, and these hexagons on the molecular scale are responsible for the hexagonal symmetry of the ice crystal. The hexagonal rings of molecules join together side by side to form an open lattice of puckered hexagonal layers, which lie perpendicular to the hexagonal axis.

The bent shape of the water molecule, which is similar in water vapour and ice, allows the two hydrogen atoms of each molecule to be directed toward any two of the four neighbours to which it is bonded. As a result, each water molecule can assume six different orientations. These occur statistically, with equal probability, subject only to the condition that the neighbouring molecules must adjust their orientations so that only one hydrogen atom occurs along each bond line and thus none of the hydrogen bonds is broken. This type of statistical disorder in the molecular orientations has important effects on the physical properties of ice, and it contributes to the ice crystal a definite amount of entropy that does not vanish at absolute zero (−273.15° C).

The ice structure does not provide sites suitable in size or bonding environment for most of the common inorganic ions or organic molecules. For this reason, ice formed by the freezing of water solutions of most substances is very much purer than the solutions themselves, a phenomenon that is the basis for the freezing method for desalination of seawater.

Electrical properties. The water molecule acts as a small electric dipole because the hydrogen atoms carry a positive charge (+0.33 electron units) and the oxygen atoms a negative charge (−0.66 electron units). An applied electric field tends to align the molecular dipoles, and the molecules respond by changing from one of their six possible orientations to another, this being allowed by the orientation-disordered structure. Ice thus has a very high dielectric constant (approximately 100). The mechanism by which water molecules change from one orientation to another involves the presence of defects in the crystal structure. These defects, called bond defects, are places in the crystal where a hydrogen bond is broken, either by omission of a hydrogen atom along the bond line, or by inclusion of two hydrogen atoms along the line. The bond defects are present in low concentration, only about one bond in 10 million being broken at 0° C. The defects wander rapidly through the crystal, jumping from one bond to the next, and each jump of a defect is accompanied by rotation of the water molecule past which the defect jumps. The motion of the bond defects thus determines the rate of molecular reorientation. Under an alternating electric field of frequency higher than about 50,000 cycles per second, the bond defects do not have time to reorient the molecules in response to the field, and the dielectric constant drops to a low value (about 3).

Under a steady voltage, ice conducts a steady electric current, the charge being transported by the migration of protons (hydrogen ions) through the crystal. The conductivity is much higher than that of most nonmetallic crystals except semiconductors, and ice therefore is called a protonic semiconductor. The protons do not exist in the crystal as free ions, but instead are attached to water molecules, as H_3O^+ ions. The H_3O^+ ions, together with OH^- ions in equal numbers, occupy water molecule sites in the crystal and constitute a second type of defect in the ideal structure of ice. These ionic defects are present in a concentration of approximately one defect for every 10^{11} water molecule sites. An H_3O^+ defect moves through the crystal simply by the jumping of one of its three protons along the hydrogen bond to a neighbouring water molecule, thereby converting the neighbour into the H_3O^+ ion. Movement of the ionic defects through the crystal transports charge and is responsible for the protonic conductivity of ice.

Flow. To casual observation, ice is a brittle material and shatters like glass when struck with a hammer or ice pick. However, under low stresses of long duration or under higher stresses when fracture is inhibited by pressure (*e.g.,* at depth in glaciers), ice flows plastically. The hexagonal layers of the ice crystal can glide past one another, much like sheets of paper sliding over one another. This gliding occurs by the movement of crystal dislocations. The flow of glacier ice, for example, takes place by the deformation of the individual crystals in this manner, but the different crystals, gliding in different directions, tend to interfere with one another. This considerably impedes the flow and also forces the crystals to bend. The bending does not become severe, however, because a process of recrystallization causes new, fresh crystals to grow continuously at the expense of the old, deformed ones.

The flow of ice in bulk appears somewhat like the flow of a very viscous liquid, except that the viscosity coefficient is not a constant, as in liquids. Instead, it decreases rapidly with increasing stress, so that the flow rate increases much more rapidly than in simple proportionality to the stress.

ice age, also called GLACIAL AGE, any geologic period during which thick ice sheets cover vast areas of land. Such periods of large-scale glaciation may last several million years and drastically reshape surface features of entire continents. A number of major ice ages have occurred throughout the Earth's history. The earliest known took place during Precambrian time dating back more than 570,000,000 years. The most recent periods of widespread glaciation occurred during the Pleistocene epoch (1,600,000 to 10,000 years ago). A lesser, recent glacial stage called the Little Ice Age began in the 16th century and advanced and receded intermittently over three centuries. Its maximum development was reached around 1750, at which time glaciers were more widespread on Earth than at any time since the principal Quaternary Ice Ages.

ice bug, any insect of the small order Grylloblattodea (about 15 species). This rare and primitive insect is found in the mountains of Japan, western North America, and eastern Siberia. A pale, wingless creature between 15 and 30 mm (0.6 and 1.2 inches) long, it has biting mouthparts, long antennae, and small compound eyes. Grylloblattids usually live beneath rocks near mountain snow lines or beneath rotten logs at lower altitudes. They feed on other insects.

ice cave, cavity in ice or an underground cave that has permanent ice deposits. The two types of ice cave are wholly unrelated.

The first type of ice cave is formed by meltwater streams carving labyrinths in the bases of glaciers or by streams and wind hollowing out tunnels in snowfields. These usually have scalloped, translucent walls that transmit a blue light.

The second type of ice cave occurs either when frigid winter air settles into downward-leading caverns where it cannot be forced out or when moisture freezes in currents of cold air. Frozen lakes, icicles, and ice draperies are common formations. Helictite-like icicles also form where air currents deflect the freezing water. The splendid ice deposits formed in the lava caves of the northwestern United States are dwarfed by the limestone ice-cave systems of the Alps. The Eisriesenwelt (Ice Giant World) in Austria exhibits a frozen landscape that extends 42 km (26.1 miles).

ice cream, frozen dairy food made from cream or butterfat, milk, sugar, and flavourings. Frozen custard and French-type ice creams also contain eggs. Hundreds of ice-cream flavours have been devised, the most popular being vanilla, chocolate, and strawberry.

Iced desserts were introduced into Europe from the East. Marco Polo brought back descriptions of fruit ices from his travels in China. Italian cooks developed recipes and techniques for making both water and milk ices; Buontalenti, one of the cooks taken to France by Catherine de Medici, first prepared such treats for the French court. In 1670 a Sicilian, Francisco Procopio, opened a café in Paris and began to sell ices and sherbets, which became so popular that by 1676 there were 250 ice makers in the capital. Tortoni, owner of a café in late-18th-century Paris, is credited with developing cream ices. In the United States, ice cream was served by George Washington, Thomas Jefferson, and Dolley Madison. Philadelphia became the hub of ice-cream manufacture in the United States; the ice-cream soda was invented there in 1874. The ice-cream cone, portable and self-contained, originated at the 1904 World's Fair in St. Louis, Mo., U.S.

Commercial ice cream is made by combining, under constant agitation, the liquid ingredients (milk, cream, syrups, etc.). These liquids are heated and combined with dry ingredients (sugar, stabilizers, dried eggs or milk) to form a mix, which is then pasteurized and homogenized. The mix is ripened for several hours in a refrigerated vat, then combined with finely chopped fruit, nuts, or other solids. The mix is agitated while being frozen in order to incorporate air and control the size of the ice crystals that are formed. The partially frozen ice cream is drawn off into packages and frozen solid, or "hardened." So-called soft-service ice cream was invented in 1939; it is served directly from the freezing machine without being allowed to harden.

Homemade ice cream is often made with a base of boiled custard. The mix, with flavourings, is poured into a canister surrounded with ice and salt or a refrigerator unit. The contents of the canister are agitated by means of a hand crank or electric motor until the ice cream is softly frozen. The ice cream is usually allowed to harden further in a freezer.

To make the best use of the Britannica, consult the INDEX *first*

ice dancing, the art or sport of dancing on ice, using skates. Although the English diarist Samuel Pepys claimed to have danced on the ice during London's great frost of 1683, modern ice dancing probably developed out of the Vienna Skating Club's adaptation of the waltz in the 1880s. The sport grew rapidly in popularity during and after the 1930s, and dance steps now recognized internationally include the 10- or 14-step, killian, and varieties of the waltz, tango, and fox-trot. Dance steps are made up of figure-skating movements and



Ice dancing: Diane Towler and Bernard Ford, world champions in 1966–69

Camera Press—Miller Services Ltd.

are usually performed in set, unvarying patterns, although major competitions include a short free-dancing exhibition to demonstrate the dancers' general skill and originality.

Unlike pair skating, to which it is quite similar, ice dancing does not allow the introduction of movements of strength or skill (particularly lifts), which are inconsistent with the character of the dance. Also, dancers must keep one skate on the ice at all times. World ice-dance championships, under supervision of the International Skating Union, were initiated in 1950. For world champions, *see* Sporting Record: *Ice skating. See also* Olympic Games.

ice formation, any mass of ice that occurs on the Earth's continents or surface waters. Such masses form wherever substantial amounts of liquid water freeze and remain in the solid state for some period of time. Familiar examples include glaciers, icebergs, pack ice, and ground ice associated with permafrost—*i.e.,* perennially frozen soil found in frigid regions.

A brief treatment of ice formations follows. For full treatment, see MACROPAEDIA: Ice and Ice Formations.

Approximately three-quarters of the Earth's fresh water is stored in the enormous ice sheets that cover Antarctica and Greenland and in the smaller ice caps, mountain glaciers, and pediments scattered throughout the rest of the world. These expanses of perennial ice originate on land by the compaction and recrystallization of snow and other forms of precipitation under the weight of successive layers that have accumulated year after year. They occur in every region, including the Equator at high altitudes.

River and lake ice also occur over a good portion of the world. These sheets of ice remain on their respective surface-water bodies for varying lengths of time. Lakes in Antarctica, for example, are completely covered with ice throughout the entire year, whereas those in the colder areas of the continental United States experience freezing surface-water temperatures for only about 100 days in an average year.

In the oceanic waters of the polar regions, ice occurs in the form of pack ice and icebergs. Pack ice consists of frozen saltwater that has been broken up and jammed together by wind. In most cases, it is only one to two years old, and it expands during winter to cover large areas of the oceans. During spring and summer, warmer temperatures cause the pack ice to melt, resulting in a retreat of its borders. The same warmer weather conditions promote the calving (breaking off) of icebergs at the seaward edges of glacial masses. These large chunks of ice (some extend several kilometres in length) then drift with the current toward the Equator.

Permafrost usually consists of rocks and soil particles consolidated by ice. Such frozen ground occurs in regions where temperatures below 0° C (32° F) persist for two years or more (*e.g.,* the Arctic and sub-Arctic). It is estimated that permafrost underlies nearly 25 percent of the terrestrial land surface. Various forms of ground ice are found in permafrost. The most conspicuous of these is foliated ice, which frequently develops in thermal contraction cracks in permafrost as wedge-shaped, vertical, or inclined sheets 2.5 centimetres to 3 metres (about 1 inch to 10 feet) wide and 0.3 to 9.2 m deep. Another prominent form is pingo ice, which occurs horizontally or in lens-shaped masses.

ice hockey, game played on ice by two teams, each composed of six players on skates. The players use sticks to hit a hard-rubber disk, called a puck, into their opponent's goal.

A brief treatment of ice hockey follows. For full treatment, *see* MACROPAEDIA: Sports, Major Team and Individual.

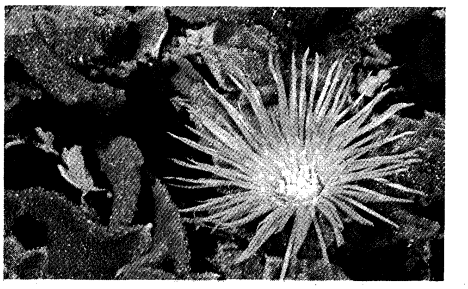
Ice hockey is believed to have developed from the hockey-type game of shinty, which was played by British soldiers stationed in Canada during the 1860s. The first record of a puck, rather than a ball, being used was in 1860 at Kingston Harbour, Ont., and the first game with rules was played in 1879 between two student teams at McGill University in Montreal. The game thereafter spread quickly throughout Canada and the United States.

The National Hockey League (NHL), organized in 1917, consists of professional teams in the United States and Canada. The annual Stanley Cup, which is the highest award in professional ice hockey, was first given in 1893 to the best Canadian team and since 1917 to the winner of the NHL play-offs. Ice hockey was made an event in the Winter Olympic Games in 1920, and in 1924 the Boston Bruins became the first U.S. team in the NHL. The World Hockey Association was founded in 1972 as a rival to the NHL, but in 1979 the two leagues were merged.

A game consists of three 20-minute periods (overtime is used to resolve play-off games), and it is the only major sport in which substitution is allowed while the game is in play. Players are frequently substituted, rarely staying on the ice for more than two minutes. The goalies are the only exception, as it is their duty to protect the goal, from which they will only occasionally stray.

Ice hockey is a very aggressive game, and players must wear protective equipment. The puck is often stripped from a player by means of a hit, or check, to the body. Many types of hits are illegal and draw penalties. For fouls such as tripping, elbowing, and charging, the offending player is required to sit out two or five minutes of play, leaving his team shorthanded. If the opposing team scores a goal during a penalty, the penalized player comes back on the ice. This man-advantage situation is referred to as a power play and is one of the most entertaining aspects of the game. *See* Sporting Record: *Ice hockey. See also* Olympic Games.

ice plant, also called SEA FIG, or SEA MARIGOLD (*Mesembryanthemum crystallinum*), low-growing annual plant, of the carpetweed family (Aizoaceae) and one of about 75 species commonly called fig-marigolds,



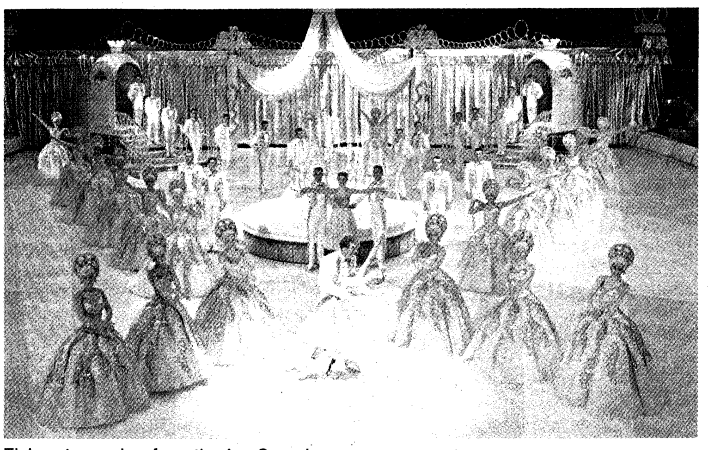
Ice plant (*Mesembryanthemum crystallinum*)

Ray Oakdale from Root Resources—EB Inc.

constituting the genus *Mesembryanthemum.* Most are fleshy-leaved desert herbs native to the Old World. Ice plant is the most commonly grown species and is named for the transparent, glistening swellings on its edible leaves. It is cultivated in gardens and as an indoor pot plant. It is naturalized in California where it clothes road embankments and provides an erosion control.

ice shelf, thick mass of floating ice that is attached to land, formed from and fed by tongues of glaciers extending outward from the land into sheltered waters. Where there are no strong currents, the ice becomes partly grounded on the sea bottom and attaches itself to rocks and islands. The shelf is pushed forward by glacial pressure until its forward growth is terminated by sea currents. Built up by accretions of snowfall, it remains relatively stable for millions of years. It is a phenomenon presently found only in Antarctica, where the largest ice barrier, the Ross Ice Shelf, extending into the Ross Sea, is about the size of France. Ice shelves are thought to have been responsible for the formation of many fjords in Scandinavia and elsewhere during the Pleistocene Epoch.

ice show, professional skating spectacle that combines the colourful movement of huge casts of skaters with all the arts of the theatre—brilliant lighting, gorgeous costumes, special musical scores, and careful direction. Among the features of an ice show are big production numbers, clowns, skating chimpanzees, and a pas de deux—a showpiece dance for two performers, male and female, who are usually champion figure or free-style skaters. One of the earliest ice shows was staged in 1915 at the Hippodrome in New York City.



Elaborate number from the *Ice Capades*

Photo Researchers

Featuring a German ice ballerina, Charlotte (Oelschlagel), and an ice ballet imported from Berlin, the show, called *Flirting in St. Moritz,* created a sensation in New York City, ran for 300 days, and inspired *The Frozen Warning* (1916), the first motion picture centred on skating. Another pioneer ice show, *The Ice Follies,* was first produced in 1936 by Oscar Johnson, Edward Shipstad, and Roy Shipstad. In 30 years it played to more than 60,000,000 people. Later prominent shows in the United States were *Ice Capades;* the *Hollywood Ice Review; Sonja Henie Ice Revue,* produced by the Norwegian skating star Sonja Henie; and *Holiday on Ice Shows,* presented on ingenious mobile rinks, complete with portable refrigeration equipment that could be set up indoors or out. In a single year this company had seven separate full-scale productions playing throughout the world. In northern European countries, especially in Great Britain, the U.S.S.R., and the Scandinavian countries, elaborate pantomimes with stories portrayed on ice have been tremendously popular.

Articles are alphabetized word by word, not letter by letter

ice skating, the recreation and sport of gliding across an ice surface on blades fixed to the bottoms of shoes (skates), propelled by alternate action of the legs.

Ice skating probably developed in Scandinavia as early as 1000 BC, the first skates being made from shank or rib bones of elk, oxen, reindeer, and other animals. At what time metal was introduced for skate blades is not precisely known, but bone was in use in England late in the 12th century.

As a recreation skating has been continuously practiced on the canals of the Netherlands since the Middle Ages by both males and females. It was popular in England in the 17th century, and the first skating club was formed in Edinburgh in 1742. In the 1740s British servicemen introduced ice skating to North America. It was also popular at the French court about 1776, Marie-Antoinette being among the skaters. Napoleon Bonaparte skated at Auxerre in 1781.

The first speed racing in England was in the Fens during 1814, and the first race for amateurs in 1823. The Skating Club (for figure skating) was founded in London in 1830. The first all-iron ice skate that clipped onto the boot was invented by E.W. Bushnell of Philadelphia in 1848. The New York Skating Club was formed in 1860, and in 1864 Jackson Haines, a dancing master from Chicago, demonstrated in Europe a technique incorporating dance movements. The Vienna Ice Club, founded in 1867, using Haines's ideas developed a Viennese school of skating that resulted in the modern international school of figure skating (*q.v.*). The first rink in Canada was opened at Toronto in 1868, and a rink opened at Davos, Switz. in 1877. The first rink with artificially frozen ice, a private one, the Glaciarium, was opened in London in 1876, and throughout the century larger and public rinks with artificially made ice appeared. Early in the 20th century, such rinks were opened in Melbourne and Johannesburg.

Crude team games played on ice are mentioned as early as the 2nd century AD, but only in the 19th century did such goal-scoring sports on skates as bandy, shinty, and ice hurling appear in northern Europe.

Sports involving ice skating alone were organized by the National Skating Association of Great Britain (1879), the United States Figure Skating Association (1886), and the Canadian Amateur Skating Association (1888). These groups, with other national groups formed in the interim, founded in 1892 the International Skating Union (ISU), which thereafter became the world governing body for speed skating, ice dancing (*qq.v.*), and figure skating. World championships had begun in the 1890s for speed skating (men only) and figure skating. Skating events were included in the Olympic Winter Games from their inception in 1924: figure skating for men and women from 1924; speed skating for men from 1924 and for women from 1960; and ice dancing from 1976. The rise in popularity of ice hockey (*q.v.*) from mid-19th-century beginnings coincided with that of pure skating from the 1920s. The increasing number of rinks with artificially produced ice throughout the 20th century spread the popularity of recreational ice skating. For world records and champions, *see* Sporting Record: *Ice skating. See also* Olympic Games.

iceberg, floating mass of freshwater ice broken from the seaward end of a glacier or a polar ice sheet and most typically found in open seas, especially around Greenland and Antarctica. Icebergs form mostly during the spring and summer when warmer weather increases the rate of calving (separation) of icebergs at the boundaries of the Greenland and Antarctic ice sheets and smaller outlying glaciers. In the Northern Hemisphere, for example, about 10,000 icebergs are produced each year from the west Greenland glaciers and an average of 375 flow south of Newfoundland into the North Atlantic shipping lanes where they are a hazard to navigation.

A brief treatment of icebergs follows. For full treatment, *see* MACROPAEDIA: Ice and Ice Formations.

At the point where glaciers or ice shelves meet the sea, water pressure beneath the ice shelf or glacier tongue interacts with the outward-moving glacier. Tides, which may have ranges up to 6 metres (20 feet) in the Arctic, together with small sea level changes associated with wind and swells, produce an intermittent increase and decrease in force on the protruding end of the glacier or ice shelf resulting in the birth of a large monolith of drifting ice. Another way in which an iceberg is formed, characteristic of southern Greenland glaciers, consists of a melting or evaporation of the surface portions of the glacier near its terminus at a greater rate than the water erosion on its underside. This results in an underwater shelf and eventually, through continued erosion by water, natural buoyancy of submerged ice, and periodic tidal and other hydraulic forces, the shelf is broken off and an iceberg floats to the surface. Most Antarctic icebergs are formed through gradual break off from the Antarctic continental ice sheet as it thins toward the coast and exudes into the ocean as a great ice shelf with fronts hundreds of miles long.

Icebergs are produced at a rate of approximately 280 cubic kilometres per year (67 cubic miles per year) in the Arctic and 1,800 cu km (430 cu mi) per year in the Antarctic.

Western Greenland is the major iceberg source area in the Northern Hemisphere. Eastern Greenland icebergs tend to move northward; they are small and few in number. There are also few icebergs in the Arctic Basin proper. The source area for most icebergs in the Barents Sea is Franz Josef Land. Icebergs are not found in the North Pacific except in sounds along the Alaskan-Canadian coast between latitudes 55° N and 60° N. In the Southern Hemisphere most icebergs are concentrated south of the Antarctic current convergence at about 60° S.

Arctic icebergs vary in size from the size of a large piano, called growlers, to the dimensions of a ten-story building. Most icebergs have a specific gravity of 0.9, and thus six-sevenths of the mass is below the sea surface. Many icebergs in the Arctic are about 45 m (150 ft) tall and 180 m long. Icebergs of the Antarctic are tabular in shape and not only are far more abundant but are of enormous dimensions compared to those in the Arctic. Lengths up to 8 km (5 mi) are not unusual, with ice 45 m above water.

From the known amount of precipitation over Greenland, and the assumption that the ice volume and precipitation rate now are approximately the same as they were many centuries ago, it can be estimated that the mean age of the ice in icebergs is 5,000 years. Arctic ice islands and giant Antarctic bergs last as long as 10 years at high latitude. Most icebergs from western Greenland melt within two years of calving from the parent glacier.

Once an Arctic Ocean iceberg has been calved and moves out to the open sea, it usually transits Baffin Bay in from three months to two years, during which time it undergoes some disintegration through melting and calving of smaller chunks of ice from its perimeter. This results in a decrease in mass of about 90 percent by the time it reaches the coast of Newfoundland and the Grand Banks in the North Atlantic. When the iceberg enters the region of the Grand Banks, where the warm waters of the Gulf Stream meet the colder waters of the Labrador Current, it has only a few days of life remaining. In mild sea conditions an iceberg deteriorates at a rate of height decrease of about 6 ft per day in 0°–4° C (32°–40° F) water, and about 10 ft per day in 4°–10° C (40°–50° F) water.

Although the bulk of the iceberg is below water, in many situations wind has a dominant influence on the movement. The wind intensity and direction over Baffin Bay in the spring of one year, for example, influences the number of icebergs that slip into the North Atlantic that year and the following year.

The day-to-day movement of an iceberg is controlled by the size and shape of the iceberg, previous and present wind, surface wind current, and general ocean current. The most important factor in assessing wind drift of icebergs is size and shape. Winged icebergs, those with sail-like pinnacles around the central mass, are very much influenced by the winds and move at speeds of one knot, or 24 nautical miles, per day under the influence of steady winds of 30 knots. The momentum of icebergs is so great that once in motion they continue for hours after the wind has abated.

The drift of icebergs is the result of the ocean current and the wind. When the winds are variable or less than 32 knots, and the current greater than 0.5 knot, the current predominates, but when steady 30-knot winds blow for more than 12 hours, the wind effect becomes important even in areas where the ocean current is one to two knots.

Icebergs transport sediment in the form of pebbles, cobbles, boulders, and finer material, and even plant and animal life, thousands of miles from their source area. The distribution of icebergs 10,000 years ago, for example, can be inferred from sediments that are widely disseminated on the ocean floor of the North Pacific Ocean as far south as latitude 48° N and in the South Atlantic Ocean as far north as the latitude of the Cape of Good Hope in the Southern Hemisphere.

Icebergs are coloured brown, black, and green by a combination of sediment and plankton deposits under the source area ice shelf, and glacial blue ice.

In the open ocean most ice is seen by radar at ranges depending upon the size of its subaerial silhouette, but smaller icebergs or growlers can only be detected when the sea surface is calm, and then only at ranges of about one mile. Sonar is effective in detecting icebergs; the range of detection, however, is frequently limited by the water conditions and speed of commercial vessels. The problem of iceberg protection in the Northern Hemisphere is one of tracking icebergs as they come down the

Labrador Current, and reporting the whereabouts of these floating menaces to all North Atlantic shipping as often as twice daily.

iceboating, also called ICE YACHTING, a winter sport of sailing and racing on ice in modified boats. An iceboat is basically a sailboat that travels on thin blades, or runners, on the surface of the ice. An iceboat consists first of a single fore-and-aft spar, called the backbone,



DN-60 iceboats
UPI—EB Inc.

which may be wide enough to have a cockpit in its hull to carry the crew. This spar, or hull, is securely mounted on a broad, flexible crosspiece, or runner plank, which is at a right angle to it and which has a steel runner at each of its two ends. A third runner, the steering runner, is mounted at either the fore or aft end of the hull and is controlled by the helmsman using a tiller. A vertical mast carries either one or two sails, usually a mainsail and a jib. Smaller iceboats dispense with a cockpit in the hull and instead have a shallow, elliptical tray mounted on the backbone and upon which the one- or two-man crew sits. The modern iceboat's structural elements are made of high-strength steel.

Although there are hints of iceboating in the archaeological past as far back as 2000 BC in what is now the Scandinavian region, iceboating as a means of winter transport dates firmly only to the 17th and 18th centuries on the frozen Gulf of Riga and on the canals of The Netherlands. In 1790 the first iceboat appeared on the Hudson River in New York.

The sport began in the mid-19th century, the Poughkeepsie Ice Yacht Club being formed in 1865 and the Hudson River Ice Yacht Club in 1870. A Swedish club was founded in 1901, and in 1928 the European Ice Yachting Union was formed with Latvia, Lithuania, Estonia, Sweden, Austria, and Germany as members.

The wooden ice yachts of the 19th century were large and had six or seven crew members. The *Icicle* was 22.9 yards (21 m) long and had 1,070 square feet (99 square m) of sail. Ice yachting was a rich man's sport. In 1900 the fleet of the Hudson River club numbered more than 50, including 6 of the first class with more than 600 square feet (54.75 square m) of sail. These large iceboats reached speeds which at that time were the fastest ever attained by any vehicle. The American iceboat *Scud,* for example, sailed at 107 miles per hour (172 km/hr) in 1885.

In about 1931, Starke Meyer of Milwaukee designed a hull with the steering runner at the bow and the runner plank at the stern, instead of the other way around, as in most previous designs. The downward and forward thrust of the mast, located between the two points of support, served to increase rudder traction and reduce the tendency of the craft to spin on the ice. Meyer's bow-steering design defeated all competition, and smaller versions, called skeeters, with a sail of only about 75 square feet (7 square m), showed they could sail safely and fast. By 1940 the design had crystallized, and the skeeter, or class E boat, as it is now designated, enjoyed a rapid growth. Skeeters were able to rival the larger iceboats in sailing speed, and they have dominated all open competitions over the past decades. The standard skeeter has a hull that is 22 feet (6.7 m) long. The DN-60, a boat with 60 square feet (5.6 square m) of sail, designed in the hobby shop of the *Detroit News* in 1937, suddenly caught on in the late 1950s and has been popular ever since. The standard DN is 12 feet (3.6 m) long with 60 to 80 square feet (5.6 to 7.4 square m) of sail.

The iceboat can reach at least four times the speed of the wind propelling it, and speeds of more than 140 miles per hour (220 km/hr) have been recorded. An iceboat that is sailing downwind can reach no greater a speed than that of the wind itself. But an iceboat can reach much faster speeds when it sails across the wind rather than being pushed along by it, since by its very motion the boat creates a wind from the velocity of its own movement that greatly supplements the natural wind. These principles were only vaguely understood in the early days of iceboat racing, and the traditional rig with a stern-mounted rudder was the standard design despite the boat's forward thrust sometimes lifting the stern rudder from the ice and sending the whole boat into a spin.

Iceboating became less popular in Europe after World War II but remained popular in the United States and Canada, mainly in the Northeast, where the ruling body is the Eastern Ice Yachting Association (founded 1937), and in the Midwest, where clubs from Wisconsin, Illinois, Michigan, and Ontario founded the Northwestern Ice Yachting Association in 1912. The regional associations have approximately six boat classes, ranging from 75 to 350 square feet (7 to 32 square m) of sail.

Association, national, and international races are held. Iceboat racing is generally like regular yachting in terms of right-of-way and overtaking. Races are typically run on a windward–leeward course such that the boats are usually sailing across the wind.

icefish, any of several different fishes, among them certain members of the family Channichthyidae (order Perciformes), sometimes called crocodile icefish. They are also called white-blooded fish, because they lack red blood cells and hemoglobin. The fish are apparently able to survive without red blood cells because they live in very cold, well-oxygenated waters and have a large volume of skin respiration. Most of the 16 species of crocodile icefishes occur in the Antarctic and feed on crustaceans and small fish.

Certain species of smelt and species of *Salanx,* or icicle fish, are also called icefish. These forms belong to separate families in the order Salmoniformes. *See also* icicle fish.

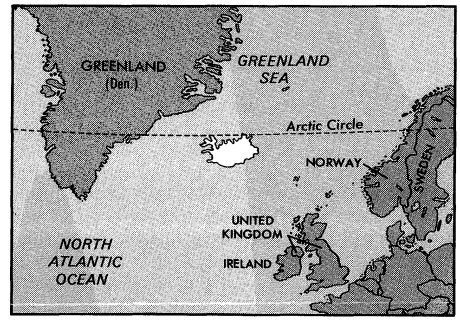
Iceland, officially REPUBLIC OF ICELAND, Icelandic LÝDHVELDIDH ÍSLAND, island country in the North Atlantic Ocean, lying between Norway and Greenland and covering an area of 39,768 square miles (103,000 square km). The capital is Reykjavík. Iceland is bounded by latitudes 66°30′ (the Arctic Circle) and 63°15′ N and is about 220 miles (350 km) long from north to south; it is bounded by longitudes 24°15′ and 13°45′ W and is about 335 miles (540 km) from east to west. Iceland's nearest European neighbour is Scotland in the United Kingdom, lying about 500 miles (800 km) to the southeast. Its rugged coastline, of more than 3,000 miles (4,800 km), meets the Greenland Sea and the Arctic Circle on the north, the Norwegian Sea on the east, the Atlantic Ocean on the south and west, and the Denmark Strait (which separates it from Greenland by about 200 miles (320 km) on the northwest. The population in 1990 was estimated to be 252,300.

A brief treatment of Iceland follows. For full treatment, *see* MACROPAEDIA: Iceland.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. Iceland may be divided into four regions that are defined by climate and coastal characteristics. The island's three northern regions are generally colder and have drier weather conditions, with rugged coastlines characterized by fjords; the southern region experiences higher precipitation and temperatures and has smoother coastlines, characterized by sandy beaches and lagoons formed by extensive offshore sandbars. Of the northern regions, the northwestern region is a peninsular plateau that is heavily dissected by steep valleys; the north-central region is characterized by broad valleys and grassy lowlands; and the northeastern region has numerous fjords, providing excellent harbours. The southern region is quite varied in its landscape, ranging from extensive lowlands to the country's highest peak, Mount Hvannadals, which rises to an elevation of 6,952 feet (2,119 m). The peak is situated on the southern edge of Vatna Glacier, the island's largest glacier, which covers more than 3,240 square miles (8,390 square km) and is equal in area to all of continental Europe's glaciers combined. Of Iceland's approximately 200 volcanoes, at least 30 have erupted since the island's settlement, together accounting for more than 150 eruptions. Earthquakes occur frequently, but they seldom result in serious damage.

Iceland's longest river is the Thjörs (143 miles [230 km]), which also has the largest drainage basin (2,907 square miles [7,530 square km]). It originates, as do many of the country's numerous rivers, as a debris-laden glacial melt stream. Iceland utilizes only about one-tenth of its estimated hydroelectric potential. Hot springs occur at some 250 locations throughout the country and are one of the country's major natural resources; Reykjavík, for example, is heated entirely by hot water piped from nearby geothermal springs.



Iceland

The climate of Iceland is controlled both by tropical and polar air currents and by two ocean currents, the Gulf Stream and the East Greenland Polar Current. While the latter current sometimes carries Arctic drift ice to the island, the ameliorating effects of the Gulf Stream keep Iceland much warmer than would otherwise be possible for a country so far north. The average July temperature for the country (except the mountainous interior) is about 52° F (11° C), and the average January temperature is a relatively moderate 32° F (0° C). Precipitation varies from more than 160 inches (4,100 mm) in parts of southeastern Iceland to 16 inches (406 mm) in the north-central region.

Of Iceland's total land area, less than 1 percent is considered arable, and forests, even

after reforestation programs in the decades of the 1960s and '70s, amounted to only slightly more than 1 percent of the total land area. Grazing land, however, exists in practically every coastal valley and accounts for more than one-fifth of the land area. Most of the remainder is either glaciated (about 12 percent), covered with peat bogs, or lava desert. Salmon and trout abound in the country's many lakes and rivers.

The people. The people of Iceland are an extremely homogeneous population. Historians differ as to their exact origin and ethnic composition but agree that between 60 and 80 percent were originally of Nordic stock, mostly from Norway. The remainder, from Scotland and Ireland, was largely of Celtic stock. The dominant language in the period of settlement (9th and 10th centuries AD) was Old Norse, which evolved into the modern Icelandic language that is spoken throughout the country. Lutheranism has been the dominant religion since the mid-16th century, and today nearly all of the population belongs to the established Evangelical Lutheran Church.

Iceland's population has a relatively low annual growth rate, which is similar to that of other Western industrialized countries. Life expectancy at birth in the late 20th century was one of the highest in the world, at 75 years for men and 80 years for women.

Iceland has experienced much country-to-city migration. The urban proportion of the population rose from about one-tenth in 1900 to about nine-tenths today. More than half the population lives in Reykjavík and the surrounding area. The centre of Iceland is uninhabited.

Economy. A free market economy predominates in Iceland, although industry ownership by the government has increased gradually, especially in the important fishing industry. The gross national product (GNP) is growing more rapidly than the population. Iceland's GNP per capita is higher than the average for Europe.

What agricultural land there is requires heavy fertilization. Iceland is self-sufficient in meat and milk products, and a wool industry has developed there. The fishing industry accounts for approximately one-fifth of the GNP and employs about one-sixth of the work force. Most of Iceland's exports, moreover, are fish products. More than three-fourths of the total catch is cod and capelin.

Iceland's electricity is generated almost entirely by hydroelectric plants. The island's many greenhouses, which cover a total of some 35,800 acres (14,500 hectares), are heated by geothermal sources.

The government encourages industrial growth through foreign exploitation of its energy resources, and both Norway and Switzerland have established energy-intensive processing plants on the island. Manufacturing and industry account for approximately one-eighth of the GNP and employ about one-quarter of the work force. Major manufactures include aluminum, ferrosilicon, and textile products. Communications, trade, and services employ almost half of the work force and account for more than half of the GNP.

Most of the work force in Iceland belongs to trade unions or employer organizations. Unemployment is very low. Productivity has not kept pace with large pay raises, and the resulting inflation has forced repeated devaluations of the currency to maintain competitive fish pricing abroad.

The central government of Iceland receives a major portion of its income from such indirect taxes as import duties and sales levies, while local governments derive most of their money from corporate and personal income taxes. Expenditures are directed primarily to social services, including major outlays to social security and welfare, education, and health.

Marine products dominate exports. Major imports include machinery and transport equipment, mineral fuels, and construction materials. Iceland's principal sources of imports are Germany, Denmark, and the United Kingdom. The country's principal export markets are the United Kingdom, the United States, and Germany. The balance of trade, while generally favourable, suffered in the mid-1980s because of reduced fish-product exports.

There are no railroads in Iceland, and most of its main roads follow the coastline. Icelandair and local air services are important in compensating for the limited road system. Heavy freight is carried by coastal shipping.

Government and social conditions. Iceland is a multiparty democracy. Its president is elected to a four-year term by universal adult suffrage; as the government's titular head, the president appoints a prime minister, who wields the country's real executive power. The prime minister is accountable to the Althing, Iceland's bicameral legislature, which is one of the oldest legislative assemblies in the world. Its members are elected to four-year terms by a mixed system of proportional representation. There are six major political parties. The constitution, adopted by referendum in 1944, vests the highest judicial authority in a seven-member Supreme Court. Iceland belongs to the North Atlantic Treaty Organization; the country's main contribution is to provide facilities for a small U.S. force at Keflavík air base.

Because of its compulsory health insurance that finances many medical services, Iceland has one of the highest standards of public health in the world. Hospital services are provided entirely without charge, and the cost of other medical services is low. Welfare services include unemployment insurance, old age and disability pensions, family allowances, and sickness benefits.

Almost all Icelandic schools from primary through university are free. Education is compulsory through age 16, and secondary and higher education are widely available. Students can enroll in four-year academic colleges at the age of 15 or 16. Graduation entitles the student to admission to the University of Iceland, founded in 1911, in Reykjavík.

The news media in Iceland enjoy complete freedom from governmental censorship. Radio and television are operated by the Icelandic National Broadcasting Service; most of the country's television programs are imported from the United States.

History. It is possible that Mediterranean seafarers of the Classical world knew of the existence of Iceland, and it appears that the earliest inhabitants of the island were Irish hermits. These hermits are reputed to have fled the island upon the arrival of the pagan Norwegians in the late 9th century AD.

According to early Icelandic sources, the first permanent Norwegian settlement was by Ingólfur Arnarson and his wife, who in 874 established a homestead on the site of present-day Reykjavík. The number of new settlers increased toward the end of the century, and most were of Norwegian origin. By about 930 the Icelandic Commonwealth had been formed, with its Althing. Christianity arrived in the 10th century and the Althing is said to have assisted the missionary work. By 1000 the entire country was Christian.

Norway attempted to control Iceland from the 10th century onward, and when internal difficulties resulted in Icelandic civil war in the 13th century, the Icelandic nobles accepted Norwegian sovereignty (1262–64). The union of Denmark and Norway in 1380 resulted in the transfer of the governance of Iceland to Denmark. Until the Reformation, Iceland was relatively autonomous politically, but from the mid-17th century the Danish crown exercised increasing control. Also from this time the island's economy declined. Trade declined sharply because of violent struggles for its monopoly. Famines and epidemics depleted the population, and climatic changes made the winters increasingly severe.

During the 19th century an independence movement arose, largely through the efforts of Jón Sigurdsson. The Althing was reestablished and some modernization took place. In 1874, Christian IX of Denmark granted Iceland its own constitution. Some tensions continued, however, until 1904, when Iceland was granted its own national government in Reykjavík. This was followed by the Act of Union in 1918, when Iceland became a completely independent state, united with Denmark solely by the monarchy and a common foreign policy.

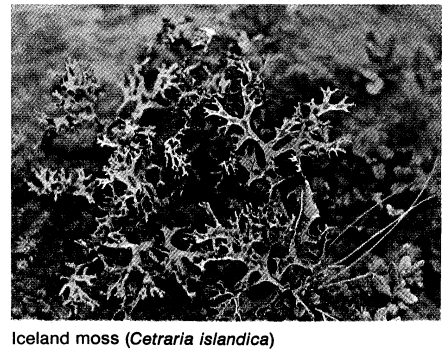
During the German occupation of Denmark in the 1940s, British, then American, troops occupied Iceland and used it for a strategic air base. In 1944 the Althing established a republic, severing all formal ties with Denmark. The action was approved in a national plebiscite.

Iceland's postwar problems mostly concerned fishing rights in Icelandic waters. After skirmishes with neighbouring countries, particularly Great Britain, a 200-mile (320-kilometre) limit was finally established.

In 1980 the Icelanders elected a woman to the office of the presidency, the first elected female chief of state (*i.e.,* president as distinct from prime minister) in the world.

Iceland, National Church of: *see* National Church of Iceland.

Iceland moss (*Cetraria islandica*), a fruticose (branched, bushy) lichen with an upright thallus usually attached in one place. It varies in colour from deep brown to grayish white and may grow to a height of 7 cm (3 inches). The trough-shaped branches fork into flattened lobes that are edged with short hairs. Growing in alpine areas of the Northern Hemisphere and on the lava slopes and plains of Iceland (where it got its name), it is an important food for reindeer, caribou, musk-oxen, and moose. Iceland moss is used as a food supplement for



Iceland moss (*Cetraria islandica*)
Ben Strickland—Van Cleve Photography

sheep and cattle and was probably the first lichen used as food by humans. It is soaked, dried, powdered, and mixed with cereals and potatoes for use in breads, soups, salads, and jellies. Slightly bitter-tasting, it contains about 70 percent lichenin, a lichen starch, and an extractable brown dye. Because Iceland moss is a source of glycerol, it is used in the soap industry and in the manufacture of cold creams.

Iceland spar, also called ICELAND CRYSTAL, a transparent calcite used for polariscope prisms. *See* calcite.

Icelanders' sagas, also called FAMILY SAGAS, the class of heroic prose narratives written 1200–20 about the great families who lived in Iceland from 930 to 1030. They are a unique contribution to Western literature and are far in advance of any medieval literature in

their realism, their controlled, objective style, their powers of character delineation, and their overwhelming tragic dignity. The family sagas represent the highest development of the classical age of Icelandic saga writing. Their artistic unity, length, and complexity have convinced most modern scholars that they are written works by individual authors, although the theory that they were composed orally still has adherents. Their historicity has also been the subject of long debate; but whether or not they are true to history, they are true to the grim ethos of a vanished way of life, which they portray with dramatic power and laconic eloquence.

Icelandic language, Icelandic ISLENSK, national language of Iceland; it belongs (with Norwegian and Faeroese) to the West Scandinavian group of North Germanic languages and developed from the Norse speech brought by settlers from western Norway in the 9th and 10th centuries. Old Icelandic, usually called Old Norse, is the language in which the *Eddas*, sagas, and skaldic poems were written in the Middle Ages. By the time these works were written, several dialectal characteristics that differentiate Icelandic from Norwegian had emerged.

In grammar, vocabulary, and orthography, modern Icelandic is the most conservative of the Scandinavian languages. It still has three genders (masculine, feminine, and neuter), four cases for nouns (nominative, genitive, dative, accusative), several declensions, and complicated pronoun and verb systems that have changed little since the classical period. For this reason, Icelanders today can still read the Old Icelandic sagas without difficulty. A great deal of change has taken place, however, in the pronunciation since Old Norse times.

Although Icelandic borrowed words from Celtic, Danish, Latin, and Romance languages, most of these words have been replaced with totally Icelandic forms since the beginning of the 19th century, when a purist movement developed; now, all technical and abstract terms are formed only from Icelandic elements. *See also* Old Norse language.

Icelandic literature, body of writings in Icelandic, including those from Old Icelandic (also called Old Norse) through Modern Icelandic. It is perhaps best known for the richness of its classical period—equivalent in time to the early and medieval periods in western European literature—especially for its *Edda* (*q.v.*), its skaldic poetry, and its sagas. *See* Scandinavian literature.

Icelandic low, large atmospheric low-pressure centre that forms between Iceland and southern Greenland. It causes many of the strong winter winds over the North Atlantic Ocean. In winter, the ocean is considerably warmer than the continents, and this difference is responsible for the location of the Icelandic low, which dominates the wind circulation over the North Atlantic. In summer, the low weakens and often divides into two separate cells. Its January mean sea-level pressure is 996 millibars (29.4 inches of mercury). The Gulf Stream displaces the Icelandic low northward.

Iceni, in ancient Britain, a tribe that occupied the territory of modern Norfolk and Suffolk and, under the leadership of its queen Boudicca (Boadicea), revolted against Roman rule.

Having controlled the Iceni through a client-king, Prasutagus, the Romans attempted to annex his territory after his death (AD 60), thus provoking his queen to lead a revolt of all East Anglia. After several initial successes by the Britons, the Romans ultimately defeated them and regained the province. They severely punished the Iceni, who eventually became a small tribal community with a capital at Venta Icenorum (modern Caister St. Edmund in Norfolk).

Ichang Series, division of the Ordovician Period in southern China (the Ordovician Period began about 500,000,000 years ago and lasted about 70,000,000 years). The Ichang Series of rocks precedes those of the Neichiashan Series and is the lowermost Ordovician Series in China. The Ichang has been further subdivided into two stages: the Yinchufu is the lower stage, and this is followed by rocks of the Ningkuo Stage.

Ichihara, city, Chiba Prefecture (*ken*), Honshu, Japan, on the east coast of Tōkyō-wan (Tokyo Bay). The city was formed by the amalgamation of the towns of Ichihara, Goi, Sanwa, Shizu, and Anegasaki in 1962. Except for the trade centre and railway station of Goi, the towns' economies before World War II were based on agriculture and fishing. Agriculture has deteriorated, and air pollution is a serious problem. Ichihara is now part of the Keihin Industrial Region. Its coastal area has been reclaimed for use by petrochemical and steel industries. Pop. (1983 est.) 230,351.

Ichijitsu Shintō (Japanese religion): *see* Sannō Ichijitsu Shintō.

Ichikawa, city, Chiba Prefecture (*ken*), Honshu, Japan, on the Edo-gawa (Edo River) east of Tokyo. The city is composed of the three towns of Ichikawa, Yawata, and Nakayama, which were salt-producing post towns on the Chiba-kaidō (Chiba Highway) during the Tokugawa era (1603–1867). Since the opening of two railway lines in 1894, the city has served as a commercial, industrial, and residential suburb of Tokyo. Ichikawa houses educational institutions. The cultivation of vegetables and fruit on the plateaus to the north is important. Pop. (1983 est.) 386,823.

Ichikawa FAMILY, Kabuki actors flourishing in Edo (modern Tokyo) from the 17th century to the present. The most famous names are Danjūrō, Ebizō, Danzō, and Ebijūrō, and, according to Kabuki convention, these names were assumed by a natural or adopted son of the Ichikawa family when his skill entitled him to inherit the mantle of a famous ancestor. Thus, there have been 12 Danjūrōs (the highest honorific name) and 10 Ebizōs (the second highest). Among the best known Ichikawas was Danjūrō I (1660–1704), the most famous actor of the Genroku period (1688–1703). He was also a playwright who originated the *aragoto* ("rough business") style of heroic drama, the specialty of the Ichikawa family. The heroic dramas feature bold, handsome, idealized warriors with exaggerated and magical powers and childlike, uncomplicated natures. The warrior's face is marked with red, blue, and black lines, and he carries a huge sword.

Danjūrō VII (1791–1859), the greatest actor of the late Tokugawa period (1603–1867), established the *Kabuki jūhachiban* ("18 Grand Plays of Kabuki"), the special repertoire of the Ichikawa family. Danjūrō IX (1838–1903), of the Meiji period (1868–1912), revitalized the theatre and participated in the first Kabuki performance in the presence of the emperor.

Danjurō XI (1909–65) was among the top Kabuki actors in the post-World War II period. He performed in both traditional and contemporary plays. His performances as Prince Genji in an adaptation of *Genji monogatari* (*The Tale of Genji*) constituted a high point in postwar Kabuki theatre. His son, who became Ebizō X, was one of Tokyo's "Great Five," the young Kabuki actors on whom the future of Kabuki depended following the deaths of many of the great actors of the previous generation. In 1985 Ebizō X took the name Danjurō XII.

Ichikawa Kon (b. Nov. 20, 1915, Ise, Japan), Japanese motion-picture director who introduced sophisticated Western-style comedy to Japan in the 1950s. Later he became concerned with such more serious subjects as antiwar sentiment and modern man's search for identity.

Ichikawa graduated from the Ichioka Commercial School in Ōsaka. He worked in the animation department at the J.O. motion-picture studio in Kyōto and entered the Tōhō Motion Picture Company in 1942, when J.O. was merged with Tōhō. He made his first motion picture, *Musume Dojo-ji* (*The Girl at Dojo Temple*), in 1946 for the Shintōhō Motion Picture Company. *Sambyaku rokujūgo ya* (1948; "Three Hundred and Sixty-five Nights") was his first big box-office success. He collaborated with his wife, Wada Natto, a screenwriter, on the screenplays for many of his early films.

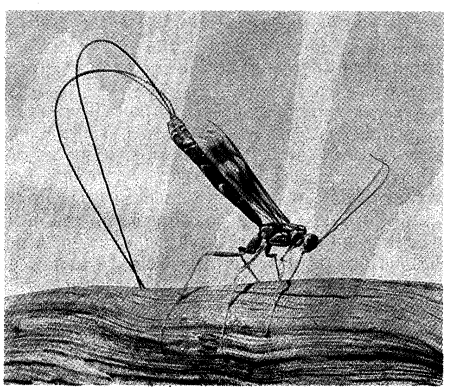
In the 1950s, Ichikawa and Wada developed the genre of the verbally witty comedy in Japan in such pictures as *Ashi ni sawatta onna* (1953; "The Woman Who Touched the Legs"), a remake of an earlier silent comedy, and *Pū-san* (1953; "Mr. Pū"). Two of Ichikawa's later features, *Biruma no tategoto* (1956; *The Burmese Harp*, 1966) and *Nobi* (1959; *Fires on the Plain*, 1963), are strong antiwar statements. Of the films that followed, *Kagi* (1959; *Odd Obsession*, 1961), *Bonchi* (1960); *Kuroi jūnin no onna* (1961; "Ten Dark Women"), *Yukinojō henge* (1963; "The Revenge of Yukinojō"), and *Matatabi* (1973; "The Wanderers") are notable for Ichikawa's delicate treatment of the material and the strikingly beautiful visual composition of each scene.

One of his greatest achievements was the documentary *Tōkyō Orimpikku* (1965; *Tokyo Olympiad*, 1966), in which he emphasized the attitudes and responses of the spectators and competitors over the outcome of the events. His later work included a serialization of *The Tale of Genji* and a number of popular suspense melodramas.

Ichinomiya, city, Aichi Prefecture (*ken*), central Honshu, Japan. It developed in the 7th century around the principal Shintō temple of the historic province, the Masumida-jinja (Masumida Shrine). During the Tokugawa period (1603–1867) it was an important transport centre on the Gifu-kaidō (Gifu Highway). Ichinomiya is now part of the Nagoya industrial area, specializing in woollen and cotton textiles for both kimonos and Western-style clothes. Pop. (1983 est.) 256,177.

ichneumon, small carnivorous mammal, a species of mongoose (*q.v.*).

ichneumon, any member of the family Ichneumonidae (order Hymenoptera), a large and widely distributed insect group of considerable economic importance. The name sometimes refers to any member of the superfamily Ichneumonoidea, which includes the families Stephanidae, Braconidae, and Ichneumonidae. The Stephanidae, a largely tropical



Ichneumon
J. Simon—Bruce Coleman Inc.

group, consists of several hundred species; the Braconidae is a large, widely distributed group.

About 40,000 ichneumon species are known. Adults vary considerably in shape, colour, and size, averaging about 1.2 centimetres (about ½ inch) long. The largest ichneumons of North America, those of the genus *Megarhyssa,* reach 5 cm in length. Most species resemble wasps in having a long, slender, curved abdomen. They usually differ from the stinging wasps in having longer antennae with more segments, or sections. The ovipositor, or egg-laying organ, is often longer than the body. Many species have a dark spot on the fore wing.

Ichneumons parasitize most insect groups—especially Lepidoptera (moths and butterflies) and other Hymenoptera, as well as spiders. Thus, the group as a whole is beneficial to man because it parasitizes many insect pests. A relatively small number of species parasitize beneficial insects.

The females lay their eggs in or on the larvae or pupae (rarely eggs or adults) of the host. The ichneumon larva feeds on the fats and body fluids of the host until fully grown, then usually spins a silken cocoon. The species that parasitize hosts in open habitats usually develop as internal parasites; those that attack hosts in concealed places, such as wood burrows, usually feed on the host externally. In most cases a single larva develops in one host; in some cases, however, many larvae develop in a single host.

Consult the INDEX *first*

ichthyology, scientific study of fishes, including, as is usual with a science that is concerned with a large group of organisms, a number of specialized subdisciplines: *e.g.,* taxonomy, anatomy (or morphology), behavioral science (ethology), ecology, and physiology. Because of the great importance of fishes as human food, economic ichthyology is a significant segment of the field.

The ancient Greek naturalists, especially Aristotle, were highly knowledgeable about many aspects of fish biology, and until the end of the 19th century the main advances were in taxonomy, as new species were described and the relationships of those already known were clarified. In the mid-20th century a great increase in interest in oceanography, together with new techniques and equipment for underwater observations (especially the self-contained underwater breathing apparatus, or SCUBA), opened many new avenues for the study of fish behaviour and ecology under natural conditions. The development of improved methods of keeping fishes in tanks led to an increase in their use as laboratory animals in the fields of behaviour, ecology, functional anatomy, and even toxicology and parasitology.

A great variety of fishes are kept by aquarium hobbyists, a few of whom make valuable observations on fish behaviour. The majority of fish research, however, is conducted at institutional aquariums, in which large tanks can simulate natural conditions, and at universities and museums, which maintain large collections of preserved specimens. Much fishery research is conducted at the laboratories of government agencies, which are responsible for managing natural fish populations so as to maintain them as a renewable resource.

Ichthyornis, a genus of about six species of extinct birds found as fossils in the Upper Cretaceous deposits (about 66,400,000 to 97,500,000 years old) in the Great Plains area of the United States (Wyoming, Kansas, and Texas). The sole genus of the order Ichthyornithiformes, these flying birds, with strongly developed wings, were one of the notable discoveries of the American paleontologist Othniel Charles Marsh. The two best known species were about the size of the domestic pigeon.

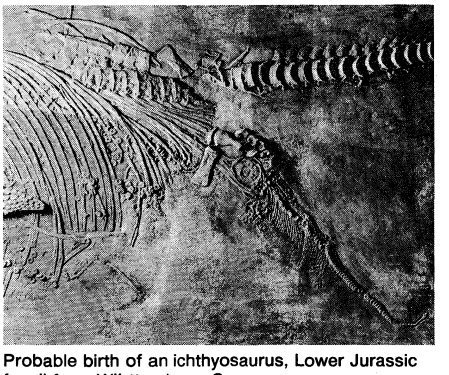
Indications are that *Ichthyornis* (meaning "fish bird"), like its modern relatives, lacked teeth. Because it was formerly believed to have teeth, *Ichthyornis* was grouped with another extinct sea bird, *Hesperornis.* The brain of *Ichthyornis* showed greater development than that of *Hesperornis,* but it still was smaller than that of modern birds. Another primitive feature was the vertebrae, which were like those in primitive reptiles.

The breastbone (sternum) is large, with a strong keel; and the wing bones are long and well developed, with the shoulder girdle similar to that of living birds of strong flight. The legs were strong, with short shanks (tarsus), long anterior toes, and a small, slightly elevated hind toe. The tail had a well-developed terminal plate of bone (pygostyle).

The indication is that these were birds of active flight, probably with webbed feet and resembling in general form modern gulls and terns. The resemblance is considered superficial, as the species of *Ichthyornis* differ as indicated by the form of the vertebrae. They are, however, recognized as members of the subclass Neognathae, the modern birds.

The two groups of birds from Cretaceous time that have had most widespread attention because of their strange form are the divers, such as *Hesperornis,* and the strong-winged *Ichthyornis,* also probably of aquatic habit. Because of representatives of modern families found among the fossil species from the Paleocene and Eocene of early Tertiary time, it has seemed evident that groups other than *Hesperornis* and *Ichthyornis* must have existed in the preceding Cretaceous. Knowledge of these, based on fragments of fossil bone, has slowly come to light until there is fairly definite record from Cretaceous rock strata of other ancestral kinds of birds related to the living groups of loons, grebes, flamingos, cranes, and shorebirds, indicative of early diversity in the avian class.

ichthyosaur, any member of an extinct group of aquatic reptiles that were very porpoise-like in appearance and habits; the ichthyosaurs were the most highly specialized reptiles adapted to aquatic environments. The ichthyosaurs had a very wide geographic range



Probable birth of an ichthyosaurus, Lower Jurassic fossil from Württemberg, Ger.
Wolf Strache, Stuttgart

and span almost the entire Mesozoic Era (between 66,400,000 and 245,000,000 years ago), but they were most abundant and diverse during the Jurassic Period (208,000,000 to 144,000,000 years ago). Excellent fossil specimens occur in the fine-grained shales of Early Jurassic age of southern Germany, in which the outline of the body, including a well-developed fleshy dorsal fin, is preserved.

A representative genus is *Ichthyosaurus,* from which the group takes its name. *Ichthyosaurus,* very fishlike in appearance, is especially well known from Jurassic deposits. The body was streamlined; no distinct neck was present, and the head blended smoothly into the body. The limbs were modified into paddle-like organs used to steer the animal. The animal propelled itself by means of a well-developed, fish-like caudal fin and by undulations of the body. The vertebral column, which is formed from disklike elements, bent downward into the lower lobe of the caudal, or tail, fin; the upper lobe was unsupported by bone. Early reconstructions of ichthyosaurs showed them with the spinal column straightened, and it was not until well-preserved material was found that the bent nature of the backbone became apparent. The skull of *Ichthyosaurus* was long; the jaws were greatly lengthened and armed with numerous sharp teeth. The eyes were very large, and the nostrils were positioned far back on the top of the skull, another adaption to an aquatic existence. *Ichthyosaurus* was about 3 metres (10 feet) long and was probably able to move through the water at high speeds. It probably fed largely on fish and other marine animals.

The ichthyosaurs were so highly specialized for an aquatic existence that it is unlikely they ventured upon the land; if stranded upon a shore, they must have been as helpless as modern beached whales and porpoises are. It is apparent that the ichthyosaurs must have evolved a mechanism by which they could reproduce in the water. Several specimens are known in which the skeletal remains of small, immature ichthyosaurs are preserved within the bodies of larger individuals. Although it has been suggested that these smaller ichthyosaurs had been eaten by larger ones, it is more likely that the specimens are females and offspring that died during parturition.

The ancestry of the ichthyosaurs is uncertain at best. Certain Early Mesozoic representatives already possessed most of the specializations that characterize the group. Ichthyosaurs became adapted for different sorts of habits. One form fed on mollusks; its teeth were modified into flat, crushing structures. In another the lower jaw was shortened, while the upper jaw was long and pointed in a structure similar to that of the modern swordfish. The ichthyosaurs became progressively rarer toward the end of the Mesozoic and were extinct before the era ended.

ichthyosis, also called FISH-SKIN DISEASE, or XERODERMA, a hereditary condition involving dryness and scaliness of the skin brought about by excessive growth of the horny outermost covering of the skin. The dead cells of this horny layer do not slough off at the normal rate but tend instead to adhere to the skin surface to form scales; horny plaques and papules may also be present in more severe cases. The skin in this condition is intolerant of even the mildest irritants and is prone to severe chapping and fissuring in cold weather. Ichthyosis is usually not detected at birth, but, as the child grows older, dry branny scaling will appear, being most marked on the extensor surfaces of the extremities. Ichthyosis may sometimes be associated with a deficiency of the sweat glands and, less frequently, with irregularities in the growth of hair, teeth, and nails. In its mild and simplest form, ichthyosis is probably the most common of the hereditary skin disturbances.

Ichthyostega, genus of extinct amphibians found as fossils in Late Devonian rocks in eastern Greenland (the Devonian Period began about 408,000,000 years ago and lasted about 48,000,000 years). *Ichthyostega* is among the oldest known vertebrates that can be called amphibians; the genus retains many fishlike



Ichthyostega, model by J.S. Collard (H.R. Allen Studios)

By courtesy of the Royal Scottish Museum, Edinburgh; photograph, the Natural History Photographic Agency

characteristics. *Ichthyostega* was about one metre (three feet) long and had a small dorsal fin along the margin of its tail; the tail itself possessed a series of bony supports, typical of the tail supports that are found in fish. Other fishlike traits include the relatively short snout region, the presence of a preopercular bone in the cheek region (which serves as part of the gill cover in fish), and many small scales on the body. Advanced traits shared with more advanced amphibians include typical early amphibian limbs and limb supports, the lack of gills, and strong ribs. *Ichthyostega* and its relatives represent forms that appear to be near the evolutionary line leading to the more advanced amphibians. It is possible that the ichthyostegids persisted into the following Mississippian Period.

icicle fish, also called ICEFISH, or GLASSFISH (*Salanx*), any of several semitransparent fishes, family Salangidae, found in freshwaters and salt waters of eastern Asia and considered a delicacy by the Chinese. The numerous species are slender and troutlike in form, scaleless or finely scaled, and seldom more than 15 centimetres (6 inches) long. They are large-mouthed predators with large canine teeth.

Ickes, Harold L(eClair) (b. March 15, 1874, Frankstown Township, Pa., U.S.—d. Feb. 3, 1952, Washington, D.C.), U.S. social



Ickes

By courtesy of the Library of Congress, Washington, D.C.

activist who became a prominent member of the New Deal Democratic administration of Pres. Franklin D. Roosevelt.

Admitted to the Illinois bar in 1907, Ickes early developed an aroused social conscience; he worked as a volunteer in a settlement house, frequently handled civil liberties cases without pay, and fought for municipal reform and the curbing of public utilities. Vacillating for many years between the two major political parties, he helped swing liberal Republicans to the opposition in the 1932 elections; he was, therefore, a natural choice for secretary of the interior when Roosevelt was seeking a progressive Republican for his Cabinet. Ickes became one of the most energetic and dedicated New Dealers in Washington and a lifelong supporter of the President. In his new post he fought for the preservation of natural resources against exploitation by private interests.

Ickes won a wider reputation as head of the Public Works Administration (PWA; 1933–39). He spent money so carefully that many of his projects—ranging from highways and public buildings to huge Western dams—were slow getting under way, thereby failing to stimulate the depressed national economy as early as desired. Despite the expenditure of more than $5,000,000,000, however, Ickes' numerous PWA contracts were virtually graft-proof. One of his most valuable services to consumers was in establishing "yardsticks" for electric-power rates through federal and municipal power projects.

During presidential campaigns, Ickes became known as "Roosevelt's hatchet man" because of his colourful attacks upon Republican candidates; between campaigns he feuded with almost equal vigour with several of his Democratic colleagues, and his trenchant opinions of many others were recorded in his lively diary, published posthumously (*The Secret Diary of Harold L. Ickes,* 3 vol., 1953–54). He resigned in February 1946 after a dispute with Pres. Harry S. Truman.

Icknield Way, famous prehistoric trackway across England from Norfolk to Wiltshire, following dry ground along the East Anglian ridge, the Chiltern Hills, and the Berkshire Downs. In Wiltshire are the great foci of the prehistoric occupation of the county at Stonehenge and Avebury; on the Norfolk–Suffolk border near Brandon are the major flint mines known as Grime's Graves. The name, British in origin, was used first for the western sections in Berkshire but is now applied more generally to the track north of the Thames, which is crossed at the Goring Gap. In parts the track is doubled above and below the spring line of the escarpment, suggesting seasonal variation in use.

icon, in Eastern Christian tradition, a representation of sacred personages or events in mural painting, mosaic, or wood. After the iconoclastic controversy of the 8th–9th century, which disputed the religious function and meaning of icons, the Eastern Church formulated the doctrinal basis for their veneration: since God had assumed material form in the person of Jesus Christ, he also could be represented in pictures. Icons are considered an essential part of the church and are given special liturgical veneration. They also serve as mediums of instruction for the uneducated faithful through the iconostasis (*q.v.*), a screen shielding the altar,



"Annunciation," reverse of a double-sided painted panel icon from Constantinople, early 14th century; in the Skopolije Museum, Skopje, Yugos.

Hirmer Fotoarchiv, Munchen

covered with icons depicting scenes from the New Testament, church feasts, and popular saints. In the classical Byzantine and Orthodox tradition, iconography is not a realistic but a symbolical art; its function is to express in line and colour the theological teaching of the church.

Iconium (Turkey): *see* Konya.

Iconoclastic Controversy, a dispute over the use of religious images (icons) in the Byzantine Empire in the 8th and 9th centuries. The Iconoclasts (those who rejected images) objected to icon worship for several reasons, including the Old Testament prohibition against images in the Ten Commandments (Ex. 20:4) and the possibility of idolatry. The defenders of icon worship insisted on the symbolic nature of images and on the dignity of created matter.

In the early church, the making and veneration of portraits of Christ and the saints were consistently opposed. The use of icons, nevertheless, steadily gained in popularity, especially in the eastern provinces of the Roman Empire. Toward the end of the 6th century and in the 7th, icons became the object of an officially encouraged cult, often implying a superstitious belief in their animation. Opposition to such practices became particularly strong in Asia Minor. In 726 the Byzantine emperor Leo III took a public stand against icons; in 730 their use was officially prohibited. This opened a persecution of icon worshippers that reached great severity in the reign of Leo's successor, Constantine V (741–775).

In 787, however, the empress Irene convoked the seventh ecumenical council at Nicaea at which Iconoclasm was condemned and the use of images was reestablished. The Iconoclasts regained power in 814 after Leo V's accession, and the use of icons was again forbidden at a council (815). The second Iconoclast period ended with the death of the emperor Theophilus in 842. In 843 his widow finally restored icon veneration, an event still celebrated in the Eastern Orthodox Church as the Feast of Orthodoxy.

iconography, the science of identification, description, classification, and interpretation of symbols, themes, and subject matter in the visual arts. The term can also refer to the artist's use of this imagery in a particular work. The earliest iconographical studies, published in the 16th century, were catalogs of emblems and symbols collected from antique literature and translated into pictorial terms for the use of artists. The most famous of these works is Cesare Ripa's *Iconologia* (1593). Extensive iconographical study did not begin in Europe until the 18th century, however, when, as a companion to archaeology, it consisted of the classification of subjects and motifs in ancient monuments.

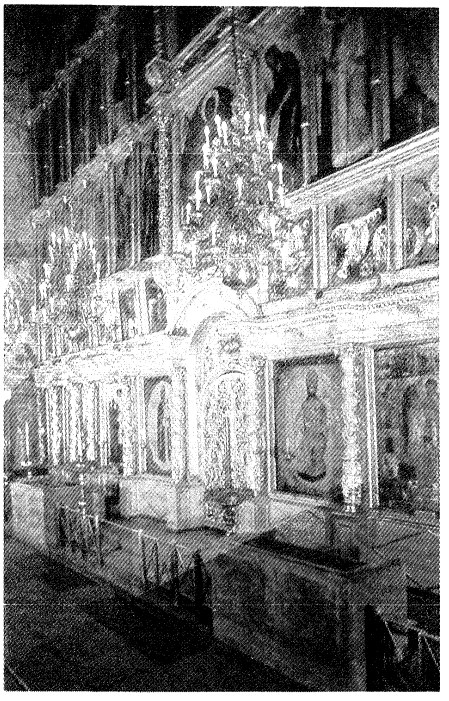
In the 19th century, iconography became divorced from archaeology and was concerned primarily with the incidence and significance of religious symbolism in Christian art. In the 20th century, investigation of Christian iconography has continued, but the secular and classical iconography of European art has also been explored, as have the iconographic aspects of Eastern religious art.

iconostasis, in Eastern Christian churches of Byzantine tradition, a solid screen of stone, wood, or metal, usually separating the sanctuary from the nave. The iconostasis had originally been some sort of simple partition between the altar and the congregation; it then became a row of columns, and the spaces between them were eventually filled with icons. In later churches it extends the width of the sanctuary, though the height may vary, and

is covered with panel icons. The iconostasis is pierced by a large, or royal, door and curtain in the centre, in front of the altar, and two smaller doors on either side. It always includes the icon of the Incarnation (mother with child) on the left side of the royal door and the second coming of Christ the Pantocrator (Christ in majesty) on the right. The sacrament of the Eucharist, revealed through the doors between the two main icons, is thus the manifestation of Christ in the church during the time between his two comings. Icons of the four Evangelists, the Annunciation, and the Last Supper cover the royal doors themselves. Representations of the archangels Gabriel and Michael, the 12 Apostles, the feasts of the church, and the prophets of the Old Testament are arranged on the iconostasis in complicated patterns, with all figures facing the royal doors.

The veneration of icons came under attack during the Iconoclastic Controversy of 725–843, but the Eastern Church finally recognized icons as the main form of representing divine revelation and as a pictorial history of the Christian mystery to be contemplated by the faithful while being performed behind the screen in the eucharistic sacrament.

In various parts of the modern Orthodox world, there is a tendency to restore the communal character of the Eucharist, which was partially broken by the development of the iconostasis, by either suppressing the iconostasis or giving it a lighter form.



Iconostasis, Archangel Cathedral, the Kremlin, Moscow, 1505–09

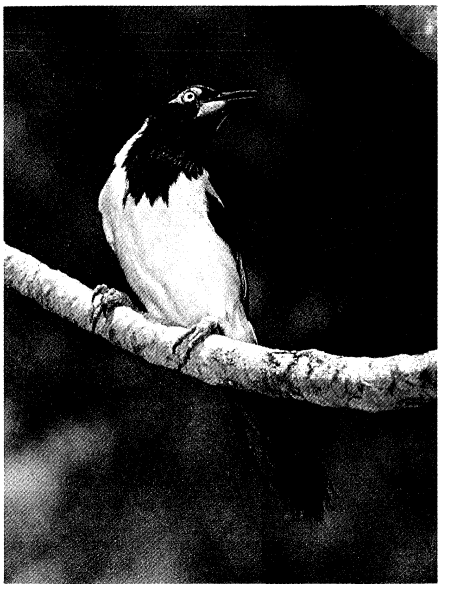
Novosti Press Agency

ICSH (interstitial-cell stimulating hormone): *see* luteinizing hormone.

ictalurid, any fish of the family Ictaluridae, which includes about 35 species of North and Middle American freshwater catfishes. Ictalurids are "typical" catfishes, with large, wide heads, tapering, scaleless bodies, and eight prominent mouth barbels. The family includes the channel and other North American catfishes (*see* catfish), as well as the madtom and bullhead (*qq.v.*) groups.

Icteridae, songbird family, order Passeriformes, consisting of 88 species of great diversity in size, habits, and diet, found throughout the Americas.

Members range in size from 16 to 54 centimetres (6 to 21 inches) long. They have conical bills, strong feet, and long, pointed wings. Most show black in varying degrees.



Troupial (*Icterus icterus*)

Des and Jen Bartlett—Bruce Coleman Ltd.

The family includes such common birds as blackbirds (*Agelaius*), grackles (*Quiscalus*), orioles (*Icterus*), meadowlarks (*Sturnella*), cowbirds (*Molothrus*), and bobolinks (*Dolichonyx oryzivorus*). Tropical members are the troupials (*Icterus icterus*), oropendolas (*Psarocolius*), and caciques (*Cacicus*).

Ornithologists refer to these birds as icterids. The Icteridae belongs to the songbird suborder (Passeres).

Ictinus, also spelled IKTINOS (fl. 5th century BC), Greek architect, one of the most celebrated of Athens, known for his work on the Parthenon on the Acropolis, the Temple of the Mysteries at Eleusis, and the Temple of Apollo Epicurius at Bassae.

According to Vitruvius (*Ten Books on Architecture,* preface to book seven), Ictinus designed the Parthenon with Callicrates, although there is some speculation that they were not collaborators but actually rivals—that Ictinus continued the work begun by Callicrates. Ictinus was also involved in the rebuilding and enlargement of the Telestrion hall at the temple to Demeter and Persephone at Eleusis in collaboration with Coroebus, Metagenes, and Xenocles. The Telestrion hall, where the Eleusian mysteries were performed, was a square hall with rock-cut seats. Ictinus probably worked at Eleusis *c.* 430 BC, sometime after he had completed his work on the Parthenon.

The Temple of Apollo Epicurius at Bassae (in Arcadia, near Phigalia) was said to be one of the most beautiful temples in the Peloponnese. Most of the columns from the temple still stand. A sculptured Ionic frieze from the temple of Apollo at Bassae, which has remained in fairly good condition, is among the treasures of the British Museum.

id, in Freudian psychoanalytic theory, one of the three agencies of the human personality, along with the ego and superego (*qq.v.*). The oldest of these psychic realms in development, it contains the psychic content related to the primitive instincts of the body, notably sex and aggression, as well as all psychic material that is inherited and present at birth. The id (Latin for "it") is oblivious of the external world and unaware of the passage of time. Devoid of organization, knowing neither logic nor reason, it has the ability to harbour acutely conflicting or mutually contradictory impulses side by side. It functions entirely according to the pleasure–pain principle, its impulses either seeking immediate fulfillment or settling for a compromise fulfillment. The id supplies the energy for the development and continued functioning of conscious mental life, though the working processes of the id itself are completely unconscious in the adult (less unconscious in the child). In waking life it belies its content in slips of the tongue, wit, art, and other at least partly nonrational modes of expression. The primary methods for unmasking its content, according to Freud, are the analysis of dreams and free association.

Many psychoanalysts now consider the conception of an id overly simple, though still useful in drawing attention to the irrational and antisocial impulses within even the most normal human being.

ʿid (Arabic), Syriac ʿIDA ("festival, holiday"), Turkish BAYRAM, either of the two canonical festivals of Islām. The first of these celebrations, according to the calendar, is the ʿĪd al-Fiṭr (al-ʿĪd aṣ-Ṣaghīr; Küçük Bayram; "festival of breaking fast," or "minor festival"), which immediately follows the fasting month of Ramaḍān, occupying the first three days of the tenth month, Shawwāl. It is a time of official receptions and private visits, when friends congratulate one another, presents are given, new clothes are put on, and the graves of relatives are visited.

The second, the ʿĪd al-Aḍḥā (al-ʿĪd al-Kabīr; Kurban Bayram, "sacrificial feast," or "major festival"), falls on the tenth and the following three days of the last month of the year, Dhū al-Ḥijjah. Throughout the Muslim world, all who can afford it sacrifice at this time a legal animal (sheep, goats, camels, or cattle), and then divide the flesh equally among themselves, the poor, and friends and neighbours, to commemorate the ransom of Ismāʿīl (Ishmael) with a ram.

Ida (d. 559), king of Bernicia (from 547), soon after the foundation of the kingdom of Bernicia by the Angles in the British Isles. He built the fortress of Bebbanburh, the modern Bamborough; and after his death his kingdom, which did not extend south of the Tees, passed in turn to six of his sons.

Ida (Greece): *see* Idi.

Ida, modern Turkish KAZ DAĞI, mountain range in northwestern Asia Minor, near the site of ancient Troy. A classic shrine, Ida was where Paris passed judgment on the rival goddesses and was the scene of the rape of Ganymeda. From its highest peak, about 5,800 feet (1,800 metres), the gods are said to have witnessed the Trojan War.

Ida (Ide, Idhi, or Psiloriti) is also the classical name of the highest mountain (8,058 feet [2,456 metres]) of Crete, site of another classic shrine and the cave where Zeus was said to have been reared.

IDA: *see* International Development Association.

Idah, town, Benue State, south central Nigeria, on a sandstone cliff on the east bank of the Niger River. The traditional capital of the Igala people, Idah was brought under the jurisdiction of the Kingdom of Benin by Oba (King) Esigie in the early 16th century. From Benin the polity of Idah adopted both a system of kingship and the art of *cire perdue* ("lost wax") casting in bronze. Tsoede, the son of an early *ata* ("king"), left Idah and conquered and refounded the Kingdom of Nupe (near the confluence of the Niger and Kaduna rivers); he is also said to have introduced bronze casting to the Nupe (an art for which they later became well known).

During the 19th century Idah was a thriving port, trading palm oil and kernels and rubber to Europeans and staple crops, cotton, woven cloth, horses and other livestock, pots, and knives to the Ibo people just to the south. The Igala were able to maintain strict control over the Lower Niger trade north of Idah (no Ibo boats were allowed above the port), partially because just south of the town the Niger valley emerges from a narrow, rocky section to some wide, extensive floodplains.

Modern Idah remains a major trading centre (palm produce, yams, cassava, rice, fish) on the river. Besides trade and farming, the local population is engaged in making canoes, fishing nets, and soap; handicrafts and cotton weaving are also significant. There are limestone deposits in the vicinity and coal deposits near Ankpa, 68 miles (109 km) east-northeast.

Islām is the predominant religion of the town. Christian missionaries have been active among the Igala since the 1860s, and Idah's Roman Catholic community sponsors both a secondary school and a teacher-training college. A federal polytechnic, a government craft school, and a hospital also serve Idah. Roads from the town lead to Nsukka and Ayangba, and there is ferry service to Agenebode across the Niger River. Pop. (1983 est.) 45,740.

Idaho, constituent state of the United States of America, lying in the northwestern part of the country. It is bounded on the north by Canada, on the east by Montana and Wyoming, on the south by Utah and Nevada, and on the west by Oregon and Washington. The capital is Boise.

A brief treatment of Idaho follows. For full treatment, *see* MACROPAEDIA: United States of America: *Idaho.*

The area that is now Idaho was explored by Meriwether Lewis and William Clark in 1805. A trading post was established at Pend Oreille Lake in 1809, and other settlements followed. Idaho was a part of the disputed Oregon Country that passed to the United States when Britain relinquished its claims in 1846. The discovery of gold in 1860 led to an influx of settlers and was followed by a wave of Confederate refugees after the American Civil War. Mormons from Utah also settled there and frequently clashed with other Christian denominations. Idaho became the 43rd state of the United States in 1890.

Idaho's physical relief is dominated by the northern Rocky Mountains. The granite batholith of central Idaho, exposed in the Sawtooth Mountains, is one of the largest in North America. Nearly all of the state drains to the Pacific. The southern part of Idaho lies within the Columbia Plateau and is dominated by the Snake River, the course of which includes Hells Canyon, North America's deepest gorge (7,900 feet [2,400 m]). The valley of the Snake is a geologically complex sequence of lakes, lava beds, mesas, buttes, canyons, and desertscape, most notably symbolized by the barren craters and cones of the Craters of the Moon National Monument.

Indians, particularly the Kutenai, Salish (Kalispel), Coeur d'Alene, Nez Percé, and Shoshoni, were Idaho's first inhabitants. Living on reservations located in about the same areas as their ancestral homes, they now comprise only a tiny fraction of the state's population. The state is predominantly Mormon: the Church of Jesus Christ of Latter-day Saints has about half of the state's total church membership. Some cities in southeastern Idaho are more than 90 percent Mormon.

Idaho is sparsely populated, with an average of only about 12 persons per square mile (5 per square km). The urban population is slightly more than one-half of the total.

Potatoes have become almost synonymous with Idaho; wheat and sugar beets are also major crops. Cattle and sheep are raised in the prairies and mountain plateaus. Forestry is an important industry. Silver, lead, antimony, and molybdenum are mined.

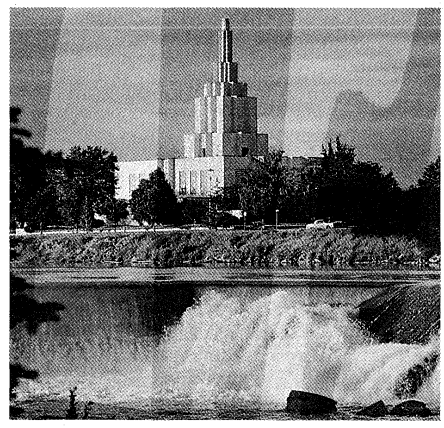
The manufacturing sector has only recently exceeded agriculture in terms of the state's personal income. Food processing, machinery manufacturing, and the production of chemicals are the leading industries.

Transportation is hindered by the mountains, and only one major highway connects north and south. Four transcontinental railroads cross Idaho, and Lewiston is connected to the Pacific Ocean by way of the navigable Snake and Columbia rivers.

Culture in Idaho is mainly the province of the schools and colleges. There are three major universities—Boise State University, Idaho State University in Pocatello, and the University of Idaho at Moscow—and several colleges. University education leans toward agriculture, mining, engineering, and forestry. Notable Idaho cultural figures include novelists Vardis Fisher and Carol Ryrie Brink. Area 83,564 square miles (216,432 square km). Pop. (1990 est.) 1,017,000.

Idaho City, seat of Boise county, southwestern Idaho, U.S., above the confluence of Elk and Mores creeks, in a mountainous area (elevation 4,400 feet [1,340 m]) of the Boise National Forest, 24 miles (39 km) northeast of Boise. Perhaps the most famous of Idaho's early boomtowns, it was founded as Bannack City in 1862 during the great gold-mining rush into the Boise Basin and in its heyday had a population of 30,000–40,000. It became the transportation, commercial, and social hub of central and southwestern Idaho and was named the territorial capital. Placer mining, however, quickly declined, and by 1869 the population had dwindled to 1,000. By 1918 almost all local mining activities had ceased. The town has been disfigured by fires, dredging, and decay. Surviving relics include the Masonic Hall, Gold Hill (once a rich placer ground), St. Joseph's Catholic Church, Boise Basin Museum, and Boot Hill Cemetery. Tourism (sightseeing, fishing, camping, hunting, and skiing) is the economic mainstay of the town's inhabitants. Pop. (1986 est.) 370.

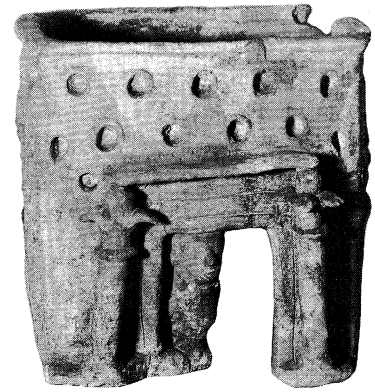
Idaho Falls, city, seat (1911) of Bonneville county, southeastern Idaho, U.S., on the upper Snake River. It originated as the Eagle Rock settlement at Taylor's Ferry (1863), later Taylor's Bridge. Renamed in 1890 for the low but wide (1,500 feet [460 m]) cataract in the river (now a source of hydropower), it developed first as a railroad division point and later as a centre of irrigated farming. The city



Idaho Falls Mormon Temple, Idaho
Herb and Dorothy McLaughlin

has diversified industry, but its main sources of income are potatoes, livestock, the nearby Idaho National Engineering Laboratory (nuclear-power testing), and tourism. The Idaho Falls Mormon Temple (1944) is a riverbank landmark. Inc. town, 1890; city, 1900. Pop. (1987 est.) 42,638.

Idalium, also called IDALION, ancient city in southern Cyprus, near modern Dali. Of pre-Greek origin, Idalium was one of 10 Cypriot kingdoms listed on the prism (many-sided tablet) of the Assyrian king Esarhaddon (680–669 BC). Eventually dominated by the Phoenician city of Citium, it became the centre of a cult of Aphrodite and of the Greco-Phoenician



Terra-cotta model shrine, about 600 BC, found at Idalium and believed to represent the Resheph-Apollo temple; in the Louvre, Paris
Cliche Musees Nationaux, Paris

deity Resheph-Apollo. A terra-cotta model found there (now in the Louvre) is believed to represent the Resheph-Apollo temple.

Idar-Oberstein, city, Rhineland-Palatinate *Land* (state), southwestern Germany, on the Nahe River at the mouth of the Idarbach. The present city was formed in 1933 through the union of Idar, Oberstein (both chartered in



The Nahe River running through Idar-Oberstein, Ger.
Marburg/Art Resource, New York

1865), Algenrodt, and Tiefenstein. Until 1670 Idar and Oberstein belonged to the barons of Oberstein, later counts of Falkenstein; two ruined castles, the Alte Burg (*c.* 1197) and the Neues Schloss (*c.* 1330), date from that period. The towns changed hands several times before passing finally to the Birkenstein principality of Oldenburg in 1817. Idar-Oberstein has been important for precious-stone polishing, jewelry manufacture, and precious-metal working since the 17th century. There is a notable museum of gems in the city. Pop. (1989 est.) 33,227.

ʿiddah, a specified period of time that must elapse before a Muslim widow or divorcee may legitimately remarry. The Qurʾān (2:228) prescribes that a menstruating woman have three monthly periods before contracting a new marriage; the required delay for a non-menstruating woman is three lunar months. A widow's delay is 4 months and 10 days.

These stipulations serve to remove all ambiguity about paternity should pregnancy have occurred shortly before the couple's separation or the death of the husband. If a woman becomes pregnant before the divorce or separation, she may remarry after the birth of her child. The child's true father is consequently also the legal father. In the case of divorced partners, *'iddah* also provides an opportunity for reestablishing the marriage, but no reunion can take place until a period of waiting removes all doubt about existing pregnancy.

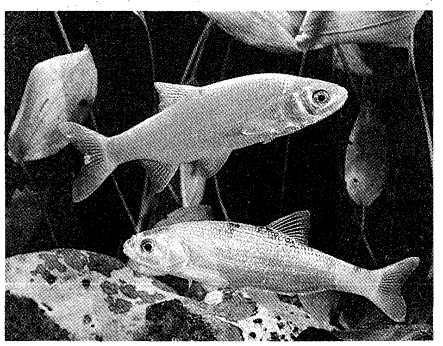
Iddesleigh, Stafford Henry Northcote, 1st earl of: *see* Northcote, Sir Stafford Henry.

Iddings, Joseph Paxson (b. Jan. 21, 1857, Baltimore—d. Sept. 8, 1920, Brinklow, Md., U.S.), U.S. geologist who demonstrated the genetic relationships of neighbouring igneous rocks formed during a single period of magmatic activity.

From his studies of the graduation of texture and chemical composition among rocks, Iddings concluded that physical conditions affect the essential mineral composition as well as the crystal structure of rocks. He showed that crystalline variations depend upon temperature and rate of cooling and thus challenged the widely held opinion that granular rocks were produced only in large masses at great depths.

Iddings joined the U.S. Geological Survey in 1880. From 1883 to 1890 he worked with the team surveying Yellowstone National Park, and in 1895 he became professor of petrology at the University of Chicago. He collaborated in preparing the *Quantitative Classification of Igneous Rocks* (1903) and later published *Igneous Rocks* (1909–13), *Rock Minerals* (1906), and *The Problem of Volcanism* (1914).

ide, also called ORFE (*Idus idus*), common sport and food fish of the carp family, Cyprinidae, widely distributed in rivers and lakes of Europe and western Siberia. An elongated, rather stout fish, the ide is blue-gray or blackish with silvery sides and belly, and is usually about 30–50 centimetres (12–20 inches) long. It eats fish and insects and other invertebrates. The golden ide is a hardy, reddish-gold variety of the species commonly kept in pools and park lakes.



Golden ides (*Idus idus*)
Jane Burton—Bruce Coleman Ltd.

ideal gas (physics): *see* perfect gas.

ideal language, in Analytic philosophy, a language that is precise, free of ambiguity, and clear in structure, on the model of symbolic logic, as contrasted with ordinary language, which is vague, misleading, and sometimes contradictory. In the *Tractatus Logico-Philosophicus* (1921), the Viennese-born philosopher Ludwig Wittgenstein viewed the role of language as providing a "picture of reality." Truth was seen as making logical propositions that either agreed or disagreed with reality. An ideal language was thus seen as the necessary criterion for determining the meaning, or meaninglessness, of statements about the world.

ideal solution, homogeneous mixture of substances that has physical properties linearly related to the properties of the pure components. The classic statement of this condition is Raoult's law (*q.v.*), which is valid for many highly dilute solutions and for a limited class of concentrated solutions, namely, those in which the interactions between the molecules of solute and solvent are the same as those between the molecules of each substance by itself. Solutions of benzene and toluene, which have very similar molecular structures, are ideal: any mixture of the two has a volume equal to the sum of the volumes of the separate components, and the mixing process occurs without absorption or evolution of heat. The vapour pressures of the solutions are mathematically represented by a linear function of the molecular composition.

When the components of nonideal solutions are mixed, the volume of the mixture ordinarily differs from the sum of the volumes of the pure components, and heat is evolved or absorbed. The properties of such solutions often are described in terms of their deviations from those of ideal solutions. Mixtures of acetone and chloroform, for example, are said to show negative deviations from ideality: their vapour pressures are lower than those calculated on the assumption of a linear relationship to the molecular composition. Solutions of acetone and carbon disulfide, on the other hand, have higher vapour pressures than those that would characterize an ideal solution.

ideal type, in the social sciences, mental construct derived from observable reality although not conforming to it in detail because of deliberate simplification and exaggeration. It is not ideal in the sense that it is excellent, nor is it an average; it is, rather, a logical ideal used to order reality by selecting and accentuating certain elements.

The concept of the ideal type was developed by the early-20th-century German sociologist Max Weber, who used it in his historical studies. Some writers confine the use of ideal types to general, suprahistorical phenomena (*e.g.,* bureaucracy) that recur in different times and places, although Weber also used them for historically unique occurrences (*e.g.,* his famous Protestant ethic).

Problems in using the ideal type include its tendency to focus attention on extreme, or polar, phenomena, while overlooking the connections between them, and the difficulty of showing how the types and their elements fit into a conception of a total social system.

Idealism, in philosophy, doctrine emphasizing primacy of spirit or consciousness in viewing the world. Idealists argue that abstract relations between entities are more real than objects apprehended through the senses, existence being principally in the realm of ideas; this last notion is called specifically metaphysical Idealism. There is an epistemological type of Idealism, which claims that the mind, in seeking knowledge, can apprehend only what is spiritual, or claims that at any rate the reality of objects resides in their perceptibility.

A brief treatment of Idealism follows. For full treatment, *see* MACROPAEDIA: Philosophical Schools and Doctrines.

Although there are many types of Idealism, six tenets are shared by all of them: the existence of universals (qualities common to every member of a category); a transcendence of the here and now; the idea that relations between entities may transform those entities; a dialectical approach, building up systems that incorporate elements from sometimes contradictory constituents (most Idealists hold that even bad can be transcended to produce good); and, finally, that the mind is considered superior to matter, particularly if expressed as spirit.

Idealists have tried to define ultimate reality; to delimit the basic data of human knowledge (which they have tended to see as a spirit force embracing the whole of world history); and to construct a philosophy of history that accounts for the fact of change and any purpose that may inhere in change.

Among individual Idealist contentions are: that the essence of an object is its being perceived (formulated by the 18th-century British Bishop George Berkeley; Berkeley's brand is called subjective Idealism); that the relationship of a subject and object is part of the fact about the subject's and object's existence; a tendency toward a mystical apprehension of the "absolute" (as in the case of Plato's embracing the idea of the good); and the ontological proof of God's existence set out by St. Anselm in the 11th century, arguing that because God is conceived of as perfect he must exist, since if he did not exist he would not be perfect.

Various strands of Idealism exist; one such is the formalistic or transcendental Idealism proposed in the late 18th century by Immanuel Kant (who himself actually preferred the term critical Idealism). Kant argued that the human mind could make sense of its experience only on the basis of certain highly specific general conceptual features, such as the ability to locate and relocate objects in space and time. Still, from the fact that the human mind could make sense of its experience only if reality exhibited such features, it did not follow that reality was actually like that. Indeed, Kant believed that one renders reality intelligible by imposing on sensory experience those general conceptual features that are the essential preconditions of an intelligible reality, and that reality itself, although conceivable, was not directly receivable.

In contrast to Berkeley's subjective Idealism was objective Idealism, formulated by the three German successors of Kant. These were F.W.J. Schelling (aesthetic Idealism), J.G. Fichte (moral Idealism), and G.W.F. Hegel (dialectical Idealism). Differences between subjective and objective Idealism were not always clear-cut, however. For instance, Fichte's Idealism was later called subjective in contrast to Schelling's objective variety, while Hegel's became known as absolute Idealism.

Hegel in particular rejected Kant's version of Idealism. He argued that the concept of the unknowable "things in themselves" was itself unintelligible. The central doctrine of absolute Idealism is that reality can be known, and can be known to be ultimately spiritual in nature, but that "spirit" or "mind" can only realize itself in relation to the external world. Mind fulfills itself in its encounters with physical reality. This process of realization seems to consist in a historical progression whereby one inadequate but intellectually dominant concept eventually generates inconsistencies that lead to its being replaced by an opposing concept. This concept also displays inconsistency, however. Hence the solution is to combine these two concepts in a third, less inadequate concept. However, this concept in turn, although an improvement on previous concepts, itself displays inadequacies that generate a new thesis and antithesis (as Hegel called this pattern of concept progression). The process known as the dialectic gradually resulted in the concepts' reaching the one fully adequate concept, the "absolute idea," which would demonstrate that reality could only be understood as a totality that was spiritual in nature.

In the 19th and 20th centuries, Idealism underwent numerous revivals and reinterpretations. Similar doctrines have played central roles in Indian, Chinese, and Islāmic metaphysics and epistemology.

Idealism, absolute (philosophy): *see* absolute Idealism.

Idealism, subjective (philosophy): *see* subjective Idealism.

Idealism, transcendental (philosophy): *see* transcendental Idealism.

Idelsohn, Abraham Zevi (b. July 14, 1882, Felixberg, Latvia, Russian Empire—d. Aug. 14, 1938, Johannesburg), Jewish cantor, composer, founder of the modern study of the history of Jewish music, and one of the first important ethnomusicologists.

Trained as a cantor from childhood, Idelsohn later studied music in Berlin and Leipzig. Before emigrating to Jerusalem in 1905, he was a cantor in Leipzig and Regensberg, Ger., and in Johannesburg. In Jerusalem he served as a cantor and in 1910 founded the Institute for Jewish Music. The previous year, funded by the Vienna Academy of Sciences, he had begun collecting from oral tradition the music of various European, Asian, and North African Jewish groups. The result was *Thesaurus of Hebrew Oriental Melodies*, 10 vol. (1914–32). This work and the more than 1,000 recordings made by Idelsohn provided a basis for the first comparative study of Jewish biblical cantillation (intoned recitation) and demonstrated an underlying unity in the religious chants even among geographically widely separated groups. His studies, especially those of the chants of the Yemenite Jews, also led to his further research demonstrating the close relationship of Jewish and early Christian chants. He also did important early studies of the nature of the *maqāmāt,* the melodic frameworks used in Islāmic music.

Idelsohn also composed the first Hebrew opera, *Yiftaḥ* (1922; "Jephthah"), which incorporates traditional melodies; an unfinished opera, *Eliyahu* ("Elijah"); and the song "Hava nagila" ("Come, Let's Rejoice"), a setting of his own text to a melody that he adapted from a Ḥasidic (a pietistic Jewish movement) melody. His books include *Jewish Music in Its Historical Development* (1929); *Jewish Liturgy* (1932); and *Sefer ha-shirim*, 2 vol. (1913–22; "Book of Songs"), the first Hebrew songbook published in Palestine.

Idemitsu Kōsan Co., Ltd., Japanese petrochemical corporation founded in 1911, as Idemitsu Shōkai, and reorganized and incorporated under its current name in 1940. Headquarters are in Tokyo.

The company as originally founded in Moji (now a part of Kita-Kyūshū), Japan, by Idemitsu Sazō was a general trading company, dealing in the distribution of various goods, including such commodities as grain and such bulk products as fuel and lubricating oils. By 1914 the company had embarked on a major expansion on the Asian mainland, opening an office in Darien, Manchuria, and extending a sales network first through North China, Korea, and Taiwan and later into South China. By the outbreak of World War II in Europe, the company was making sizable inroads into the territories once the exclusive trading grounds of Dutch, British, and American companies.

In 1945, however, with its overseas trade lost, Idemitsu Kōsan fell on hard times. In 1949, under the Allied occupation, it secured rights to distribute petroleum products. The company first expanded into marketing and distribution, creating a fleet of tankers and establishing depots and warehouses. By 1957 the company had begun refining oil and was importing crude oil from a variety of overseas sources. By 1976 it was also producing its own oil and gas in the offshore Aga Field in the Sea of Japan. Meanwhile, in 1964, with the creation of a subsidiary, Idemitsu Petrochemical Co., Ltd., the company began producing a wide range of petrochemical products, including plastics and synthetics.

identity theory, in philosophy, one view of modern Materialism that asserts that mind and matter, however capable of being logically distinguished, are in actuality but different expressions of a single reality that is material. Strong emphasis is placed upon the empirical verification of such statements as: "Thought is reducible to motion in the brain."

The double-aspect theory is similar to this, with one notable exception: reality is not material; it is either mental or neutral. The latter case is illustrated by an undulating line that is both concave and convex at the same time; each aspect is an integral, but only a partial, expression of the total reality.

Idéologie, English IDEOLOGY, French philosophic movement of the late 18th and early 19th centuries that reduced epistemological problems (of the nature or grounds of knowledge) to those of psychology (as in the work of Condillac), before advancing to ethical and political problems. The Idéologues, by analysis of ideas, viewed the simple sensory elements of Condillac's sensationalism as generating, by successive composition, the totality of the psychic and spiritual sentiments and, finally, of the social, moral, and political sentiments as well. Named by Destutt de Tracy, the movement had as active members the Marquis de Condorcet, Maine de Biran, and P.-J.-G. Cabanis.

ideology, a systematic body of beliefs about the structure and working of society that includes a program of practical politics based on a comprehensive theory of human nature and requiring a protracted social struggle to enact. Such comprehensive and action-centred doctrines about society were characteristic of the 19th century in particular, which for that reason is sometimes referred to as the "age of ideology." Since then there have been many different definitions of ideology, and most original political and sociological thinkers have used the word in their own characteristic sense.

A brief treatment of ideology follows. For full treatment, *see* MACROPAEDIA: Ideology.

The word ideology was coined in 1796 by the French writer A.L.C. Destutt de Tracy as a name for his own "science of ideas." To establish this science Destutt de Tracy relied on the sensationalist epistemology of John Locke and Étienne Bonnot de Condillac, as well as on Francis Bacon's faith in the meliorative value of scientific knowledge. Human intellectual faculties are simply another aspect of our animal nature, he wrote, and "ideology is a part of zoology." Destutt de Tracy and his supporters called themselves *idéologistes,* and their program, adopted by the Directory as official doctrine between the years 1795 and 1799, aimed at the creation of a democratic, rational, and scientific society. The *idéologistes* quickly lost power with the rise of Napoleon, who reorganized the *idéologiste* stronghold in the Institut National in 1802–03 and began to heap scorn upon them as *idéologues.* It was then that the word first acquired a pejorative connotation.

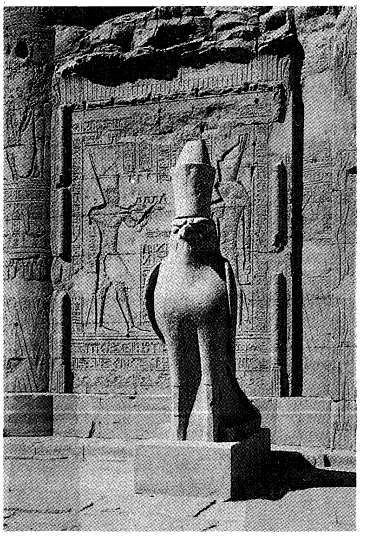
Certain characteristics of Destutt de Tracy's thought were to prove to be true generally of ideologies: it presented a more or less comprehensive theory of society, it established a political program, it foresaw a struggle for the implementation of that program and required therefore followers who were committed to it, and it envisioned a leadership of intellectuals. Implicit in any ideology thus characterized is a challenge to established secular and religious leadership, and it is that challenge that has linked ideology with revolution both of the left and of the right. In the modern age Socialism, Communism, Fascism, and Nazism have been among the most fully articulated ideologies and among the most successful in winning recruits to their various programs.

This connection of ideology with political activism and even extremism has added other, and generally pejorative, shades of meaning to the term.

The classical pejorative characterization of the concept of ideology is in the work of Karl Marx and Friedrich Engels. Their view of ideology stemmed from their materialistic conception of history. The ideas of the members of the bourgeois class, for instance, reflect their own class interests rather than an objectively true picture of society. The ideas of this particular class, however, are thrust upon the proletariat as well, serving to preserve the dominant position of the bourgeoisie. Certain ideas, as of social mobility, liberty, and even love, are myths whose passive acceptance by the proletariat serves to solidify the status quo. Ideology, in Marxist doctrine, is thus a system of illusions about the nature of society.

In more common political discourse, ideology is frequently contrasted unfavourably with pragmatism and ideologists with experienced and worldly practitioners of politics. To the extent that any ideology insists upon its particular encompassing theory of man and society and on a program predicated on that theory, it is, to be sure, at odds with the aims and practices of pluralistic societies. The similarities between ideology and militant religious belief have often been noted, as has the fact that the rise of ideologies occurred in an age also marked by rapidly increasing secularism.

Idfū, also called EDFU, or BEHDET, Egyptian DJEBA, Greek APOLLINOPOLIS, Coptic ATBO, town on the west bank of the Nile in Aswān *muḥāfaẓah* (governorate), Upper Egypt.



Statue of the god Horus at Idfū
A.F. Kersting

The chief god of the city of ancient times was Horus of the Winged Disk, called the Behdetite. His consort was Hathor of Dandarah, whose statue during the late empire was brought to Idfū annually by boat on a ceremonial visit. The chief monument of ancient Idfū is the great sandstone temple of Horus, 451 ft (138 m) long and 250 ft (76 m) wide, standing on the site of an earlier temple of the 18th-dynasty (1567–1320 BC) period. The present building was begun by Ptolemy III Euergetes I in 237 BC and completed by Ptolemy XI in 57 BC. The work was frequently interrupted by nationalistic revolts in Upper Egypt. The decoration of the walls consists of inscriptions and scenes in relief that form a unique collection of temple liturgy as well as nationalism cloaked in religious imagery. The temple's simple plan along one main axis

serves as the classic example of an Egyptian temple.

Excavation of extensive mounds covering the ancient city and cemeteries of Idfū has yielded a rich harvest of ostraka (inscribed pottery fragments) and papyri. In the necropolis west and north of the town were found mastaba tombs of Old Kingdom officials and a number of Middle Kingdom burials.

The modern town is a trading centre for grain, cotton, and dates, and it has a sugar factory. It is linked to the Cairo–Aswān railway by a bridge across the Nile River. Pop. (1976 est.) 34,693.

Idhra (Greece): *see* Hydra.

Idi, also spelled IDA, IDHI, or IDHA (Doric Greek: Timber Tree), Modern Greek PSILORITIS, mountain, riddled with caves, west central Crete, in the *nomós* of Réthímnon, southern Greece. One of the two peaks of Idi, Timios Stavros, at 8,058 ft (2,456 m), is the highest mountain in Crete. According to one legend Zeus was reared in the Idiean cave on the scrub-covered slopes of the peak. The well-known Kamares wares (Minoan polychrome pottery) owe their name to Kameres cave, where the wares were first discovered. The limestone mass of Idi acts as a large subterranean reservoir, supplying water to the springs of the surrounding villages, which are thereby able to practice year-round agriculture, including the raising of olives, citrus fruits, vegetables, wine grapes, barley, oats, and wheat. Goats and sheep are also raised on the mountain's slopes.

Idi Amin Dada, Lake (Uganda and Zaire): *see* Edward, Lake.

idiopathic respiratory distress (medicine): *see* respiratory distress syndrome.

idiophone, class of musical instruments in which a resonant solid material—such as wood, metal, or stone—vibrates to produce the initial sound. The eight basic types are concussion, friction, percussion, plucked, scraped, shaken, stamped, and stamping. In many cases, as in the gong, the vibrating material itself forms the instrument's body. Other examples include xylophones and rattles.

A plucked idiophone, such as a Jew's harp or a music box, is known as a linguaphone. The names idiophone and membranophone (membrane instruments, *e.g.,* drums) replace the looser term percussion instruments when a precise, acoustically based classification is required. *See also* aerophone; chordophone; electrophone; membranophone.

idiorrythmic monasticism, also called EREMITIC MONASTICISM (Greek *eremos,* "desert"), the original form of monastic life in Christianity, as exemplified by St. Anthony of Egypt (*c.* 250–355). It consisted of a total withdrawal from society, normally in the desert, and the constant practice of mental prayer. The contemplative and mystical trend of eremitic monasticism is also known as Hesychasm. In the Christian East, the "idiorrythmic" system (Greek *idios,* "particular"; *rhythmos,* "rule," or "discipline") always coexisted with cenobitic monasticism. It is still proctered on modern Mt. Athos, Greece. *See also* cenobitic monasticism.

Idjil (Mauritania): *see* Fdérik.

Idkū, also spelled EDKOU, town, northern al-Buḥayrah *muḥāfaẓah* (governorate), Lower Egypt; it lies on a sandy strip behind Khalīj Abū Qīr (Bay of Abu Kir), in the northwestern Nile Delta. Immediately south is the Buḥayrat Idkū (Lake Idku), a 58-sq-mi (150-sq-km) lagoon that stretches 22 mi (35 km) behind the coast and has a maximum width of 16 mi. Drained by the Būghāz (channel) al-Ma'addīyah, connecting with the Mediterranean, the lagoon is reputed to be the ancient Canopic branch of the Nile. Idkū's isthmus position enables it to capitalize on the fisheries of both the lagoon and the Mediterranean. Other industries include rice milling and silk weaving. Idkū is linked by coastal road and railway to Alexandria, 26 mi to the west-southwest, and Rosetta (Rashīd), 12 mi northeast. Pop. (1983 est.) 68,300.

Idler, The, a weekly column written by Samuel Johnson and not, as is sometimes supposed, an independent periodical publication. It was published in *The Universal Chronicle* between 1758 and 1760. "The Idler" essays were shorter and more humorous than those which Johnson had earlier written for a twice-weekly sheet, *The Rambler.* They still reveal the moralist and earnest social reformer (especially on such subjects as vivisection and debtors' prisons), but in them he is more willing to put on display his insight into the human comedy, which he describes with a surprisingly light touch, such as the female bargain hunter ("Whatever she thinks cheap, she holds it the duty of an economist to buy").

The collected essays from "The Idler" column (of which Johnson wrote all but 12) were published in 1761. A useful selection is published by the Cambridge University Press.

Idlib, town and *muḥāfaẓah* (governorate), northwestern Syria. The town, capital of the governorate, is situated in a fertile basin midway between Aleppo and Latakia. It is an important textile centre and a market for one of Syria's better agricultural districts. Major crops include cotton, cereals, olives, figs, grapes, tomatoes, sesame, and almonds. Local industries include spinning and olive-oil pressing.

Idlib *muḥāfaẓah,* with an area of 2,510 sq mi (6,501 sq km), embraces a region of fertile basins—notably al-Ghāb depression—along the Turkish frontier. The irrigated depression through which the Orontes River flows is a major cotton-, wheat-, and barley-growing area. West of Idlib town is another irrigation project, enabling cultivation of additional acreage. Pop. (1981 prelim.) town, 51,334; governorate, 579,991.

Ido, artificial language constructed by the French logician and Esperantist Louis de Beaufront and presented at the Délégation pour l'Adoption d'une Langue Auxiliaire Internationale (Delegation for the Adoption of an International Auxiliary Language) of 1907. The language is a reworking of Esperanto (*q.v.*), intended by its originator to improve upon what he considered weak points in Esperanto. In fact, Ido takes its name from an Esperanto suffix meaning "derived from"—*i.e.,* derived from Esperanto. Ido allows spellings that are more natural to the average European than spellings in Esperanto, although they are less true to Esperanto's rule of one letter for each sound. It has excluded special accented letters found in Esperanto (*ĉ, ĵ, ŝ, ĝ, ĥ*) in favour of more familiar forms (*ch, j, sh;* sounds equivalent to Esperanto ĝ [English *j*] and *ĥ* [Greek *ch,* Russian *kh*] are not represented), and it allows *qu* for Esperanto *kw, x* for *ks,* and *y* for Esperanto *j.* Its grammar is also similar to Esperanto, but Ido incorporates rather more Romance features; *e.g.,* infinitives in *-ar, -er, -ir* as in Spanish, plurals of nouns in *-i* as in Italian, and verb inflections reminiscent of Latin or Interlingua. In the decade or two following its appearance, Ido acquired some popularity, which then declined.

idocrase (mineral): *see* vesuvianite.

idol, in philosophy, a false tendency of the mind that hinders clear thought. Francis Bacon adopted the concept from his contemporary Giordano Bruno and in *Novum Organum* (1620) distinguished four kinds of idols: (1) "idols of the tribe," prejudices common to the human race; (2) "idols of the cave," prejudices peculiar to individuals; (3) "idols of the marketplace," prejudices encouraged by one's social group and mother tongue; and (4) "idols of the theatre," prejudices or false notions taught and encouraged by various schools of thought.

idolatry, in Judaism and Christianity, the worship of someone or something other than God as though it were God. The first of the Ten Commandments prohibits idolatry: "You shall have no other gods before me."

Several forms of idolatry have been distinguished. Gross or overt idolatry consists of explicit acts of reverence addressed to a person or an object—the Sun, the king, an animal, a statue. This may exist alongside the acknowledgment of a supreme being; *e.g.,* Israel worshipped the golden calf at the foot of Mt. Sinai, where it had encamped to receive the Law and the covenant of the one true God.

A person becomes guilty of a more subtle idolatry, however, when, although overt acts of adoration are avoided, he attaches to a creature the confidence, loyalty, and devotion that properly belong only to the Creator. Thus, the nation is a good creature of God, but it is to be loved and served with an affection appropriate to it, not with the ultimate devotion that must be reserved for the Lord of all nations. Even true doctrine (*e.g.,* true doctrine about idolatry) may become an idol if it fails to point beyond itself to God alone.

At the same time, Christian thought has insisted upon the principle of mediation and has rejected the charge that attachment to a mediating agency is automatically idolatrous. The Christian Scriptures are called "the Holy Bible" not because they have an intrinsic holiness or are themselves the source of such holiness but because the God who alone is holy is mediated and disclosed to humans through the words of the Bible. Christians are not in agreement about the agents of mediation—*e.g.,* about the role of the Virgin Mary and of the other saints. But where such mediation is acknowledged to be present, it is also acknowledged that reverence shown toward it applies not to the agent of mediation in and of himself but to the one for whom the agent stands. A special instance is the human nature of Jesus Christ (which is worthy of divine worship because of its inseparable union with the Second Person of the Holy Trinity) and the consecrated Host in the Eucharist (which may properly be adored because it has been changed into the very body of Christ). Although the accusation of idolatry is thus a part of the polemic of Christian against Christian, so that Protestants are accused of bibliolatry and Roman Catholics of Mariolatry, the fundamental meaning of the term is the direct moral corollary of the Jewish–Christian avowal of the oneness of God: "Hear, O Israel: The Lord our God is one Lord."

See also aniconism.

Idoma, inhabitants of the confluence region of the Niger and Benue rivers in southern Nigeria. A number of peoples, including the Agala, Iyala, Okpoto, Nkum, and Iguwale are classified as speakers of distinguishable Idoma dialects. Within the dialect cluster there is a considerable degree of mutual intelligibility. This linguistic unity is made more conspicuous by the lack of cultural and political unity among Idoma speakers.

The basic unit of social structure is the extended family, usually consisting of a man, his wives, their children, and the wives and children of his sons. Major and minor lineages, whose members are related to each other in the male line, are settled on identifiable tracts of land; larger lineages may be formed by the smaller. The ancestor cult has been fundamental in indigenous Idoma religions.

The land inhabited by the Idoma is nearly

all orchard bush (tropical uplands with open woodland), sometimes becoming open grassland or rain forest.

Idoma economy is characterized by rainy-season agriculture and dry-season hunting. Large and small markets are held in rotation within the various districts. Within the general area, crafts such as the weaving and dyeing of cotton cloth and blacksmithing have been developed.

Idomeneus, in Greek legend, son of Deucalion, grandson of Minos and Pasiphae, and king of Crete. He courted Helen and took a distinguished part in the Trojan War. According to the *Odyssey,* he returned home safely, but a later tradition relates that he was overtaken by a violent storm and vowed to sacrifice to Poseidon the first living thing that met him when he reached home. The first to greet him was his son, whom he thus slew; as a result, a plague developed, and Idomeneus was driven out. He fled to the district of Sallentum in Calabria and subsequently to Colophon in Asia Minor, where he settled near the Temple of the Clarian Apollo.

Idrīs, an immortal figure in Islāmic legend, mentioned in the Qur'ān (Islāmic sacred scriptures) as a prophet. According to the traditions of the Sunnah, the major sect of Islām, Idrīs appeared sometime between the prophets Adam and Noah and transmitted divine revelation through several books. He did not die but was taken bodily to paradise to spend eternity with God. Popular legend also credits him with the invention of writing and sewing and of several forms of divination. He is regarded as the patron saint of craftsmen and Muslim knights.

Scholars, however, have not been able to assign Idrīs a definite historical identity. On linguistic grounds he has been variously identified as the biblical Ezra, the Christian Apostle Andrew, Alexander the Great's cook Andreas, and sometimes as the biblical Elijah or Muslim al-Khiḍr. Parallels have also been drawn between the biblical Enoch and Idrīs, on the basis of several striking similarities: both are pious men taken physically to paradise, and both live a reputed 365 years, suggesting that they had originally been sun gods. Idrīs (and Enoch) has also been woven into the Islāmic mythology surrounding the Greco-Egyptian god Hermes Trismegistos as the first incarnation of the tripartite Hermes.

Idris I, in full SĪDĪ MUḤAMMAD IDRĪS AL-MAHDĪ AS-SANŪSĪ (b. March 13, 1890, Jarabub, Cyrenaica, Libya—d. May 25, 1983, Cairo), the first king of Libya when that country gained its independence in 1951.

In 1902, Idris succeeded his father as head of the Sanūsīyah, an Islāmic mystical brotherhood centred in Cyrenaica. Because he was a minor, active leadership passed to his cousin,



Idris I

Central Press—Pictorial Parade/EB Inc.

Aḥmad ash-Sharīf. Ruling in his own right after 1916, Idris' first problem was to deal with the Italians, who in 1911 had invaded Libya in an effort to create a North African empire but were unable to extend their authority much beyond the coast. By the peace of Arcoma (1917), Idris secured a cease-fire and, in effect, confirmation of his own authority in inland Cyrenaica. A further agreement in 1919 established a Cyrenaician parliament and a financial grant to Idris and his followers. When Idris proved unable and unwilling to disarm his tribal supporters as Italy demanded, however, the Italians invaded the Tripolitanian hinterland in the spring of 1922. Tripolitanian tribesmen offered to submit to Idris' authority in the hope of securing greater unity and more effective resistance. Idris saw resistance as futile, however, and he went into exile in Egypt, where he remained until British forces occupied Libya in 1942 during World War II (1939–45).

Idris continued to direct his followers from Egypt, not returning to Libya permanently until 1947, when he could head an official government. His main support came from conservative tribesmen, who thought in terms of a Sanūsī government ruling over Cyrenaica, but younger and more urbanized elements looked to a union of the Libyan provinces. The issue was finally determined by the United Nations in November 1949, when the General Assembly resolved that the future of Cyrenaica, Fezzan, and Tripolitania should be decided upon by representatives of the three areas meeting in a national assembly. This assembly established a constitutional monarchy and offered the throne to Idris. Libya declared its independence in December 1951.

Under Idris the throne had a preponderance of influence over the parliament and absolute control over the army. The government was an oligarchy of wealthy townsmen and powerful tribal leaders, who divided the important administrative positions among themselves and supported the King. This situation, along with the external support of Western alliances and the internal military support of his loyal tribesmen, enabled Idris to guide the affairs of the central government strongly. Many of the younger army officers and members of the growing urban middle class, however, resented Idris' socially conservative policies and his aloofness from the growing currents of Arab nationalism. In September 1969, while Idris was at a Turkish spa for medical treatment, the army, led by Col Muammar al-Qaddafi, overthrew his government. He went first to Greece and then was given political asylum in Egypt. In 1974 he was tried in absentia on charges of corruption and found guilty. He remained in exile in Cairo.

Idris ibn Raja Iskandar, Sultan (b. 1849, Perak, Malaya—d. Jan. 14, 1916, Kuala Kangsar, Federated Malay States), sultan of Perak, 1887–1916.

Idris succeeded to the throne of Perak only 13 years after the British had declared a protectorate over the state. He reigned during a crucial and formative period in its history, during which it became a part of the unified Federated Malay States administration and saw vast increases in population, especially from immigrant Chinese and Indians, and in economic growth, from the export of tin and rubber. Of all the sultans in Malaya at the time, Idris was certainly the most influential and probably the most able. Though handicapped by his position as a ward of the British, and by his training as a Malay aristocrat of the old school, he strove to adapt himself to the times and to the needs of his rapidly changing state and its peoples. One of his principal concerns was education. It was no accident that the two leading higher educational institutions in the peninsula for Malays—the Malay College, providing education in English to the sons of the elite, and the Sultan Idris Training College for vernacular schoolteachers—had close associations with him; the first was established under his auspices in the royal town of Kuala Kangsar, and the second (also in Perak) was named after him.

Idris was noted as a strong defender of state, as opposed to federal, rights (resisting, for example, the institution of a common purse) and a staunch advocate of increased Malay participation in the ranks of the administration. He recognized, however, that his state was rapidly becoming multiracial, and the outpouring of addresses and other tributes offered to him by representatives of all communities and groups on the occasion of his silver jubilee in 1912 was testimony to the wide extent of the respect and affection in which he was held.

Idrīsī, ash-Sharīf al-, byname of ABŪ ʿABD ALLĀH MUḤAMMAD IBN MUḤAMMAD IBN ʿABD ALLĀH IBN IDRĪS AL-ḤAMMŪDĪ AL-ḤASANĪ AL-IDRĪSĪ (b. 1100, Sabtah, Mor.—d. 1165/66, Sicily, or Sabtah), Arab geographer, an adviser to Roger II, the Norman king of Sicily. He wrote one of the greatest works of medieval geography, *Kitāb nuzhat al-mushtāq fī ikhtirāq al-āfāq* ("The Pleasure Excursion of One Who Is Eager to Traverse the Regions of the World").

Al-Idrīsī traced his descent through a long line of princes, caliphs, and holy men to the Prophet Muḥammad. His immediate forebears, the Ḥammūdids of the short-lived caliphate (1016–58) in Spain and North Africa, were an offshoot of the Idrīsids of Morocco (789–985), a dynasty descended from Muḥammad's eldest grandson, al-Ḥasan ibn ʿAlī.

Few facts are known about al-Idrīsī's life. He was born in Sabtah (now Ceuta, a Spanish exclave in Morocco), where his Ḥammūdī ancestors had fled after the fall of Málaga, their last foothold in Spain, in 1057. He spent much of his early life travelling in North Africa and Spain and seems to have acquired detailed and accurate information on both regions. He is known to have studied in Córdoba for a number of years and also to have lived in Marrakesh, Mor., and Qusṭanṭinah (Constantine), Alg. Apparently his travels took him to many parts of western Europe, including Portugal, northern Spain, the French Atlantic coast, and southern England. He visited Asia Minor when he was barely 16 years old.

In about 1145, while still at the peak of his powers, al-Idrīsī entered the service of Roger II of Sicily—a step that marked a turning point in his career. Henceforward, all his great achievements were to be indissolubly linked to the Norman court at Palermo, where he lived and worked for the rest of his life. Some Western scholars have suggested that al-Idrīsī may have been regarded as a renegade by other Muslims for entering the service of a Christian king and praising him lavishly in his writings. Moreover, some writers have attributed the paucity of biographical information on al-Idrīsī in Muslim sources to these circumstances.

There has always been uncertainty about al-Idrīsī's reasons for going to Sicily. It has been suggested that he may have been induced to do so by some of his Ḥammūdī kinsmen, who are known to have settled there and who, according to the Spanish-Arab traveller Ibn Jubayr (1145–1217), enjoyed great power and prestige among Sicilian Muslims. According to the 14th-century Arab scholar aṣ-Ṣafadī, Roger II invited al-Idrīsī to Sicily to make a map of the world for him, telling him:

> You are a member of the caliphal family. For that reason, when you happen to be among Muslims, their kings will seek to kill you, whereas when you are with me you are assured of the safety of your person.

Al-Idrīsī agreed to stay, and Roger settled upon him a king's pension.

Al-Idrīsī's service in Sicily resulted in the

completion of three major geographic works: (1) a silver planisphere on which was depicted a map of the world; (2) a world map consisting of 70 sections formed by dividing the Earth north of the equator into 7 climatic zones of equal width, each of which was subdivided into 10 equal parts by lines of longitude; and (3) a geographic text intended as a key to the planisphere. This was his great work of descriptive geography, known as *Kitāb nuzhat al-mushtāq fī ikhtirāq al-āfāq* and also as *Kitā Rujār,* or *al-Kitāb ar-Rujārī* ("The Book of Roger"). In compiling it, al-Idrīsī combined material from Arabic and Greek geographic works with information obtained through first-hand observation and eyewitness reports. The king and his Arab geographer chose a number of persons, including men skilled in drawing, and dispatched them to various countries to observe and record what they saw. Al-Idrīsī completed the book in January 1154, shortly before Roger's death.

The silver planisphere has been lost, but the maps and book have survived. A German scholar, Konrad Miller, published the maps in his *Mappe Arabicae* (1926–31), and later an emended world map, based upon Miller's work, was published by the Iraq Academy (Baghdad, 1951). The first loose sections of a critical edition of Idrīsī's *Kitāb nuzhat al-mushtāq,* undertaken by a committee of Italian scholars in cooperation with a group of international experts, had begun to appear in the early 1970s.

Kitāb nuzhat al-mushtāq represents a serious attempt to combine descriptive and astronomical geography. That this effort was not an unqualified success apparently stems from the author's inadequate mastery of the physical and mathematical aspects of geography. He has been criticized not only for failing to make use of the important geographic contributions of other scientists of his times, such as the 11th-century Arab scholar al-Bīrūnī, but also for his uncritical use of earlier Greek and Arab sources. Nevertheless, al-Idrīsī's book is a major geographic monument. It is particularly valuable for its data on such regions as the Mediterranean basin and the Balkans.

A number of other geographic works are attributed to al-Idrīsī, including one (now lost) written for William I (William the Bad), Roger's son and successor who reigned from 1154 to 1166, as well as several critical revisions and abridgments. The Medici press in Rome published an abridgment of *Kitāb nuzhat al-mushtāq* in 1592; a Latin translation was erroneously published under the title *Geographia Nubiensis.* The only complete translation of the work in any language is P.A. Jaubert's two-volume *Géographie d'Édrisi* (1836–40); it is unreliable, however, because it was based on faulty manuscripts. Al-Idrīsī's scientific interests embraced medical matters as well, and his *Kitāb al-adwiya al-mufradah* ("Book of Simple Drugs"), in which he lists the names of drugs in as many as 12 languages, shows the range of his linguistic abilities. Al-Idrīsī seems to have had a good knowledge of Arabic literature, and—judging by some of his verse that has survived—he was also an accomplished poet. No details are known about the last years of his life. (W.Jw.)

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Idrīsid DYNASTY, also called AL-IDRĪSIYŪN, Arab Muslim dynasty that ruled in the Berber areas of Morocco from 789 until 921.

The founder, Idrīs I (Idrīs ibn 'Abd Allāh ibn Ḥasan II), who reigned 789–791 at Walīla, was a *sharīf,* or princely descendant of Muḥammad, and was one of the few survivors of the battle of Fakhkh, in which many of the 'Alids were slain by the 'Abbāsids. He fled west and succeeded in conquering Berber tribes in northern Morocco and a part of the Atlantic plains. His son, Idrīs II (reigned 802–828), resumed his work without, however, succeeding in subduing the whole country. Nevertheless, in 808, Idrīs II founded as a capital for his little kingdom the town of Fez (modern Fès), which henceforth became a political and religious centre. The Idrīsids were the first to organize, outside the Berber tribal system, a central government that was partly composed of Arabs. They established the sharifian tradition in Morocco and were also responsible for making a part of northern Morocco linguistically Arabic. After the death of Idrīs II, however, the kingdom was divided up, and the power of the Idrīsids declined. They were eventually crushed between the Umayyad Caliphs of Córdoba and the Fāṭimids. The last Idrīsid ruler was killed while a prisoner of the Umayyads in 985.

Idua Oron (Nigeria): *see* Oron.

Idukki, also spelled IDIKKI, town, southeastern Kerala state, southwestern India, 81 miles (130 km) southeast of Cochin and 79 miles (127 km) northeast of Kottayam. It is known for its large hydroelectric project. The Idukki arch dam, 554 feet (169 m) high, on the Periyār River, was completed in 1974. It connects two huge rocks, Kurathi, 3,035 feet (925 m) high, and Kuravan, 2,753 feet (839 m) high. Together with the Cheruthoni dam (1976), on the Cheruthoni River, and the Kulamavu dam (1977), on the Muvattu Puzha River, the Idukki dam forms a large reservoir. The dam is used primarily for flood control and to provide electric power.

Short, swift-flowing streams cross the region surrounding the town of Idukki. Agriculture is the basis of the area's economy; crops include rice, cassava, pulse (legumes), sugarcane, ginger, oilseeds, millet, coconut, pepper, betel nuts, cardamom, and tea. Industries consist of processing cashew nuts, coffee, and tea; *bidi* (cigarette) making; paper milling; and sawmilling. Fish by-products are also processed. Pop. (1981) town, 8,886.

Idun, also spelled IDUNN, or IDUNA, in Norse mythology, the goddess of spring or rejuvenation and the wife of Bragi, the god of poetry. She was the keeper of the magic apples of immortality, which the gods must eat to preserve their youth. When, through the cunning of Loki, the trickster god, she and her apples were seized by the giant Thiassi and taken to the realm of the giants, the gods quickly began to grow old. They then forced Loki to rescue Idun, which he did by taking the form of a falcon, changing Idun into a nut (in some sources, a sparrow), and flying off with her in his claws.

idyll, also spelled IDYL (from Greek *eidyllion,* "little picture"), a short poem of a pastoral or rural character in which something of the element of landscape is depicted or suggested. The term was used in antiquity to designate a variety of brief poems on simple subjects in which the description of natural objects was introduced. The conventions of the pastoral were developed by the Alexandrian school of poetry, particularly by Theocritus, Bion, and Moschus, in the 3rd century BC, and the *Idylls* of Theocritus are the source of the popular idea of this type of poem.

The word was revived during the Renaissance, when some poets employed it to distinguish narrative pastorals from those in dialogue. The general use, or misuse, of the word arose in the 19th century from the popularity of two works, the *Idylles héroïques* (1858) of Victor-Richard de Laprade and the *Idylls of the King* (1859) of Alfred, Lord Tennyson, neither of which was related to the pastoral tradition. Thereafter the word was used indiscriminately to refer to works on a variety of subjects.

Although it is impossible to define the idyll as a definite literary form, the adjective idyllic has come to be synonymous with the rustic, pastoral, and tranquil, the mood first created by the Alexandrian poets. *See also* eclogue.

Ieper (Belgium): *see* Ypres.

Iesi (Italy): *see* Jesi.

If, small Mediterranean island 2 miles (3.2 km) outside the port of Marseille, Fr. Its castle, built by the French king Francis I in 1524, was later used as a state prison. The castle was made famous when Alexandre Dumas *père,* the 19th-century French writer, used it as one of the settings in his novel *The Count of Monte Cristo* (1844–45).

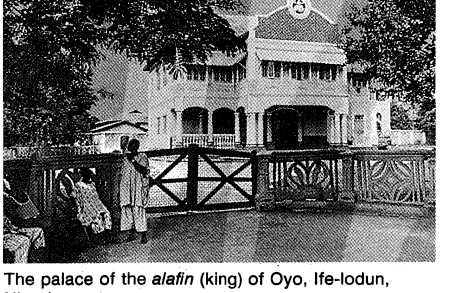
A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Ifat, Muslim state that flourished in Ethiopia from 1285 to 1415 in the fertile uplands of eastern Shewa. Toward the end of the 13th century a ruler whose dynastic title was Walashma gained an ascendancy over the Muslim kingdoms of eastern Shewa. By gradually winning over the newly formed states of Fatajar, Dawaro, and Bale and by subduing various Shewan and Afar regions, including the state of Adal, he finally succeeded in constituting the state of Ifat.

Alternately subject to the pagan kingdom of Damot, to the Christian kingdom of Ethiopia, and sometimes independent, Ifat became—as the northernmost of several Muslim states—the buffer between them and the advance southward of Ethiopian authority. When its sultan, Hakk ad-Dīn, warring against the Ethiopian king Amda Tseyon, was conquered by him in 1328, Ifat was made tributary to Ethiopia. (At this time Ifat's dominion extended eastward to the port of Zeila.) Thereafter Ifat was continually in revolt against Ethiopia. It was finally destroyed in 1415, when its last attempt at independence under Sultan S'adad-Dīn was foiled by Yeshaq I of Ethiopia, who subsequently annexed Ifat to his kingdom.

IFC: *see* International Finance Corporation.

Ife-Iodun, also called IFE, formerly ILE-IFE, town, Oyo state, southwestern Nigeria, at the intersection of roads from Ibadan (40 miles [64 km] west), Ilesha, and Ondo. It is one of the larger centres and probably the oldest town of the Yoruba people. Considered by the Yoruba to be a holy city and the legendary birthplace of mankind, it was held to have been founded by a son of the deity Oduduwa and was certainly the capital of a well-established kingdom (probably named for Ifa, the god of divination) by the early 11th century.



The palace of the *alafin* (king) of Oyo, Ife-Iodun, Nigeria

Konran Media, Inc.

By the late 12th or early 13th century, its artisans were producing the naturalistic terracotta heads and the bronze pieces made by the *cire perdue* ("lost-wax") process for which the Ife kingdom is now well known. Ife had great political and cultural influence over the Edo kingdom of Benin to the southeast.

Although Benin and Old Oyo (Katunga) became the seats of more important political kingdoms than Ife, the town remained the chief religious centre for the Yoruba. In return for the *ida oranyan* ("sword of state," symbolizing spiritual authority) given to an *alafin* ("king") of Oyo upon his coronation, the *alafin* had to promise not to attack Ife. When Alafin Awole tried to raid Ife territory for slaves in 1793, it brought severe internal resistance and the series of wars that destroyed the 16th- to 19th-century Oyo empire. Although Ife managed to avoid the attacks by the Muslim Fulani that struck other parts of Yorubaland, it was weakened in the 1820s through struggles for control of the internal slave trade with Owu, to the southwest. After an *oni* ("king") of Ife allowed Yoruban Oyo refugees from the Ilorin Fulani conquest to build the walled town of Modakeke just outside Ife, he was poisoned. After Ife declared war (1882) against Ibadan, its forces were repulsed when they attacked Modakeke. Shortly afterward, a combined army from Ibadan and Modakeke nearly destroyed Ife.

In the centre of modern Ife-lodun is the *afin* ("palace") of the present *oni,* the spiritual head of the Yoruba people, who has custody of the sacred staff of Oranmiyan (a king of Benin), an 18-foot (5.5-metre) granite monolith in the shape of an elephant's tusk. The palace compound is also the site of the Ife Museum (1954), which contains a collection of *cire perdue* bronze castings and terra-cotta sculptures that was partly acquired by the German archaeologist Leo Frobenius in 1910 and subsequently expanded through excavations at the Wunmonije compound (1938–39) and at nearby Ita Yemoo (1957).

Obafemi Awolowo University (formerly the University of Ife) was founded in 1961. One of Nigeria's major universities, it is located north of the town; it operates a teaching hospital and has a major library. The affiliated Institute of Agricultural Research and Training operates the Moor Plantation for agricultural research and has the country's largest specialized agricultural library. Institutes of education (operating a mobile library service) and physical education are also centred in the town and affiliated with the university. Ife-lodun is the seat of the Historical Society of Nigeria (1955) and has several teacher-training colleges; it also has a technical institute and several hospitals. In 1948 Ife was the site of the inaugural Conference of the Society of the Descendants of Oduduwa, a group of Yoruba nationalists who formed the core of the Action Group, a national political party.

Ife-lodun is a major collecting point for cocoa and cotton; palm oil and kernels, yams, cassava, corn (maize), pumpkins, and kola nuts are cultivated for local markets. Ife-lodun's inhabitants are primarily town-dwelling farmers. Pop. (1989 est.) 249,200.

Iffland, August Wilhelm (b. April 19, 1759, Hannover, Hanover [Germany]—d. Sept. 22, 1814, Berlin), German actor, dramatist, and manager, a major influence on German theatre.

Destined for the church, Iffland, at the age of 18, broke with parental authority and joined the Gotha court theatre to study acting under Konrad Ekhof's direction. In 1779, after Ekhof's death, Iffland went with the Gotha company to Mannheim, where he created the part of Franz Moor in Schiller's *Die Räuber* and where his own plays achieved great popularity. He virtually controlled the Mannheim theatre and maintained a conservative policy



Iffland, engraving
Ullstein

and repertory. In 1796, on Goethe's invitation, Iffland appeared as guest star on the Weimar court stage, charming his audiences with truthful and yet stylized portraits of pathetic and comic middle-class characters. His flights into tragedy (Lear, Wallenstein, Egmont) were less successful. As an author Iffland achieved comparable fame in the fields of domestic drama and sentimental comedy. In 1798 he was appointed manager of the Berlin National Theatre, and in 1811 he became director-general of all the royal theatres in Prussia. His autobiography, *Meine theatralische Laufbahn* (1798; "My Career in the Theatre"), was republished in 1886.

Ifni, former north African enclave of Spain and now part of the southwestern region of Morocco, along the Atlantic coast. An arid semidesert region of mountains and coastal plain, Ifni was first settled by Diego García de Herrera, lord of the Canaries, as a fortified Spanish fishing, slaving, and trading locality in 1476. Abandoned in 1524 because of disease and Moorish hostility, it was reclaimed following a Spanish-Moroccan treaty in 1860. Effective Spanish reoccupation of the region, however, did not occur until 1934. The enclave became part of Spanish West Africa in 1946 and was reorganized as a province under a governor-general in 1958. In 1969, Ifni was ceded to Morocco. The predominantly Berber population is engaged in fishing and in the raising of sheep, camels, and goats. Sidi Ifni, the chief city, is a local handicrafts centre and small port trading primarily with the Canary Islands.

Ifrane, town, north-central Morocco. Founded in 1929, Ifrane is situated in the Moyen (Middle) Atlas mountains and includes in its immediate environs Morocco's premier winter and summer resort areas. Located at an elevation of about 5,400 feet (1,650 m) above sea level, the modern town caters to international tourists. Nearby cedar-covered, extinct volcanic craters are equipped with alpine ski-runs. Azrou, 11 miles (17 km) southwest of Ifrane at an elevation of about 3,950 feet (1204 m), is an old Berber settlement that was developed into an all-seasons resort; trout fishing is especially popular. The local Beni Mguild tribe grazes sheep and produces quality carpets. Pop. (1982) mun., 7,717.

ʿifrīt, in Islāmic mythology, a class of infernal *jinn* (spirits below the level of angels and devils) noted for their strength and cunning. An *ʿifrīt* is an enormous winged creature of smoke, either male or female (*ʿifrītah*), who lives underground and frequents ruins. *ʿIfrīts* live in a society structured along ancient Arab tribal lines, complete with kings, tribes, and clans. They generally marry one another, but they can also marry humans. While ordinary weapons and forces have no power over them, they are susceptible to magic, which humans can use to kill them or to capture and enslave them. As with the *jinn,* an *ʿifrīt* may be either a believer or an unbeliever, good or evil, but he is most often depicted as a wicked and ruthless being.

The rare appearance of the term *ʿifrīt* in the Qurʾān (the sacred scripture of Islām) and in Ḥadīth (eyewitness narratives recounting Muḥammad's words, actions, or approbations) is always in the phrase "the *ʿifrīt* of the *jinn*" and probably means "rebellious." The word subsequently came to refer to an entire class of formidable, rebellious beings, but, in the confused world of chthonic (underworld) spirits, it was difficult to differentiate one from another. The *ʿifrīt* thus became virtually indistinguishable from the *mārid,* also a wicked and rebellious demon. *See also* jinnī.

Ifugao, group of wet-rice agriculturalists occupying the mountainous area of northern Luzon, Philippines. They are of Malay stock and their language is Austronesian (Malayo-Polynesian), as is that of their neighbours, but they have developed a number of cultural characteristics that set them apart. They numbered nearly 70,000 in 1939, but World War II reduced their population to a figure (1948) of 50,000. By the late 20th century, their population had increased to about 190,000.

Their great system of irrigated rice terraces—steeply contoured, mountain-terraced walls of stone that lean slightly inward at the top—is world renowned and was developed with a simple technology. In addition to rice, the prestige crop, large amounts of sweet potatoes are grown on hillside plots and form the staple diet of the poorer class. Pigs and chickens are also raised, primarily for the numerous rituals and sacrifices.

The Ifugao live in small hamlets of 5 to 10 houses scattered among the rice terraces. Early Spanish missionaries were impressed with the construction of the Ifugao houses—achieved without saws or other such tools—and with the decorative carvings adorning the beams and moldings of each house.

Ifugao social organization is based almost exclusively on kinship. Each individual is the centre of a "kinship circle" which extends to the third cousin, and these units were all-important in the feuds and headhunting activities that formerly prevailed. The Ifugao lack political organization and have relied on marriage alliances and trading pacts; they recognize temporary go-betweens who settle disputes in terms of customary law. The aristocrats, who form an upper class, maintain their prestige by periodic feasts.

Ifugao religion has an elaborate cosmology and more than a thousand deities of various classes. Ancestral and other deities are invoked in the case of illness or other difficulties with the aid of rice wine and feasting.

IG Farben, in full INTERESSENGEMEINSCHAFT FARBENINDUSTRIE AKTIENGESELLSCHAFT (German: "Syndicate of Dyestuff-Industry Corporations"), world's largest chemical concern, or cartel, from its founding in Germany in 1925 until its dissolution by the Allies after World War II. The IG (*Interessengemeinschaft,* "syndicate" or, literally, "community of interests"), partly patterned after earlier U.S. trusts, grew out of a complex merger of German manufacturers of chemicals, pharmaceuticals, and dyestuffs (*Farben*). The major members were the companies known today as BASF AG, Bayer AG, Hoechst AG, Agfa-Gevaert AG (Agfa merged with Gevaert, a Belgian company, in 1964), and Cassella AG (from 1970 a subsidiary of Hoechst).

The movement toward association had begun in 1904, with the merger of Hoechst and Cassella—a merger that immediately prompted a rival merger by BASF and Bayer, later joined by Agfa. (This latter group was called the *Dreibund,* or "Triple Confederation.") In 1916, at the height of World War I, the rival groups joined forces and, with

the addition of other firms, formed the Interessengemeinschaft der Deutschen Teerfarbenfabriken (Syndicate of German Coal-Tar Dye Manufacturers). This "little IG" was no more than a loose association: member companies remained independent, while dividing production and markets and sharing information. In 1925, after protracted legal and fiscal negotiations, the "big IG" was formed: assets of all constituent companies were merged, with all stock being exchanged for BASF shares; BASF, the holding company, changed its name to IG Farbenindustrie AG; headquarters were set up in Frankfurt; and central management was drawn from the executives of all constituent companies. (Cassella at first held out and was not absorbed by IG Farben until 1937.)

Policy-making was fused, but operations were decentralized. Regionally, production was split into five industrial zones—Upper Rhine, Middle Rhine, Lower Rhine, Middle Germany, and Berlin. In terms of vertical organization, the company's production was split among three "technical" commissions, each governing a different range of products. Marketing was split among four sales commissions. In the course of the late 1920s and 1930s, IG Farben also became international, with trust arrangements and interests in major European countries, the United States, and elsewhere.

In 1945 the company came under Allied authority; its industries (along with those of other German firms) were to be dismantled or dismembered with the stated intent "to render impossible any future threat to Germany's neighbours or to world peace." In the western zones of Germany, however, especially as the Cold War advanced, this disposition toward liquidation lessened. Eventually the Western powers and West Germans agreed to divide IG Farben into just three independent units: Hoechst, Bayer, and BASF (the first two being refounded in 1951; BASF in 1952).

Igala, also spelled IGARA, a largely Muslim people of Nigeria, living on the left bank of the Niger River below its junction with the Benue River. Their language belongs to the Kwa subgroup of the Niger-Congo family. Their ruler, the *ata,* also governs two other groups, the Bassa Nge and the Bass Nkome, who live between the Igala and the Benue River.

Traditional Igala society was politically organized as a despotic kingdom: kings were divine, held absolute power, and were surrounded by numerous taboos; they held elaborate courts attended by a host of officials and servants, many of them slaves and eunuchs. Human sacrifice and headhunting were practiced.

The Igala are primarily an agricultural people, growing a wide range of crops typical of the area, including yams, taro, pumpkins, squash, corn (maize), manioc, and peanuts (groundnuts). Palm oil and kernels have become significant as cash crops.

Christian missionaries have worked among the Igala since 1865, converting many in the towns and larger villages; Islām, however, remains the stronger force.

Igarashi FAMILY (fl. 15th–17th century), Japanese lacquerware artists who specialized in the *maki-e* technique, wherein a design is made by sprinkling minute gold, silver, or copper flakes over a lacquer ground. The founder of the Igarashi family, Shinsai, contributed to the art by perfecting two techniques of lacquer design. The *taka-maki-e* technique employs a mixture of lacquer putty, white lead, lampblack, powder, camphor, and gold or silver foil in relief against a lacquer ground. In the *nashiji* method, numerous layers of lacquer, each sprinkled with tiny flakes of gold or silver, are superimposed and polished to produce an effect like that of the skin of a golden or brown pear. Shinsai's son, Hosai, served the military ruler Toyotomi Hideyoshi, while his grandson Dōho worked for the Maeda family in Kaga province (now Ishikawa prefecture), creating the Kaga *maki-e* lacquer design. The name Dōho and the family's association with the Maeda clan were continued by Dōho's son and grandson.

Igarka, city, Krasnoyarsk *kray* (region), central Russian Soviet Federated Socialist Republic, 60 miles (100 km) north of the Arctic Circle and on the Yenisey River, 418 miles (673 km) from the sea but accessible to ocean-going vessels. It was founded in 1929. The city is an important wood-export port both to other parts of the Soviet Union and abroad and also serves as a sawmilling centre. A permafrost research station is located there. Pop. (1970) 15,624.

Igbira, also spelled IGBIRRA, or EBIRA, inhabitants of the areas lying immediately to the northeast and the southwest of the confluence of the Niger and Benue rivers in central Nigeria. Their language is sufficiently divergent from others nearby that some linguists classify it with the Nupe-Gbari language group, while others believe it to be a subgroup of the Kwa language group.

The two main habitats within the Igbira area are a dense, deciduous forest along the Niger and Benue rivers and a hilly savanna region away from the rivers. Most Igbira are engaged in agriculture; they grow mainly yams but also produce such crops as beans, millet, and corn (maize). The rivers are used for both fishing and transport. Women do most of the trading and sell both their own and their husbands' produce.

Igbira households are based on extended families composed of close patrilineal relatives under the authority of the oldest male member. Inheritance and clan membership are reckoned patrilineally. Igbira marry outside of their clans, which are kinship groups represented by totemic animals such as the lion, crocodile, leopard, and python. A key institution in enforcement was the *iregba,* a shrine where decisions on religious matters or social offenses were made.

Groups of Igbira village (wards) draw their chiefs from branches of ruling families, in alternation. Village councils can settle disputes, sometimes in collaboration with the chiefs or with councils of other villages involved in cases. The specifics of chief selection or succession vary between areas within the Igbira region. The Igbira kingdoms of Panda and Koton Karifi were independent small states for about 100 years, until their conquest in the mid-19th century by the Fulani (Fulbe). British administration through traditional rulers began in the early 20th century.

The traditional beliefs of the Igbira centre on Hinegba, the supreme god, who is benevolent, resides in the sky, and controls the universe. Hinegba is approached through intermediary spirits, who are connected with such natural objects as trees. Igbira ancestors are also viewed as agents of Hinegba. Since the early 20th century an increasing number of Igbira have been converted to Islām and some to Christianity.

Igbo, also spelled IBO, people living chiefly in southeastern Nigeria who speak Igbo, a language of the Kwa branch of the Niger-Congo family. The Igbo may be grouped into the following main cultural divisions: northern (Onitsha), southern (Owerri), western (Ika), eastern (Cross River), and northeastern (Abakaliki). Before European colonization the Igbo were not united as a single people but lived in autonomous local communities; by the mid-20th century a sense of ethnic identity was strongly developed (*see* Biafra).

Most Igbo are subsistence farmers, the staples being yam, cassava, and taro. Other crops include corn (maize), melon, okra, pumpkin, and beans. Men are chiefly responsible for yam cultivation, women for other crops. Land is owned communally by groups of kinsmen and is made available to individuals for farming and building. Some livestock, important as a source of prestige and for use in sacrifices, is also kept. The principal exports are palm oil and kernels. Trading, local crafts, and, more recently, wage labour are important in Igbo economy.

Except for the northeastern groups, the Igbo live in rain-forest country. Most Igbo occupy villages of dispersed compounds, but in some areas villages are compact. The compound is typically a cluster of huts belonging to individual household units. The village, an autonomous social and political unit, is usually occupied by a patrilineage. The eldest male descendant of the founder of the village serves as its ritual and political head in conjunction with a council of elders or of certain titleholders.

Before the advent of colonial administration, the largest political unit was the village group, a federation of villages averaging about 5,000 persons. Members of the group shared a common market and meeting place, a common tutelary deity, and ancestral cults that supported a tradition of descent from a common ancestor or group of ancestors. Authority in the village group was also vested in a council of lineage heads and influential and wealthy men. In the eastern regions these groups tended to form larger political units, usually referred to as tribes or clans.

Igbo religion includes belief in a creator god, an earth goddess, and numerous other deities and spirits and a belief in ancestors who protect their living descendants. Revelation of the will of the deities is sought by divination and oracles. Many Igbo are now Christians.

Ighil Izane (Algeria): *see* Relizane.

Igilium (Italy): *see* Giglio Island.

Iglau (Czechoslovakia): *see* Jihlava.

Iglesia Filipina Independiente: *see* Philippine Independent Church.

Iglesia ni Kristo (Tagalog: "Church of Christ"), the largest entirely indigenous Christian church in the Philippines. Its members assert that the early church was restored in God's chosen nation, the Filipinos, when Felix Manalo launched this church in 1914. Rapid growth after 1945 produced some 600,000 members by the late 20th century, imposing chapels throughout the nation, and a wealthy centralized organization under Bishop Eraño Manalo, the son of Felix. Strong discipline from the leaders dictates a literal interpretation of the Bible and suggests individual contributions and the casting of votes, making the church a substantial political power. Unitarian in theology and Philippine in its languages, liturgy, and music, it represents a popular anti-Western movement for spiritual independence.

Iglesias, town and episcopal see, Cagliari *provincia,* southwestern Sardinia, Italy, west-northwest of Cagliari city. The cathedral dates from 1288; an example of Franciscan architecture characteristic of Sardinia is seen in the 15th-century Church of San Francesco. Iglesias is the centre of a region in which lead, zinc, and silver are mined and sulfuric acid is distilled. The local mining school houses a museum of mineralogy. Pop. (1987 est.) mun., 30,390.

Iglesias, Pablo (b. Oct. 18, 1850, El Ferrol, Spain—d. Dec. 9, 1925, Madrid), political leader who played a significant role in the development of Spanish democratic socialism and trade unionism.

Iglesias was brought up in a foundling home and eventually became a printer. He helped

found the Spanish Socialist Party in May 1879 and soon became its secretary. In 1882 he organized the first strike in Spain after the 1875 restoration of the monarchy, and in 1885 he became president of the Socialist Party's central committee. The following year *El Socialistica,* the Socialist newspaper, was founded, with Iglesias as its editor. He also came to head the Socialist-affiliated Unión General de Trabajadores (General Union of Workers), organized in 1888.

An effective organizer, Iglesias guided the slowly expanding Socialist Party on a disciplined, austere, and evolutionary course. Though for many years he scorned alliance with non-working-class parties, he believed in parliamentary and municipal political action. He was one of the first Socialists elected to the Madrid Municipal Council (1905) and to the Cortes, the Spanish parliament (1910). In 1921 he was able to prevent the Socialist Party from joining the Communist International.

igloo, also spelled IGLU, also called APUTIAK, temporary winter home or hunting-ground dwelling of Canadian Eskimos. The term igloo, or iglu, from Eskimo *igdlu* ("house"), is related to Iglulik, a town, and Iglulirmiut, an Eskimo people, both on an island of the same



Eskimos building an igloo
Ewing Galloway

name. The igloo, usually made from blocks of snow and dome-shaped, is used only in the area between the Mackenzie River Delta and Labrador where, in the summer, Eskimos live in sealskin or, more recently, cloth tents.

To build the igloo, a deep snowdrift of fine-grained, compact snow is cut into blocks with a snow knife, a swordlike instrument originally made of bone but now usually of metal. Each block is a rectangle measuring about 2 feet (60 centimetres) by 4 feet and 8 inches (20 centimetres) thick. After a first row of these blocks has been laid out in a circle on a flat stretch of snow, the top surfaces of the blocks are shaved off in a sloping angle to form the first rung of a spiral. Additional blocks are added to the spiral to draw it inward until the dome is completed except for a hole left at the top for ventilation. Joints and crevices are filled with loose snow. A clear piece of ice or seal intestine is inserted for a window. A narrow, semicylindrical passageway about 10 feet (3 metres) long, with vaults for storing supplies, leads into the igloo. Drafts are kept from the main room by a sealskin flap hung over the exterior entrance to the passageway and by a low, semicircular retaining wall that is sometimes built out a few feet from the end of the tube. The major furnishings are a shallow saucer to burn seal blubber for heat and light, and a low sleeping platform of snow covered with willow twigs topped by caribou furs.

Dimension of the igloos vary, but they generally accommodate only one family. An experienced Eskimo can build a snow igloo in between one and two hours. Sod, stone, and wood have also been used to construct igloos.

IGN: *see* Institut Géographique National.

Ignatius OF ANTIOCH, SAINT, also called IGNATIUS THEOPHOROS (Greek: God Bearer) (d. *c.* 110, Rome), bishop of Antioch, Syria, known mainly from seven highly regarded letters that he wrote during a trip to Rome, as a prisoner condemned to be executed for his beliefs. He was apparently anxious to counteract the teachings of two groups: the Judaizers, who did not accept the authority of the New Testament; and the Docetists, who held that Christ's sufferings and death were apparent but not real. The letters have often been cited as a source of knowledge of the Christian Church at the beginning of the 2nd century.

Record of his life. Although St. Ignatius, bishop of Antioch, was an influential church leader and theologian, he is known almost entirely from his own writings. There is no record of his life prior to his arrest, but his letters reveal his personality and his impact on the Christianity of his time. Ignatius represented the Christian religion in transition from its Jewish origins to its assimilation in the Greco-Roman world. He laid the foundation for dogmas that would be formulated in succeeding generations. His advocacy of a hierarchical structure of the church with emphasis on episcopal authority, his insistence on the real humanity of Christ, and his ardent desire for martyrdom are subjects that have generated much discussion.

Eusebius of Caesarea, whose *Ecclesiastical History* is the chief primary source for the history of the church up to 324, reported that Ignatius' arrest and his condemnation to the wild beasts in the Roman arena occurred during the reign of the Roman emperor Trajan (98–117). Eusebius, on unknown grounds, dates the event to 107 or 108. Ignatius' letters contain the only reliable information about him, but only one of them—that to the church in Rome—is dated (August 24), and even then no year is given.

Ignatius, surnamed Theophoros, was bishop of Antioch at the time of his arrest. Whether he was a native of the city is uncertain; his Greek prose, however, does have an Oriental flavour characteristic of that part of the Hellenistic world. His thought is strongly influenced by the letters of St. Paul and also by the tradition connected with the Apostle John. It is possible that he knew John personally.

Journey to Rome. Ignatius was taken prisoner during a persecution of the Antioch church; he was put in chains and escorted, along with others, by a unit of soldiers to Troas in northwestern Asia Minor for embarkation to Rome. By that time he must have been a well-known figure among Christians. All along his way delegations of churches, even from places off his route, accompanied him from town to town. For unknown reasons, the journey was interrupted at Smyrna (modern Izmir, Tur.), where he was warmly received by the local Christians and their bishop, Polycarp, who was to become his beloved friend.

There he was also met by representatives—the bishop, some elders, or presbyters, and some deacons—of the nearby churches of Ephesus, Magnesia on the Maeander, and Tralles, who as far as possible looked after his needs. After these delegations left Smyrna, he wrote letters to their respective communities thanking them for their attentions and offering them guidelines for their lives as Christians. At his request the deacon Burrus of Ephesus was allowed to stay with him. Ignatius also wrote to Rome, urging his fellow Christians there not to prevent his martyrdom by intercession on his behalf and commending to their charity Syrian Christians who had arrived there ahead of him.

From Smyrna his journey continued to the district of Troas, where a shorter stay was made pending embarkation. This stopover was not long enough for Ignatius to write to all the churches he wished to address. He did, however, write to the congregations at Philadelphia and Smyrna (these letters were delivered by Burrus, who had accompanied him to Troas) and to Bishop Polycarp, asking him in a personal letter to write to other churches in his name. At Troas he had been joined by the deacons Philo of Cilicia and Agathopus from Syria; they gave him the consoling news that Antioch was again "at peace." It is not certain whether this meant a lull in the persecution of Christians or perhaps—to judge from Ignatius' use of the word peace elsewhere—a return of the community to concord after some religious dissension. In his letter to Polycarp, Ignatius asked to have a deacon appointed to bring the people of Antioch the congratulations of the church of Smyrna and to encourage other churches to follow Smyrna's example. Some time later Polycarp wrote to the church of Philippi in Macedonia for news about Ignatius and his companions, who had recently passed through their city. His death in the Roman arena is recorded by Polycarp's disciple Irenaeus, who died about 200/203. Documentation ends here; the rest is inference.

The letters: warnings against false teachings. The letters of Ignatius abound in warnings against false doctrines and false teachers and in admonitions to preserve peace and concord by willing subordination in all religious matters to the clergy and above all to the bishop. Nevertheless, he frequently assures his readers that their own church gives no cause for concern and that his words are prompted merely by pastoral solicitude. Only in his letter to the church of Philadelphia does he intimate that at least some of the community tended to segregate, and, in a passage in the letter to the Smyrnaeans, he seems to imply that there had been dissenters.

Smyrna is the only place along his journey where Ignatius stayed for a sufficiently long time to have firsthand knowledge of the state of their church; he knew of the others from informants, who gave him little grounds for worry. Ignatius' anxiety, perhaps, had its roots in his experiences as a bishop at Antioch. If the peace that returned to Antioch after he left is to be understood as the restoration of concord within the Christian community, then the church of Antioch might have been divided on the very same issues about which Ignatius writes to the other churches.

Ignatius apparently fought two groups of heretics: Judaizers, who did not accept the authority of the New Testament and clung to such Jewish practices as observing the Sabbath; and Docetists (from the Greek *dokein,* "to seem"), who held that Christ had suffered and died only in appearance. Ignatius untiringly affirmed that the New Testament was the fulfillment of the Old Testament and insisted upon the reality of Christ's human nature. For him, Christ's Passion, death, and Resurrection were a vital guarantee of "life everlasting" in the risen Christ. Ignatius believed that, had Christ died only in appearance, his own suffering and his readiness to sacrifice his life for Christ would have no meaning.

Such sentiments are a strong argument against the proposition that Ignatius had come under the influence of some early form of Gnosticism—a dualistic religion that stressed salvation by esoteric knowledge, or *gnōsis,* rather than by faith. Some of Ignatius' formulations possibly echo Gnostic language, and he seems to have made an impression on certain Gnostic sects. Nevertheless, there is no trace in his letters of the basic Gnostic equation of good and evil with spirit and matter. He does not even take up St. Paul's antinomy of flesh and spirit. For him, the spirit is above the flesh rather than against it; even what the

"spiritual man" does "according to the flesh" is spiritual.

Martyrdom as union with Christ. Concern for the doctrine that Christ is man as well as God is the main reason that Ignatius insisted so emphatically on "siding with the bishop." On this earth the bishop represents to his church the true bishop, Christ. Union with the bishop in belief and worship means union with Christ. Those who in a spirit of pride break away from the bishop destroy that union. The unity of the church with its monarchical structure is for Ignatius a concrete realization already on earth of the future life in Christ; authority within the church has not yet become for him a principle of institutional discipline. Ignatius used, for the first time in Christian literature, the expression catholic church, meaning the whole church that is one and the same wherever there is a Christian congregation.

Ignatius' letter to the church of Rome is by far the longest and the richest in laudatory epithets. Throughout his letter he speaks of the Roman Christians in terms of special distinction. But even when he states that their church holds the first place in the whole Christian "community of love [*agapē*]," he acknowledges a position of preeminence rather than of jurisdiction.

Ignatius' desire to become a martyr is also linked with his understanding of union with Christ. To be a perfect disciple of Christ means to imitate Christ in his Passion, to share in it, to be united with Christ in suffering. Many times in his letters Ignatius accuses himself of being imperfect because he has not yet been put to this test. Now, on his journey to Rome, he at last "begins to be a disciple," and his great fear is that his friends in Rome might obtain for him a pardon and so deprive him of his way to perfection. This longing for martyrdom has sometimes been interpreted as a neurotic obsession. Although the language used by Ignatius in voicing this desire does often sound exaggerated, his attitude was shared by many Christians of his time. For Ignatius, love of martyrdom ultimately springs from a deep conviction that only by union with Christ's Passion will he participate in Christ's glory. Even this belief does not free him from the fear that he might recoil in the face of death, and he asks the churches to pray for his strength and constancy.

Ignatius' personal relationships. Only rare glimpses of Ignatius' personal relations are possible from the letters. His greetings, in the manner of St. Paul, to individuals at the end of his letters seldom have a personal ring. In his letter to the church of Smyrna he singles out Tavia for special mention, but his reason seems to be pastoral. Another woman of that town, Alke, is remembered twice as "a name dear to me," and a certain Attalus as "my beloved." Among the clergy Ignatius finds words of special warmth for the deacons. They are "most dear" to him, and he likes to speak of them as his "fellow-slaves." By his time deacons apparently were no longer mere dispensers of the church's charities, as they are depicted in the Acts of the Apostles. If the bishop represents Christ as shepherd, the deacons are images of Christ as "the servant of all." In emphasizing his fellowship with them, Ignatius insists on the common bond among all Christians in the service of God.

Among all the persons known from Ignatius' correspondence, Polycarp, bishop of Smyrna, stands out as his personal friend. Ignatius made the acquaintance of his younger colleague during his stay at Smyrna. He addresses him and generally speaks of him with an affection that is absent in his praise of other bishops. Polycarp received the only personal letter from Ignatius; it is a letter of advice from an experienced older man to a younger one who, for all the promise he shows for the future, still has to find his way. Polycarp, in turn, when writing to the Philippians, praises Ignatius as an example of patience and of willingness to suffer for Christ. Some 40 years later (perhaps in 155) Polycarp himself was to follow in his friend's footsteps to a martyr's death.

Preservation of the letters. Polycarp made a collection of Ignatius' letters and sent them to the church of Philippi, as he had been requested by the Philippians. The collection apparently contained some, if not all, of the seven letters that were known to Eusebius and are now commonly held to be genuine. The letter to the Romans was quoted as early as the 2nd century by Irenaeus, then bishop of Lugdunum (modern Lyon). In the 4th century these letters were corrupted by the heavy insertions of an interlator, and the collection was augmented by six letters forged under Ignatius' name. This enlarged collection was commonly known in the Middle Ages.

A single Latin version based on the original text of the seven genuine letters was, however, made in England in the 13th century, perhaps by the great scholar and translator Robert Grosseteste. The genuine collection, freed from interpolations and forgeries, was restored by 17th-century scholarship. In the period after the Protestant Reformation, Ignatius' notion of the church, as found in the enlarged collection, was greatly emphasized by Roman Catholics and harshly criticized by Protestants; the rediscovery of the letters in their original form, however, has led to a just and objective assessment of his personality and his views against their historical background. (L.G.J.B.)

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Ignatius OF LOYOLA, SAINT: *see* Loyola, Saint Ignatius of.

Ignatyev, Nikolay Pavlovich, Graf (Count), Ignatyev also spelled IGNATIEV (b. Jan. 29 [Jan. 17, old style], 1832, St. Petersburg—d. July 3 [June 20, O.S.], 1908, Krupoderintsy, Russia), pan-Slavist diplomat and statesman who played a major role in the administration of Russia's foreign policy in Asia during the reign of Alexander II (ruled 1855–81).



Ignatyev
Novosti Press Agency

Having become an officer in the Russian Guards at 17, Ignatyev began his diplomatic career in 1856 at the Congress of Paris, after the Crimean War. In 1858 he led a mission to Central Asia, where he concluded a treaty of friendship and trade with the Khan of Bukhara. The following year he was sent to Peking to conclude a treaty defining the eastern Russo-Chinese border. His negotiations were at first unsuccessful, but, taking advantage of an Anglo-French siege of Peking (1860), he convinced the Chinese that Russia was a friendly power and succeeded in negotiating the Treaty of Peking (1860). In that treaty China recognized Russia as master of all the lands on the left bank of the Amur River as well as of those between the Ussuri River and the Pacific Ocean, thereby allowing Russia to construct the city of Vladivostok and become a major power in the northern Pacific region.

After returning from China, Ignatyev became head of the ministry of foreign affairs' Asian department, which had jurisdiction over Russia's relations with the Ottoman Empire as well as with the Far East; in 1864 he was appointed ambassador to Constantinople. Influenced greatly by pan-Slavism and hoping to liberate the Christian Slavs within the Ottoman Empire from Turkish rule, he encouraged the autonomous principality of Serbia to wage a war, which ended unsuccessfully, against the Turks (1876–77) and the Bulgarians to revolt, also unsuccessfully, against their Turk rulers (1876). In 1878, however, after Russia had defeated the Turks in the Russo-Turkish War of 1877–78, Ignatyev negotiated the Treaty of San Stefano, which granted Serbia complete independence from the Turks, created a state of Bulgaria, and was generally favourable to Russia. But the western European powers objected to this settlement; when Ignatyev was unable to prevent them from replacing it with the Treaty of Berlin (1878), which was distinctly less advantageous to Russia, he was forced to retire.

After Alexander III ascended the throne (1881), Ignatyev was named minister of interior. Although he was a conservative, who made provisions for extraordinary security measures to go into effect should revolutionary disorders occur, and also an extreme nationalist, who allowed pogroms against the Jews to be conducted unchecked (1881), Ignatyev also carried out liberal reforms planned by his predecessor, including implementations of the act that had emancipated the serfs in 1861.

He also retained his Slavophile ideals and in 1882 proposed that the Emperor reestablish the 17th-century political institution—the *zemsky sobor* ("assembly of the land"). Alexander, mistakenly fearing that Ignatyev was suggesting the creation of a constitutional form of government, dismissed him (May 1882). Ignatyev later was chairman of a committee that developed a reform program for the government of Russia's Central Asian territories (1884), but he never again held a highly influential post.

igneous rock, any of various crystalline or glassy rocks formed by the cooling and solidification of molten earth material. Igneous rocks comprise one of the three principal classes of rocks, the others being metamorphic and sedimentary.

A brief treatment of igneous rocks follows. For full treatment, *see* MACROPAEDIA: Minerals and Rocks.

Igneous rocks occur as intrusions or extrusions. Plutonic intrusive rocks congeal far below the Earth's surface and occur as batholiths, bosses, laccoliths, and veins. They include granite, syenite, diorite, gabbro, and peridotite. The hypabyssal intrusive rocks (*i.e.,* those formed at a moderate distance below the surface) occur as dikes, sills, and other similar small bodies, and are represented by porphyry, porphyrite, diabase, and lamprophyre. The extrusive igneous rocks are volcanic and found typically as lava flows. They include obsidian, perlite, rhyolite, trachyte, andesite, basalt, and tephrite. Igneous rocks may also occur as pyroclastic ejecta, which are the fragmented

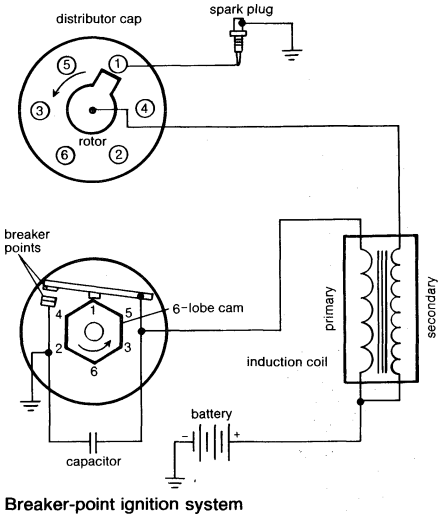
products of explosive volcanic eruptions. Examples of pyroclastic rocks are agglomerate and certain types of breccia and tuff.

Although the different types of igneous rocks vary widely in composition, the vast majority of them consist of less than a dozen groups of minerals. These are quartz, feldspars, pyroxenes, amphiboles, micas, olivines, nephelinite, leucite, and apatite. Igneous rocks also show considerable variation in texture and structure. For example, plutonic intrusive rocks cool slowly and, as a result, their crystals are coarse, well-shaped, and approximately of equal size. Because crystallization is complete, there is no glassy matter present. Miarolitic cavities (irregular openings) commonly develop in plutonic rocks during the late stages of crystallization; they often are filled with vapour deposits. Extrusive igneous rocks, having cooled rapidly in contact with air, are as a rule finely crystalline or at least have a fine-grained groundmass representing that part of the viscous semicrystalline lava flow which was still liquid at the moment of eruption. At this time they were exposed only to atmospheric pressure and the gases they contained were free to escape. Various important modifications arise from this, the most striking being the presence of numerous steam cavities often drawn out to elongated shapes and subsequently filled up with minerals by infiltration. As crystallization was going on while the lava was creeping forward over the surface, the latest formed minerals are commonly arranged in subparallel winding lines that follow the direction of movement. In some cases, the lava cooled at an extremely rapid rate, forming noncrystalline rock (*i.e.*, glassy rock such as obsidian and tachylyte). A common feature of glassy rock is the presence of rounded bodies (spherulites) consisting of fine divergent fibres of imperfect feldspar crystals radiating from the centre.

ignimbrite, rock composed of compacted volcanic ejecta (*see* tuff).

ignition system, in a gasoline engine, means employed for producing an electric spark to ignite the fuel–air mixture; the burning of this mixture in the cylinders produces the motive force.

The basic components in the ignition system are a storage battery, an induction coil, a device to produce timed high-voltage discharges



Breaker-point ignition system

from the induction coil, a distributor, and a set of spark plugs. The storage battery provides an electric current of low voltage (usually 12 volts) that is converted by the system to high voltage (some 40,000 volts). The distributor routes the successive bursts of high-voltage current to each spark plug in the firing order.

In older automobile ignition systems, the high-voltage pulses are produced by means of breaker points controlled by a revolving distributor cam. When the points are in contact they complete an electrical circuit through the primary winding of the ignition coil. When the points are separated by the cam, the primary circuit is broken, which creates a high-voltage surge in the secondary windings of the induction coil. Breaker points have been largely replaced by electronic devices in newer automobiles. Most now use a magnetic device, called a reluctor, that is operated by the distributor shaft to produce timed electric signals, which are amplified and used to control the current to the induction coil. These newer ignition systems are more reliable than the old, permit better control of the engine, and produce higher-voltage output to the spark plugs.

During the evolution of solid-state ignition systems, there have been many modifications. Some ignition conversion systems, for example, extend breaker-point life by using transistors, devices in which a small current in the input (the breaker-point circuit) controls a much larger current in the output (the coil primary circuit).

Consult the INDEX *first*

ignitron, electron tube functioning as a rectifier to convert ac (alternating current) to dc (direct current). Each conduction cycle is started by an external voltage applied to the igniter, a small element touching the tube's cathode, which is a pool of mercury. Electrons released by the igniter from the surface of the mercury initiate a conducting arc through the tube. The arc lasts until voltage on the ignitron's plate is reduced to the point that the arc can no longer be sustained.

Large ignitron devices may be built inside vacuum tanks instead of tube envelopes. Electrical welding equipment incorporates an ignitron as a heavy-duty relay.

Igor, also called INGVAR (b. *c.* 877—d. 945, Dereva region, Russia), grand prince of Kiev and presumably the son of Rurik, prince of Novgorod, who is considered the founder of the dynasty that ruled Kievan Rus and, later, Muscovy until 1598. Igor, successor to the great warrior and diplomat Oleg (ruled *c.* 879–912), assumed the throne of Kiev in 912.

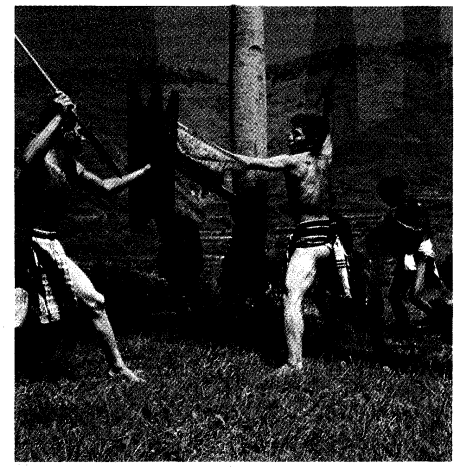
Depicted as a greedy, rapacious, and unsuccessful prince by the 12th-century *Russian Primary Chronicle,* Igor in 913–914 led an expedition into Transcaucasia that ended in total disaster for his forces. He also conducted two expeditions against Byzantium (941 and 944), but many of his ships were destroyed by the "Greek fire," and the treaty he finally concluded in 944 was less advantageous to Kiev than the one obtained by Oleg in 911. Igor did manage to extend the authority of Kiev over the Pechenegs, a Turkic people inhabiting the steppes north of the Black Sea, as well as over the East Slavic tribe of Drevlyane. When he went to Dereva, however (the land of the Drevlyane located in the region of the Pripyat River), to collect tribute (945), his attempt to extort more than the customary amount provoked the Drevlyane into rebelling and killing him.

Igor SVYATOSLAVICH (b. 1150—d. 1202), prince of the Russian lands of Novgorod–Seversky after 1178 and of Chernigovsky (1198–1202), who led an unsuccessful campaign against the Cumans (Polovtsy) in 1185.

During the 12th century the southern and western Russian principalities were continually invaded and devastated by the nomadic Cumans. Svyatoslav III, cousin of Igor and prince of Kiev, inflicted a severe defeat upon them in 1183. But two years later Igor, the son of Svyatoslav, prince of Chernigovsky (died 1164), led his son Vladimir of Putivl, his brother Vsevolod of Trubchevsk, and their nephew Svyatoslav Olgovich of Rylsk on another expedition against the nomads. After travelling from Novgorod–Seversky to the Donets River, they continued into the steppes, where they engaged the Cumans in a three-day battle (May 1185). Igor's forces were completely defeated; all four princes were captured, and the Cumans were able to resume their raids upon Russian territory.

In 1186 Igor escaped from captivity and returned to Novgorod–Seversky, where he resumed his rule but drifted into relative insignificance. His campaign was not only described in the Russian chronicle but also became the subject of a major epic poem of old Russian literature, *Slovo o polku Igoreve* ("The Song of Igor's Campaign"), presumably written by a member of Igor's force.

Igorot (Tagalog: Mountaineer), any of various ethnic groups in the mountains of northern Luzon, Philippines, all of whom keep, or have kept until recently, their traditional religion and way of life. Some live in the tropical forests of the foothills, but most live in rugged grassland and pine forest zones higher up. The



Igorot headhunter's dance; northern Luzon, Philippines

H. Linker—Shostal/EB Inc.

1975 census showed a total of about 478,000. Their languages belong to the northern Luzon subgroup of the Philippine languages, which belong to the Austronesian (Malayo-Polynesian) family.

The Igorot peoples are Austronesians of a Mongoloid stock. They were notorious in earlier days for their wars and headhunting; they were partially pacified by the Spanish, and the process was completed during the U.S. hegemony.

Ethnologists distinguish about 10 main ethnic groups, each with its own dialect and culture. There are also variations within these groups.

Two broader groupings may be made of the Igorot as a whole: one, by far the larger, comprising the peoples of the higher country who cultivate wet rice, mostly in steplike terraces on the mountainsides; the other comprising peoples of the lower rain-forest areas, who grow dry rice in seasonally shifting gardens. The first group (the Nabaloi or Ibaloi, Kankanai, Lepanto or northern Kankanai, Bontoc, southern Kalinga, Tinggian) nearly all live in populous villages, but one ethnic unit (the Ifugao) has small farmsteads of kinsmen dotted throughout the rice terraces. The second group (the Gaddang, northern Kalinga, and Isneg or Apayao) are sparsely settled in hamlets or farmsteads around which new gardens are cleared as the soil is worked out; some Gaddang live in tree houses.

Cultural elements common to the Igorot peoples as a whole include metalworking in iron and brass, weaving, and animal sacrifice. They believe in spirits, including those of ancestors, and have complex rituals to propitiate them. There are no clans or tribes, and political organization is generally limited to the village level. Kinship is traced on both the paternal and the maternal sides, extending as far as third cousins.

Igor's Campaign, The Song of, also translated LAY OF IGOR'S CAMPAIGN, Russian SLOVO O POLKU IGOREVE, masterpiece of Old Russian literature, an account of the unsuccessful campaign in 1185 of Prince Igor of Novgorod-Seversky against the Polovtsy (Kipchak, or Cumans). As in the great French epic *The Song of Roland,* Igor's heroic pride draws him into a combat in which the odds are too great for him. Though defeated, Igor escapes his captors and returns to his people. The tale was written anonymously (1185–1187) and preserved in a single manuscript, which was discovered in 1795 by A.I. Musin-Pushkin, published in 1800, and lost during Napoleon's invasion of Russia in 1812.

The tale is not easily classified; neither lyric nor epic, it is a blend of both, with a suggestion of the political pamphlet as well. It is the product of a writer familiar with oral poetry, chronicles, and historical narratives. It is distinguished principally by its modernity. The author's worldview is secular; Christianity is incidental to events.

The *Song* alone of all Old Russian literature has become a national classic, one that is familiar to every educated Russian. An English translation of it by Vladimir Nabokov was published in 1960.

Iguaçu Falls, also spelled IGUASSÚ, or IGUAZÚ, Spanish CATARATAS DEL IGUAZÚ, Portuguese CATARATAS, or SALTOS, DO IGUAÇU, cataract on the Iguaçu River, 14 miles (23 km) above its confluence with the Paraná, at the Argentina–Brazil border. The horseshoe-shaped falls are 269 feet (82 m) high and 2.5 miles (4 km) wide—four times the width of Niagara Falls in North America. Numerous rocky and wooded islands on the edge of the escarpment over which the Iguaçu River plunges divide the falls into some 275 separate waterfalls or cataracts, varying between 200 and 269 feet (60 and 82 m) in height. The name of the falls, like that of the river, is derived from a Guaraní word meaning "great water."

The rate of flow of the falls may rise to a maximum of 450,000 cubic feet (12,750 cubic m) per second during the rainy season from November to March. Minimum flow occurs during the dry season from August to October. It has been estimated that the mean annual rate of flow is about 62,000 cubic feet (1,756 cubic m) per second.

The falls occur where the Iguaçu River, flowing westward, tumbles over the edge of the Paraná Plateau into a narrow chasm or canyon. Among the many islands associated with the falls, the most notable are San Martín Island and Grande Island, which are both situated just above the falls. Grande Island divides the river into two branches, which then rejoin before cascading downward over basalt rock and lava formations into the chasm, which is called Garganta del Diablo ("Devil's Throat"); the effect has been described as that of "an ocean plunging into an abyss." (The Iguaçu River then continues its course through the canyon to its junction with the Paraná River.)

A number of the individual falls are broken midway by protruding ledges; the resultant deflection of the water, as well as the spray that arises, creates what appears to be a barrage of rainbows. From the foot of the falls, a curtain of mist rises nearly 500 feet (152 m) into the air, thus adding to the spectacular rainbow effect.

From San Martín Island, which is situated in the Argentine half of the river, a fine view of the Argentine sector of the falls may be obtained; individual falls to be seen from this vantage point include those known as San Martín, Bozzetti, Dos Hermanas ("Two Sisters"), Mitré, and Tres Mosqueteros ("Three Musketeers"). Tourists visiting the falls on the Argentine side are permitted complete freedom of movement and can climb in and out of the falls as they wish. From the Brazilian shore, the falls can be seen in their entirety; among individual Brazilian falls are those known as Benjamin Constant, Deodoro, and Floriano.

The first Spanish explorer to visit the falls was Alvar Núñez Cabeza de Vaca, who in 1541 named them Salto de Santa María; the falls, however, retained their original name, Iguaçu. Jesuit missionaries began to investigate the falls in the 18th century, but these explorations were cut short by the expulsion of the Jesuits from South America in 1767. The first topographic maps of the falls were not completed until 1892.

In 1897 Edmundo de Barros, a Brazilian army officer, envisaged the establishment of a national park at Iguaçu Falls, comparable in many ways to Yellowstone National Park in the United States. Following boundary rectifications between Brazil and Argentina, two separate national parks were established, one by each state. Both parks were created to preserve the vegetation, wildlife, and scenic beauty associated with the falls; both also have government-owned hotels for the accommodation of tourists. The Argentine park also has a natural-history museum. Each park prohibits hunting but permits fishing.

The vegetation of the region is rich and varied, ranging from semideciduous to tropical, and has been a focus of botanical interest. Water plants include a family (Podostemaceae) that grows only in rushing water and is found on the ledges of the falls. Contrasts are also abundant, with orchids growing next to pines, bamboos next to palm trees, and mosses next to lianas and colourful begonias.

Animal life is equally varied and abundant but has been much less studied. Mammals include several members of the cat family (ocelots and jaguars), deer, tapir, and innumerable smaller animals. Birds of many varieties are also to be found. Fish include the dorado (golden salmon), mandi, and cascudo.

In addition to the falls continuing to be a major tourist attraction, the possibility also exists that they could be harnessed to provide hydroelectric power. Apart from problems of the two states in establishing a cooperative approach, however, seasonal variations in the rate of flow and the lack of a potential market for the power produced also constitute obstacles to the immediate realization of such a project.

Iguaçu River, also spelled IGUASSÚ, Portuguese RIO IGUAÇU, Spanish RÍO IGUAZÚ, river, Paraná and Santa Catarina states, southern Brazil, formed by headstreams rising in the Serra do Mar near Curitiba. It winds generally westward through the uplands for about 820 miles (1,320 km) before joining the Paraná River at the point where Argentina, Brazil, and Paraguay meet. It forms a small portion of the Brazilian-Argentine border. Although sections of the river are navigable, it is known chiefly for the spectacular Iguaçu Falls. Hydroelectric plants are located on the river at the Segredo, Osorio, and Santiago falls. A railroad runs between Iguaçu Falls and the Itaipu hydroelectric plant.

Iguala, in full IGUALA DE LA INDEPENDENCIA, city, north-central Guerrero state, south-central Mexico. It was settled in 1750 and was named in honour of Agustín de Iturbide's Iguala Plan, proclaiming Mexico an independent monarchy (Feb. 24, 1821). On the Cocula River, in the Iguala valley, 2,398 feet (731 m) above sea level, the city is an important regional commerce and communications centre. Products from much of Guerrero, including corn (maize), beans, sugarcane, peanuts (groundnuts), lemons, and rice, are gathered there and distributed to inland plateau cities. There are some small-scale industrial activities, including the extraction of sesame-seed oil and the production of soap. Iguala is on both the Mexico City–Acapulco expressway and the Mexico City–Balsas River railroad. It is also served by domestic airlines. Pop. (1980) 66,005.

Iguala Plan, Spanish PLAN DE IGUALA (Feb. 24, 1821), appeal issued by Agustín de Iturbide, a creole landowner and a former officer in the Spanish army who had assumed leadership of the Mexican independence movement in 1820. His plan called for an independent Mexico ruled by a European prince (or by a Mexican—*i.e.,* Iturbide himself—if no European could be found), retention by the Roman Catholic church of all of its powers, equal rights for creoles and *peninsulares* (those of Spanish ancestry on both sides, born in Mexico and Spain, respectively), and elimination of property confiscations. The plan soon won the approval of virtually every influential group in Mexico, though it completely ignored the rights of the lower classes. Thus, the achievement of independence in Mexico stood in contrast to the independence movement in South America, where liberal elements predominated: the conservative upper classes, including the higher clergy, now sanctioned Mexican independence because it freed them from the newly installed Liberal government in Spain, which they feared would upset the social and economic status quo in Mexico. On Aug. 24, 1821, Iturbide and the Spanish viceroy, Juan O'Donojú, signed the Convention of Córdoba (a town in Veracruz state), by which Spain acquiesced in the Iguala Plan and agreed to withdraw its troops. The Spanish government subsequently refused to accept the Convention (1822), but Iturbide had already made himself emperor of Mexico.

iguana, any of about 13 species that include the larger members of the lizard family Iguanidae, 1 m (about 3 feet) or more long. The name sometimes includes the smaller members of the family, but "iguanid" is better applied in this case.

The common iguana (*Iguana iguana*) occurs from Mexico to Brazil, and the closely related



Iguana (*Iguana iguana*)
Willis Peterson

West Indian iguana (*I. delicatissima*) lives on several of the Caribbean islands. Other well-known relatives are the rhinoceros iguana (*Cyclura cornuta*) of Haiti, the desert iguana (*Dipsosaurus dorsalis*) of Mexico and the United States, and the marine (*Amblyrhynchus cristatus*) and land (*Conolophus*) iguana of the Galápagos Islands.

iguanid, any lizard of the family Iguanidae. Representatives are found throughout the Americas from southern Canada to the tip of South America. Isolated species occur on Madagascar and the Fiji Islands. The family includes the giant iguana of the American tropics, the marine iguana of the Galápagos Islands, and the common genus *Anolis* with about 200 species.

Iguanids are a generalized group of lizards with well-developed legs, eyes, and tails. Many are arboreal. Most have territorial and courtship displays.

Iguanodon, genus of large herbivorous dinosaurs found as fossils in Late Jurassic and Early Cretaceous rocks of a wide area of Europe, North Africa, and eastern Asia (the Jurassic Period preceded the Cretaceous and ended 136,000,000 years ago). *Iguanodon* was more than 10 metres (30 feet) long; its head was 4 metres (12 feet) off the ground. The



Iguanodon skeleton

By courtesy of the trustees of the British Museum (Natural History); photograph, Imitor

hind limbs of this biped were very well developed, and the long, thick tail served as a counterbalance. The forelimbs were relatively well developed, with unusual hands; the thumb projected upwards perpendicular to the rest of the hand and was rigid, much like a sharp spike. The teeth were serrated and bladelike.

Iguanodon was one of the first dinosaurs to be found and studied intensively. The remains of many individuals have been found, some in groups, suggesting that *Iguanodon* travelled in herds. Tracks and trackways of *Iguanodon* are relatively common. It has been suggested that *Iguanodon* was partially aquatic in habit; when threatened, it sought refuge in a stream or lake.

Iguassú (falls and river, South America): *see* Iguaçu Falls; Iguaçu River.

Iguazú (falls and river, South America): *see* Iguaçu Falls; Iguaçu River.

Iguvine Tables, a set of inscribed bronze tables found in 1444 at Iguvium (modern Gubbio, Italy), an Umbrian town. Seven tables are still extant in the museum at Gubbio; possibly there were two others that were taken to Venice in 1540 and there lost. They are written in the Umbrian language, four and part of a fifth using the Umbrian script, the rest Latin characters. The earliest appear to date from the 3rd or 2nd century BC, the latest from the early part of the 1st century BC. These tables give the liturgy of the Fratres Atiedii, a brotherhood of priests, and are of great value for the study of ancient Italic language and religion.

The first table contains regulations for the purification of the sacred mount or citadel of Iguvium (including directions for taking the auspices beforehand) and for the lustration (purification) of the people. Tables six and seven contain essentially the same material as the first, but in greatly expanded form and in somewhat later language. The second, third, and fourth tables describe several different sacrifices, many of the details of which are quite obscure. The fifth table deals with administrative details of the brotherhood, including duties of the *adfertor* (chief priest), fees due him, and provisions for fining him if he has not performed his duties properly; it ends with a statement of mutual obligations between the Fratres Atiedii and two of the (originally) 10 divisions of the Iguvine people.

Ihara Saikaku, Ihara also spelled IBARA, original name probably HIRAYAMA TŌGO (b. 1642, Ōsaka—d. Sept. 9, 1693, Ōsaka), poet and novelist, one of the most brilliant figures of the 17th-century revival of Japanese literature, who enchanted readers with racy accounts of the amorous and financial affairs of the merchant class and the demimonde.

Saikaku first won fame for his amazing facility in composing haikai, humorous renga (linked-verse) poems from which the 17-syllable haiku was derived. In 1671 he turned out, in "a day and a night," 1,600 verses. Not satisfied with composing at the rate of one verse a minute, he steadily increased his prowess, reaching 4,000 in 24 hours in 1680 and the incredible figure of 23,500 in 1684. This was somewhat more than 16 haikai per minute, and the performance earned him the nickname of the "20,000 poet." Saikaku continued to write verse at more normal speeds, but his style was considered so bizarre that rival poets called it "Dutch" to indicate its outlandishness.

Saikaku is best known, however, for his novels, written in a swift, allusive, elliptic style that stems from his training as a haikai poet. Their content reflects, from many angles, Japanese society in a time when the merchant class had risen to such prominence that its tastes prevailed in the arts and the licensed pleasure quarters catered to its whims. *Kōshoku ichidai otoko* (1682; *The Life of an Amorous Man,* 1964), the first of Saikaku's many novels concerned with the pleasure quarters, relates the erotic adventures of its hero, Yonosuke, from his precocious experiences at the age of 6 to his departure at 60 for an island of women. Of other works in a similar vein, the best is thought to be *Kōshoku gonin onna* (1686; *Five Women Who Loved Love,* 1956).

Saikaku also wrote novels about the samurai (aristocratic warrior caste), but they were generally considered inferior to his erotic tales or



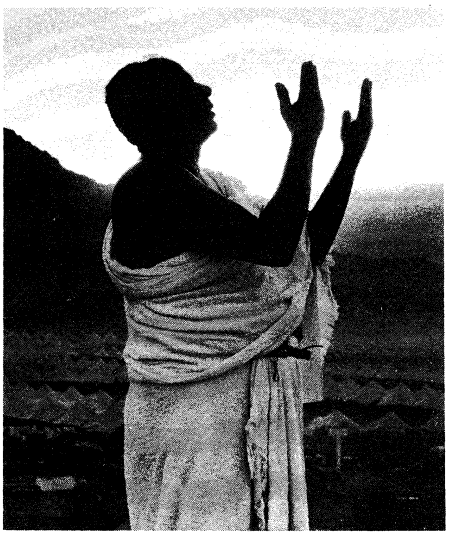
Ihara Saikaku, woodblock print from a playbook of the Edō period (1603–1867)

By courtesy of the International Society for Educational Information, Tokyo

to such accounts of tradesmen's lives as *Nihon Eitaigura* (1688; *The Japanese Family Storehouse,* 1959), a collection of stories on how to make (or lose) a fortune. Whatever the subject, Saikaku's satirical humour and his knack (derived from writing haikai) of being able to seize the one detail that best evokes a person's character or milieu are always conspicuous. Although most at home in dealing with the lively atmosphere of Ōsaka, he wrote about all Japan. His *Saikaku Shokoku Banashi* (1685; "Saikaku's Tales from the Provinces") records many stories picked up on his travels. His popularity was enormous everywhere, and his influence on fiction continued after his death.

Ihering, Rudolf von: *see* Jhering, Rudolf von.

iḥrām, sacred state into which a Muslim must enter in order to perform the *ḥajj* (major pilgrimage) or the *ʿumrah* (minor pilgrimage). At the beginning of a pilgrimage, the Muslim stops at a designated station to perform certain ritual cleansing ceremonies; each male shaves his head, cuts his nails, and trims his beard before donning a white, seamless, two-piece garment. Women also wear white; although no particular dress is prescribed, by tradition they wear long robes. During the period



Pilgrim at prayer in the robe of *iḥrām*

Middle East Features—Black Star/EB Inc.

of sanctification, sexual activity, shaving, and cutting one's nails all are forbidden in accordance with the pilgrim's special relationship to God during the *iḥrām.*

The word is also used for the state of a worshipper during the performance of the *ṣalāt,* the ritual prayer repeated five times daily.

Ii Naosuke (b. Nov. 29, 1815, Hikone, Japan—d. March 24, 1860, Edo), Japanese feudal lord and statesman who was responsible for Japan's signing the first treaty of commerce with the United States (1858), opening the country to Western influence, and for the last attempt at reasserting the traditional political role of the Tokugawa (the dynasty of Japan's military rulers) before its fall in 1867.

Ii and his family. The Ii family, from which he was descended, ruled the fief of Hikone and played an important part in the administration of the shoguns; *i.e.,* the military dictators who had in effect ruled Japan since the 12th century. The family owed its prominent position to its standing among the *fudai* daimyo, the barons who had helped the Tokugawa become shoguns in the early 17th century. When Ii Naosuke was born, the 14th son of Ii Naonaka, his father had already

turned over power to his eldest son. After the father's death, all sons except the heir had by family custom to be adopted into other baronial families or else be reduced to the status of family retainer with a small stipend. The



Ii Naosuke, detail of a portrait by his second son, Naoyasu, second quarter of the 19th century; in the collection of Gotoku-ji, Setagaya, Tokyo

By courtesy of the International Society for Educational Information, Tokyo, Inc.

only son for whom an adoptive family could not be found, Ii devoted himself to his studies at an academy established by his family. As a samurai, a member of the warrior class, he was schooled in the arts of warfare, as well as in Japan's cultural traditions, and he developed into a strong-willed and independent individual.

At 31, Ii's fortunes suddenly brightened when his brother's son died, and, ironically, as he was the only brother who had not been adopted, he was made heir apparent. When his brother died in 1850, Ii, then 35 years old, became lord of Hikone and thus acquired a base from which to project himself into national politics.

Arrival of Perry. The arrival of a U.S. flotilla under Commo. Matthew Perry in 1853 produced a major crisis for the shogunate. Perry had been sent by his government to demand that the country abandon its traditional isolation and enter into relations with the outside world. The Tokugawa authorities, confronted with the display of superior U.S. power, broke with precedent and sought the advice of the feudal nobles. Ii Naosuke was among those who favoured developing relations with the West. He argued that, while Japan was not yet strong enough to defend itself against foreign aggression, foreign contact would eventually provide Japan with the strength necessary to reimpose a policy of isolation. Others, however, urged that the intruders should be repelled by force if necessary. Since the Tokugawa government did not have the military capability to repulse the Americans, it signed the Perry Convention of 1854, which opened two ports to U.S. ships needing supplies and repairs. The task of arranging for trade, not covered in the Perry Convention, fell to Townsend Harris, who became the first U.S. consul to Japan.

Trade proved to be a controversial issue because the proponents of continued isolation would not be silenced. The problem was compounded by a crisis in domestic politics centring on the choice of an heir apparent to the reigning shogun, Iesada, who was childless.

There were two candidates with strong support. One was the Shogun's first cousin, who was still a child. The other was a grown man of demonstrated ability, the son of Tokugawa Nariaki, who was only collaterally related to the Shogun and not a member of the ruling group but who assiduously promoted the candidacy of his son. The Shogun's cousin, on the other hand, was supported by the senior councillors (*rōjū*), a small group of *fudai* daimyo who had acquired policy-making power in the shogunate. This group, anxious to preserve its power position, preferred a child shogun. The stage was thus set for a struggle.

Ii entered the conflict in 1858, when he assumed direct control of the government as honorary chief councillor (*tairō*), a position filled only intermittently, usually in crises. Before he took office, the shogunate had sought the Imperial court's permission to sign the U.S. treaty, but antitreaty forces had succeeded in blocking approval. Ii authorized his negotiators to sign the treaty without waiting for Imperial permission. He had learned that, if it were delayed, Japan might have to make even greater concessions, since it appeared that Britain and France were likely to seek even more far-reaching treaties.

Succession to the shogunate. In the succession issue, Ii took a much more conservative position than in foreign affairs. Ignoring pressure from Nariaki and others to bring new groups into the policy-making machinery, he acted in favour of the *fudai* daimyo, who had appointed him, by promoting the Shogun's cousin as heir apparent.

In response, an angry delegation of barons led by Nariaki criticized Ii for having signed the treaty without the Emperor's consent and demanded that Nariaki's son be made heir apparent to the Shogun. Ii rejected these complaints and demands and purged the opposition. He placed Nariaki under house arrest, stripped other barons of their rank, and arrested and even executed some officials.

Ii's victory proved short-lived. On March 24, 1860, Ii, accompanied by his retainers and bodyguards, was on his way to the Shogun's castle when a band of armed followers of Nariaki waylaid them. Ii's bodyguards were unable to defend him, and the attackers cut off his head, ending his meteoric rise to power when he was only 45 years old. His bold leadership as *tairō* had secured for a time the stability of the shogunate and the continuity of Tokugawa rule; neither was to survive him for long. (N.I.)

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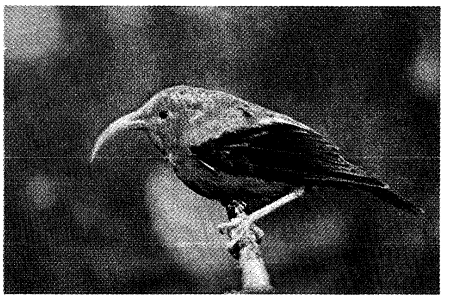
Iio Sōgi, also called SŌGI (b. 1421, Japan—d. Sept. 1, 1502, Hakone, Japan), Buddhist monk and greatest master of renga (linked verse), the supreme Japanese poet of his age.

Sōgi was born of humble stock, and nothing is known of his career before 1457. His later writings suggest that after serving as a Zen monk in Kyōto he became, in his 30s, a professional renga poet. His teachers included not only provincial renga masters but also court nobles, and though his training undoubtedly benefitted his poetry, it also exerted an inhibiting influence. Sōgi's own selection of his best work shows him at his most ingenious in the aristocratic tradition; but his modern reputation is based on the deeply moving vein found in his simpler and more personal poems.

Sōgi is known as a traveller-poet. His life for 40 years was divided between the capital and the provinces. From 1466 to 1472, a period when warfare ravaged Kyōto, he lived mainly in eastern Japan. His return to Kyōto in 1473 ushered in his most fruitful period. His residence became the centre of literary activity in the city, and he compiled several collections of his poetry. In 1480 he made a journey to Kyushu (recorded in his *Tsukushi no michi no ki*; "A Record of the Road to Tsukushi"), not in the traditional manner as a wandering priest but as a celebrity, feted everywhere by his admirers.

Sōgi's reputation derives mainly from two renga sequences, *Minase Sangin Hyakuin* (1486; *Minase Sangin Hyakuin: A Poem of One Hundred Links Composed by Three Poets at Minase,* 1956) and *Yuyama Sangin Hyakuin* (1491; "One Hundred Poems Composed by Three Poets at Yuyama"); in each of these, three poets led by Sōgi took turns at composing short stanzas (links) to form a single poem with many shifts of mood and direction. Sōgi left over 90 works including renga anthologies, diaries, poetic criticism, and manuals.

iiwi (*Vestiaria coccinea*), Hawaiian songbird, one of the commoner members of the Hawaiian honeycreeper (*q.v.*) family, Drepanididae, order Passeriformes. A nectar-feeder, named for its squeaky call ("ee-ee-vee"), it is 15 cen-



Iiwi (*Vestiaria coccinea*)

M. Ord—Photo Researchers

timetres (6 inches) long, with a red body, black wings with small white patches, black tail, and sickle-shaped red bill.

Iizuka, city, Fukuoka Prefecture (*ken*), Kyushu, Japan, on the upper Onga-gawa (Onga River). The city developed as a mining centre with the opening of the Chikuhō Coalfield and a railway from Wakamatsu in the 1890s. The mines were gradually closed after World War II, and Iizuka is now a commercial centre and railway hub. Pop. (1980) 80,288.

Ijaw, also spelled IJO, people of the forests of the Niger River Delta in Nigeria comprising a large number of formerly autonomous groups. They speak a language of the Kwa branch of the Niger-Congo family.

West of the main Niger outlets each group occupies a cluster of villages linked by loose ties of cooperation, mainly against outsiders. Its members claim descent from a common ancestor. At group and village levels, government is by assemblies of elders, often presided over by priests. The economy is based on fishing, palm oil collecting, and floodland agriculture.

Formerly, when the economy was based primarily on fishing, each group claimed a distinctive culture, as well as political autonomy. Following contact with European merchants in about 1500, however, the communities of Bonny, Calabar, and Nemke began trading first in slaves and then in palm oil. Wealthy traders became very powerful and governed in council with a hereditary king. Each trader purchased numerous slaves for incorporation into his own section of the community; if the

trader had no suitable heir, an able slave succeeded him. Competition with other groups over hinterland markets and stress on cultural separation rather than on links of common descent meant that ability was valued more than pedigree, permitting the emergence of slave-born leaders, such as George of Calabar and Jaja of Opobo.

Ijebu-Ode, town, Ogun State, southwestern Nigeria. It is situated along the highway between Shagamu and Benin City. Ijebu-Ode was by the 16th century established as the chief town of the Ijebu people (a subdivision of the Yoruba). As the seat of the *awujale,* the Ijebu political and spiritual ruler, it served as the capital of the Ijebu Kingdom, which for several centuries dominated the trade between the ports of the Lagos Lagoon (including Lagos, 44 miles [70 km] west-southwest) and the Yoruba hinterland (especially Ibadan, 38 miles [60 km] north). During the Yoruba civil wars of the late 19th century, Ijebu opposed Ibadan and closed the trade routes to the coast. By defeating the *awujale* at Ijebu-Ode in 1892 and thus destroying the Ijebu trade monopoly, the British convinced the rest of Yorubaland to come to terms under their protection.

Modern Ijebu-Ode is a major collecting station for kola nuts, which are purchased for trucking to the northern states. Ijebu-Ode also serves as a collecting point for cocoa and palm oil and kernels, which are exported from Lagos. The town's industry includes a printing and publishing firm. Its artisans are known for their handiwork in iron. Local trade is primarily in yams, cassava, corn (maize), palm produce, and oranges; and rubber and timber have become important commercial products of the area.

The town, whose *awujale* retains a position as the traditional Ijebu leader, is also headquarters of a local government council. It is the site of the Ogun State College of Education, Muslim and Christian primary teacher-training colleges, and a government vocational school. There are also a hospital for infectious diseases and a leprosy settlement. Pop. (1983 est.) 113,110.

Ijill (Mauritania): *see* Fdérik.

ijmāʿ (Arabic: "agreeing upon," or "consensus"), the universal and infallible agreement of the Muslim community, especially of Muslim scholars on any Islāmic principle, at any time. The consensus, based on the Ḥadīth (sayings of Muḥammad), "My people will never agree in an error," constitutes the third of the four sources of Islāmic jurisprudence, the *uṣūl al-fiqh* (*q.v.*). In effect, *ijmāʿ* has been the most important factor in defining the meaning of the other *uṣūl* and thus in formulating the doctrine and practice of the Muslim community.

In Muslim history *ijmāʿ* has always had reference to consensuses reached in the past, near or remote, and never to contemporaneous agreement. It is thus a part of traditional authority and has from an early date represented the Muslim community's acknowledgment of the authority of the beliefs and practices of Muḥammad's city of Medina.

Ijmāʿ also has come to operate as a principle of toleration of different traditions within Islām. It thus allows, for example, the four legal schools (madhabs) equal authority and has probably validated many non-Muslim practices taken into Islām by converts.

In modern Muslim usage, *ijmāʿ* has lost its association with traditional authority and appears as a democratic institution and an instrument of reform.

IJmuiden, port of Amsterdam and part of the *gemeente* (commune) of Velsen, Noordholland *provincie,* western Netherlands. The port is situated at the western end of the North Sea (Noordzee) Canal, which was opened in 1876. IJmuiden is also an industrial centre with fertilizer and cement factories, and it is an important fishing port with a government fish market. Three huge locks at IJmuiden link the canal to the North Sea. Two breakwaters project seaward from the canal mouth for nearly 1 mile (1.6 km). Used as a base for German torpedo boats in World War II, its facilities were damaged by Allied bombing but have since been rebuilt. Pop. (1974 est.) 40,336.

Ijo (people): *see* Ijaw.

ijolite, intrusive igneous rock that is composed essentially of nepheline and an alkali pyroxene, usually aegirinaugite. It is the plutonic equivalent of the volcanic nephelinites and nepheline dolerites. Typically, the pyroxene is well-crystallized and is surrounded by the nepheline. Accessory minerals include black garnet, titanite, perovskite, apatite, cancrinite, and calcite.

Ijolites form characteristic members of carbonatite–alkali igneous complexes, such as those of Alno, Swed.; Fen, Nor.; Kola Peninsula, U.S.S.R., where they contain abundant wollastonite; and Iron Hill, Colo. The ijolites of Magnet Cove, Ark.; Ice River, B.C.; and Sekukuniland, Transvaal, are among the better-known representatives found in rock collections. The rocks known as urtite (Kola Peninsula) and melteigite (near Fen, Nor.) are essentially similar assemblages; in the former, nepheline largely predominates, whereas the latter is a variant with an excessive proportion of pyroxene.

IJssel River, river of The Netherlands, an important distributary of the Rhine. It leaves the Lower Rhine (Neder Rijn) just southeast of Arnhem and flows northeastward for 70 miles (113 km) to enter the IJsselmeer (a lake formed from the old Zuiderzee) between the Northeast (Noordoost) and East Flevoland polders. The river is navigable and slow-moving and deposits much silt. Zutphen, Deventer, and Zwolle are important municipalities along its course.

IJsselmeer, shallow freshwater lake, northern and central Netherlands. It was formed from the southern part of the former Zuiderzee by the building of a dam (Afsluitdijk; completed 1932) separating the IJsselmeer from both the Waddenzee (the northern part of the former Zuiderzee) and the North Sea.



Part of the north dam (the Afsluitdijk) across the IJsselmeer, Neth.

Pierre Berger—Photo Researchers

The dam that formed the IJsselmeer lies about 25 feet (8 m) above sea level and is 19 miles (31 km) long, extending between the provinces of Noordholland and Friesland. The dam was constructed of boulder clay backed by sand and is faced with stone to just below water level, on a base of boulders resting on mats of willow. There is a highway and bicycle path along the top of the dam; locks provide passage for barges and small seagoing craft. Regulated by sluices, the formerly brackish water has been replaced by fresh water, partly by inflow from the IJssel River, a branch of the Rhine. This source of fresh water is valuable to Noordholland and Zuidholland and Friesland during occasional summer droughts and also helps to improve their brackish marshlands. The original fishing for herring, anchovies, and flounder has been replaced by freshwater fisheries, chiefly for eels. In spring, the eel larvae, born in the Sargasso Sea (a large tract of relatively still water in the North Atlantic) enter the lake through the locks.

Large parts of the lake's total area of 1,328 square miles (3,440 square km) have been reclaimed by constructing encircling dikes and pumping the water out. As a result, the land area of The Netherlands has been increased by 626 square miles (1,620 square km) of fertile polders.

IJsselmeer Polders, Dutch IJSSELMEERPOLDERS, group of four polders, central Netherlands, that were reclaimed from the IJsselmeer, a lake that used to be part of the former Zuiderzee. The polders are located in the lake's southern part and along its eastern shore (except for Wieringermeer in the northwest).

The Zuiderzee project, which involved the construction of a dam (Afsluitdijk; completed 1932) enclosing the IJsselmeer and the subsequent land reclamation of its rich marine clay, began in 1920, following the plans of engineer-statesman Cornelis Lely. The Wieringermeer Polder (75 square miles [193 square km]), the Northeast (Noordoost) Polder (181 square miles [469 square km]), and the East (Oostelijk) Flevoland Polder (204 square miles [528 square km]) were completed in 1930, 1942, and 1957, respectively. The South (Zuidelijk) Flevoland Polder (166 square miles [430 square km]) was completed in 1968. A fifth potential polder is the Markerwaard Polder in southwest IJsselmeer. Under construction since 1963, its diking was partially complete by the mid-1980s, but national debate regarding the future of the area based on concerns about recreational facilities, nature conservation, fishing, and increased costs has made empoldering less likely.

The Zuiderzee project is controlled by the Dutch government, which also administers the newly reclaimed areas and selects their prospective inhabitants. Many farmers in the Northeast Polder came from Zeeland and were originally victims of the devastation of World War II and the 1953 floods.

The Wieringermeer Polder, on the northeastern coast of Noordholland, has been incorporated into that province. The Northeast, East Flevoland, and South Flevoland polders were united in 1986 into one administrative unit called Flevoland province, centring on the new town of Lelystad.

The four polders reclaimed from the IJsselmeer increase the land area of The Netherlands by about 626 square miles (1,620 square km). Originally intended almost exclusively for agricultural production (corn [maize], wheat, oilseeds, sugar beets, potatoes), the polders are also used for industrial and recreational purposes and as residential areas.

ijtihād (Arabic: "effort") in Islāmic law, the independent or original interpretation of problems not precisely covered by the Qurʾān, Ḥadīth (traditions concerning the Prophet's life and utterances), and *ijmāʿ* (scholarly consensus). In the early Muslim community every adequately qualified jurist had the right to exercise such original thinking, mainly *raʾy* (personal judgment) and *qiyās* (analogical reasoning), and those who did so were termed *mujtahid*s. But with the crystallization of legal schools (madhabs) under the ʿAbbāsids (reigned 750–1258), the Sunnites (the majority branch of Islām) held at the end of the 3rd century AH that the "gates of *ijtihād*" were closed and that no scholar could ever qualify

again as *mujtahid*. All subsequent generations of jurists were considered bound to *taqlīd*, the unquestioned acceptance of their great predecessors as authoritative and could, at most, issue legal opinions drawn from established precedents. The Shīʿah, the minority branch, never followed the Sunnah in this respect and still recognize their leading jurists as *mujtahids*, although in practice the Shīʿī law is little more flexible than that of the Sunnah. In Shīʿī Iran, the *mujtahids* act as guardians of the official doctrine, and in committee may veto any law that infringes on Islāmic ordinances.

Several prominent Sunnī scholars, such as Ibn Taymīah (1236–1328) and Jalāl ad-Dīn as-Suyūṭī (1445–1505), dared to declare themselves *mujtahids*. In the 19th and 20th centuries reformist movements clamored for the reinstatement of *ijtihād* as a means of freeing Islām from harmful innovations (*bidʿahs*) accrued through the centuries and as a reform tool capable of adapting Islām to the requirements of life in a modern world.

IJzer River (Europe): *see* Yser River.

Ikare, town, Ondo State, southwestern Nigeria, in the Yoruba Hills, at the intersection of roads from Owo, Okene, Kabba, and Ado-Ekiti. An agricultural trade centre (yams, cassava, corn [maize], okra, pumpkins, rice) for the local Yoruba people, it is also a collecting point for cocoa, palm produce, tobacco, and cotton (which is sent to the textile mill at Ado-Ekiti, 37 mi [60 km] west). The town is the headquarters of the Akoko North Local Government Council and has Muslim and Christian secondary schools; it also has a trade school and government- and church-operated hospitals. Pop. (1983 est.) 101,700.

Ikbāl, Sir Mahomed (Indian poet): *see* Iqbāl, Sir Muḥammad.

Ike Taiga, original name MATAJIRŌ, also called IKENO TAIGA (b. June 6, 1723, Kyōto—d. May 30, 1776, Kyōto), painter of the mid-Edo period (1603–1867) who, together with Yosa Buson, established the *bunjin-ga*, or literati, style of painting, which survives to this day in Japan. (The style had originated in China and was first called Nan-ga, or the Southern School, of Chinese art; it was closely related to scholarship and literature.)

The son of a farmer, Ike was taught calligraphy and Chinese Classics from an early age and eventually became one of the leading calligraphers of the Edo period. He first studied Nan-ga through an illustrated book of Chinese painting, *Pa-chung hua-pʿu* (*c.* 1620), and was later influenced by such older Japanese Nan-ga painters as Ryū Rikyō and Gion Nankai, whom he first met about 1736 and 1752, respectively. Unlike most other *bunjin-ga* painters, who merely followed closely the style's models, he developed a more free and ample style, full of vitality and brightness.

Ike's works consist mostly of landscapes and portraits, usually on a larger scale than later *bunjin-ga* paintings. Among his representative large-scale works are the screen pictures "Gohyaku rakan" ("The Five Hundred Disciples of Buddha") and "Seiko" ("The Western Lake"), both for the Mampuku-ji (Mapuku Temple) at Uji, and "Sansui jinbutsu" ("Chinese Recluses in a Mountain"; a 10-screen work) of the Henjōkō-in (Henjōkō Temple) on Mt. Kōya. He collaborated with Yosa Buson to work on illustrations for *Jūben jūgichō* (1771; "Ten Advantages and Ten Pleasures"), albums based on the poems of Li Li-weng of the early Ch'ing dynasty (1644–1911). Ike did the illustrations for the 10 advantages, while Buson did the 10 pleasures. Ike taught his wife, Gyokuran, painting, and she became a famous painter herself.

ikebana, traditionally, the classical art of Japanese flower arranging; the meaning of the term was later extended to encompass all the various styles of Japanese floral art. *Ikebana* was introduced in Japan in the 6th century by Chinese Buddhist missionaries who had formalized the ritual of offering flowers to the Buddha. The first school of flower arranging in Japan, Ikenobō (*q.v.*), was founded by Ono no Imoko in the early 7th century. Based on a harmony of simple linear construction and an appreciation of the subtle beauty of flowers and natural material, *ikebana* has separated into several major schools according to historical periods and differing theories of artistic composition. The other major schools, in addition to Ikenobō, are Ko (Koryū), Ohara, and Sogetsū. For individual styles, *see* rikka, shōka, nageire, moribana, and zen'ei ikebana.

Ikeda, city, Ōsaka Urban Prefecture (*fu*), Honshu, Japan, on the Fukuchiyama Line (railway), northwest of Ōsaka. Settled in prehistoric times, Ikeda was a flourishing trade centre during the Tokugawa era (1603–1867). After the development of railway transport in the late 19th century, it served as a residential suburb of Ōsaka. Industries include brewing, woodworking, and engine manufacture. Garden trees are cultivated in the surrounding area. Pop. (1983 est.) 101,217.

Ikeda Hayato (b. Dec. 3, 1899, Hiroshima Prefecture, Japan—d. Aug. 13, 1965, Tokyo), prime minister of Japan from July 1960 until October 1964, who was instrumental in Japan's phenomenal economic growth in the years after World War II.

Born into a sake brewer's family, he was graduated from Kyōto Imperial University



Ikeda
UPI/EB Inc.

law school in 1925 and began his career in the Ministry of Finance. After rising to the position of vice minister of finance, he won a House of Representatives seat in the January 1949 general election and became minister of finance in the government of Yoshida Shigeru. Eventually he and the future prime minister Satō Eisaku became known as leading exponents of the "Yoshida school" of conservative politics.

Ikeda sought to stabilize an economy wracked by inflation with the strong deflationary policy recommended by Joseph Dodge, a Detroit banker sent by the U.S. government to study the economic difficulties of occupied Japan. Ikeda's pursuit of "balanced financing" was helped along after 1950 by military contracts related to the Korean War. Under the prime minister Yoshida, Ikeda played a leading role in peace treaty negotiations with the United States. In October 1952 he became international trade and industry minister, and for much of the rest of the decade he was either finance or international trade minister, or minister without portfolio. He also served terms as secretary general of the Liberal Party (subsequently Liberal-Democratic Party) and as chairman of the party's political affairs research committee.

When Kishi Nobusuke resigned in July 1960, Ikeda became president of the party and began his four years as prime minister. After the turbulence accompanying Kishi's extension of the Japan–U.S. security treaty, Ikeda emphasized "magnanimity and patience" in resolving political and other differences. He also launched a high-rate economic growth policy and, in a Washington, D.C., conference with Pres. John F. Kennedy in 1961, he arranged for annual cabinet-level talks on economic affairs between the two countries. He visited South and Southeast Asian countries and promoted Japanese economic and technical assistance in these regions. In 1962 he visited western Europe and suggested that the U.S., western Europe, and Japan should be the "three pillars" around which free world unity could be strengthened. In 1963 he signed the partial nuclear test ban treaty and laid much of the groundwork for the Japan–Korea treaty signed later. He resigned in October 1964 because of ill health.

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Ikeja, town and capital of Lagos State, 10.5 mi (17 km) northwest of Lagos, the federal capital, southwestern Nigeria. Originally settled by the Yoruba people, the locality was raided for slaves until the mid-19th century. Early in the 20th century it became an agricultural hinterland for Lagos; kola nuts were first grown in Nigeria in this area. The opening of the Lagos–Ibadan railway in 1901 and the growth of Lagos as a port transformed Ikeja into a residential and industrial suburb of the federal capital. In the mid-1960s an industrial estate was established, and in 1976 Ikeja became the capital of the newly formed Lagos State.

The industrial estate contains cotton textile plants that are among Nigeria's largest; there is also a wool textile plant in the town. Other factories manufacture footwear, cosmetics, pharmaceuticals, plastics, paper and cork products, ceramics, paints, matches, and light bulbs. There are a number of food processing plants and a large brewery in the town. Heavy industries include steel products, trailer-truck tanks, wire, aluminum, and rubber products. Several publishers and printers and import-export businesses are also centred at Ikeja.

The Lagos State College of Science and Technology (1977), the Federal Institute of Industrial Research (1955), a primary teachers' college, and a community nursing school are located in the town. The Lagos State radio broadcasting service has its headquarters there. A housing project has been built in the town to ease the overcrowding problems of Lagos. Ikeja is also headquarters of a local government council. Murtala Muhammad international airport, serving Lagos, is located in Ikeja, and Nigeria Airways has its headquarters there. Pop. (1983 est.) 60,370.

Ikenobō, oldest school of floral art in Japan; the term Ikenobō later came to be used loosely to describe any classical Japanese flower arrangement. The Ikenobō (literally, "priest's residence by a pond") school was founded in the early 7th century by Ono no Imoko, a former Japanese envoy to China. After becoming a Buddhist priest, Ono no Imoko took up residence at Rokkaku-dō, a small temple in what was to become Kyōto. There, as part of Buddhist ritual, he began formulating the rules of arrangement for the *rikka* style of flower arrangement, a formal, vertically oriented style using a tall or tallish, narrow-mouthed vase. From its basic tristructure of branches representing heaven, man, and Earth, the freer,



Informal (*so*) Ikenobō arrangement, *surimono* print by Hiroshige, 19th century; in the Metropolitan Museum of Art, New York

By courtesy of the Metropolitan Museum of Art, New York, bequest of Mrs. H.O. Havemeyer, 1929

shōka style evolved. Ikenobō arrangements are divided into *shin* (formal), *gyō* (semi-formal), and *so* (informal).

Ikere-Ekiti, also called IKERE, or IKERRE, town, Ondo State, southwestern Nigeria, on the road from Akure to Ado-Ekiti. A major collecting point for cocoa, it also serves as an agricultural trade centre (yams, cassava [yuca], rice, corn [maize], palm oil and kernels, okra, pumpkins) for the Ekiti branch of the Yoruba people. Ikere-Ekiti has government and Christian teacher-training colleges; there is also a hospital. The town is headquarters of the Ekiti South Local Government Council. Pop. (1983 est.) 176,800.

Ikeya-Seki, Comet, one of a group of Sun-grazing comets having similar orbits and including the great comet known as 1882 II. Discovered Sept. 18, 1965, by two Japanese amateur astronomers, Ikeya Kaoru and Seki Tsutomu, Ikeya-Seki made its closest approach to the Sun (470,000 kilometres, or about 290,000 miles; less than the Sun's radius) on Oct. 21, 1965. The comet was then bright enough



Comet Ikeya-Seki, 1965

By courtesy of Lick Observatory, California

to be seen with the naked eye in daylight. Like the similarly spectacular Comet 1882 II, it was fragmented by its proximity to the Sun; Ikeya-Seki gave astronomers their first chance since 1882 to study a comet in such conditions.

Ikhnaton (Egyptian king): *see* Akhenaton.

Ikhshīdids DYNASTY, Muslim Turkish dynasty from Fergana in Central Asia that ruled Egypt and Syria from 935 to 969. The founder, Muḥammad ibn Ṭughj, appointed governor of Egypt in 935, two years later obtained the title *ikhshīd* (Persian: "prince, ruler") from the ʿAbbāsid caliph ar-Rāḍī; he then secured his position in Egypt and Syria against opposition from Muḥammad ibn Rāʾiq, ʿAbbāsid *amīr al-umarāʾ* (commander in chief), and the Ḥamdānid Sayf ad-Dawlah of Aleppo. From 946 until 968, real governmental power rested in the hands of the vizier, Abū al-Misk Kāfūr, though Ibn Ṭughj's sons Unūjūr and ʿAlī remained nominal rulers. Kāfūr, originally a black slave from either Ethiopia or the Sudan, successfully restrained Fāṭimid and Ḥamdānid intrusions into his territories; he also patronized learning and the arts, briefly boasting the presence of the eminent poet al-Mutanabbī in his court. In 969 the Fāṭimids overthrew the last of the Ikhshīdid rulers, a boy named Abū al-Fawāris Aḥmad, grandson of the founder, while the Ḥamdānids drove the Ikhshīdī governors from northern Syria.

ikhtilāf (Arabic: "disagreement"), in Islām, differences of opinion on religious matters. Such diversity is permissible as long as the basic principles of Islām are not affected. *Ikhtilāf* is thus the opposite of *ijmāʿ* (consensus). *Ikhtilāf* permits a Muslim to choose the interpretation of religious teachings that best suits his own circumstances and causes the least harm. Two famous sayings from Ḥadith in favour of *ikhtilāf* were attributed to the Prophet Muḥammad: "Difference of opinion in the Muslim community is a sign of divine favour"; and "It is a mercy of God that the theologians differ in opinion."

Ikhtilāf thus allowed Islām to develop four equally orthodox legal schools: the Mālikī, the Ḥanafī, the Shāfiʿī, and the Ḥanbalī, within each of which there have been diverse interpretations of the same religious texts. Disagreements among Muslim theologians usually focus on details of legal practices, which, though relatively minor when compared with the great tenets of the faith, are nevertheless most relevant in everyday life.

Ikhwān (Arabic: Brethren), in Arabia, members of a religious and military brotherhood that figured prominently in the unification of the Arabian Peninsula under Ibn Saʿūd (1912–30); in modern Saudi Arabia they constitute the National Guard.

Ibn Saʿūd began organizing the Ikhwān in 1912 with hopes of making them a reliable and stable source of an elite army corps. In order to break their traditional tribal allegiances and feuds, the Ikhwān were settled in colonies known as *hijrah*s. These settlements, established around desert oases to promote agricultural reclamation of the land, further forced the Bedouin to abandon their nomadic way of life. The *hijrah*s, whose populations ranged from 10 to 10,000, offered tribesmen living quarters, mosques, schools, agricultural equipment and instruction, and arms and ammunition. Most important, religious teachers were brought in to instruct the Bedouin in the fundamentalist precepts of Islām taught by the religious reformer Ibn ʿAbd al-Wahhāb in the 19th century. As a result the Ikhwān became archtraditionalists. By 1918 they were ready to enter Ibn Saʿūd's elite army.

In 1919 the Ikhwān began a campaign against the Hāshimid kingdom of the Hejaz on the northwestern coast of Arabia; they defeated King Ḥusayn ibn ʿAlī at Turabah (1919), then conducted border raids against his sons ʿAbd Allāh of Transjordan and Fayṣal of Iraq (1921–22). In 1924, when Ḥusayn was proclaimed caliph in Mecca, the Ikhwān labelled the act heretical and accused Ḥusayn of obstructing their performance of the pilgrimage to Mecca. They then moved against Transjordan, Iraq, and the Hejaz simultaneously, besieged aṭ-Ṭāʾif outside Mecca, and massacred several hundred of its inhabitants. Mecca fell to the Ikhwān, and, with the subsequent surrenders (1925) of Jiddah and Medina, they won all of the Hejaz for Ibn Saʿūd. The Ikhwān were also instrumental in securing the provinces of Asir, just south of the Hejaz on the coast (1920), and Ḥāʾil, in the north of the peninsula, along the borders of Transjordan and Iraq (1921).

By 1926 the Ikhwān were becoming uncontrollable. They attacked Ibn Saʿūd for introducing such innovations as telephones, automobiles, and the telegraph and for sending his son to a country of unbelievers (Egypt). Despite Ibn Saʿūd's attempts to mollify the Ikhwān by submitting their accusations to the religious scholars (*ʿulamāʾ*), they provoked an international incident by destroying an Iraqi force that had violated a neutral zone established by Great Britain and Ibn Saʿūd between Iraq and Arabia (1927–28); the British bombed Najd in retaliation.

A congress convened by Ibn Saʿūd in October 1928 deposed Ibn Ḥumayd, ad-Dawīsh, and Ibn Ḥithlayn, the leaders of the revolt. A massacre of Najd merchants by Ibn Ḥumayd in 1929, however, forced Ibn Saʿūd to confront the rebellious Ikhwān militarily, and, in a major battle fought in March on the plain of as-Sabalah (near al-Arṭāwīyah), Ibn Ḥumayd was captured and ad-Dawīsh seriously wounded. Then in May 1929 Ibn Ḥithlayn was murdered. In retribution the Ikhwān killed his murderer, Fahd, the son of one of Ibn Saʿūd's governors, and commandeered the road between Ibn Saʿūd's capital, Riyadh, and the Persian Gulf. The rebels suffered a setback in August at the hands of ʿAbd al-ʿAzīz ibn Musāʿid; their leader, ʿUzayyiz, ad-Dawīsh's son, and hundreds of his soldiers were either killed in battle on the edge of an-Nafūd desert or died of thirst in the desert. Shortly afterward, an important Ikhwān faction defected, and Ibn Saʿūd was able to surround the rebels and force them to surrender to the British in Kuwait in January 1930. The Ikhwān leaders, ad-Dawīsh and Ibn Ḥithlayn's cousin Nāyif, were subsequently imprisoned in Riyadh.

Not all of the Ikhwān had revolted. Those that had remained loyal to Ibn Saʿūd stayed on the *hijrah*s, continuing to receive government support, and were still an influential religious force. They were eventually absorbed into the Saudi Arabian National Guard.

Ikhwān al-Muslimūn, al-: *see* Muslim Brotherhood.

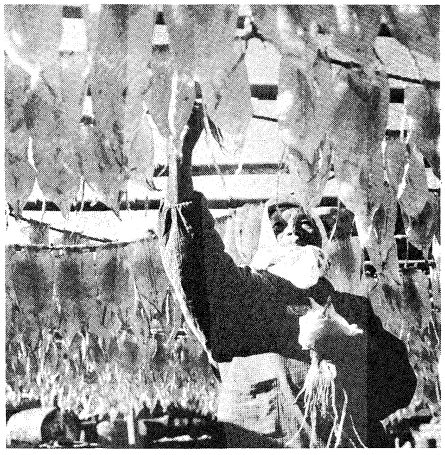
Ikhwān aṣ-Ṣafāʾ (Arabic: Brethren of Purity), a secret Arab confraternity, founded at Basra, Iraq, that produced a philosophical and religious encyclopaedia, *Rasāʾil ikhwān aṣ-ṣafāʾ wa khillān al-wafāʾ* ("Epistles of the Brethren of Purity and Loyal Friends"), sometime in the second half of the 10th century AD.

Neither the identity nor the period of the Ikhwān aṣ-Ṣafāʾ has been definitively established, but the various authors of the *Rasāʾil* do seem to reflect the doctrinal position of the Ismāʿīlīyah, a radical Shīʿī Muslim sect influenced by Manichaeism and Neoplatonism, which preached an esoteric interpretation of the Qurʾān open only to initiates (*see* Ismāʿīlīyah). The Ikhwān aṣ-Ṣafāʾ, like all other Islāmic philosophers, attempted to naturalize Greek philosophy in a way of their own; they chose to follow a fairly orthodox Neoplatonic position and admitted Hermetic, Gnostic, astrological, and occult sciences on a large scale in the belief that their absorption of ancient wisdom enabled them to fathom the esoteric meaning of revelation.

According to the Ikhwān aṣ-Ṣafāʾ, individual human souls emanate from the universal soul and rejoin it after death; the universal soul in its turn will be united with God on the day of the Last Judgment. The *Rasāʾil* are thus intended to purify the soul of misconceptions and lead it to a clear view of the essence of reality, which in turn will provide for happiness in the next life. To accomplish this enlightenment, the *Rasāʾil* are structured

theoretically to lead the soul from concrete to abstract knowledge. There is also an important summary of the whole encyclopaedia, *ar-Risālah al-jāmi'ah.*

Iki, island, Nagasaki *ken* (prefecture), Japan, in Tsushima-kaikyō (Eastern Channel), about 10 miles (16 km) off the coast of Kyushu. Most of its 52-square-mile (134-square-kilometre)



Drying cuttlefish on Iki, Japan
Imperial Press—FPG/EB Inc.

area is tableland; cereals, oranges, and tobacco are the important crops. The fishing industry yields mackerel and cuttlefish. Anchorages are at Gōnoura (the chief town), Katsumoto, and Ashibe. The island served as a gateway for Chinese and Korean culture to enter Japan. Pop. (1980) 41,035.

Ikire, town, Oyo state, southwestern Nigeria, on the road from Ibadan to Ife. A collecting point for local cash crops (cocoa and palm oil and kernels), it also serves as a trade centre for yams, maize (corn), cassava, palm produce, cotton, and kola nuts. Cotton weaving is a traditional industry of its Yoruba inhabitants. The town is served by Roman Catholic and public secondary schools and by a hospital, a dispensary, and a maternity clinic. Pop. (1988 est.) 100,900.

Ikirun, town, Oyo state, southwestern Nigeria, on the railroad from Lagos and at the intersection of roads from Oshogbo, Inisha (Inisa), Igbajo, and Ila (Illa). Mainly inhabited by Yoruba people, the town was raided for slaves in the 19th century by Fulani warriors from Ilorin (42 miles [68 km] north-northwest).

The modern town is a local trading centre (yams, corn [maize], cassava, pumpkins, beans, and okra) at the northern edge of the main cocoa belt; it serves as a collecting point for cotton and tobacco, the chief cash crops. Cotton weaving is a traditional local industry, but the town of Oshogbo, 14 miles (23 km) southeast, is the more important textile centre. Ikirun's Akinorun Grammar School and its health dispensary and maternity clinic are government-sponsored. Pop. (1988 est.) 148,600.

Ikorodu, town, Lagos state, southwestern Nigeria, near the Lagos Lagoon, on the Bight of Benin, 14 miles (23 km) northwest of Lagos, the federal capital. A traditional settlement of the Awori people (a subgroup of the Yoruba), it became important in the mid-19th century as a trading post of the Remo (Ijebu-Remo) Kingdom on the trade route from Lagos to Ibadan. During the Ibadan–Ijaiye wars (1860–65), the Ikorodu traders, encouraged by both Ibadan and Lagos, decided to break from their Ijebu overlords and smuggled arms across the Ijebu–Egba blockade to Ibadan (58 miles [93 km] north-northeast). In 1865, when the Egba decided to punish Ikorodu, British forces from Lagos intervened and decisively defeated the Egba army in a battle at Ikorodu.

Modern Ikorodu is a collecting point for fish, poultry, cassava, corn (maize), vegetables, palm oil and kernels, okra, cabbages, tomatoes, pineapples, and bananas that are shipped to Lagos. Many truck farms are located in the vicinity of the town. The commercial manufacture of pottery is a significant local industry. Ikorodu has a secondary school and a hospital. The town is served by highways between Lagos and Shagamu and between Lagos and Epe. Pop. (1988 est.) 151,400.

Ikot Abasi, also called OPOBO, formerly EGWANGA, port town, Akwa Ibom state, southern Nigeria, near the mouth of the Imo (Opobo) River. Situated at a break in the mangrove swamps and rain forest of the eastern Niger delta, it served in the 19th century as a collecting point for slaves. In 1870 Jubo Jubogha, a former Ibo slave and ruler of the Anna Pepple house of Bonny (28 miles [45 km] west-southwest), came to Ikot Abasi and founded the Kingdom of Opobo, which he named for Opobo the Great, a Pepple king (reigned 1792–1830). Also called Chief Jaja by Europeans, he destroyed the economic power of Bonny and made Opobo the leading power of the eastern Niger delta oil-palm trade until he was deported in 1887 by the British, who established a trading post at Opobo Town, 4 miles (6 km) southwest, on the west bank of the Imo River.

Modern Ikot Abasi serves as a trading centre for yams, cassava, fish, palm produce, corn (maize), and taro for the Ibibio people of the area; it also is known for boatbuilding, although a sandbar partially blocks the entrance to its port from the Gulf of Guinea. The town is headquarters of a local government council and has a secondary school, a government hospital, and a maternity clinic. It is linked by highway to Aba and Port Harcourt. Pop. (latest estimate) 42,860.

Ikot Ekpene, town, Akwa Ibom state, southern Nigeria, on the coastal highway, between Calabar and Aba. It is the chief trade centre (yams, cassava, taro, corn [maize], and palm produce) for a densely populated area known for its export of palm oil and kernels. It is mainly inhabited by the Anang branch of the Ibibio people, who are noted for their cane furniture and basket handicrafts. The town has a federal teacher-training college and is the headquarters of the Ikot Ekpene Local Government Council. Pop. (1988 est.) 71,190.

Iktinos: *see* Ictinus.

Il-76 (Soviet aircraft): *see* Ilyushin Il-76.

Il Domenichino (composer): *see* Sarti, Giuseppe.

Il-Khanid DYNASTY, also spelled ĪL-KHĀN (1256–1353), Mongol dynasty that ruled in Iran. Il-khan is Persian for "subordinate khan."

Hülegü, a grandson of Genghis Khan, was given the task of capturing Iran by the paramount Mongol chieftain Möngke. Hülegü set out in about 1253 with a Mongol army of about 130,000. He founded the Il-Khanid dynasty in 1256, and by 1258 he had captured Baghdad and all Iran. The Il-Khans consolidated their position in Iran and reunited the region as a political and territorial entity after several centuries of fragmented rule by petty dynasties. During the reign of the Il-Khan Maḥmūd Ghāzān (reigned 1295–1304), the Il-Khans lost all contact with the remaining Mongol chieftains of China. Maḥmūd Ghāzān himself embraced Sunnite Islām, and his reign saw an Iranian cultural renaissance in which such scholars as Rashīd ad-Dīn flourished under his patronage.

Ghāzān's brother Öljeitü (reigned 1304–16) converted to Shī'itē Islām in 1310. Öljeitü's conversion gave rise to great unrest, and civil war was imminent when he died in 1316. His son and successor, Abū Sa'īd (reigned 1317–35), reconverted to Sunnite Islām and thus averted war. But during Abū Sa'īd's reign factional disputes and internal disturbances continued and became rampant. Abū Sa'īd died without leaving an heir, and with his death the unity of the dynasty was fractured. Thereafter various Il-Khanid princes ruled as regional dynasts until 1353.

Il Zazzerino (composer): *see* Peri, Jacopo.

Ila, also called BAILA, SUKULUMBWE, or SHUKULUMBWE, a Bantu-speaking people inhabiting an area west of Lusaka, the national capital of Zambia. The Ila-Tonga cluster consists of about 12 dialect groups, including the Lozi, Koba, Lenje, Tonga, Totela, Ila, and others.

The Ila combine agriculture with animal husbandry. Men hunt, fish, and clear land, while women gather foods from the countryside and are responsible for most of the cultivation. Early in the 20th century, crops such as corn (maize), sorghum, millet, beans, peanuts (groundnuts), and yams were cultivated by hoe techniques and shifting land use. Since that time the Ila have overcome an aversion to forcing cattle into harnesses, and animal-drawn plowing has supplanted the hoe culture. They possess large numbers of cattle and consume a considerable amount of milk.

The Ila do not operate within a centralized political system; an autonomous *mwami* (chief) presides over each of a number of independent *shishi* (territories). Their villages are governed by headmen and councils of elders.

The Ila appear to recognize kinship by both male and female links, depending upon circumstances and purposes. Marriage expenses or bride price in cattle, blankets, shells, and hoes were provided primarily by the husband's matrilineal relations, but assistance was also given by patrilineal relations; after marriage the extended-family compound of the husband's father was the usual residence. The Ila traditionally worship Leza (the supreme being) and the spirits of family ancestors, but missionaries opened schools in the 1920s, and many of the Ila are now Christian.

Ila, also spelled ILLA, also called ILA ORANGUN, town, Oyo state, southwestern Nigeria, in the Yoruba Hills and east of the secondary highway from Ado-Ekiti to Omu-Aran. One of the oldest settlements of the Yoruba, it was founded according to tradition by the *orangun* ("ruler") of Ila, a son of Oduduwa, the deity who is said to have spread earth on the primeval water. Modern Ila is a collecting centre for tobacco (which is sent to the cigarette factories at Oshogbo, 28 miles [45 km] southwest, and Ibadan, 82 miles [132 km] southwest) and cotton; local trade is primarily in palm oil and kernels, yams, cassava, and corn (maize). The town has a secondary school and health facilities. Pop. (1988 est.) 216,100.

Ilacomilus: *see* Waldseemüller, Martin.

Īlām, city, western Iran. The city is rural in appearance and is located near the Iraq–Iran border. A number of roads emanate from Īlām, linking it with the border towns of Mehrān and Dehlorān. The city's population consists mostly of Kurds. Local industries produce bricks, woven cloth, coarse carpets, and sack cloth.

The surrounding region is a continuation of the valley of Mesopotamia and was formed by the deposition of sediments eroded from the Zagros Mountains. Economically backward, the region is populated by the Posht-e Huhi group of Lurs, many of whom are settled farmers. They are Shī'ite Muslims, and their periodic revolts were, in times past, a source of trouble for the Iranian government. Agricul-

ture is the principal occupation of the region, and barley, wheat, rice, oilseeds, potatoes, and dates are grown. There are also a few oilfields in the region. A climatological station and a small thermoelectric power plant are located at Īlām. Pop. (1982 est.) 75,000.

ilang-ilang (tree): *see* ylang-ylang.

Ilaro, town, western Ogun state, southwestern Nigeria. Located in a tropical rain forest and on the former trade route from the towns of the Empire of Oyo to the port of Porto-Novo (now the capital of Benin), 40 miles (64 km) southwest, it was established by the late 18th century as the capital and chief trade centre of the Egbado people (a subgroup of the Yoruba). With the decline of Oyo in the early 19th century, the Egbado Kingdom, which paid tribute to Old Oyo (170 miles [274 km] northeast), was raided for slaves by the Dahomeyans until it was absorbed in the 1840s and '50s by the more powerful Egba Kingdom at Abeokuta (29 miles [47 km] northeast). As a subject town, Ilaro served the Egba as a trading post on the western route from Lagos to Ibadan. In the 1860s European missionaries arrived and established the Yoruba Anglican Mission in Ilaro. Following the 1890 delineation of colonial boundaries by the French and the British, the Egbado, who felt oppressed by Egba rule, asked for British protection and control of their territory. Much to the anger of the Egba at Abeokuta, a British military garrison was built in Ilaro in the same year.

Modern Ilaro, headquarters of the Egbado South Local Government Council, is a collecting point for cocoa, palm oil and kernels, kola nuts, vegetables (especially rice and okra), and fruits. Yams, cassava, and corn (maize) are also cultivated by the town's farmers. Cotton weaving and dyeing (with locally grown indigo) are traditional industries. There are deposits of limestone (used by a cement plant at Ewekoro, 13 miles [21 km] east-northeast) and phosphate in the vicinity.

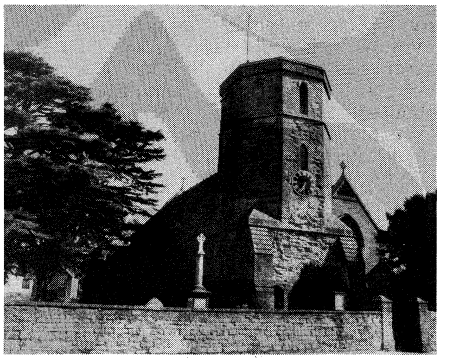
Ilaro is the site of a federal polytechnic school and a teacher-training college and is also served by a hospital. It is located at the end of a spur on the Lagos–Nguru railway and lies at a junction of local roads. Pop. (1988 est.) 38,370.

Ilawe Ekiti, also called ILAWE, town, Ondo state, southwestern Nigeria. It lies in the Yoruba Hills, at the intersection of roads from Akure, Ado-Ekiti, and Ilesha. A collecting point for cocoa, it also serves as an agricultural trade centre for the yams, cassava, corn (maize), palm oil and kernels, fruits, rice, pumpkins, and okra that are raised by the local Yoruba people (Ilesha [Ijesha], Ekiti, and Ondo branches). The town is the headquarters of a government council and health facilities. Pop. (latest census) 11,084.

Ilbert Bill, in Indian history, controversial measure proposed in 1883 that sought to allow senior Indian magistrates to preside over cases involving British subjects in India; the bill, severely weakened by compromise, was enacted by the Indian Legislative Council on Jan. 25, 1884. The bitter controversy surrounding the measure deepened antagonism between British and Indians and was a prelude to the formation of the Indian National Congress the following year.

British subjects in 1873 had been exempted from trial by Indian magistrates, and in cases involving death or transportation they could only be tried by a high court. But by 1883 the viceroy, Lord Ripon, proposed to make British subjects amenable to sessions courts, over which Indians were now senior enough in the civil service to preside. This proposal as embodied in the Ilbert Bill provoked furious protests, especially among the Calcutta European business community and the Bengal indigo planters; and there was covert sympathy from many officials. A compromise was reached by which a British subject could claim a jury, half of which would be Europeans. The new westernized Indian middle class felt itself slighted by this arrangement, and the incident did much to give Indian national feeling a political form.

Ilchester, parish, South Somerset district, county of Somerset, England, on the River Yeo. Ilchester was the Romans' Lindinis and the northern tribal capital of the Durotriges, an early British people. A royal mint was established in the 10th century and remained in operation until Henry II's reign (1154–89). A royal charter dates from the 12th century. From the 14th to the 19th century, the community was the county's administrative centre. Of the medieval town's seven parish churches, only St. Mary Major remains. The corporation, established in 1556, was abolished in 1886. Pop. (1981) 1,768.

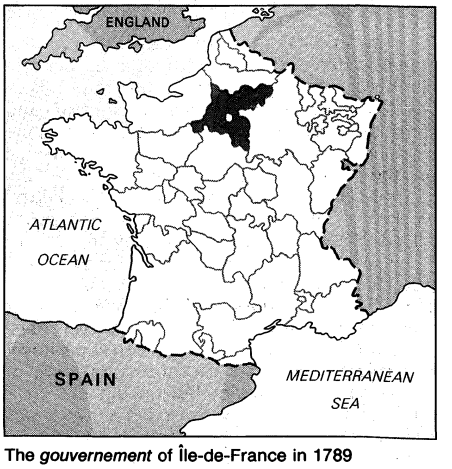


Church of St. Mary Major, Ilchester, England
The J. Allan Cash Photolibrary

Ildigüzid DYNASTY, also spelled ILDEGÜZID, ILDEGIZID, or ILDENIZID: *see* Eldegüzid.

Île-de-France, planning region (French *région de programme*), encompassing the north-central French *départements* of Val-d'Oise, Seine-et-Marne, Seine-Saint-Denis, Paris, Hauts-de-Seine, Val-de-Marne, Essonne, and Yvelines and roughly coextensive with the historic region of the Île-de-France. The capital is Paris. The region has an area of 4,637 square miles (12,011 square km) and is bounded by the *départements* of Eure to the northwest, Oise and Aisne to the north, Marne, Aube, and Yonne to the east, Loiret to the south, and Eure-et-Loir to the west.

The area around Paris was originally known as Francia, from which the name of France was derived. Under the Merovingians (476–750), Francia meant the region between the Rhine and the Seine rivers; it was restricted under the Carolingians to the country bounded by the Aisne, Oise, and Seine rivers. In the 10th and 11th centuries it signified only the territory limited by the Seine, the Marne, the Beuvronne, the Oise, and the Nonette. In the Middle Ages, *île* ("island") often designated areas more or less bounded by rivers but was not given specifically to "France" before 1387. The name is not found in written documents before 1429; but in the second half of the 15th century it designated a wide military province of government, bounded on the north by Picardy, the west by Normandy, the south by Orléanais and Nivernais, and the east by Champagne. Its capital was Paris. In the 16th century, the *gouvernement* of Île-de-France was constituted under a *gouverneur,* or a lieutenant of the king; in the 18th century, it was divided between the *généralités,* or *intendances,* of Paris and Soissons. During the French Revolution the Île-de-France was divided into *départements.*



The *gouvernement* of Île-de-France in 1789

The Île-de-France is the most densely populated region in France. During a century (1850–1950) when most areas of France were losing population, the magnet of Paris attracted immigrants from all over the country. The population of the Île-de-France consequently increased more than fourfold between 1850 and 1968, but, with the central government's policy of decentralization from Paris, it lost potential immigrants to more distant regions and has subsequently increased at a rate slightly below the national average. Essonne, Seine-et-Marne, Yvelines, and Val-d'Oise have grown at the expense of the *département* of Paris, whose population has been declining since 1968. Hauts-de-Seine, Seine-Saint-Denis, and Val-de-Marne have shown little or no growth during the same period. More than 800 of the 1,278 communes belonging to the Île-de-France are still classified as rural despite their proximity to Paris.

Agriculture is of negligible importance outside Seine-et-Marne, Val-d'Oise, and Yvelines. Agriculture in Seine-et-Marne tends to be highly mechanized and employs only a small percentage of the work force; sugar beets are a major crop. Sugar beets and wheat are grown in Val-d'Oise, in the French Vexin, and in the plain of the Île-de-France.

Industries are highly developed, although the number of workers employed in the secondary sector of greater Paris has declined sharply since 1962. Manufactures include electronic and aeronautical equipment. Industries, research laboratories, and institutions in the Île-de-France employ approximately two-thirds of the nation's engineers and mathematics and computer specialists. Pop. (1987 est.) 10,290,000.

Ile-Ife (Nigeria): *see* Ife-lodun.

Ilebo, formerly PORT-FRANCQUI, town, south-central Zaire, central Africa. The town lies along the Kasai River near its junction with the Sankuru River. Ilebo is a river port and has rail connections with Kananga and Lubumbashi. It is an important transshipment point in the transport of copper and other minerals from the Shaba region to Kinshasa and Matadi. Ilebo is also a busy commercial, industrial, and agricultural centre. The large pavilion of the Hôtel des Palmes, built for an official visit by the Belgian king Albert I in the 1920s, dominates the town. Pop. (1984 prelim.) 48,831.

ileitis, chronic inflammation of one or more sections of the intestine. In its strict sense, the term refers to an inflammation of the lower, or terminal, portion of the small intestine, known as the ileum. A specific and more serious type of inflammation involving both the small and large intestines is known as regional ileitis, or Crohn's disease. Ileitis can affect persons of both sexes of all ages but most commonly strikes those between age 20 and 50. The symptoms are extremely variable but

basically consist of a chronic or intermittent diarrhea, sometimes bloody, that is accompanied by painful abdominal cramps. Fever, weakness, weight loss, and anemia may also occur and can produce a progressive physical deterioration in patients with Crohn's disease. Obstructions or fistulas (abnormal channels) between adjacent coils of intestine may also develop. The initial acute attack of ileitis may be so sudden that it is confused with appendicitis. A patient may competely recover from an initial attack of simple ileitis, but the usual course of Crohn's disease is one of gradual progression, with periods of remission and relapse continuing for many years.

Crohn's disease results in the thickening of the intestine, the narrowing of its channel, and the ulceration of its lining. Diagnosis of the disease is established through X-ray examination of the small (and perhaps large) intestine, in which the narrowing and ulceration of the intestine is evident. Simple ileitis can be caused by intestinal infections, irritations, or obstructions; faulty intestinal absorption of food; or even emotional stress. Crohn's disease may possibly be caused by a defect in the autoimmune system. Bed rest is useful in treatment, as are a few drugs, but Crohn's disease often persists until the affected part of the intestine must be surgically removed.

Ilek Khanid DYNASTY: *see* Qarakhanid dynasty.

ileostomy, the surgical formation of an artificial anus by making an opening from the ileum through the abdominal wall. *See* ostomy.

Ilerda, Campaign of (49 BC), the victory of Julius Caesar over Pompey's forces in Spain. In the spring of 49 BC, Caesar sent six legions from Gaul into Spain under Gaius Fabius and joined them at Ilerda (Lérida) on the Sicoris (Segre) River. Five Pompeian legions, together with many Spanish auxiliaries, commanded by Lucius Afranius and Marcus Petreius, were concentrated against Caesar.

After Caesar failed to provoke Afranius to battle and was short of supplies because of floods, he diverted part of the river just below Ilerda to make a ford near his camp. This move forced the Pompeians to move two legions over the Sicoris to cover their communications. Afranius, no longer at an advantage, retired toward the Ebro. Caesar pursued him, and after a week of maneuvering, the Pompeians, short of supplies, had to surrender.

Îles du Salut (French Guiana): *see* Salut, Îles du.

Ilesha, town, Oyo state, southwestern Nigeria. It lies in the Yoruba Hills and at the intersection of roads from Ife-lodun, Oshogbo, and Akure. The town is one of the oldest settlements in Yorubaland—according to tradition, it was founded by an *owa* ("king") who was one of the 16 sons of the deity Oduduwa. Ilesha was an important military centre in the campaigns against Ibadan, 60 miles (97 km) west-southwest, in the 19th-century Yoruba civil wars, and the town has a memorial to Ogedengbe, an Ileshan warrior-leader who died in 1910.

Modern Ilesha is a major collecting point for the export of cocoa and a traditional cultural centre for the Ilesha (Ijesha) branch of the Yoruba people. Palm oil and kernels, yams, cassava, corn (maize), pumpkins, cotton, and kola nuts are collected for the local market. Local industries manufacture nails and carpets, and the town has a brewery; there are also a recording company and a publishing firm. Several prominent quartzite ridges lie east of Ilesha, and gold mining is an important activity in the area.

Ilesha is the site of the Oyo State College of Education and of other teacher-training colleges. Wesley Guild Hospital (1913), several other hospitals, and a settlement for lepers also serve the town. Ilesha is the seat of a branch of the Oyo State High Court. Near the Market Square are the traditional king's palace (the Afin), the central mosque, and the principal park. Pop. (1983 est.) 273,400.

Consult the INDEX *first*

ileum, final and longest segment of the small intestine; it is specifically responsible for the absorption of vitamin B^{12} and the reabsorption of conjugated bile salts. The ileum is about 4 m (13 feet) in length and extends from the jejunum (the middle section of the small intestine) to the ileocecal valve, which empties into the colon (large intestine). The ileum is suspended from the abdominal wall by the mesentery.

The smooth muscle of the ileum's walls is thinner than the walls of other parts of the intestines, and its peristaltic contractions are slower. The ileum's lining is also less permeable than that of the upper small intestine. Small collections of lymphatic tissue (Peyer's patches) are embedded in the ileal wall, and specific receptors for bile salts and vitamin B^{12} are contained exclusively in its lining; about 90 percent of the conjugated bile salts in the intestinal contents is absorbed by the ileum.

Two percent of all adults are born with a congenital ileum malformation, called Meckel's diverticulum, which consists of a side channel of up to five cm (two inches) in length extending from the intestinal wall. The malformation occurs when the duct leading from the navel to the small intestine in the fetus fails to atrophy and close. It then causes intestinal bleeding and inflammation and is usually surgically removed when discovered. Injury or disease affecting the terminal ileum produces vitamin B^{12} deficiency and extensive diarrhea, the latter resulting from the interference of bile salts on water absorption in the large intestine.

Ilex, genus of plants commonly known collectively as holly (*q.v.*).

Ilf, Ilya; and Petrov, Yevgeny, pseudonyms, respectively, of ILYA ARNOLDOVICH FAYNZILBERG and YEVGENY PETROVICH KATAYEV (respectively b. Oct. 15 [Oct. 3, Old Style], 1897, Odessa—d. April 13, 1937, Moscow; b. Dec. 13 [Nov. 30], 1903, Odessa—d. July 2, 1942, Crimea), Soviet humorists, whose intimate literary collaboration at the end of the 1920s and in the '30s resulted in a number of immensely popular satirical works.

Born into a poor Jewish family, Ilf worked at various trades while a youth, becoming a journalist in Odessa at the age of 18. He went to Moscow in 1923 to begin a career as a professional writer. Petrov, the son of a teacher, began his career as a news-service correspondent, worked briefly as a criminal investigator, and went to Moscow in 1923, where he became a professional journalist. Initially, Ilf worked on the staff of *Gudok* ("The Whistle"), the central rail-workers' newspaper, while Petrov worked on the satirical journal, *Krasny perets* ("Red Pepper"). In 1926 Petrov moved to "The Whistle," and he and Ilf formed their unique literary partnership.

In 1928 they published the first fruit of their collaboration, *Dvenadtsat stulyev* (*The Twelve Chairs*), a rollicking picaresque novel of farcical adventures within a framework of telling satire on Soviet life during the NEP (New Economic Policy) period. The work was an instant success, and its rogue-hero—the irrepressible Ostap Bender—became overnight, and remains, one of the most popular personages in Russian fiction. Killed off at the end of *The Twelve Chairs,* Bender was resurrected in a sequel, *Zolotoy telyonok* (1931; *The Little Golden Calf*), an equally humorous but more serious and trenchant satire centring upon pretenders who claim to be the son of a dead Soviet hero.

In 1936, following a tour of the United States, Ilf and Petrov wrote *Odnoetazhnaya Amerika* ("One-Storied America"), a witty account of their automobile trip across that country. In large part an exposé of the materialistic and uncultured character of American life, the work nevertheless indicates that many aspects of capitalist society appealed to the authors. A kind of sequel to this work was the long story *Tonya* (1937), which portrays with appropriate satirical touches the life of Soviet people compelled to live in a capitalist society. In addition to these major works, from 1932 Ilf and Petrov collaborated on a number of humorous and satiric sketches for the newspaper *Pravda.*

In 1937 Ilf died of tuberculosis. Petrov continued his literary work, writing for the newspaper *Literaturnaya gazeta* ("Literary Gazette") and the magazine *Ogonyok* ("Little Light"). In 1942 he was killed on a trip from the besieged city of Sevastopol to Moscow.

Ilha do Bazaruto (Mozambique): *see* Bazaruto Island.

Ilhéus, city, southeastern Bahia state, northeastern Brazil. It is situated just east of Itabuna near the mouth of the Cachoeira River on Ilhéus Bay, an inlet of the Atlantic. An old Portuguese colonial settlement that was originally named São Jorge dos Ilhéos (1532), it was given city status in 1881. Most of Brazil's cacao is grown in the locality, and Ilhéus is consequently one of the world's most important cacao ports. Cocoa butter, rubber, chemicals, piassava, and timber are also exported. The city was used as a setting by the writer Jorge Amado in his writings on Brazilian society. Ilhéus has good road and air connections with Salvador, the state capital, 130 miles (210 km) north-northeast. A hydroelectric plant northwest of Ilhéus supplies energy to the area. Pop. (1980 prelim.) 71,240.



Cathedral of São Sebastião, on the Atlantic shore in Ilhéus, Braz.
Dilson Martins

Iliad, epic poem in 24 books traditionally attributed to the ancient Greek poet Homer (*q.v.*). This epic and the *Odyssey* were regarded by the Greeks as the symbol of Hellenic unity and heroism and also as a source of moral, and even practical, instruction. The poem tells the story of the wrath of Achilles (who has been slighted by Agamemnon, the Greek commander in chief) and its disastrous consequences in the Trojan War. The principal action covers the events of only four days in the final year of the war; various preceding

episodes relating to the course of the war are described, and a host of characters, human and divine, are presented.

Iliamna Lake, lake, southwestern Alaska, U.S., west of Cook Inlet (Gulf of Alaska). The second largest freshwater lake entirely within the United States (after Lake Michigan), it is 80 mi (129 km) long and 25 mi wide and covers an area of 1,000 sq mi (2,590 sq km). It drains southwest through the Kvichak River into Bristol Bay and the Bering Sea. It is noted for its game fish, especially rainbow trout. The active Iliamna Volcano (10,016 ft [3,053 m]) lies northeast of the lake at the head of Tuxedni Glacier. Named by Eskimo, the lake was said to be inhabited by a mythical giant blackfish that would bite holes in canoes.

Iligan, chartered city, capital of Lanao del Norte province, northern Mindanao, Philippines. On the southeastern shore of Iligan Bay, it is the island's major industrial city and an important port at the mouth of the Iligan River. Its growth has stemmed largely from the proximity of the Agus River, with its great hydropower potential harnessed at Maria Cristina Falls. Industries include steel, calcium-carbide, and ferroalloy plants. Fertilizer, cement, and plywood are also manufactured. The city has an airport. Inc. city, 1950. Pop. (1980) 167,358.

Ilinsky, Igor (Vladimirovich) (b. 1901, Moscow), Russian actor of stage and screen, especially well known for his comic portrayals of middle-class buffoons.

Although Ilinsky debuted at the Novy Theatre in Shakespeare's *The Merry Wives of Windsor,* it was not until he became associated with the experimental productions of Vsevolod Yemilyevich Meyerhold during the 1920s that Ilinsky became prominent. Among the notable roles he created under Meyerhold's direction are Istlen in Émile Verhaeren's *The Dawn* (1920), Bruno in Fernand Crommelynck's *Magnificent Cuckold* (1922), and Prisypkin in Vladimir Mayakovsky's *Bedbug* (1928). He is perhaps best remembered for his creation of the role of Chlestakov in Meyerhold's world-famous revival of Nikolay Gogol's *Inspector General* (1926). Ilinsky recreated the latter role at the Maly Theatre in 1938.

Ilinsky's film career paralleled his stage work, beginning in 1924, when he appeared as Krivcov, a private detective, in Yakov Protazanov's *Aelita.* Ilinsky was honoured as a People's Artist of the U.S.S.R. in 1949.

iliocostalis muscle, any of the deep muscles of the back, which, as part of the erector spinae (sacrospinalis) muscle group, aid in extension (bending backward), lateral flexion (bending to the side), and rotation of the spinal column. The iliocostalis group consists of a lower part (iliocostalis lumborum) that extends from the ilium (upper part of the hipbone) to the lower ribs, a middle part (iliocostalis dorsi, or thoracis) that extends from the lower to the upper ribs, and an upper part (iliocostalis cervicis) that extends from the upper ribs to the transverse processes (side projections) of the cervical vertebrae (in the neck).

iliofemoral thrombophlebitis (medicine): *see* milk leg.

Ilion, village, Herkimer County, central New York, U.S., on the Mohawk River and the Barge Canal, adjacent to Mohawk village, 11 mi (18 km) east-southeast of Utica. Settled in 1725 by Palatinate Germans, it was known successively as German Flats, Morgan's Landing, and Remington's Corners before incorporation as Ilion (after ancient Ilion [Troy]) in 1852. Completion of the Erie Canal in 1825 spurred its industrial growth. About that time, Eliphalet Remington perfected the rifle, and his armory, built in 1828 beside the canal, was the forerunner of a vast arms industry. The demand for Remington weapons supported the community and the surrounding villages. Every type of firearm made by the company is displayed in the Remington Arms Museum. Remington Industries also introduced the first practical typewriter in 1873. Further diversification led to the development of Univac computers. Herkimer County Community College was established at Ilion in 1966. Pop. (1980) 9,190.

Ilipa, Battle of (206 BC), victory of the Roman general Publius Cornelius Scipio (later surnamed Africanus) over Carthaginian forces in Spain during the Second Punic War. Scipio, who had been campaigning against the Carthaginian armies in Spain since 210, met their combined forces under Hasdrubal Gisco and Mago near Ilipa (modern Alcalá del Río, near Seville). With 45,000 infantry and 3,000 cavalry, he had about 10,000 men less than the enemy.

Victory was won, however, by brilliant tactics made possible by Scipio's recent reforms and training. The battle ended Carthaginian power in Spain and thereby affected the course of the war against Hannibal.



Ramparts of the old walled city of Saint-Malo, Ille-et-Vilaine *département*, France
Paul Almasy

Ilium, also called ILION, or ILIOS (ancient city): *see* Troy.

Ilkley, parish, Bradford district, metropolitan county of West Yorkshire, England, in the middle portion of the Wharfedale (valley of the River Wharfe). Formerly a spa, Ilkley is now a residential town near Manchester. It is famous for a popular Yorkshire song, "On Ilkla Moor baht'at" ("On Ilkley Moor Without a Hat"). The ruins of Bolton Abbey are nearby. Pop. (1981 prelim.) 24,082.

Illa (Nigeria): *see* Ila.

Illahun (ancient Egyptian site): *see* Lāhūn, al-.

Illawarra, southern coastal district, New South Wales, Australia, extending 110 mi (180 km) from Bald Hill (north of Stanwell Park) south to the Shoalhaven River and Batemans Bay and from the shore west to the Illawarra Range of the Eastern Highlands, occupying an area of 2,200 sq mi (5,800 sq km). Its name derives from a corruption of the Aboriginal word *alowrie,* meaning "high pleasant place by the sea." Sighted in 1770 by Capt. James Cook, it was first explored in 1796 by Matthew Flinders and George Bass. In the 1820s the district supported a cedar-wood industry and now embraces the industrial city of Wollongong, the coal deposits at Bulli, rich dairylands in the south, beach resorts, and a prosperous offshore fishing industry. Port Kembla, the chief port for the area, is a major centre of metal manufacturing, including iron and steel works. Lake Illawarra is a shallow lagoon located 50 mi south of Sydney; the 8,500 ac (3,400 ha) of Lake Illawarra provide good prawning grounds.

Ille-et-Vilaine, *département,* Bretagne region, northwestern France, created from the northeastern part of the historic province of Brittany (*q.v.*). Bounded north by the English Channel and Manche *département,* it has an area of 2,609 sq mi (6,758 sq km). The coastline stretches eastward from an estuary 5 mi (8 km) west of Dinard to within 3 mi of Mont-Saint-Michel; it includes part of the rocky Côte d'Émeraude, broken by the estuary of the Rance River, at the mouth of which are Dinard and Saint-Malo (*q.v.*). In those areas in which a difference of more than 8 m exists between high and low tide, tidal power has been harnessed in the estuary to generate electricity. The north-flowing Rance is linked by the Canal d'Ille et Rance at Rennes (*q.v.*), the departmental capital, with the Vilaine River, which flows southwestward to the Atlantic.

The climate is temperate and rainy. East of the Côte d'Émeraude, the Marais de Dol, the flat coastal strip of the bay of Mont-Saint-Michel, has been reclaimed and is used for sheep raising and market gardening. Oysters are cultivated near Cancale, on the coast. The coastal resorts have become more important than the fishing industry to the economy of the *département.* The Rennes basin is fertile (raising grains, especially wheat, fodder crops, and legumes). Pastoral farming has expanded, and cider-apple orchards continue to abound. Some industries have been established in the Rennes region, where a major motorworks is situated, and at Fougères, which specializes in women's footwear. Jacques Cartier, who explored Canada, was born in Saint-Malo, as was the writer Chateaubriand. The *département* is divided into four *arrondissements*—Rennes, Saint-Malo, Fougères, and Redon—and is in the educational division of Rennes. Pop. (1982) 749,764.

illegitimacy, status of children begotten and born outside of wedlock. Many statutes either state, or are interpreted to mean, that usually a child born under a void marriage is not illegitimate if his parents clearly believed they were legally married. Similarly, annulment of a marriage usually does not illegitimize the children.

The historical trend of legitimacy laws has been toward more humane treatment of illegitimate children. Under early Roman, Spanish, and English law, the inheritance rights of such children were curtailed. During the

Middle Ages, European countries regarded illegitimate children as virtual outlaws.

Legitimacy lawsuits usually concern either a child's inheritance or the matter of obtaining support payments from a father who refuses to acknowledge his paternity. Generally, legitimacy is presumed unless clearly contradicted. Evidence that the mother has a questionable reputation is insufficient to show lack of paternity.

The natural parents are usually given custody of their illegitimate offspring, the mother having priority. Formerly, fathers of illegitimate children had no obligation to support them, but many statutes have modified this. The mother's husband usually has no obligation to provide support, unless the marriage occurred after the birth of the child.

An illegitimate child's status may be changed by a legal action called legitimation, granting him all the rights of legitimate children—except that property or money already given to a naturally legitimate child cannot be transferred to a legitimated one who would otherwise have been entitled to part of it. In some places, legitimation automatically occurs if the parents subsequently marry, if the mother marries someone else, or if the father publicly acknowledges and supports the child. Many statutes authorize a court declaration of the legitimacy of the child. The modern trend is strongly toward legitimation.

Illiciales, order of primitive, dicotyledonous flowering plants comprising the families Illiciaceae and Schisandraceae, with three genera, of mostly tropical and subtropical woody plants. All have radially symmetrical, mainly beetle-pollinated flowers that lack differentiation between the outer and inner floral whorls (sepals and petals). The order is botanically significant in having features showing characteristics of ancient gymnosperm groups, such as wood with primitive vessels (water-conducting cells). The order is considered to have arisen from the ancestors of the magnolia order (Magnoliales) and to be related to the ancestors of the buttercup order (Ranunculales); thus, it occupies a key position in the evolution of flowering plants.

The family Illiciaceae has one genus, *Illicium,* with 42 species of shrubs and trees having evergreen, aromatic leaves and bisexual flowers, the inner petals of which grade gradually into stamens (male pollen-producing structures). The female portion of the flower consists of 7 to 15 carpels (ovule-bearing structures), usually in a single whorl. At maturity the flower produces a characteristic woody fruit composed of a ring of several joined podlike follicles, each of which splits open along one seam to release a single seed. The star anise (*Illicium verum*), named for this characteristic fruit, is a shrub, the dried fruits of which are the source of oil of star anise, a volatile, aromatic oil used for flavouring candies, liqueurs, and perfumes.

The family Schisandraceae contains two genera: *Schisandra* with 25 species and *Kadsura* with 22 species of climbing vines with separate male and female flowers that are often found on separate plants. The fruits in this family produce one to five seeds each. A few species are occasionally cultivated as ornamentals—for example, the magnolia vine (*Schisandra chinensis*), for its fragrant white or pink flowers and attractive fruits, and *Kadsura japonica,* for its clusters of scarlet-coloured fruits.

Illinois, a confederation of small, Algonquian-speaking Indian tribes originally spread over what is now southern Wisconsin and northern Illinois and parts of Missouri and Iowa; the best-known tribes were the Cahokia, Kaskaskia, Michigamea, Peoria, and Tamaroa. The Illinois were primarily hunters; small parties took forest mammals throughout the year, and most of the village participated in communal winter bison hunts on the prairie. Corn (maize) and other vegetables cultivated by women added to their diet. Their villages consisted of dwellings covered with rush mats, in which several families were housed. Little is known of Illinois social organization, but it was probably similar to that of the Miami, with a civil chief elected from among a village council and a war chief chosen according to his ability to lead raids.

By the middle of the 17th century most of the Illinois had concentrated along the Illinois River from Starved Rock to the Mississippi, having moved there because of harassment by the Dakota, Fox, and other northern tribes. Iroquois raids greatly reduced their numbers, and the introduction of liquor by French traders further weakened the tribe. The murder of the Ottawa chief Pontiac by an Illinois provoked the vengeance of several northern Algonquian tribes, further reducing their population. The survivors took refuge with French settlers in Kaskaskia, in Illinois, while the Sauk, Fox, Kickapoo, and Potawatomi dispossessed them of most of their territory. In 1832 the remaining Illinois sold their lands, moving to Kansas and then to Oklahoma.

Illinois, constituent state of the United States of America, lying in the heart of the Midwest, bounded on the north by Wisconsin, on the east by Lake Michigan and Indiana, on the south by Kentucky, and on the west by Missouri and Iowa. The capital is Springfield.

A brief treatment of Illinois follows. For full treatment, *see* MACROPAEDIA: United States of America: *Illinois.*

Indian settlement in Illinois dates from 8000 BC. The Mississippian people, whose religious centre was Cahokia in southwestern Illinois, probably constituted the largest pre-Columbian (around AD 1300) community north of Mexico. All the Illinois tribes inhabiting the area at the time of European settlement were of Algonquian stock. The French explorers Marquette and Jolliet entered the territory in 1673. Illinois was controlled by the French until 1763, when it passed to the British. Illinois became a territory of the United States after 1783 and was made the 21st state in 1818. Some 250,000 Illinoisans fought for the Union during the American Civil War. After the war the state grew rapidly into an industrial centre. Despite the great fire of 1871, the city of Chicago grew to be one of the largest cities in the country.

Illinois consists primarily of flat prairie, although irregular plains cover some western, northern, and southern areas. Southernmost Illinois is characterized by open hills, but the hills of northwestern Illinois contain the state's highest point (1,235 feet [376 m] above sea level). The deep black soil of much of northern and central Illinois is among the finest in the world in terms of agricultural quality. The state's great length—equivalent to the distance from New England to Virginia—gives it an unusual variety of northern and southern plant life.

The climate is temperate with cold, snowy winters and hot summers. Mean winter temperatures are about 22° F (−6° C) in the north and 37° F (3° C) in the south; summer equivalents are 74° F (23° C) and 80° F (27° C). Mean annual precipitation in the north is about 34 inches (864 mm) and in the south about 46 inches (1,168 mm). Tornadoes can occur frequently during the spring.

The first white U.S. settlers of Illinois were of Anglo-Saxon origin. Settlers from Virginia, Kentucky, and Tennessee moved into southern Illinois, while New Englanders and New Yorkers moved into the northern parts by way of the Erie Canal and the Great Lakes. The great waves of European immigration that began in the 1840s and culminated after World War I left their mark on Illinois. Chicago still has numerous ethnic communities that preserve and maintain their native traditions. The migration of blacks to Illinois cities began during World War I, and by 1980 they constituted 15 percent of the total population of the state and 40 percent of Chicago's. The population of Illinois is highly urbanized—more than 80 percent—but its rate of growth has slowed considerably and has fallen well below the national average. Like other states in the North, Illinois has experienced the emigration of its people and industries to locations in the south and west.

Agriculture remains a major sector of the state's economy. Farms cover four-fifths of the land area, and most of them are family-owned. Illinois is a national leader in both soybean and corn (maize) production. Production of pork, milk and other dairy products, and beef are also important.

The state has large deposits of coal, but seams are thin and sulfur content is high. There are limited reserves of petroleum, and production, although down from the 1940 high, is still significant. Lead, zinc, limestone, and silica are also extracted. There are several nuclear power stations.

Illinois is one of the largest industrial centres of the nation. It ranks among the top states in the production of fabricated metals, food products, rubber products, and electrical-machinery manufacturing, as well as in its number of printing and publishing establishments. It is also among the top manufacturers of nonelectrical machinery, which accounts for the largest share of its foreign exports.

The state is also a major insurance centre and the home of the Chicago Board of Trade—the nation's oldest and largest commodity market—and the Chicago Mercantile Exchange.

Illinois is the focal point of many transportation networks. It has three navigable rivers, one of which connects, by canal, Lake Michigan with the Mississippi River. It ranks high among the states in railway mileage. Chicago is a major hub for Amtrak passenger service and is the freight centre of the country. Its O'Hare International Airport is one of the nation's and the world's busiest airports, and the state has an extensive network of roads.

Cultural activities are heavily concentrated in Chicago, with its many museums and theatres, its celebrated Chicago Symphony and other orchestras, its opera, and other cultural establishments. An extensive public university system brings cultural attractions to all corners of the state. Central Illinois is well known for its Lincoln landmarks and southern Illinois for the Shawnee National Forest. Western Illinois is known for its Spoon River country, immortalized by the poet Edgar Lee Masters. Architectural landmarks abound in Chicago, where Frank Lloyd Wright, Louis Sullivan, Daniel Burnham, and Ludwig Mies van der Rohe all worked. Area 56,345 square miles (145,934 square km). Pop. (1990 est.) 11,612,000.

Illinois Central Gulf Railroad Company (IC), U.S. railroad formed in 1972 by the merger of the Illinois Central Railroad Company and the Gulf, Mobile, and Ohio Railroad Company.

The Illinois Central Railroad was chartered in 1851, the first of many railroads to receive a grant of land upon completion of its line. In 1856 the line from Chicago to Cairo, Ill., was opened, thereby earning the line 2,500,000 acres. At Cairo passengers and freight transferred to Mississippi River steamers for further travel until a bridge across the Mississippi was opened in 1889. While it was expanding, the IC absorbed more than 100 smaller railroads, reaching Kansas City and Omaha to the west, Indianapolis and Louisville to the east, and the Gulf of Mexico to the south.

After the merger with the Gulf, Mobile

and Ohio, which also provided service from Chicago to the Gulf of Mexico, the line operated in 13 states, extending from Chicago in the north to New Orleans and other gulf ports in the south and from Indianapolis and Louisville in the east to Kansas City, Omaha, and Sioux Falls, S.D., in the west. In 1985, however, the company sold its lines extending from Chicago westward to Iowa and Omaha. The railroad's freight revenues come from the transport of coal, farm products, and a variety of industrial materials. It operates passenger trains for the National Railroad Passenger Corporation (Amtrak) and a commuter service in the Chicago area.

The railroad is a wholly owned subsidiary of IC Industries, Inc. (formed in 1962), a holding company with subsidiaries in other industries ranging from soft drinks to automotive parts.

Illinois River, navigable stream formed by the junction of the Des Plaines and Kankakee rivers in Grundy county, northeastern Illinois, U.S. It flows generally west across the state until it reaches Hennepin, where it turns abruptly south to join the Mississippi River at Grafton after a course of 273 miles (440 km). The Illinois drains an area of approximately 25,000 square miles (64,750 square km) and occasionally broadens into wide expanses such as Peoria Lake. The Illinois and Michigan Canal, constructed from the Chicago River to the Illinois River (1848) at a point near La Salle, made navigation between these streams possible, and when the Illinois Waterway was completed in 1933, shipping between the Great Lakes and the Gulf of Mexico via the waterway and the Mississippi River became practicable. Cities along the river's course include Morris, Ottawa, La Salle, Peru, Peoria, Pekin, Havanna, and Beardstown. Its tributaries include the Spoon and Sangamon rivers and the Fox, Vermilion, Mackinaw, and La Moine rivers. State parks along the Illinois River include Starved Rock (near Ottawa), Fort Creve Coeur (near Peoria), and Pere Marquette (near the confluence with the Mississippi River).

illite, any of a group of mica-type clay minerals widely distributed in marine shales and related sediments. Illite contains more water and less potassium than true micas, but it has a micalike sheet structure and is poorly crystallized. It may form a chemical series with both muscovite and montmorillonite; it is a weathering product of muscovite and alters to montmorillonite under humid conditions. For chemical formula and detailed structure and physical properties, *see* clay mineral (table); mica (table).

illumination, in painting, the embellishment of the text of handwritten books with gold or, more rarely, silver, giving the impression that the page has been literally illuminated. In medieval times, when the art was at its height, specialization within scriptoria or workshops called for differentiation between those who "historiated" (*i.e.,* illustrated texts by relevant paintings) and those who "illuminated" (*i.e.,* supplied the decorative work that embellished initial capital letters and often spilled into margins and borders, and that almost invariably introduced gold in either leaf or powdered form). The two functions sometimes overlapped, particularly when drolleries and other irrelevancies began to populate initials and borders, and even in medieval times the distinction was often blurred. In modern times the term denotes the illustration and decoration of early manuscripts in general, whether or not with gold.

The idea of associating painting with the written word, whether for illustration or decoration, is both ancient and widespread. In the illumination of manuscripts, two traditions are outstanding: the Eastern, or Islāmic, tradition and the even longer tradition established



Illuminated initial "U" for "Uerba" (*i.e.,* "Verba") in the book of Jeremiah, from the Winchester Bible, English, 12th century; in the Cathedral Library, Winchester, England (MS. 17, fol. 148R)

By permission of the Dean and Chapter of Winchester; copyright The Warburg Institute, the University of London

in Europe from classical antiquity. After the development of printing in Europe in the second half of the 15th century, illumination was superseded by printed illustrations.

In the great era of the illuminated manuscript, however, the art of the illuminator often played an important role in the development of art. The portability of the manuscript made it a simple means for the transmission of ideas from one region to another, and even from one period to another. On the whole, the development of painting in manuscripts paralleled the development of monumental painting. *See also* miniature painting.

Illuminato, plural ILLUMINATI (Christian heretic): *see* Alumbrado.

illusion, false perceptual experience of actual stimuli. An illusion is not a simple error in perception; rather, it has features whose nature it is to evoke an incorrect perception. Illusions must be distinguished from hallucinations: the former, unlike the latter, result from some external perceptual stimulus.

A brief treatment of illusion follows. For full treatment, *see* MACROPAEDIA: Perception, Human.

Illusions can be classified according to their sources. Some illusions are produced when the stimulus presented to the senses has been altered by some environmental condition; these are called stimulus-distortion illusions. A standard example is the stick that appears bent when part of it is immersed in water, an effect attributable to refraction of light rays. A similar illusion is a mirage, in which, for example, a shimmering pool of water is perceived over a highway or desert heated by the sun. A familiar auditory stimulus-distortion illusion is the perception that the pitch of a siren changes as the siren moves. This is called the Doppler effect and is caused by the relative compression and expansion of the sound waves as the siren moves toward and then away from the listener.

When the mechanisms by which stimuli are received, processed, and interpreted are misled, so-called perceiver-distortion illusions can result. For example, paradoxical cold results when a spot on the skin that normally responds only to cold responds to something very warm, relaying an illusory sensation of cold. In responding to stimuli, human sense organs adapt themselves in certain ways, and this phenomenon can give rise to illusions. For example, the retina will adjust itself to a light of a given brightness, thus temporarily narrowing its range of sensitivity. If a second light of exactly the same intensity is seen immediately after the first, it will seem less bright because the eye is less sensitive.

Many illusions are generated by tricking the normal processes by which the brain interprets sense data. An illusion of this sort essentially brought about the development of the motion-picture industry. (*See* movement perception.) In a process called closure, the brain tends to perceive as whole slightly incomplete figures. For example, the brain compensates if part of the image of a figure falls on the blind spot of the retina, so that the viewer does not perceive a gap. In other cases, a drawing of a figure can include competing visual cues, causing the brain to misjudge the figure's visual properties. Such drawings include the many familiar optical illusions in which straight lines appear to be curved or shapes equal in size appear to be unequal.

Certain illusions stem from the ambiguity of visual cues. For example, in a well-known drawing that can be seen either as a vase or as two profiles facing each other, it is uncertain what is the figure and what is the ground against which the figure is set. Thus, the brain can choose, using the profiles as the ground to perceive the vase, or the vase as the ground to perceive the profiles.

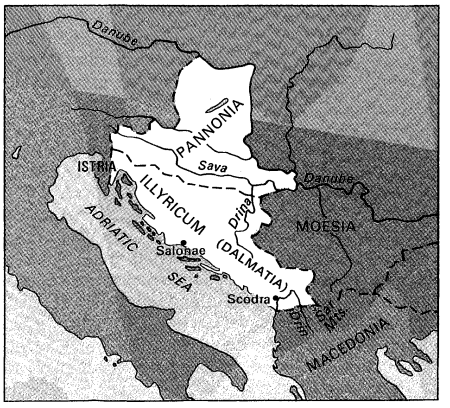
Some illusions involve two senses simultaneously. In the phenomenon called synesthesia, objects of one sense are experienced as objects of another. The most common instances of synesthesia involve sounds and colours, whereby a person might experience a colour when hearing a tone, or vice versa. Further, an experience presented via one sense might be so vivid that it provokes the illusion of a complementary experience appropriate to another sense, as in the impression of smelling the food in a painting of a sumptuous banquet.

Illustrated London News, monthly picture magazine of news and the arts, published in London, a forerunner in the use of various graphic arts. It was founded as a weekly in 1842 by Herbert Ingram, and it became a monthly in 1971. It was London's first illustrated periodical, with 32 woodcuts in the 16 pages of its first issue. It was the first periodical to make extensive use of woodcuts and engravings and the first to use photographs. The *Illustrated London News* was an instant success, and when, shortly after it appeared, it won the approval of the archbishop of Canterbury, it also won the support of the churchgoing public. At first its illustrations focused mainly on English social life. Later, it broadened its scope to embrace general news and the arts and began to send its artists all over the world to record events as they occurred. In 1912 it became the first periodical using rotogravure to publish an integrated picture and text section. When the *Illustrated London News* became a monthly, it had gained note for its worldwide photographic coverage of cultural activities.

Illyria, northwestern part of the Balkan Peninsula, inhabited from about the 10th century BC onward by the Illyrians, an Indo-European people. At the height of their power the Illyrian frontiers extended from the Danube River to the Gulf of Ambracia on the Adriatic and from that sea to the Šar Mountains.

The Illyrians, bearers of the Hallstatt culture (*see* Hallstatt), were divided into tribes, each a self-governing community with a council of elders and a chosen leader. A strong tribal chieftain, however, could unite several tribes into a kingdom. The last and best-known Illyrian kingdom had its capital at Scodra (modern Shkodër, Alb.). One of its most important rulers was King Agron (second half of the 3rd century BC), who, in alliance with Demetrius II of Macedonia, defeated the Aetolians (231). Agron, however, died suddenly, and during the minority of his son, his widow, Teuta, acted as regent. Queen Teuta attacked

Sicily and the Greek colonies of the coast with part of the Illyrian navy. Simultaneously, she antagonized Rome, which finally sent a large fleet to the eastern shores of the Adriatic. Although Teuta submitted in 228, the Illyrian kingdom of the interior was not destroyed,



Roman Illyria (c. 30 BC–AD 138)

Adapted from *Westermann Grosser Atlas zur Weltgeschichte*; Georg Westermann Verlag, Braunschweig

and a second naval expedition was sent against Illyria in 219. Philip V of Macedonia aided his Illyrian neighbours and thus started a protracted war that ended with the conquest of the whole Balkan Peninsula by the Romans. The last Illyrian king, Genthius, surrendered in 168 BC.

The Roman province of Illyricum stretched from the Drilon River (the Drin, in modern Albania) in the south to Istria (modern Yugoslavia) in the north and to the Savus (Sava) River in the east; its administrative centre was Salonae (near present-day Split) in Dalmatia. With the extension of the Roman Empire along the Danube Valley, Illyricum was divided between the provinces of Dalmatia and Pannonia (*qq.v.*).

Under the empire Illyria enjoyed a high degree of prosperity. It was traversed by a Roman road, and Illyria's ports served as important trade and transit links between Rome and what is now eastern Europe. Copper, asphalt, and silver were mined in parts of the region, and Illyrian wine, oil, cheese, and fish were exported to Italy.

Since the semiautonomous clansmen of the Illyrian highlands were hardy warriors, it was inevitable that the emperors should recruit them to serve with the Roman legions and even the Praetorian Guard. When in the 3rd century BC the empire began to be threatened by the barbarian peoples of what are now eastern and central Europe, Illyricum became a principal military bulwark of Rome and its culture in the ancient world. Several of the most outstanding emperors of the late Roman Empire were of Illyrian origin, including Claudius II Gothicus, Aurelian, Diocletian, and Constantine the Great, most of whom were chosen by their own troops on the battlefield and later acclaimed by the Senate.

In AD 395 the empire was finally divided, and Illyria east of the Drinus River (the Drina, in modern Yugoslavia) became part of the Eastern Empire. Between the 3rd and 5th century it was devastated by the Visigoths and the Huns, who, however, left no lasting mark on Illyria. But the Slavs, who started their incursions into the Balkan Peninsula in the 6th century, had by the end of the 7th century transformed the ethnic structure of all the Illyrian-speaking territories. Croatia, Serbia, Dalmatia, Bosnia, Montenegro, and parts of Macedonia lost their Illyrian language and were thoroughly Slavonized, so that only the Albanians remain as direct descendants of the ancient Illyrians. For the later history of the region, *see* Balkans.

Illyrian language, Indo-European language spoken in pre-Roman times along the eastern coast of the Adriatic Sea and in southeastern Italy. The language of the Illyrian fragments found in Italy is usually called Messapic, or Messapian. Some scholars believe the modern Albanian language (*q.v.*) to be descended from Illyrian. *See also* Messapic language.

Illyrian Provinces, stretch of territory along the Dalmatian coast that constituted a part of Napoleon's French Empire from 1809 to 1814. When the French victory of 1809 compelled Austria to cede a portion of its South Slav lands to France, Napoleon combined Carniola, western Carinthia, Görz (Gorica; modern Gorizia), Istria, and parts of Croatia, Dalmatia, and Ragusa (modern Dubrovnik) to form the Illyrian Provinces, which he incorporated into his empire. Napoleon's dominant interest in creating this political unit was to cut off Austria's access to Italy and the Mediterranean Sea. He also placed the capable marshal A.-F.-L. Viesse de Marmont in charge of the provinces.

Under Marmont's supervision, the provinces' government organization was revised, the Code Napoléon was introduced, and roads and schools were constructed. Local citizens were given administrative posts, and native languages were used to conduct official business. In addition, serfs were freed and given possession of the land they cultivated.

As a result of the French administration, which ended in 1814, when the French were forced to return the Illyrian Provinces to the Austrian Empire, the region not only made cultural and economic advances but also began to develop a sense of Slav unity and national awareness that matured and manifested itself in the 1830s and 1840s in the powerful literary and political Illyrian movement.

'ilm al-ḥadīth, form of investigation established by Muslim traditionists in the 3rd century AH (9th century AD) to determine the validity of accounts (hadiths) of Muḥammad's statements, actions, and approbations as reported by various authorities. In the first two centuries of Islām, during the period of territorial expansion, there arose a need to accommodate a great diversity of cultures in the Muslim community. The hadiths then multiplied in number and were often fabricated in order to create a normative past that could accommodate contemporary situations. Thus many early opinions on the religious law and dogma of Islām, as well as sectarian prophecies and other expectations, were cast in the form of hadiths. Once the Prophet's personal example, as recorded in hadiths, became established as the universal Muslim norm (*sunnah*), however, Muslim scholars attempted to determine forgeries or doubtful reports among the existing body of hadiths. They were bound in principle to accept any textually reliable hadith and had to restrict themselves principally to the scrutiny of isnads—*i.e.,* the chains of oral or written transmission by which the reliability of hadiths were determined (*see* isnād).

All acceptable hadiths therefore fall into three general categories: *ṣaḥīḥ* (sound), those with a reliable and uninterrupted chain of transmission and a *matn* (text) that does not contradict orthodox belief; *ḥasan* (good), those with an incomplete isnad or with transmitters of questionable authority; *da'īf* (weak), those whose *matn* or transmitters are subject to serious criticism.

Isnads are further evaluated according to the completeness of their chains: they may be unbroken and reliable all the way back to Muḥammad (*musnad*) yet very short (*'ālī*), implying less likelihood of error; they may lack one authority in the chain of transmitters or may be missing two or more transmitters (*mu'ḍal*) or may have an obscure authority, referred to simply as "a man" (*mubham*).

The transmitters themselves, once established in the historical record as reliable men, determine further categories; the same tradition may have been handed down concurrently through several different isnads (*mutawātir*), indicating a long and sound history, or a hadith may have been quoted by three different trustworthy authorities (*mashhūr*) or by only one (*āḥād*).

Many scholars produced collections of hadiths, the earliest compilation being the great *Musnad* of Aḥmad ibn Ḥanbal, arranged by isnad. But only six collections, known as *al-kutub as-sittah* ("the six books"), arranged by *matn*—those of al-Bukhārī (d. 870), Muslim ibn al-Ḥajjāj (d. 875), Abū Dā'ūd (d. 888), at-Tīrmidhī (d. 892), Ibn Mājāh (d. 886), and an-Nasā'ī (d. 915)—came to be recognized as canonical in orthodox Islām, though the books of al-Bukhārī and Muslim enjoy a prestige that virtually eclipses the other four.

Ilmen, Lake, lake in Novgorod *oblast* (administrative region), northwestern Russian Soviet Federated Socialist Republic. Lake Ilmen occupies the centre of the Ilmen Plain, an undulating glacial lowland much of which is drained by rivers flowing into the lake; the lake in turn provides the headwaters of the Volkhov River. The lake occupies a shallow basin almost filled by riverine deposits, and its area varies vastly according to river flow—between 283 and 807 square miles (733 and 2,090 square km). The lake is navigable in summer months and has an average depth of 33 feet (10 m). Among the nearly 50 rivers that flow into Lake Ilmen, the largest are the Msta, Pola, Lovat, Psizha, and Shelon. The Volkhov flows out of the lake.

ilmenite, iron-black, heavy, metallic oxide mineral, composed of iron and titanium oxide ($FeTiO_3$), that is used as the major source of titanium. It forms solid-solution series with geikielite and pyrophanite in which magnesium and manganese, respectively, replace iron in the crystal structure. These three minerals are found disseminated or in veins in gabbro, diorite, or anorthosite, as in Quebec, New York, and Norway. Ilmenite also forms large masses, as in Iron Mountain, Wyo., and in the Ilmen Mountains, U.S.S.R., from which it derives its name. Smaller quantities are present in copper-ore veins, pegmatites, black beach sands, and placer deposits. For detailed physical properties, *see* oxide mineral (table).

ILO: *see* International Labour Organisation.

Ilobasco, town, north-central El Salvador. It is in a rich agricultural area (cattle, coffee, sugarcane, and indigo) but is known primarily for its clay dolls, a major item for sale to tourists, as well as for other types of pottery made from local clays. Since the completion in 1954 of a dam and hydroelectric complex on the Lempa River and the creation nearby of a lake recreation area, Ilobasco's tourist trade has grown. The town's population was swollen by refugees fleeing battles between government troops and leftist guerrillas in the early 1980s. Pop. (1980 est.) mun., 53,509.

Ilobu, town, Oyo state, southwestern Nigeria. It lies along a tributary of the Oshun River and on the road from Ogbomosho to Oshogbo. A trade centre (yams, corn [maize], cassava, palm oil and kernels, pumpkins, beans, and okra) for a savanna area mainly inhabited by the Yoruba people, it also serves as a collecting point for cash crops (cotton, tobacco, and cocoa). Cotton weaving is a traditional local industry; but the town of Oshogbo, 8 miles (13 km) southeast, is the area's most important textile centre. Ilobu has a government health office. Pop. (1983 est.) 143,800.

Ilocano, also spelled ILOKANO, or ILOKAN, also called ILOKO, or ILOCO, third largest cul-

tural-linguistic group in the Philippines. When discovered by the Spanish in the 16th century, they occupied the narrow coastal plain of northwestern Luzon, known as the Ilocos region. The growth of their population later led to much migration to neighbouring provinces, as well as to Mindanao and Hawaii. Their language is closely related to others of northern Luzon, all of which belong to the Austronesian (Malayo-Polynesian) family of languages. The Ilocano (Iloko) language in the mid-1970s was spoken by about 4,686,000 persons.

The major Ilocano provinces, Ilocos Norte, Ilocos Sur, and La Union, are among the most densely populated areas in the Philippines. Rice is the staple crop, grown on small fields and irrigated by rainfall during the rainy season. Vegetables and pigs, goats, and chickens are also raised. Tobacco is an important cash crop. Many Ilocano supplement their incomes by wage work or handicrafts.

The wealthier families generally reside in the cities and towns. Marriages are usually arranged so as to maintain class lines, the husband's family providing the *sabong,* or dowry of land. Most of the people are Roman Catholic.

Ilocos Norte, province occupying the northwestern corner of Luzon, Philippines. It is 1,312 sq mi (3,399 sq km) in area. The province comprises a narrow coastal agricultural plain and the Ilocos (Malaya) Range paralleling the shore, which is bordered by the South China Sea (west) and the Luzon Strait (north). The province borders Ilocos Sur (south). The region is noted for its tobacco production. Rice and corn (maize) are other leading crops, and fishing and forestry are important. Laoag, the provincial capital, is the largest city in northern Luzon. Batac (a major trading centre), San Nicolas, Bacarra, Pasuquin, and Dingras are other population centres. There are two national parks in the province—Northern Luzon Heroes Hill and Paoay Lake. Ilocano is the dominant language and ethnic group. The mountainous regions are occupied by Tinggians and Apayos. Pop. (1980) 390,666.

Ilocos Sur, province lying along the northwestern coast of Luzon, Philippines. With an area of 996 sq mi (2,580 sq km), it is bordered by the South China Sea (west) and the province of Ilocos Norte (northeast). The province does not have highly productive soil, and its low rate of population growth is due to steady migration, principally to the southern islands. Tobacco, rice, and corn (maize) are the main crops. Vigan, the provincial capital, and the towns of Candon, Narvacan, and Cabugao are on the coastal lowland. Bessang Pass National Park and the historic Tirad Pass, where the Filipinos made their last defense against the Americans in 1898, are also located in the province. The Ilocanos are the major ethnic group, and the Kankanay the largest minority. Pop. (1980) 443,591.

Iloilo, province, eastern portion of the island of Panay, Philippines. It includes offshore islands in the Visayan Sea (east) and Guimaras Island in Guimaras Strait. The province has an area of 2,056 sq mi (5,324 sq km) and is mountainous in the west and hilly in the northeast, where the Bulabog-Putian National Park lies between Dingle and San Enrique. Its irregular coastline has productive fisheries based on the port of Estancia in the north. Drained by the Jalaud River, the central and coastal regions, constituting the Iloilo Basin, are level and fertile, and many areas annually harvest two rice crops. Other products include sugarcane, coconuts, bananas, and corn (maize). Forest products and textile manufacturing are also important.

Cabatuan and Janiuay (on the main north–south highway), Pototan and Santa Barbara (freight depots on the Iloilo Railroad), and Barotac Nuevo are important trading and rice-milling centres. Other population centres in addition to Iloilo City, a chartered city and the provincial capital, include Miagao, Lambunao, Dumangas, and Calinog. Pop. (1980) 1,433,641.

Iloilo City, chartered city, capital of Iloilo province, on the southeastern coast of Panay, Philippines. At the mouth of the Jaro River on the Iloilo Strait and sheltered by the offshore Guimaras Island, it is the commercial centre of Panay and a regional centre for sugar exports.

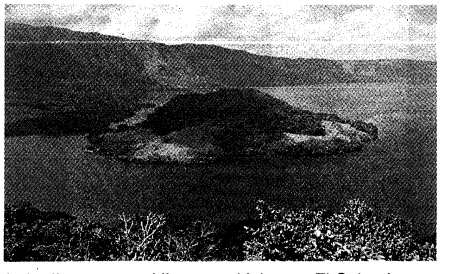
Pre-Spanish settlement was extensive, but the seaport remained small until 1855, when it was opened to foreign trade. The huge sugar exports of the nearby island of Negros were an additional spur to its growth, and for a time Iloilo City rivalled Cebu City as the main port of the Visayan Islands. Although freight traffic dropped with the construction of artificial ports on Negros, passenger traffic has remained high. Thousands of migrant labourers annually journey through Iloilo City, which is linked by rail with Roxas, on the northern coast, to Negros' sugar plantations. Iloilo City is also a major fishing port, and it has a large airport.

The city has a compact urban core and several plaza and market centres. It did not include a large rural area upon chartering and is thus more urbanized than most Philippine cities. Buildings constructed after a fire in 1899 show marked Spanish influence. Iloilo City is known for its old churches and for *jusi* (raw silk) and *piña* (pineapple fibre) fabrics. It is the seat of Central Philippine University (1905), the University of San Agustín (1904), and West Visayas State College (1924). Inc. city, 1936. Pop. (1980) 244,827.

Ilokano, also spelled ILOKAN, also called ILOKO (people): *see* Ilocano.

Ilongo (people): *see* Hiligayon.

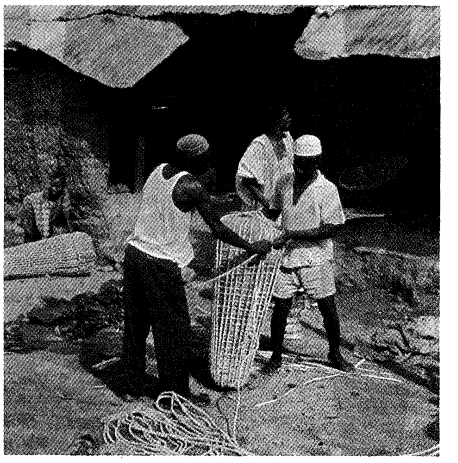
Ilopango, Lake, Spanish LAGO DE ILOPANGO, lake, south central El Salvador, on the borders of San Salvador, La Paz, and Cuscatlán departments. Occupying the crater of an extinct volcano, at an altitude of 1,450 ft (442 m), it has an area of 40 sq mi (100 sq km). In 1880 the water level rose, a natural channel (Río Jiboa) was formed on the eastern side, and the resultant drainage left a volcanic island in the centre of the lake. The island, known as Ilopango Volcano, is 150 ft high and 500 ft across. In 1928 the water again



Lake Ilopango and Ilopango Volcano, El Salvador
Walter Aguiar—EB Inc.

rose, destroying houses along the shoreline. The lake has since become a popular tourist resort, with activity centred on the towns of Asino and Ilopango on the western shore.

Ilorin, city, traditional emirate, and capital of Kwara State, western Nigeria, on the Awun River, a minor tributary of the Niger. Founded in the late 18th century by Yoruba people, it became the capital of a kingdom that was a vassal state of the Oyo Empire. Oyo's commander at Ilorin, Kakanfo (Field Marshal) Afonja, led a rebellion in 1817 that destroyed the unity of the empire. He was aided by Mallam Alimi (a Fulani from Sokoto), by Fulani warriors and slaves, and by Hausa slaves. Afonja was increasingly dominated by the Muslim Fulani, and, upon his assassination, Alimi's son, Abd as-Salam (Abdul Salami), became emir of Ilorin and pledged



Packing kola nuts at Ilorin, Nigeria
© Armand Defever—Madeline Grimoldi

allegiance (*c.* 1829) to the Sokoto caliphate. As a Muslim emirate, Ilorin subjugated several towns in Yorubaland and destroyed Oyo Ile (Old Oyo, or Katunga), 40 mi (64 km) northwest, the Oyo capital, in 1837. Abd as-Salam conducted a *jihād* ("holy war") toward the sea and was only stopped by the Ibadan victory over his cavalrymen at Oshogbo in 1840.

Throughout the 19th century, Ilorin served as a major trade centre between the Hausa of the north and the Yoruba of the south. It strongly resisted British rule, and not until 1897, when the army of the Royal Niger Company arrived after conquering Bida (106 mi east-northeast), did Ilorin recognize British supremacy. In 1900 Ilorin emirate was the only part of Yorubaland to be included in the Northern Nigeria Protectorate. Ilorin's administrative association with the north continued until the creation of Kwara State in 1967.

Modern Ilorin is mainly inhabited by Muslim Yoruba people, although its traditional ruler is a Yoruba-speaking Fulani emir. It is the headquarters of the Ilorin Local Government Council. Surrounding the historic central district with its traditional single-story red-mud houses with thatched straw roofs and numerous mosques, all protected by a mud wall, the modern city is an industrial, commercial, and educational centre. It is a major market for locally raised crops (yams, cassava, corn [maize], sorghum, millet, rice, peppers, peanuts [groundnuts], shea nuts, kola nuts, cotton) and cattle, hides, and poultry. Local handicrafts include pottery making, wood carving, leather working, cloth weaving, and mat and basket weaving. The growing industrial sector now includes sugar refining, food processing, soft-drink bottling, match and soap manufacturing, and iron-working. There are several banks and insurance companies that serve the city and state.

The city is the site of the University College of Ilorin and Kwara State College of Technology, which also contains the headquarters of the Nigerian Library Association. The Federal Agricultural and Rural Management Institute, which operates a research farm, is located in the city. Teacher-training colleges and a vocational trade school also serve Ilorin. Health services include a number of government, private, and religious hospitals and a nursing home for the elderly.

Ilorin is served by the railway and highway from Lagos (160 mi south-southwest), via Ibadan, which intersect in the city, and it has

an international airport. Pop. (1989 est.) city, 399,500.

Ilos, in Greek mythology, the founder of Ilion (Troy). Ilos (or Zacynthus, a Cretan name) has been identified either as the brother of Erichthonius or as the son of Tros and grandson of Erichthonius. According to legend, the King of Phrygia gave Ilos a spotted cow as a wrestling prize, with the advice that he found a city wherever the cow first lay down. The animal chose the hill of Ate, where Ilos marked out the boundaries of Ilion. After praying for a sign from Zeus, Ilos was sent the Palladium, a statue of Pallas Athena, for which he built a temple. Ilos' son Laomedon succeeded him as ruler of the city, and his grandson Priam was the last king of Ilion.

iltizām, in the Ottoman Empire, taxation system carried out by farming of public revenue. The state auctioned taxation rights to the highest bidder (*mültazim,* plural *mültezim* or *mültazims*), who then collected the state taxes and made payments in fixed installments, keeping a part of the tax revenue for his own use. The *iltizām* system included the farming of land taxes, the farming of urban taxes, the production of certain goods (such as wine, salt, or senna), and the provision of certain services. It began during the reign of Sultan Mehmed II (1444–46, 1451–81) and was officially abolished in 1856. Various forms of *iltizām,* however, continued until the end of the empire in the early 20th century, when the system was replaced by methods of taxation that were supervised by public officials.

Iltutmish, also called SHAMS-UD-DĪN ILTUTMISH, Iltutmish also spelled ALTAMSH (d. April 29, 1236), third and greatest Delhi sultan of the so-called Slave dynasty.

Iltutmish was sold into slavery but married the daughter of his master Quṭb-ud-Dīn Aybak (*q.v.*), whom he succeeded in 1211. He strengthened and expanded the Muslim empire in northern India and moved the capital to Delhi, where he built the great victory tower, the Quṭb Mīnār.

A wise and patient statesman who had been trained as a trusted administrator under his predecessors Muḥammad of Ghūr and Quṭb-ud-Dīn, Iltutmish was faced upon his accession not only with the deterioration of Muslim rule but also with the claim of Tāj-ud-Dīn Yildiz, the Ghazna ruler, to succession to all of Muḥammad's conquests and with the attempts by the Hindus to recover portions of their lost territory. In 1215 he captured Yildiz, who died in prison. In 1225 he forced the unruly Bengali governor to acknowledge the authority of Delhi, and shortly thereafter he consolidated again the Muslim holdings. Iltutmish was able to preserve his kingdom against the ravages of the Mongol invasions that coincided with his reign, and he succeeded in building an administrative machinery for the empire. He sought out 11th-century Islāmic classics on the art of government; and the *Ādāb-ul-Muluk,* the first Indo-Muslim classic on the art of government and warfare, was written for him.

He was tolerant of the Hindus despite the urgings of his advisers and built up the waterworks, mosques, and amenities at Delhi to make it for the first time a fitting seat of government. His reign and his advisers, especially the Wazīr Junaydī, were praised by contemporaries.

Iltutmish's eldest son had died before him, and his other sons were incompetent. He gave an excellent education to his daughter Raziyya (Raziyyat-ud-Dīn) and desired that she should succeed him. His wishes were offensive to the administrative Council of Forty, Iltutmish's personal slaves who had served as his advisers. Raziyya did succeed briefly to the throne, but her appointment of an African to an important position was considered insulting to the council, which shortly brought about her downfall. This marked the beginning of the decline of the line of Iltutmish.

Ilulíssat (Greenland): *see* Jakobshavn.

Ilumquh (Arabic: "God Is Power"), also called WADD, 'AMM, and SIN, Arabian god of pre-Islāmic times who was associated with the Moon and was greater than the two other principal astral deities of South Arabia, the goddess Shams and the god 'Athtar, who were associated with the Sun and the planet Venus, respectively. Ilumquh, protector of cities and the patron god of South Arabia's capital cities, is linked to various temples and is called father in reference to 'Athtar Venus and to each of the peoples of South Arabia. Ilumquh had many names and epithets, sometimes more than one in a single district. He was, for example, called Wadd ("Love") in Ma'īn, 'Amm ("Uncle") in Qatabān, and Sin (a name also used in Babylonia) in Ḥaḍramawt.

Although knowledge of Ilumquh's cult is incomplete, it is known that there were pilgrimages to his temples where ablutions and offerings were made and certain rules of abstinence and purity were followed. Divine guidance from the three gods was sought and later acknowledged in writing, and undertakings were determined by the response of the oracles. Sometimes documents were deposited in the temples for safekeeping.

Ilya OF MUROM, Russian ILYA MUROMETS, a hero of the oldest known Old Russian *byliny,* traditional heroic folk chants. He is presented as the principal *bogatyr* (knight-errant) at the 10th-century court of Saint Vladimir I of Kiev, although with characteristic epic vagueness he often participates in historical events of the 12th century.

Unlike the aristocratic heroes of most epics, Ilya was of peasant origin. He was a decidedly unpromising child who could not walk and who lived the life of a stay-at-home, sitting on top of the stove until he was more than 30 years old, when he discovered the use of his legs through the miraculous advice of some pilgrims. He was then given a splendid magic horse that became his inseparable companion, and he left his parents' home for Vladimir's court. There he became the head of Vladimir's retainers and performed astonishing feats of strength. He killed the monster Nightingale the Robber and drove the Tatars out of the kingdom.

Though generous and devoted, Ilya was always independent and showed little of the deference of vassal to lord. Once when Vladimir gave a party without inviting him, Ilya knocked down all the church steeples in Kiev in a fit of anger. When Vladimir sent for him, however, his anger was immediately mollified. Because of his simple heart, rough honesty, and obstinate strength, Ilya has remained a durable symbol to the eastern Slavs. His legend was the basis of the *Symphony No. 3* (1909–11; *Ilya Muromets*) by Reinhold Glière.

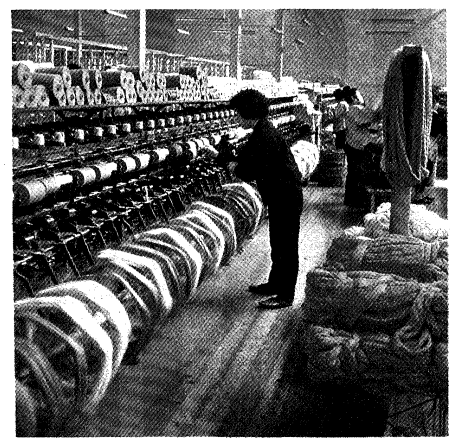
Ilyushin, Sergey Vladimirovich (b. March 30 [March 18, Old Style], 1894, Dilyalevo, Vologda province, Russia—d. Feb. 9, 1977, Moscow), Soviet aircraft designer who created the famous Il-2 Stormovik armoured attack aircraft used by the Soviet air force during World War II. After the war he designed civil aircraft: the Il-12 twin-engined passenger aircraft (1946), the Il-18 Moskva four-engined turboprop transport (1957), the Il-62 turbojet passenger carrier (1962), and the Il-86 airbus, which made its first flight in 1976.

Ilyushin was mobilized in the Russian army in 1914. He transferred to the army air arm and received a pilot's certificate in 1917. He later joined the Red Army, and in 1922 he entered the Zhukovsky Air Force Engineering Academy, Moscow, graduating in 1926. He then served as chief of design at various military and civilian aviation institutes. On April 21, 1938, while commuting by plane, he was forced to make a solo emergency landing, suffering injuries that left his forehead permanently scarred. He eventually became a lieutenant general in the Soviet Red Army engineering technical service and a professor at his old academy. He was awarded three Hero of Soviet Labour medals as well as the Order of Lenin.

Ilyushin Il-2, also called STORMOVIK, single-seat assault bomber that was a mainstay of the Soviet air force during World War II. The Il-2 is generally considered the finest ground-attack aircraft produced by any nation during World War II. It was designed by Sergey Ilyushin beginning in 1938 and went into production in 1940. The Il-2 was a single-engine, low-wing monoplane 38 feet (11.6 m) long and 48 feet (14.6 m) in wingspan. The early version was armed with two 23-millimetre cannons and two 7.6-millimetre machine guns mounted in the wings. The aircraft could also carry about 1,000 pounds (450 kg) of bombs or a lesser quantity of rockets. Later versions mounted two 37-millimetre cannons, and a two-seat version had provision for a tail gunner. The entire forward part of the aircraft was constructed of a single armour-plated shell that afforded maximum protection to the pilot. The Il-2's cannons and other weapons made it particularly effective at destroying tanks, and its use against the German panzer divisions in 1941–43 helped turn the tide of battle in the Soviets' favour. Stalin said of the Il-2 that it was "as necessary to the Red Army as air or bread." Approximately 36,000 Stormoviks were produced during the war, more than any other aircraft in history.

Ilyushin Il-76, also called IL-76, Soviet military transport aircraft, first flown in 1971 and produced from 1975. It was designed by the Ilyushin design bureau under G.V. Novozhilov. The Il-76 is a heavy transport plane, capable of handling a payload of more than 88,000 pounds (40,000 kilograms). It is equipped with two cranes that travel on overhead tracks, and its rear ramp doubles as a hoist. Unlike most military transports, the Il-76 is armed, with two guns in a rear turret. Its four turbofan engines produce 26,455 pounds of thrust each. Its maximum speed in level flight is 528 miles per hour (850 km per hour), and its ceiling is 50,850 feet (15,500 m). From 30 to 90 passengers can be accommodated.

Imabari, city, Ehime *ken* (prefecture), Shikoku, Japan, facing the Kurushima Strait on the Inland Sea. Imabari, founded as a castle town, was the first port in Shikoku to be opened to foreign trade. In 1922 the Taka-



Towel factory, Imabari, Japan
FPG—EB Inc.

matsu–Matsuyama Line (railway) was opened through the city.

The cotton textile industry was introduced to Imabari in the early 18th century, and the city now contains about 150 factories producing much of Japan's cotton cloth. The port handles a brisk trade with cities on Honshu and Kyushu; there are ferry services to neighbouring islands. Pop. (1988 est.) 123,314.

ʿImād ad-Dawlah, also called ʿALĪ IBN BŪYEH (b. 892—d. 949), one of the founders of the Būyid dynasty of Iran. ʿAlī and his brothers Aḥmad and Ḥasan were followers of Mardāvīz ebn Zeyār of northern Iran. In 934 ʿAlī revolted against local Zeyārid rulers and conquered Fārs province in southern Iran. He made Shīrāz his capital, ruling there until his death. After Aḥmad established control over the ʿAbbāsid caliphate in Baghdad in 946, ʿAlī assumed the dynastic title ʿImād ad-Dawlah.

ʿImād ad-Dīn Ismāʿīl ibn ʿUmar ibn Kathīr: *see* Ibn Kathīr.

ʿImād ad-Dīn Zangī ibn Aq Sonqur (Iraqi ruler): *see* Zangī.

imaginary number, any product of the form *ai*, in which *a* is a real number and *i* is the imaginary unit defined as $\sqrt{-1}$. *See* number system.

imaging, diagnostic, also called MEDICAL IMAGING: *see* diagnostic imaging.

Imaginism, Russian poetic movement of the post-Revolutionary period that advocated poetry based on a series of arresting and unusual images. It is sometimes called Imagism but is unrelated to the 20th-century Anglo-American movement of that name. The Imaginist movement was founded in 1919 by its leading poet, Sergey Yesenin (*q.v.*), who rivaled the leading Futurist poet, Vladimir Mayakovsky, in popularity. Like the Futurists, the Imaginists read poetry in cafés during a time of social upheaval when few books were published, but, unlike the Futurists, they were unable to adapt to the demands of Soviet life. Instead they expressed their alienation in acts of irresponsible bohemianism. The Imaginists dissolved at the time of Yesenin's suicide in 1925, and their techniques had little lasting effect on Soviet poetry, although Yesenin himself remained a popular poet and cultural hero.

Imagist, any of a group of American and English poets whose poetic program was formulated about 1912 by Ezra Pound—in conjunction with fellow poets Hilda Doolittle (H.D.), Richard Aldington, and F.S. Flint—and was inspired by the critical views of T.E. Hulme, in revolt against the careless thinking and Romantic optimism he saw prevailing.

The Imagists wrote succinct verse of dry clarity and hard outline in which an exact visual image made a total poetic statement. Imagism was a successor to the French Symbolist movement, but, whereas Symbolism had an affinity with music, Imagism sought analogy with sculpture. In 1914 Pound turned to Vorticism, and Amy Lowell largely took over leadership of the group. Among others who wrote Imagist poetry were John Gould Fletcher and Harriet Monroe; and Conrad Aiken, Marianne Moore, Wallace Stevens, D.H. Lawrence, and T.S. Eliot were influenced by it in their own poetry.

The four Imagist anthologies (*Des Imagistes,* 1914; *Some Imagists,* 1915, 1916, 1917), and the magazines *Poetry* (from 1912) and *The Egoist* (from 1914), in the United States and England, respectively, published the work of a dozen Imagist poets.

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Imalayan, Fatima-Zohra: *see* Djebar, Assia.

imam, Arabic IMĀM ("leader," "pattern"), the head of the Muslim community; the title is used in the Qur'ān several times to refer to leaders and to Abraham. The origin and basis of the office of imam was conceived differently by various sections of the Muslim community, this difference providing part of the political and religious basis for the split into Sunnite and Shīʿite Islām. Among Sunnites, imam was synonymous with caliph (*khalīfah*), designating the successor of Muḥammad, who assumed his administrative and political, but not religious, functions. He was appointed by men and, although liable to error, was to be obeyed even though he personally sinned, provided he maintained the ordinances of Islām.

Political disagreement over succession to his office after the death (661) of ʿAlī, the fourth caliph and Muḥammad's son-in-law, propelled the Shīʿite imam along a separate course of development, as partisans of ʿAlī attempted to preserve leadership of the entire Muslim community among the descendants of ʿAlī. In Shīʿite Islām, the imam became a figure of absolute spiritual authority and fundamental importance. ʿAlī and the successive imams, who are believed by Shīʿism to be the sole possessors of secret insights into the Qur'ān given them by Muḥammad, under Neoplatonic influences of the 9th–10th centuries AD became viewed as men illumined by the Primeval Light, God, and as divinely appointed and preserved from sin. They alone, and not the general consensus of the community (*ijmāʿ*) essential to Sunnite Islām, determined matters of doctrinal importance and interpreted revelation. With the historical disappearance (*ghaybah*) of the last imam—there has been no consistency in the number legitimized: among the major sects, Sabʿīyah Ismāʿīlīs acknowledge 7 imams and Ithnā ʿAsharī (Twelvers) 12—there arose a belief in the hidden imam, who is identified with the *mahdī.*

Imam has also been used as an honorary title, applied to such figures as the caliph ʿAlī ibn Abī Ṭālib and the theologians Abū Ḥanīfah, ash-Shāfiʿī, Mālik ibn Anas, Aḥmad ibn Ḥanbal, al-Ghazālī, and Muḥammad ʿAbduh. The title imam also is sometimes given to the specially trained Muslims who lead prayers in the mosques.

Imam Bondjol, also called MUHAMMAD SAHAB, PETO SJARIF, MALIM BASA, TUANKU (Master) MUDA, TUANKU IMAM, or TUANKA IMAM BONDJOL (b. 1772, Kampung Tandjung Bunga, Sumatra [now in Indonesia]—d. Nov. 6, 1864, Manado, Celebes), Minangkabau religious leader, key member of the Padri faction in the religious Padri War, which divided the Minangkabau people of Sumatra in the 19th century.

When in about 1803 three pilgrims inspired by the ideas of the puritan Wahhābī sect returned from Mecca and launched a campaign to reform and purify Islām as practiced by the Minangkabau, Imam Bondjol, then known as Tuanku Muda, was an early and enthusiastic convert. In his home valley of Alahanpandjang, he established the fortified community of Bondjol, from which he took his name, as a centre for waging a "holy war" to spread the Padri doctrines. Civil war followed, with Imam Bondjol providing political and military leadership for the Padri community. Two issues were at stake: the internal struggle between extremist religious reformers and traditional secular leaders and an attempt by Minangkabau leaders to wrest their trade from foreign control.

In 1821 Dutch forces intervened, responding to a request for aid from the secular leaders but also seeking to cut off Minangkabau trade with the British at Benkulen (Bengkulu in modern Sumatra) and on Penang Island. The Java War (1825–30), however, diverted Dutch energies, and Imam Bondjol's forces expanded the area under their control. Their military success continued until 1831, when Dutch reinforcements turned the tide. In the following years the Dutch steadily cut into the Padri-controlled area and in 1837 captured Bondjol itself. Iman Bondjol escaped, but in October of that year he surrendered and was sent into exile. The fall of the Padris marked not only the end of the war but also the end of Minangkabau independence and the addition of their territory to the Dutch colonial holdings.

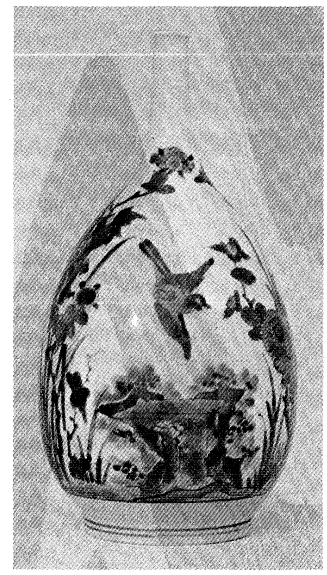
Imāmīs (Islām): *see* Ithnā ʿAsharīyah.

Imari, city, Saga *ken* (prefecture), Kyushu, Japan, facing Imari Bay. The two islands of Taka and Fuku form a natural mole, protecting the city's harbour. Imari was once a base for Japanese pirates. By the Tokugawa era (1603–1867) it had become the trade and shipping centre for the fine porcelain manufactured at Arita, 6 miles (10 km) south. Porcelain has since been produced at Okawachiyama, the southern part of Imari. The city also contains lumber, marine products, and petrochemical industries. Pop. (1985) 62,044.

Imari ware, also called ARITA WARE, Japanese porcelain made at the Arita kilns in Hizen province. Among the Arita porcelains are white glazed wares, pale gray-blue or gray-green glazed wares known as celadons, black wares, and blue-and-white wares with underglaze painting, as well as overglaze enamels. Following the late 16th-century expansion of glazed ceramic production, porcelain-like wares were introduced. Manufacture is said to date from 1616, when porcelain clays were discovered in Arita by Korean craftsmen under the master potter Ri Sampei (Yi Samp'yong). An advanced type of continuous step-chamber kiln, necessary for porcelain production, made it possible to achieve an efficient method of mass production.

Porcelain manufacturing soon became a major industry in the region, fostered by the protection and strict monopoly policies of the Saga fief. The wares were shipped throughout the country and widely exported from the port of Imari by the Dutch East India Company to other parts of the world. Sometime before 1800, porcelain production had finally spread to other parts of Japan.

In its formative period, Arita ware was affected by the impetus of Korean craftsmen



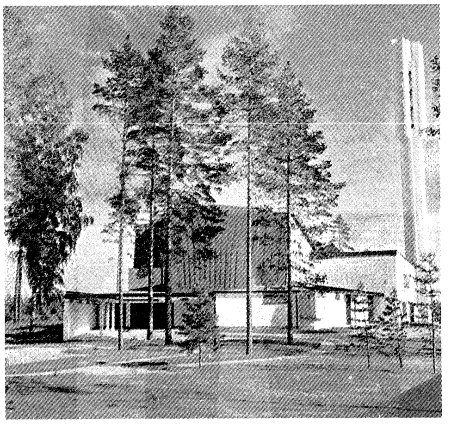
Imari blue-and-white ware sake bottle, Edo period (1603–1867); in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston, Hoyt Collection

and by the popularity of Chinese wares; but by the mid-17th century, native Japanese designs began to predominate, especially in the development of such overglaze enameled wares as Nabeshima, Kakiemon, and Old Imari.

Nabeshima ware first appeared in the late 17th century. It is characterized by pictorial decoration deriving from fabrics, the use of subjects favoured by the Kanō and Tosa schools of painting, and the employment of fashionable Edo-period decorative motifs. It is poised and highly refined, though sometimes rather lacking in vigour. Kakiemon, dating from the mid-17th century, was the first enameled ware to appear. Its designs are derived from the intimate, classical, purely Japanese style of painting known as Yamato-e. Old Imari, appearing in the 1640s, is perhaps the most striking for the sumptuousness of its ornamental colours and designs. Pictorial decoration generally covers the vessel completely. Purely decorative patterns deriving from fabric designs also appear, sometimes in combination with pictorial motifs.

Imatra, town, Kymi *lääni* (province), southeastern Finland, on the Vuoksi River (Russian Vuoksa), near the U.S.S.R. border, northeast of Lappeenranta. Imatra was formed in 1948 from parts of the communes of Ruokolahti, Joutssmo, and Jääski. The Imatra Rapids are



Vuoksenniska Church near Imatra, Fin.
Sylvie Nickels

3,225 feet (983 m) long and formerly descended approximately 60 feet (18 m). When a dam and power station was built there in the 1920s to provide electricity for southern Finland, including Helsinki and Turku, Imatra became an important industrial centre. The dam deprived the rapids of much of their force, but they remain a major tourist attraction. Industry in Imatra includes pulp and cellulose mills, lumber mills, and copper-extraction and chemical plants. Nearby is Vuoksenniska Church, designed by the 20th-century architect Alvar Aalto. Pop. (1986 est.) mun., 35,085.

Imbangala, also spelled MBANGALA, warrior group of central Angola in the early 17th century. The Imbangala, sometimes mistakenly identified with the Jaga, probably left the Lunda state of Shaba in the 15th century under a leader entitled *kinguri.* From their base in eastern Angola, they contacted the Portuguese on the coast in about 1563 and by the second decade of the 17th century had become allied to them in the slave trade. About 1618 the Imbangala established the kingdom of Kasanje between the Kwango and Kwanza rivers and became key intermediaries in the trade between the city of Luanda and the Lunda. Later an opponent of Portuguese penetration of the interior, Kasanje was finally overthrown militarily (1911–13).

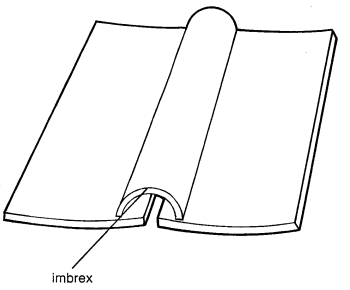
Imbe ware (Japanese pottery): *see* Bizen ware.

Imber, Naphtali Herz (b. 1856, Galicia—d. 1909, U.S.), itinerant Hebrew poet whose poem "Ha-Tiqva" ("The Hope"), set to music, was the official Zionist-movement anthem from 1933 and Israel's unofficial national anthem from 1948.

A collection of his poems, *Barkai* (1886; *Morning Star*), includes "Ha-Tiqva" and another popular Zionist song, "Mishmar ha-Yarden" ("The Watch on the Jordan").

Imbize, Jan van (Flemish Calvinist leader): *see* Hembyze, Jan van.

imbrex, plural IMBRICES, in ancient Greek and Roman architecture, a raised roofing tile used to cover the joint between the flat tiles. Used in a series, they formed continuous ridges over the aligned flat tiles.



Imbrex
From M.S. Briggs, *Everyman's Concise Encyclopaedia of Architecture,* E.P. Dutton & Co., Inc., and J.M. Dent & Sons Ltd.

Imbrices were generally of two types. In the more commonly used form, the tile was approximately semicircular; and in the monumental marble examples, the imbrex had vertical sides and an angular top. At the lower end of each row of imbrex tiles was an antefix, or decorative terminal.

Imbros (Turkey): *see* İmroz Adası.

IMCO: *see* International Maritime Organization.

Imerina (people): *see* Merina.

IMF: *see* International Monetary Fund.

Imhoff, Gustaaf Willem, baron van (b. Aug. 8, 1705, Leer, Neth.—d. Nov. 1, 1750, Batavia, Dutch East Indies [now Jakarta, Indonesia]), governor-general of the Dutch East Indies (1743–50), a reformer who tried in vain to restore the decaying Dutch East India Company to prosperity.

Son of a Dutch nobleman, van Imhoff went to the Indies in 1725 as a servant of the company. By 1732 he was a member of the chiefly advisory Council of the Indies and in 1736 became governor of Ceylon. Because of his opposition to the ruthless repression of a Chinese uprising, he was sent back (1740) to Holland, where the company's directors took his part, however, and made him governor-general of the Indies.

Van Imhoff's plan for reform was set forth in his tract "Considerations on the Present State of the Dutch East India Company." To encourage the development of the company as a territorial power, he wanted to confine its activities to the eastern part of the archipelago and to settle Dutchmen in colonies to raise crops and to trade. He eased the restrictions on free trade with Asia but not enough to make it profitable.

In his dealings with Indonesians van Imhoff was tactless. He intervened in a quarrel between the ruler of the Mataram kingdom of Java and his brother, thus touching off the Third Javanese War of Succession (1749–57), which left Mataram split into two kingdoms. In Bantam, another kingdom of Java, van Imhoff lent his support to the unpopular faction of a dynastic dispute, bringing on a popular uprising. The rebels were seeking English help when van Imhoff died, leaving his successor to solve the problem.

Imhotep, Greek IMOUTHES (fl. 27th century BC, Memphis, Egypt), vizier, sage, architect, astrologer, and chief minister to Djoser (reigned 2630–2611 BC), the second king of Egypt's third dynasty, who was later worshiped as the god of medicine in Egypt and in Greece, where he was identified with the Greek god of medicine Asclepius. Considered the designer of the first temple of Edfu, on the upper Nile, he is credited with initiating the Old Kingdom (*c.* 2575–*c.* 2130 BC) as the architect of the step pyramid built at the necropolis of Ṣaqqārah in the city of Memphis. The oldest extant monument of hewn stone known to the world, the pyramid consists of six steps and attains a height of 200 feet (61 m).

Although no contemporary account has been found that refers to Imhotep as a practicing physician, ancient documents illustrating Egyptian society and medicine during the Old Kingdom show that the chief magician of the pharaoh's court also frequently served as the nation's chief physician. Imhotep's reputation as the reigning genius of the time, his position in the court, his training as a scribe, and his becoming known as a medical demigod only 100 years after his death are strong indications that he must have been a physician of considerable skill.

Not until the Persian conquest of Egypt in 525 BC was Imhotep elevated to the position of a full deity, replacing Nefertum in the great triad of Memphis, shared with his mythological parents Ptah, the creator of the universe, and Sekhmet, the goddess of war and pestilence. Imhotep's cult reached its zenith during Greco-Roman times, when his temples in Memphis and on the island of Philae (Arabic: Jazirat Filah) in the Nile were often crowded with sufferers who prayed and slept there with the conviction that the god would reveal remedies to them in their dreams. The only Egyptian mortal besides the 18th-dynasty sage



Imhotep (reading a papyrus roll), detail of a sculpture; in the Egyptian Museum, Berlin
By courtesy of the Staatliche Museen zu Berlin, Agyptisches Museum

and minister Amenhotep to attain the honour of total deification, Imhotep is still held in esteem by physicians who, like the eminent 19th-century British practitioner Sir William Osler, consider him "the first figure of a physician to stand out clearly from the mists of antiquity."

BIBLIOGRAPHY. Jamieson B. Hurry, *Imhotep, the Vizier and Physician of King Zoser and Afterwards the Egyptian God of Medicine,* 2nd rev. ed. (1928, reprinted 1978), carefully examines the literary and archaeological sources on Imhotep.

imidazole, any of a class of organic compounds of the heterocyclic series characterized by a ring structure composed of three carbon

atoms and two nitrogen atoms at nonadjacent positions. The simplest member of the imidazole family is imidazole itself, a compound with molecular formula $C_3H_4N_2$.

Imidazole was first prepared in 1858. Other imidazole compounds have been known longer: allantoin (discovered in 1800) and parabanic acid were prepared in 1837 from uric acid. The amino acid histidine and its decomposition product histamine have the imidazole structure, as does biotin, a growth factor for both humans and yeast.

iminoglycinuria, inborn impairment of the transport system of the kidney tubules, which normally reabsorb the amino acids glycine, proline, and hydroxyproline. In young children in whom this transport system fails to develop, high urinary levels of glycine, proline, and hydroxyproline have sometimes been observed in conjunction with convulsions, high cerebrospinal fluid protein, and mental retardation. Other hereditary disorders affecting the transport of specific amino acids include the tryptophan malabsorption syndrome (or "blue diaper syndrome"), and the methionine malabsorption syndrome (or "oasthouse urine disease"). They are characterized by poor absorption of the amino acids tryptophan and methionine, respectively, from the small intestine. For other hereditary disorders of amino acid transport, *see also* cystinuria; Hartnup disease; de Toni-Fanconi syndrome.

imipramine, synthetic drug introduced into medicine in the 1960s, and considered among the most effective antidepressant drugs known. Imipramine was the first antidepressant drug of its kind (called tricyclic antidepressants because the molecular structure is based upon a system of three rings). It was studied as an antischizophrenic tranquillizer before its use to treat mental depression. It is usually administered orally but may be given by intramuscular injection.

Imipramine and closely related tricyclic antidepressant drugs are called dibenzazepines or dibenzazepine derivatives. Other dibenzazepines and derivatives in use are amitriptyline, desmethylimipramine (desipramine), nortriptyline, and protriptyline.

imitation, in psychology, the reproduction or performance of an act the stimulus for which is the perception of a similar act of another animal or person. Essentially, it involves a model to which the attention and response of the imitator are directed. As a descriptive term it covers a wide range of social adaptation. Observers of mammals in their native habitat report the duplication of the activities of the older by the younger members of the species, or of the young of each other in play.

Among human beings imitation has been used to describe a wide range of behaviours. It includes such everyday experiences as yawning when others yawn, as well as a whole host of unconsciously and passively learned reproductions of social conduct, and the deliberate adoption of the ideas and habits of others.

Studies of infants show that in the second half of the first year they imitate the expressive movements of those about them—for example, raising of the arms, smiling, and attempts at speech. In the second year they begin imitating other people's reactions to objects. As the child grows up, all kinds of models are set before him, most of them determined by his culture—physical posture, language, basic skills, prejudices and pleasures, and moral ideals and taboos. His copying these is determined chiefly by the manner in which his drives are socially and culturally directed and controlled in terms of reward and punishment.

The facts of imitation are well established. Uniformity or similarity of thoughts and acts among people does not necessarily mean, however, that these are caused by the same or similar psychological motives or mechanisms. Variations in situations, in drives, and in learned ways of adaptation are often too complicated to be easily explained as imitation.

Many earlier psychologists took it for granted that imitation was caused by an instinct or at least by an inherited predisposition. Later writers have viewed the mechanisms of imitation as those of social learning. It is usual, however, to distinguish between imitation caused by simple conditioned reflex, that caused by common trial-and-error learning, and that involving the higher thought processes. *See also* learning.

Imitation of Christ, Latin IMITATIO CHRISTI, a Christian devotional book written between 1390 and 1440. Although its authorship is a matter of controversy, the book is linked to the name of Thomas à Kempis. Whatever the identity of the author, he was a representative of the *devotio moderna* (*q.v.*) and its two offshoots, the Brethren of the Common Life and the Congregation of Windsheim.

The *Imitation of Christ* in part I gives "exhortations useful for spiritual living," in part II admonishes man to be concerned with the spiritual side of life rather than with the materialistic, and in part III affirms the comfort that results from being centred in Christ. Finally, in part IV it shows how an individual's faith has to be strengthened through the Eucharist, or Holy Communion.

The simplicity of the book's language and the direct appeal to the religious sensitivity of the individual in an uncomplicated way are perhaps the primary reasons why this little book has been so widely received and so deeply influential.

Imittós, Óros (Greece): see Hymettus, Mount.

Immaculate Conception, Roman Catholic dogma asserting that Mary, the mother of Jesus, was preserved free from the effects of the sin of Adam (usually referred to as "original sin") from the first instant of her conception. Although various texts in both the Old and the New Testaments have been cited in defense of the doctrine, it seems to have arisen from a general acceptance in the early church of Mary's holiness. Especially after Mary had been solemnly declared to be the mother of God at the Council of Ephesus in 431, most theologians doubted that one who had been so close to God could have actually experienced sinful acts.

The view that Mary had been spared also from the disposition to evil inherent in original sin was not clearly articulated until the 12th century, when considerable debate was centred on an English celebration of Mary's conception. The discussion was clouded by medieval views of the biological aspects of conception and by a concern that the belief in the universal redemption effected by Jesus should not be threatened. The latter concern (particularly associated with St. Thomas Aquinas in the 13th century) was countered not long after by the Franciscan theologian John Duns Scotus, who argued that Christ's redemptive grace was applied to Mary to prevent sin from reaching her soul and that this special intervention resulted in a more perfect redemption in her case. Mary's privilege, thus, was the result of God's grace and not of any intrinsic merit on her part. A gradual acceptance of the Franciscan's views over the next several centuries was reflected in the teaching of various popes (especially Sixtus IV in the late 15th century) and the councils of Basel (1439) and Trent (1546). It was not, however, until Dec. 8, 1854, that Pius IX, urged by the majority of Catholic bishops throughout the world, solemnly declared in the bull *Ineffabilis Deus* that the doctrine was revealed by God and hence was to be firmly believed as such by all Catholics. The feast of the Immaculate Conception is celebrated on December 8.

Immanuel (personal name): *see under* Emmanuel, or Manuel, except as below.

Immanuel Ben Solomon, also called MANOELLO GIUDEO (b. *c.* 1260—d. *c.* 1328), Hebrew poet who lived mainly in Rome, considered the founder of secular poetic writing in Hebrew. Probably a wandering teacher by profession, he was a prolific writer of Hebrew verse, sacred and secular (some of the latter being highly erotic), which he collected within a rough narrative framework in *Maḥbarot Immanuel* ("The Compositions of Immanuel"), frequently published from 1491. The last section of this work consists of a vision of heaven and hell in the style of Dante, composed immediately after the latter's death in 1321. As Manoello Giudeo (Immanuel the Jew), he was known also as a writer of Italian poetry, including an interchange of sonnets with Bosone da Gubbio on Dante's death. Immanuel also wrote philosophical commentaries on certain books of the Bible and introduced the sonnet form, thereafter very popular, into Hebrew.

immediate constituent analysis, also called IC ANALYSIS, in linguistics, a system of grammatical analysis that divides sentences into successive layers, or constituents, until, in the final layer, each constituent consists of only a word or meaningful part of a word. (A constituent is any word or construction that enters into some larger construction.) In the sentence "The old man ran away," the first division into immediate constituents would be between "the old man" and "ran away." The immediate constituents of "the old man" are "the" and "old man." At the next level "old man" is divided into "old" and "man." The term was introduced by the United States linguist Leonard Bloomfield in 1933, though the underlying principle is common both to the traditional practice of parsing and to many modern systems of grammatical analysis.

Immermann, Karl Leberecht (b. April 24, 1796, Magdeburg, Saxony—d. Aug. 25, 1840, Düsseldorf, Prussia), dramatist and novelist whose works included two forerunners in German literary history: *Die Epigonen* as a novel of the contemporary social scene and *Der Oberhof* as a realistic story of village life.

The son of a civil servant, Immermann interrupted his legal studies in Halle (1813–17) to fight in the last phase of the Napoleonic Wars. While working in the military court in Münster (1819–24), he fell in love with Elisa von Lützow, the wife of the Prussian general Adolf, Freiherr von Lützow. Their passionate love affair ended 14 years after the Lützow



Immermann, engraving by Franz Stüber, after a painting by Karl Friedrich Lessing

By courtesy of the Staatsbibliothek, Berlin

divorce (1825) because Elisa unwaveringly refused to enter upon a second marriage. At the beginning of 1824, Immermann became judge in the criminal court at Magdeburg, moving to the provincial court at Düsseldorf three years

later. In Düsseldorf he designed and built a "model" theatre where, in accordance with Goethe's theories, he especially cultivated ensemble. In 1839 Immermann was married to the 20-year-old Marianne Niemeyer, and the new life and new happiness that his marriage gave him found expression in his epic *Tristan und Isolde,* which was left unfinished at his death.

Immermann's writing is deeply marked by the transitional nature of his time. He was an eyewitness of the decline of the old aristocracy, the rise of the bourgeoisie, and the spread of industrialism and liberalism. His dramatic works include *Das Trauerspiel in Tyrol* (1828; remodeled in 1835 as *Andreas Hofer*); *Merlin* (1832); the trilogy *Alexis* (1832); and the comic epic *Tulifäntchen* (1830), a witty parody of the decline of the nobility and of romantic chivalry. Immermann's novels, however, with their acute diagnosis of the period, are more important than his plays. *Die Epigonen* (1836) gives a cross section of the society of his own period, deploring both the nobility's decay and the dangers posed by radicalism and money-worship. The convoluted tale is a pessimistic picture of society on the brink of a painful adjustment to industrialized mass society. The novel *Münchhausen* (1838–39) consists of two parts: a highly satirical and ludicrous portrayal of an idle and mendacious aristocrat, and a solidly visualized portrayal of peasants rooted in their work and in their countryside. In this latter section Immermann glorifies the sturdy respectability of the peasantry, in whom he saw the strength of the German national heritage and the means for its regeneration.

immersed tube, also called SUNKEN TUBE, technique of underwater tunneling used principally for underwater crossings. The method was pioneered by the American engineer W.J. Wilgus in the Detroit River in 1903 for the Michigan Central Railroad. Wilgus dredged a trench in the riverbed, floated segments of steel tube into position, and sank them; the segments were locked together by divers and pumped out and could then be covered with excavated material. Though the technique has been refined since, it remains basically the same and has been used for many underwater tunnels all over the world.

immersion foot, also called TRENCH FOOT, a painful disorder of the foot involving damage to the skin, nerves, and muscle that is caused by prolonged exposure to cold dampness or by prolonged immersion in cold water. *See* frostbite.

Immigration Restriction Act (1901), in Australian history, fundamental legislation of the new Commonwealth of Australia that effectively stopped all non-European immigration into the country and that contributed to the development of a racially insulated white society. Representing a widespread sentiment in all of the Australian colonies, the desire for a coordinated immigration bar against nonwhites was a primary spur in the 1890s toward Australian federation. Thus, the act was among the first pieces of commonwealth legislation enacted. It was directed primarily against Asians, who, because of Europeans' experience with influxes of Chinese labourers, were thought to be unassimilable and a threat to the European standard of living. The act practically excluded Africans as well. The essential clause of the act, rather than naming particular races or groups for exclusion, provided for a dictation test in a European language to be administered to prospective immigrants; an East Indian with a knowledge of English could be given a test in French, German, or, if need be, Lithuanian.

While still in effect, the Immigration Restriction Act has undergone considerable revision since World War II, and between 1947 and 1981 the number of persons in Australia of non-European descent more than doubled. In the late 20th century about 40 percent of all new immigrants to Australia were Asians.

immortality, in philosophy and religion, the continuity of human spiritual existence after the death of the body. The concept of immortality is to be distinguished from that of bodily resurrection.

The earlier anthropologists, such as Sir E.B. Tylor and Sir James Frazer, assembled convincing evidence that the belief in a future life was widespread in the regions of primitive culture. Among most peoples the belief has continued through the centuries. But the nature of future existence has been conceived in very different ways. As Tylor showed, in the earliest known times there was little, often no, ethical relation between conduct on earth and the life beyond. M. Jastrow wrote of "the almost complete absence of all ethical considerations in connection with the dead" in ancient Babylonia and Assyria.

In some regions and early religious traditions it came to be declared that warriors who died in battle went to a place of happiness. Later, there was a general development of the ethical idea that the afterlife would be one of rewards and punishments for conduct on earth. So in ancient Egypt at death the individual was represented as coming before judges as to that conduct. The Persian followers of Zoroaster accepted the notion of Chinvat, a bridge to be crossed after death, broad for the righteous, narrow for the wicked, who fell from it into hell. In India the steps upward—or downward—in the series of future incarnated lives have been (and still are) regarded as consequences of conduct and attitudes in the present life. The idea of future rewards and punishments dominated many Christians in the European Middle Ages and is held today by many Christians of all denominations. In contrast, many secular thinkers maintain that the morally good is to be sought for itself, and evil shunned on its own account, irrespective of any belief in a future life.

That the belief in immortality has been widespread through history is no proof of its truth. It may be a superstition that arose from dreams or other natural experiences. Thus, the question of its validity has been raised philosophically from the earliest times that people began to engage in intelligent reflection. In the Hindu *Kaṭha Upaniṣad,* Naciketas says: "This doubt there is about a man departed—some say: He is; some: He does not exist. Of this would I know." The *Upaniṣads,* the basis of most philosophy in India, are predominantly a discussion of the nature of man and his ultimate destiny. Immortality was also one of the chief problems of Plato's thought. With the contention that reality, as such, is fundamentally spiritual, he tried to prove immortality, maintaining that nothing could destroy the soul. Aristotle conceived of reason as eternal but did not defend personal immortality, as he thought the soul could not exist disembodied. The Epicureans, from a materialistic standpoint, held that there is no consciousness after death, and thus it is not to be feared. The Stoics mostly considered that it is the rational universe as a whole that persists. Individual men, as the Roman emperor Marcus Aurelius wrote, simply have their allotted periods in the drama of existence. However, the Roman orator Cicero finally accepted personal immortality. The Christian St. Augustine, following Neoplatonism, regarded human beings' souls as being in essence eternal.

The Muslim philosopher Avicenna declared the soul immortal, but his coreligionist Averroës, keeping closer to Aristotle, accepted the eternity only of universal reason. Albertus Magnus defended immortality on the ground that the soul, in itself a cause, is an independent reality. Johannes Scotus Erigena contended that personal immortality cannot be proved or disproved by reason. Benedict de Spinoza, taking God as ultimate reality, as a whole maintained his eternity, but not the immortality of individual persons within him. The German philosopher Gottfried Wilhelm Leibniz contended that reality is constituted of spiritual monads. Human beings, as finite monads, not capable of origination by composition, are created by God. He could also annihilate them. However, in that he has planted in men a striving for spiritual perfection, there may be faith that he will ensure their continued existence, thus giving them the possibility to achieve it.

The German metaphysician Immanuel Kant, admitting that the soul cannot cease by disintegration, suggested that it might end by the loss of its own power. Immortality cannot be demonstrated by pure reason, but it may be believed as a postulate of morality. Holiness, "the perfect accordance of the will with the moral law," demands endless progress "only possible on the supposition of an endless duration of the existence and personality of the same rational being (which is called the immortality of the soul)." Joseph Butler, insisting that probability is the guide to life, urged, on ethical grounds similar to those of Kant, that immortality should be accepted as probable. G.W.F. Hegel's philosophy has been interpreted by some as pointing to a cessation of finite individualities in the absolute, and by others as pointing to their persistence as constituents of the absolute. Arthur Schopenhauer conceived ultimate redemption from the misery of life as a lapse from conscious personality into the unconscious universal will.

During the 20th century, the concept of immortality waned as a philosophical preoccupation.

immovable (legal concept): *see* movable and immovable.

immunity, in biology, ability of an organism to resist attack by antigens (invasive foreign bodies). The concept also encompasses the body's response to any foreign macromolecule that invades or is introduced into its tissues.

A brief treatment of immunity follows. For full treatment, *see* MACROPAEDIA: Immunity.

Each animal and plant has a natural immunity, peculiar to a species or wider group, that is dependent upon the chemistry of its tissues. Natural immunity is based on physical barriers, such as skin and mucous membranes, and biological processes. Body secretions, such as those of sebaceous and sweat glands, urine, stomach acid, bile salts, and bile acids, all contain proteins that inhibit or destroy invading microorganisms. Lysozyme, for example, is an antibacterial agent found in tears.

If these nonspecific natural barriers are penetrated, a sequence of responses by cells and tissues of the immune system produce recognizable changes to body tissues. Granulocytes, or polymorphonuclear leukocytes, immediately flood the area of infection, phagocytizing (consuming by engulfing and destroying) the invading microbes. Macrophages, which are found in an intermediate stage called monocytes in the circulation, also move to the region and also begin to phagocytize the microbes. The result is inflammation, redness, swelling, and pus (collection of fluid, dead cells, and microorganisms). This immune response, while local, may develop into a systemic response, in which there is a general increase in white blood cells and often fever. Natural immunity does not confer lasting resistance, or immunity, to the body.

If a natural immune response is insufficient to stem further invasion by microbes, a second level of immune response (called acquired, or adaptive, immunity) is initiated by the interaction of sensitized macrophages and lympho-

cytes. The purpose of acquired immunity is to stimulate the formation of antibodies, conferring short- or long-term immunity to further infection. Antibodies, among other things, increase the degree of phagocytosis taking place, neutralize microbial toxins and viruses, and form complexes with activated complement to cause the lysis (disintegration or dissolution) of invading microbes. Such immunity can be long-lasting (as with measles) or short-lived (as with influenza).

Among the principal components of the immune system are lymphocytes, which are white blood cells produced in the bone marrow and circulated in the blood to the lymphoid tissues and organs, mainly the lymph nodes, spleen, and tonsils. They give the body its capacity to respond to a virtually limitless range of antigens. One type is the B lymphocyte, or B cell. When stimulated by an appropriate antigen, a B cell rapidly reproduces, forming a group (clone) of identical cells that all generate a particular antibody (also called immunoglobulin) designed to neutralize the triggering antigen. The antibody is circulated in the humours, or body fluids, giving the type of protection called humoral immunity. T cells, which are processed in the thymus before proceeding to the lymphoid tissue, do not produce antibodies. Instead, they attack the antigens directly, providing what is called cell-mediated immunity. Specialized T cells also regulate the action of B cells. Other white blood cells, called macrophages, act nonspecifically, enhancing the ability of antigens to stimulate the lymphocytes and engulfing and eliminating the antigens themselves. In addition, a system of proteins called complement, present in the blood, works in combination with antibodies to destroy antigens.

T cells also recognize and destroy foreign tissue grafts, unless they have been carefully matched with those of the recipient. It is also possible that they monitor the appearance of cancer cells and eliminate them.

Immunity may be either passive or active. Passive immunity is a temporary phenomenon because the immune system is not stimulated and antibodies are present for only a short time. Passive immunity may be conferred, for example, by a mother to her fetus through the placental wall, or to an infant with the mother's first milk (colostrum). Active immunity substantially stimulates the immune system through the production of antibodies and lymphocytes. Active immunity is conferred through immunization or after being exposed to, and infected with, a disease-causing pathogen.

The body's immunological machinery does not usually attack its own constituents. If the normal constraints on the body attacking its own tissues fail, the result will be an autoimmune disease such as rheumatoid arthritis. Other types of failure make the body unduly prone to infection. Until the early 1980s, the best-known of these diseases was a rare malaise known as hypogammaglobulinemia, in which antibodies are produced in inadequate quantities or not at all. Since that time, acquired immune deficiency syndrome (AIDS) has become the leading disease of the immune system.

See also antibody; antigen; immunization.

immunity, in law, exemption or freedom from liability. In England and the United States a legislator is immune from civil liability for statements made during legislative debate. He is also immune from criminal arrest, although he is subject to legal action for crime. French law and practice prohibits the arrest of a member of the legislature during a session without authorization by his chamber. This practice prevails in many European and other nations (*e.g.,* Belgium, Switzerland, Italy, Spain, and Japan).

Under international treaty, a diplomatic representative is exempt from local jurisdiction, both civil and criminal. This immunity extends to his places of office and residence.

A public prosecutor may grant immunity from prosecution to a witness who is suspected of criminal activity in return for his aid in testifying against other suspected criminals. In U.S. law, there are two types of criminal immunity—use immunity and transactional immunity. Transactional immunity, when granted, means that the recipient may not be prosecuted for any aspect of the criminal act in which he was involved. Use immunity means only that the testimony of the immunized person, given in return for immunization, may not be used against that person or coconspirators in a criminal act unknown to the prosecutor prior to the granting of immunity.

immunization, process of acquiring or inducing resistance to infection in a human, animal, or plant. The fundamental purpose of immunization is to initiate the production of antibodies. (An antibody is a protein molecule that recognizes and binds to specific receptors on the surface of an invasive antigen, a foreign complex macromolecule able to recognize and bind with an antibody specific for its surface receptor sites.) The antibody–antigen interaction takes place in the blood, in the extracellular fluid, at mucosal surfaces, or in viruses, before initial intracellular penetration or before the virus moves from the entry site to the target tissue. This interaction causes either the modulation or the destruction of the antigen. Immunization may also initiate the mobilization of lymphocytes and macrophages in a process called cellular immune response (or immunity).

Immunization may be either passive or active. In passive immunization a susceptible individual is given a vaccine that contains preformed sensitized serum collected from previously infected or immunized individuals or animals. Passive immunity imparts immediate protection during the period required for antibodies to be formed after active immunization. Natural passive immunization is acquired by human fetuses from their mothers through the placenta and confers immunity to many common infections for a period of several months. The mother's first milk (colostrum) also contains antibodies and thus serves the same function for the newborn.

Active immunization (also called vaccination) induces specific immunity to a particular antigen. Naturally acquired active immunization results from infection by a disease. An individual who recovers from the first attack of the disease may henceforth be immune to it because of the natural development of antibodies that specifically recognize and neutralize the disease-causing microorganism. Artificially induced active immunization, or vaccination, consists in introducing antigenically active but weakened microorganisms or their metabolic by-products (toxins) into the body that will trigger antibody production but will not make the individual seriously ill. The British physician Edward Jenner clearly established the principle of vaccination in 1796, although vaccination was used before that time. He made use of a rare case in which immunity against one virus (cowpox) does protect that individual against another viral disease (smallpox). This was the first documented case of a vaccine employed against specific diseases.

Vaccines used in active immunization are of two types. The first uses structural components of the antigen to induce antibody formation and prevent infection. Such a vaccine contains either living, attenuated (weakened) antigen or killed antigen. Vaccines containing live, attenuated antigen are generally better at fighting infection. The second vaccine type uses detoxified toxins from the antigen to induce the formation of antitoxins; it prevents illness without actually inhibiting the antigen. Active immunization, to be effective, should be performed before exposure to the antigen to permit the incubation period required to produce antibodies. Active immunization is long-lasting and may be reactivated quickly by a later recurrence of the same infection or by revaccination. *See also* antibody; antigen; vaccine.

immunoglobulin: *see* antibody.

immunology, the scientific study of the body's resistance to invasion by other organisms (*i.e.,* immunity). In a medical sense, immunology deals with the body's system of defense against disease-causing microorganisms and with disorders in that system's functioning. The artificial induction of immunity against disease has been known in the West at least since Edward Jenner used cowpox injections to protect people from smallpox in 1796. But the scientific basis for immunology was not established until a century later, when it was recognized that: (1) proliferating microorganisms in the body cause many infectious diseases and (2) the body has certain chemical and cellular components that recognize and destroy foreign substances (antigens) within the body. This new understanding led to highly successful techniques of immunization (*q.v.*) that could mobilize and stimulate the body's natural defenses against infectious disease.

It was only in the 20th century, however, that a comprehensive understanding was gained of the formation, mobilization, action, and interaction of antibodies and antigen-reactive lymphocytes, which are the two main active elements of the immune system. Modern immunology, besides using such basic techniques as vaccination, has become increasingly selective and sophisticated in its manipulation of the body's immune system through drugs and other agents in efforts to achieve a desired therapeutic goal. Immunologic understanding is crucial to the treatment of allergies which are themselves hypersensitive reactions by the body's immune system to the presence of harmless antigens such as pollen grains. Immunosuppressive techniques use drugs to suppress the immune system's tendency to reject and attack antigenic bone grafts and organ transplants that have been medically introduced into the host tissue. Immunology also encompasses the increasingly important study of autoimmune diseases, in which the body's immune system attacks some constituent of its own tissues as if it were a foreign body.

Imo, state, east-central Nigeria, created in 1976 from the southern half of former East-Central state, which was part of the former Eastern Region prior to 1967. With an area of 4,575 square miles (11,850 square km), it is bordered by the states of Anambra to the north, Rivers to the south, Akwa Ibom and Cross River to the east, and Bendel to the west. The British first entered the territory in 1901 when they established a military post in the region. Imo includes areas of oil-palm bush in most of the southern part and tropical rain forest in the eastern part. About three-fourths of the population is engaged in agriculture; yams, taro, corn (maize), rice, and cassava are the staple crops. Oil palm, rubber, and cocoa are the main cash crops. Imo is one of the chief onshore oil-producing areas in the country; other mineral resources include iron ore, coal, lead, zinc, and natural gas.

Owerri, the state capital, is an industrial and educational centre. It manufactures beverages, galvanized sheet-iron, leather products, and soap and is the seat of the New (Federal) University of Imo and the Alvan Ikoku College. The state's chief industrial centre is Aba, on the railway north from Port Harcourt,

where textiles, pharmaceuticals, soap, plastics, cement, footware, and cosmetics are manufactured. Umuahia has a palm oil processing plant and several breweries. The Oguta Lake, developed as a recreation area in the early 1980s, is a major tourist attraction. Imo State is mainly inhabited by the Ibo people and is one of the most densely populated areas in Nigeria. The main highway network serves Owerri, Aba, Umuahia, and Okigwi. Pop. (1983 est.) 6,004,900.

IMO: *see* International Maritime Organization.

Imola, town and episcopal see, Bologna province, Emilia-Romagna region, northern Italy, on the Santerno River, southeast of Bologna. Its Forum Cornelii was a station on the Roman road Via Aemilia; it was devastated in the 6th century by the Byzantine emperor Justinian but rebuilt and fortified by the Lombards. An independent commune from 1084, it was ruled by a succession of lords from the 13th century until it was taken by Cesare Borgia in 1499 and incorporated with the Papal States.

Notable landmarks include the medieval citadel; the 15th-century Sersanti, Calderini, and Della Volpe palaces; the church of S. Domenico with a Gothic portal of 1430; and the Romanesque cathedral of S. Cassiano (rebuilt 18th century). It has a notable museum and a library with a fine collection of incunabula and manuscripts. Lying on the main railway from Bologna to Bari, Imola is an industrial centre and produces pottery, glassware, agricultural machinery, and natural gas. Fruit, especially strawberries, is cultivated in the environs. Pop. (1984 est.) mun., 61,169.

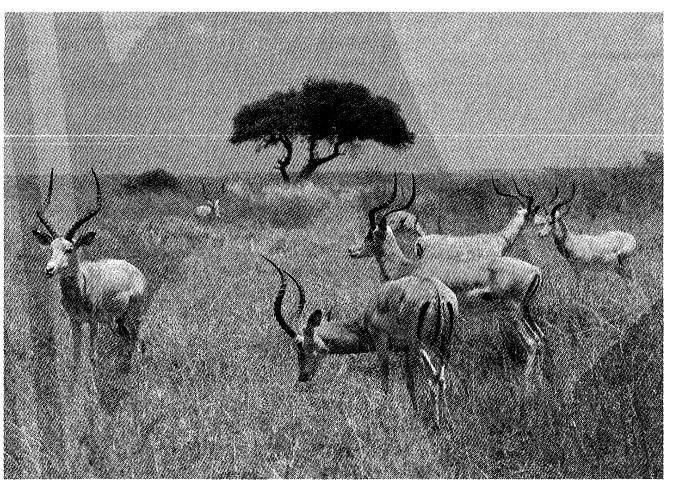
imou pine: *see* rimu.

Imouthes (Egyptian vizier): *see* Imhotep.

impact (physics): *see* collision.

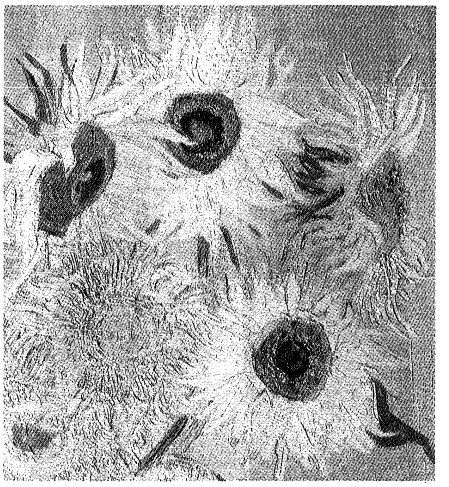
impala (*Aepyceros melampus*), swift-running antelope, family Bovidae (order Artiodactyla), found in large herds, usually near water, on the savannas and open woodlands of central and southern Africa.

The impalas are noted for their grace and their ability to jump; when alarmed, they bound off in leaps up to 9 metres (30 feet) in length and 3 m high. A lightly built animal, the impala stands 75–100 centimetres (29½–39 inches) at the shoulder. It has a golden to reddish brown coat, white underparts, a vertical black stripe on each thigh, and a black tuft behind each hind hoof. The male has long, lyre-shaped horns.



Herd of male impalas (*Aepyceros melampus*) in Nairobi National Park, Kenya
James P. Rowan

impasto, paint that is applied to a canvas or panel in quantities that make it stand out from the surface. Impasto was used frequently to mimic the broken-textured quality of highlights, *i.e.,* the surfaces of objects that are struck by an intense light. Impasto came into its own in the 17th century, when such Baroque painters as Rembrandt, Hals, and Velázquez used skillfully and minutely worked impastos to depict lined and wrinkled skin or the sparkle of elaborately crafted armour, jewelry, and rich fabrics. The 19th-century painter Vincent van Gogh made notable use of impastos, building up and defining the forms in his paintings with thick, nervous dabs of paint. Twentieth-century painters such as Jackson Pollock and Willem de Kooning often applied impastos with a dynamism and a gestural bravura that emphasized the physical qualities of the paint itself. Since then, raw pigments applied thickly to a canvas have become a staple technique of modern abstract and semi-figurative painting.



Detail of "Sunflowers," oil painting by Vincent van Gogh, 1888, in which the artist used the impasto technique; in the Neue Pinakothek, Munich
SCALA/Art Resource, N.Y.

Impatiens, large genus of herbaceous plants, belonging to the balsam family (Balsaminaceae), that are widely distributed in Asia, Africa, and North America. Some are regarded as weeds but others are popular garden plants. The name, meaning "impatient," refers to the readiness with which the plants' seeds are dispersed. The ripe seedpod bursts upon slight pressure, thus scattering the seeds.

Impatiens' simple leaves are usually alternate, the upper ones often being whorled (*i.e.,* three or more arising in a circle from the stem). The flowers, which may be purple, yellow, pink, or white, are irregular in shape and arise from the leaf axils; they may be solitary or in small clusters.

Impatiens balsamina, the garden balsam, is native to the tropics of Asia but has long been cultivated in temperate regions of the world. In its many horticultural forms it is one of the showiest of garden flowers and is relatively easy to cultivate. *I. biflora, I. nolitangere,* and *I. pallida,* all known variously as touch-me-not, snapweed, and jewelweed, are common weeds native to extensive regions of eastern North America.



Impatiens capensis
S. Rannels—Grant Heilman Photography

Impatiens balsamina, an annual that grows about 75 centimetres (30 inches) in height, has flowers of almost every colour except blue. *I. biflora,* which grows 60–90 cm tall, is an annual with orange, brown-spotted flowers. *I. capensis,* which grows 120–150 cm tall, is an annual with orange, red-spotted flowers. *I. pallida* closely resembles *I. capensis* but has larger, yellower flowers.

impeachment, in common law, a criminal proceeding instituted against a public official by a legislative body. In Great Britain the House of Commons serves as prosecutor and the House of Lords as judge in an impeachment proceeding. In the federal government of the United States the House of Representatives institutes the impeachment proceedings, and the Senate acts as judge. In Great Britain conviction on an impeachment has resulted in fine and imprisonment, and even in execution, whereas in the United States the penalties extend no further than removal and disqualification from office.

Impeachment originated in the 14th century, when it became a means of initiating criminal proceedings based on "clamour," or outcry. The Good Parliament of 1376 produced the first recognized cases of impeachment, the most important being that of William, 4th Baron Latimer, who had been closely associated with the government of Edward III. Subsequent subjects of impeachment have often been political figures, usually royal ministers. Latimer's case also marks the point at which impeachment became not merely a means of initiating criminal proceedings but also a method of trial.

After the mid-15th century, impeachment fell out of use until the 17th century, when it was revived as a means by which Parliament could get rid of unpopular ministers, usually court favourites protected by the king. From 1621 until 1679, many of the chief officers of the crown were brought down or at least jeopardized by this powerful parliamentary weapon, among them the Duke of Buckingham (1626), Archbishop William Laud (1642), the Earl of

Strafford (1640), the Earl of Clarendon (1667), and Thomas Osborne, earl of Danby (1678). In the last case it was decided that the king's power to pardon could not stop an impeachment against his minister.

The use of impeachment gradually waned after this time, and, by the end of the 18th century, it was believed that impeachment was too blunt as a political instrument and that there was no longer a need for a criminal process against a royal minister that the king could not stop. There have been no impeachment proceedings in Britain since 1806.

In the United States the impeachment process has rarely been employed. The most famous case of its use is that against Andrew Johnson, the only president ever impeached, who was charged with attempting to remove, contrary to statute, the secretary of war, Edwin M. Stanton, with inducing a general of the army to violate an act of Congress, and with contempt of Congress. Johnson was acquitted by a margin of a single vote. In 1974 the Judiciary Committee of the House of Representatives voted three articles of impeachment against Pres. Richard M. Nixon, but Nixon resigned before impeachment proceedings in the full House could begin.

Every state except Oregon provides for the removal of executive and judicial officers by impeachment. Exact procedures vary somewhat from state to state, but they are all similar to federal impeachment.

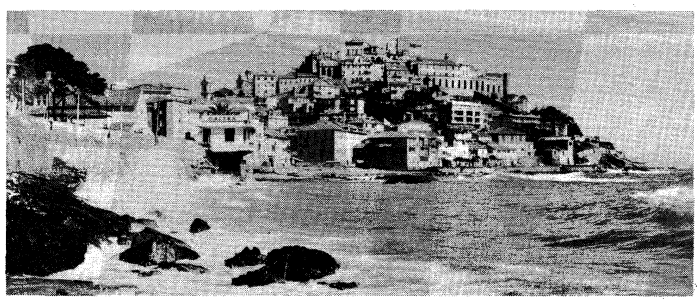
impedance, acoustic (physics): *see* acoustic impedance.

impedance, electrical: *see* electrical impedance.

Imperia, capital of Imperia province, Liguria region, northwestern Italy, on that part of the Riviera di Ponente known as the Riviera dei Fiori, east of San Remo. Formed in 1923 by the union of Porto Maurizio, Oneglia, and several villages, it took its name from the Torrente Impero (Impero Stream) that crosses the town. Porto Maurizio, once a Roman port, became the seat of a Genoese vicar in 1276 and, with Genoa, fell to the French in 1797. Joined to the Kingdom of Sardinia in 1814, it was made a provincial capital in 1860. Oneglia originated in 935 from a Roman coastal castle, Castelvecchio, and was a tenure of the Albenga episcopacy from 1100. Sold to the Doria family in 1298, it passed to the House of Savoy in 1576 and was captured by France in 1792. Passing to Piedmont in 1814, it was a provincial capital until 1859.

The Neoclassical cathedral of S. Maurizio (1779–81) is notable, as are the province building (1910) and city hall (1932).

An industrial and commercial centre and port on the Genoa–Ventimiglia–Nice railway and road, the town is noted for the production and export of olive oil and flowers. Tourism and the manufacture of spaghetti, perfume, drugs, and cement are also important. Pop. (1983 est.) mun., 41,435.



Imperia, Italy

G. Barone—SCALA, from Art Resource/EB Inc.

Imperial Chemical Industries PLC (ICI), giant British corporation founded in 1926 as Imperial Chemical Industries Ltd. to amalgamate four major British chemical companies: Brunner, Mond & Co. Ltd., Nobel Industries Ltd., United Alkali Company Ltd., and British Dyestuffs Corporation Ltd. As an ICI founder declared, this British chemical dominion was to secure the chemical independence of the British Empire. Between World Wars I and II, ICI was a major competitor of Germany's IG Farben, the cartel formed the year before (and dissolved by the Allies after World War II). By the late 1970s, ICI ranked below all three successors to IG Farben (Hoechst, BASF, and Bayer corporations) in terms of sales but was still the largest chemical concern in the United Kingdom. ICI re-registered as a public limited company in 1981. Headquarters are in London.

ICI has more than 500 subsidiaries and associated companies in the United Kingdom, elsewhere in Europe, and in Asia, Africa, North and South America, and Australia. The constituent companies in 1926 produced chemicals, dyes, explosives, fertilizers, fibres, nonferrous metals, and paints; the group now also produces a wider range of chemicals, pharmaceuticals, synthetic fibres (especially polyesters and nylon), and plastics. ICI also has interests in the Nimian Oil Field in the British North Sea.

imperial city, also called FREE IMPERIAL CITY, German REICHSSTADT, or FREIE REICHSSTADT, any of the cities and towns of the Holy Roman Empire that were subject only to the authority of the emperor, or German king, on whose demesne (personal estate) the earliest of them originated. The term *freie Reichsstadt,* or Free Imperial City, was sometimes used interchangeably with *Reichsstadt* but was rightly applied to only seven cities—Basel, Strasbourg (Strassburg), Speyer, Worms, Mainz, Cologne, and Regensburg—which had won independence.

In the Middle Ages many other places won the coveted position of *Reichsstadt.* Some gained the status by gift and others by purchase; some won it by force of arms, others usurped it during times of anarchy. There were many more free towns in southern than in northern Germany. Some free towns fell into the hands of various princes of the empire, and others placed themselves voluntarily under such protection. Mainz was conquered and subjected to the archbishop in 1462. Some towns, such as Trier, declined independence because of the inescapable financial burdens. When Trier later tried to reassert its position as an imperial city, the Emperor in 1580 assigned the city explicity to the archbishop. Similarly Donauwörth in 1607 was handed over to Bavaria by the Emperor's judgment. Other towns were separated from the empire by conquest. Besançon passed into the possession of Spain in 1648; Basel had already thrown in its lot with the Swiss Confederation, while Strasbourg, Colmar, Haguenau, and other free towns were seized by Louis XIV.

Meanwhile the free towns had been winning valuable privileges in addition to those they already possessed, and the more wealthy among them, such as Lübeck, Nürnberg, and Augsburg, were practically *imperia in imperio,* waging war and making peace, and ruling their people without any outside interference. But they had also learned that union is strength. They formed alliances among themselves, both for offense and for defense, and these *Städtebünde* had an important influence on the course of German history from the 13th to the 15th century. The right of the free towns to be represented in the imperial diet was formally recognized in 1489 at the diet of Frankfurt, and about the same time they divided themselves into two groups, or benches, the Rhenish and the Swabian. By the Peace of Westphalia in 1648 they were formally constituted as the third college of the diet and later as the third estate of the empire. A list drawn up in 1422 mentions 75 free cities, and another drawn up in 1521 mentions 84, but at the time of the French Revolution in 1789 the number had decreased to 51.

During the Napoleonic era the number of *Reichsstädte* was radically reduced. When the German Confederation was established in 1815, only Hamburg, Lübeck, Bremen, and Frankfurt were recognized as free cities, and the first three continued to hold that position in the later German Empire; but after the war of 1866 Frankfurt am Main was forcibly incorporated in the newly formed Hesse-Nassau province of Prussia. Hitler incorporated Lübeck in the Prussian province (after 1946 the *Land*) of Schleswig-Holstein in 1937; only Hamburg and Bremen survive as independent entities.

Articles are alphabetized word by word, not letter by letter

Imperial Crown, also called CROWN OF CHARLEMAGNE, crown created in the 10th century for coronations of the Holy Roman emperors. Although made for Otto the Great (912–973), it was named for Charlemagne, the first Holy Roman emperor.

The crown is made of eight round-topped plaques of gold hinged together and kept rigid by an interior ring of iron; it is decorated with jewels and enamel in the Byzantine style. It was designed to surmount or incorporate a mitre, which was worn with the points at the



Imperial Crown of the Holy Roman Empire, 10th century; in the treasury of Hofburg palace, Vienna

Lessing-Magnum

sides, and therefore is crossed only by a single arch, from front to back. In the 11th century the present arch, with its cresting of small round-topped plaques, replaced the original, and a jeweled cross, meant originally to hang upon the breast, was fastened to the front plate of the crown. The rim was adorned with side pendants that have been lost.

Another crown, more in keeping with Renaissance taste, was made for the emperor in 1602. It incorporates the imperial mitre in the form of two plates of gold, which rise up within the circlet on each side of the central arch and curve in toward it, giving the crown the appearance of a helmet or kamelaukion. Both crowns are preserved in the national treasury in Vienna.

Imperial Group, PLC, leading British manufacturer of tobacco products, including Player and Embassy cigarettes, Wilson's snuff, and several brands of cigars. Its other products included beer, prepared foods, and packaging. Corporate headquarters are in London.

The company was founded as the Imperial Tobacco Company in 1901 by a consortium of British tobacco manufacturers seeking strength through unity following an attempt by James Buchanan Duke of the American Tobacco Company to take over the British tobacco industry. Tobacco long dominated the company's product line, contributing 90 percent of its profits as recently as 1968. After that time the company diversified, and the word "tobacco" was dropped from the corporate name in 1973 to reflect the changes. The company reregistered as a public limited company in 1981, the year that it assumed the name Imperial Group. In 1986 Imperial Group was purchased by Hanson Trust PLC, a diversified manufacturer, of which it became a subsidiary. Imperial also produced and distributed a number of food products.

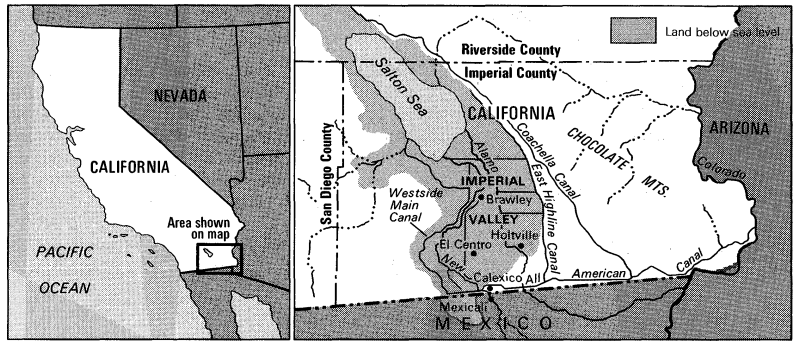
imperial preference, commercial arrangement in which preferential rates (*i.e.*, rates below the general level of the tariff) are granted to one another by the constituent units of an empire. It may also include other sorts of preference, such as favourable consideration in the allocation of public contracts, indirect subsidies to shipping, and preferential access to the capital market. Such arrangements were enforced in the first half of the 20th century by most countries with dependent colonies; of these, the British imperial preference introduced in 1932 may be considered as the most important.

With a radical change in tariff policy in 1931 and 1932, Great Britain removed the ban on the taxation of food imports, opening the way for a systematic policy of imperial preference. Such a policy, based on the principle of "home producers first, empire producers second, and foreign producers last," was negotiated at the Imperial Economic Conference in Ottawa in 1932 and took the form of a series of bilateral agreements intended to extend for five years (though they ran on after 1937 without formal renewal).

The agreements pledged the United Kingdom to allow the continued free entry of most empire goods and to impose new tariffs on certain food and metal imports from foreign countries. The dominions were to use their tariffs against U.K. produce only in order to protect efficient producers, and both sides were to maintain certain margins of preference. Although the political reasons for the agreements were strong, the effect of the Great Depression, the search for "sheltered markets," and the spread of the protectionist spirit (evidenced by the Hawley–Smoot Tariff Act of the United States in 1930) were probably more important. Trade within the empire increased after the Ottawa conference. But other factors also contributed to the upswing; they included the recovery of prices of primary products and the existence of the sterling bloc.

During and after World War II, exchange problems, commodity agreements, and other factors had more effect on trade than did preferential tariffs. The signature of the General Agreement on Tariffs and Trade (GATT) in 1947—to which the partners of the Ottawa agreements subscribed—prohibited the extension of existing preferences, and in subsequent negotiations Great Britain and its partners agreed to some reductions of preferential margins. Inflation and trade liberalization, meanwhile, reduced the value of remaining preferences. At the same time, many newly independent members of the Commonwealth also canceled preferences formerly given to British goods.

Imperial Valley, intensively irrigated part of the Colorado Desert, mainly in Imperial County, southeastern California, U.S., extending southward for 50 miles (80 km) from the southern end of the Salton Sea (a saline lake) into Mexico. Part of a trough stretching from the Coachella Valley to the Gulf of California,



Imperial Valley region

it is almost entirely below sea level (235 feet [72 m] below at the edge of the Salton Sea) and has a hot desert climate characterized by daily temperature extremes. It was once part of the Gulf, from which it was cut off by the damlike deposits of the Colorado River Delta Fan. Bordered by sand dunes and barren mountains, it was an uninhabited wasteland until the Imperial Canal was opened in 1901 and diverted Colorado River water into the valley through Mexico. Floodwaters in 1905–07 destroyed the irrigation channels and created the Salton Sea (now maintained by irrigation runoff).

Development of the region languished until the completion of the Hoover Dam in 1935 and the All-American Canal in 1940. The valley, with 3,000 miles of irrigation canals, contains about 500,000 acres (200,000 hectares) of cultivated land. Products include truck crops, alfalfa, cotton, sugar beets, and livestock. El Centro, Brawley, Calexico, and Mexicali, Mex., are commercial centres.

imperialism, state policy, practice, or advocacy of extending power and dominion, especially by direct territorial acquisition or by gaining political and economic control of other areas. Because it always involves the use of power, whether military force or some subtler form, imperialism has often been considered morally reprehensible and the term is frequently employed in international propaganda to denounce and discredit an opponent's foreign policy.

Imperialism in ancient times is clear in the history of China and in the history of western Asia and the Mediterranean—an unending succession of empires. The tyrannical empire of the Assyrians was replaced (6th–4th century BC) by that of the Persians, in strong contrast to the Assyrian in its liberal treatment of subjected peoples, assuring it long duration. It eventually gave way to the imperialism of Greece. When Greek imperialism reached an apex under Alexander the Great (356–323 BC), a union of the eastern Mediterranean with western Asia was achieved. But the cosmopolis, in which all citizens of the world would live harmoniously together in equality, remained a dream of Alexander. It was partially realized when the Romans built their empire from Britain to Egypt.

This idea of empire as a unifying force was never again realized after the fall of Rome. The nations arising from the ashes of the Roman Empire in Europe, and in Asia on the common basis of Islāmic civilization, pursued their individual imperialist policies. Imperialism became a divisive force among the peoples of the world.

Three periods in the modern era witnessed the creation of vast empires, primarily colonial. Between the 15th century and the middle of the 18th, England, France, the Netherlands, Portugal, and Spain built empires in the Americas, India, and the East Indies. For almost a century thereafter, relative calm in empire building reigned as the result of a strong reaction against imperialism. Then the decades between the middle of the 19th century and World War I were again characterized by intense imperialistic policies.

Russia, Italy, Germany, the United States, and Japan were added as newcomers among the imperialistic states and indirect, especially financial, control became a preferred form of imperialism. For a decade after World War I the great expectations for a better world inspired by the League of Nations put the problem of imperialism once more in abeyance. Then Japan renewed its empire building with an attack in 1931 upon China, and under the leadership of the totalitarian states, Japan, Fascist Italy, Nazi Germany, and the Soviet Union, a new period of imperialism was inaugurated in the 1930s and 1940s.

In their modern form, arguments about the causes and value of imperialism can be classified into four main groups. The first group contains economic arguments and often turns around the question of whether or not imperialism pays. Those who argue that it does point to the human and material resources and the outlets for goods, investment capital, and surplus population provided by an empire. Their opponents, among them Adam Smith, David Ricardo, and J.A. Hobson, often admit that imperialism may benefit a small, favoured group but never the nation as a whole. Marxist theoreticians interpret imperialism as a late stage of capitalism when the national capitalist economy has become monopolistic and is forced to conquer outlets for its overproduction and surplus capital in competition with other capitalist states. This is the view held, for instance, by Vladimir Lenin and N.I. Bukharin, to whom capitalism and imperialism are identical. The weakness in that view is that historical evidence does not support it and that it fails to explain precapitalist imperialism and Communist imperialism.

A second group of arguments relates imperialism to the nature of human beings and human groups, such as the state. Such different personalities as Machiavelli, Sir Francis Bacon, Ludwig Gumplowicz, Adolf Hitler, and Benito Mussolini, reasoning on different grounds, nevertheless arrived at similar conclusions. Imperialism to them is part of the natural struggle for survival. Those endowed with superior qualities are destined to rule all others.

The third group of arguments has to do with strategy and security. Nations are urged, proponents of this viewpoint say, to obtain bases, strategic materials, buffer states, "natural" frontiers, control of communication lines for reasons of security, or to prevent other states from obtaining them. Those who deny the value of imperialism for these purposes point out that security is not achieved. Expansion of a state's control over territories and peoples beyond its borders is likely to lead to friction, hence insecurity, because the safety zones and spheres of influence of competing nations are bound to overlap sooner or later. Related to the security argument is the argument that nations are imperialistic in the search for power and prestige for their own sake.

The fourth group of arguments is based on moral grounds, sometimes with strong missionary implications. Imperialism is excused as the means of liberating peoples from tyrannical rule or of bringing them the blessings of a superior way of life. Imperialism results from a complex of causes in which in varying degrees economic pressures, human aggressiveness and greed, search for security, drive for power and prestige, nationalist emotions, humanitarianism, and many other factors are effective. This mixture of motivations makes it difficult to eliminate imperialism but also easy for states considering themselves potential victims to suspect it in policies not intended to be imperialistic. Some states of the Third World have accused the former colonial powers and other nations of neocolonialism. Their fear is that the granting of aid or the supply of skilled personnel for economic and technical development might be an imperialist guise.

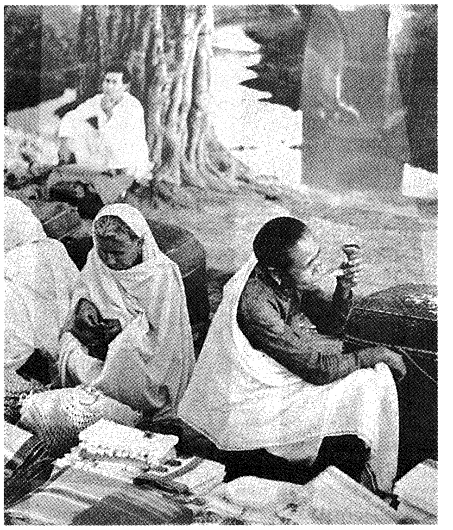
Under international organizations, attempts have been made to satisfy by peaceful means the legitimate aspirations of nations and to contain their illegitimate ones. Among the measures for these purposes are collective security arrangements, the mandate and the trusteeship system for dependent areas, the stimulation of cultural relations between nations, aid to developing countries, and the improvement of health and welfare everywhere. *See also* colonialism.

imperium (Latin: "command," "empire"), the supreme executive power in the Roman state, involving both military and judicial authority. It was exercised first by the kings of Rome; under the republic (*c.* 509 BC–27 BC) it was held by the chief magistrates (consuls, dictators, praetors, military tribunes with consular power, and masters of the cavalry) and private citizens entrusted with a special command. In the later republic, proconsuls, propraetors, second members of certain commissions also possessed the imperium. Restrictions on its use were instituted from the inception of the republic. The principle of collegiality provided that each of the magistrates of the same level (*e.g.*, the two consuls) who held it should hold it to the same degree. Down to the 2nd century BC, a series of laws was passed requiring trials for Roman citizens in capital cases, and also the right of appeal to the people (*jus provocandi ad populum*). The same rights were conventionally extended to Roman citizens in the military or other official service outside Rome. Magistrates were required to exercise imperium within the limits of their office (*provincia*). Imperium was officially conferred by the Comitia Curiata (a popular assembly) for one year or until the official completed his commission. Only in the last years of the republic was the imperium granted for specific terms beyond one year.

Caesar's opponent Pompey was the first to receive such a commission, specifically for three years by the Lex Gabinia (67 BC). Octavian obtained the imperium as holder of various offices under the republic before he became the first emperor, under the name of Augustus, in 27 BC. From then on he was granted imperium for 10- or 5-year periods by the Senate throughout his tenure of office. The Senate thereafter voted the imperium to each succeeding emperor upon his accession. Some emperors, such as Augustus, had it voted to their chosen successor. Under the empire the title *imperator* (emperor), which had been used by victorious Roman generals under the republic, was reserved as an exclusive title for the head of state. The emperors received their first acclamation as emperor at their accession and thereafter each time a Roman general won a victory. Imperium was sometimes given to others in cases of special military commands, such as that of Germanicus in AD 17. When it was granted with no special duties, as in the case of Tiberius in AD 13, it implied that the recipient was an appropriate successor to the princeps, the unofficial title used by Augustus and subsequent emperors. With the expansion of Roman power during and after the reign of Augustus, imperium took on the meaning of "empire."

impetigo, bacterial inflammatory skin disease that begins as a superficial vesicle (blister), which then ruptures and gives rise to a weeping spot on which the fluid dries to form a crust. Impetigo is caused by staphylococcal or streptococcal bacteria. It is seldom contagious in adults, a little more so in children, and very contagious in newborn infants. Except for impetigo herpetiformis, a rare form of impetigo that affects pregnant women, the lesions of uncomplicated impetigo can be effectively treated with a topical (locally applied) broad-spectrum antibiotic; in more extensive impetiginous involvement, especially in infants, the early use of a systemic antibiotic may be advisable.

Imphāl, capital of Manipur state and administrative headquarters of Manipur Central district, northeastern India, lying in the Manipur River Valley, at an altitude of 2,500 ft (760 m). Imphāl was the seat of the kings of Manipur before the region fell under British rule. In 1944 it was the site of a significant tactical victory for the Anglo-Indian forces over the Japanese on the Burmese front of World War II. The town is a major trade centre, noted for its weaving, brassware, bronzeware, and other cottage industries. Imphāl College, Imphāl Training Centre, Dhana Manjari College, and a technical school are located there. Imphāl is connected with the North-Eastern Railway at Dimāpur, Assam, and with Burma by hard-surface roads. It has an airfield with regular service to Calcutta (400 mi [650 km] west-southwest) and Gauhāti. The population is mainly Manipurī. Pop. (1981) 156,622.



Market sellers in Imphāl, Manipur, India
Marc Riboud—Magnum

implantation, in reproduction physiology, the adherence of a fertilized egg to a surface in the reproductive tract, usually to the uterine wall (*see* uterus), so that the egg may have a suitable environment for growth and development into a new offspring. Fertilization of the egg usually occurs after the egg has left the ovary and is being transported through the fallopian tubes. Male sperm cells deposited in the female reproductive tract travel up to the fallopian tubes to unite with the egg. Once fertilized, the egg begins to undergo a series of cell divisions. The egg takes up to seven days to reach the uterus; by this time the single-celled egg has divided numerous times, so that it is a ball of approximately 200 cells.

The uterus has thick walls suitable for egg attachment and growth. A female hormone known as progesterone, secreted by the corpus luteum in the ovary, influences the readiness of the uterine wall for egg implantation. It increases the blood supply in the wall, water content, and secretion of glycogen, a nutrient for the surrounding tissue and developing egg. If the uterus is not first prepared by progesterone, the egg will not attach itself. Progesterone also inhibits muscular contractions in the uterine wall that would tend to reject the adhering egg.

When the egg reaches the uterus, it usually remains free in the uterine cavity for about a day. It then attaches to the uterine lining (the endometrium). Cells in the outer surface of the egg grow rapidly once contact is made with the uterine wall. The egg disrupts the surface of the endometrium and actively burrows into the deeper tissue. By the 11th day after fertilization, the egg has completely embedded itself into the endometrium. The product of conception—first the fertilized egg and then the developing child and the placenta—normally remains implanted in the human uterus for nine months.

impleader (law): *see* joinder and impleader.

implication, in logic, a relationship between two propositions in which the second is a logical consequence of the first. In most systems of formal logic, a broader relationship called material implication is employed, which is read "If A, then B," and is denoted by $A \supset B$ or $A \rightarrow B$. The truth or falsity of the compound proposition $A \supset B$ depends not on any relationship between the meanings of the propositions but only on the truth-values of A and B; $A \supset B$ is false when A is true and B is false, and it is true in all other cases. Equivalently, $A \supset B$ is often defined as $\sim(A \cdot \sim B)$ or as $\sim A \vee B$ (in which $\sim$ means "not," $\cdot$ means "and," and $\vee$ means "or"). This way of interpreting $\supset$ leads to the so-called paradoxes of material implication: "grass is red $\supset$ ice is cold" is a true proposition according to this definition of $\supset$.

In an attempt to construct a formal relationship more closely akin to the intuitive notion of implication, Clarence Irving Lewis, known for his conceptual pragmatism, introduced in 1932 the notion of strict implication. Strict implication was defined as $\sim\Diamond(A \cdot \sim B)$, in which $\Diamond$ means "is possible" or "is not self-

contradictory." Thus A strictly implies B if it is impossible for both A and $\sim B$ to be true. This conception of implication is based upon the meanings of the propositions, not merely upon their truth or falsity.

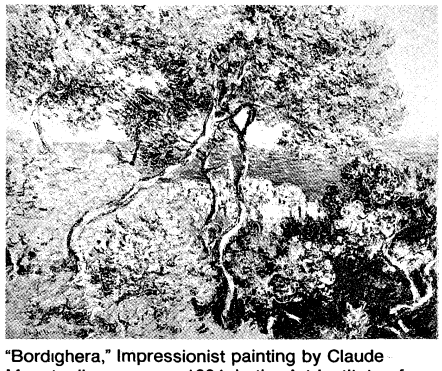
Finally, in intuitionistic mathematics and logic, a form of implication is introduced that is primitive (not defined in terms of other basic connectives): $A \supset B$ is true here if there exists a proof (*q.v.*) that, if conjoined to a proof of A, would produce a proof of B. *See also* deduction; inference.

impotence, in general, the inability of a man to achieve or maintain penile erection and hence the inability to participate fully in sexual intercourse. In its broadest sense the term impotence refers to the inability to become sexually aroused; in this sense it can apply to women as well as to men. In common practice, however, the term has traditionally been used to describe only male sexual dysfunctions. Professional sex therapists, while they identify two distinct dysfunctions as forms of impotence, prefer not to use the term impotence per se. Thus, because of its pejorative connotation in lay usage and because of confusion about its definition, the word impotence has been eliminated from the technical vocabulary.

Traditionally, erectile impotence (corresponding to the classical definition of impotence) is the failure to achieve penile erection during intercourse. It may have either physical or psychological causes. Alcoholism, endocrine disease, and neurological disorders are typical physical causes. Psychological causes include anxiety or hostility towards the sexual partner and work-related stress or other emotional conflicts outside of the relationship. Erectile impotence occasionally occurs with age and, although attributed by the individual to the aging process itself, it is usually secondary to disorders of aging, such as prostate disease.

In ejaculatory impotence, the male achieves an erection but cannot reach orgasm in the partner's vagina. The erection may be maintained for long periods, even long after the female partner has achieved orgasm. This form of impotence nearly always has an emotional rather than physical cause. *See also* sexual dysfunction.

Impressionism, French IMPRESSIONNISME, a major movement, first in painting and later in music, that developed chiefly in France during the late 19th and early 20th centuries. Impressionist painting comprises the work produced between about 1867 and 1886 by a group of artists who shared a set of related approaches and techniques. The most conspicuous characteristic of Impressionism was an attempt to accurately and objectively record visual reality in terms of transient effects of light and colour. The principal Impressionist painters were Claude Monet, Édouard Manet, Camille Pissarro, Pierre Auguste Renoir, Alfred Sisley, Edgar Degas, Paul Cézanne, Berthe Morisot, Armand Guillaumin, and Frédéric Bazille, who worked together, influenced each other, and—except for Manet, who continued to seek official favour—exhibited together independently.



"Bordighera," Impressionist painting by Claude Monet, oil on canvas, 1884; in the Art Institute of Chicago

By courtesy of the Art Institute of Chicago, Potter Palmer Collection

These artists became dissatisfied early in their careers with the limitations of academic teaching's emphasis on depicting a historical or mythological subject matter with literary or anecdotal overtones. They also rejected the conventional imaginative or idealizing treatments that were characteristic of academic painting. By the late 1860s, Manet's art reflected a new aesthetic—which was to be a guiding force in Impressionist work—in which the importance of the traditional subject matter was downgraded and attention was shifted to the artist's manipulation of colour, tone, and texture as ends in themselves. In Manet's painting the subject became a vehicle for the artful composition of areas of flat colour, and perspectival depth was minimized so that the viewer would look at the surface patterns and relationships of the picture rather than into the illusory three-dimensional space it created. At about the same time, Monet was influenced by the innovative painters Eugene Boudin and J.R. Jongkind, who depicted fleeting effects of sea and sky by means of highly coloured and texturally varied methods of paint application. The Impressionists also adopted Boudin's practice of painting entirely out-of-doors while looking at the actual scene, instead of finishing up his painting from sketches in the studio, as was the conventional practice.

In the late 1860s Monet, Pisarro, Renoir, and others began painting landscapes and river scenes in which they tried to dispassionately record the colours and forms of objects as they appeared in natural light at a given time. These artists abandoned the traditional landscape palette of muted greens, browns, and grays and instead painted in a lighter, sunnier, more brilliant key. They began by painting the play of light upon water and the reflected colours of its ripples, trying to reproduce the manifold and animated effects of sunlight and shadow and of direct and reflected light that they observed. In their efforts to reproduce immediate visual impressions as registered on the retina, they abandoned the use of grays and blacks in shadows as inaccurate and used complementary colours instead. More importantly, they learned to build up objects out of discrete flecks and dabs of pure harmonizing or contrasting colour, thus evoking the broken-hued brilliance and the variations of hue produced by sunlight and its reflections. Forms in their pictures lost their clear outlines and became dematerialized, shimmering and vibrating in a re-creation of actual outdoor conditions. And finally, traditional formal compositions were abandoned in favour of a more casual and less contrived disposition of objects within the picture frame. The Impressionists extended their new techniques to depict landscapes, trees, houses, and even urban street scenes and railroad stations.

In 1874 the group held its first show, independent of the official Salon of the French Academy, which had consistently rejected most of their works. Monet's painting "Impression: Sunrise" (1872; Musée Marmottan, Paris) earned them the initially derisive name "Impressionists" from the journalist Louis Leroy writing in the satirical magazine *Le Charivari* in 1874. The artists themselves soon adopted the name as descriptive of their intention to accurately convey visual "impressions." They held seven subsequent shows, the last in 1886. During that time they continued to develop their own personal and individual styles. All, however, affirmed in their work the principles of freedom of technique, a personal rather than a conventional approach to subject matter, and the truthful reproduction of nature.

By the mid-1880s the Impressionist group had begun to dissolve as each painter increasingly pursued his own aesthetic interests and principles. In its short existence, however, it had accomplished a revolution in the history of art, providing a technical starting point for such later artists as Paul Cézanne, Edgar Degas, Paul Gauguin, Vincent van Gogh, and Georges Seurat and freeing all subsequent Western painting from traditional techniques and approaches to subject matter.

In music, Claude Debussy has always been considered the principal Impressionist. Even though Debussy was influenced by the general aesthetic attitudes of Impressionist painters, he made no attempts to compose with musical techniques that were closely analogous to techniques of painting. Furthermore, the characteristics of Debussy's music are so variable from the first through the last of his compositions that even a general sense of Impressionism might best be restricted to most of his music composed between about 1892 to 1903 and to certain specific later compositions strongly resembling those works in style. Some of these Impressionist works would be the opera *Pelléas et Mélisande* (first performed in 1902), the orchestral piece "Nuages" ("Clouds," from *Nocturnes,* completed in 1899), and the piano piece "Voiles" ("Sails," from *Douze Préludes,* Book I, 1910). Other composers considered Impressionistic include Maurice Ravel, Frederick Delius, Ottorino Respighi, Karol Szymanowski, and Charles Griffes (*qq.v.*).

Musical Impressionism is often thought to refer to subtle fragility, amorphous passivity, and vague mood music. A more accurate characterization of Impressionist music would include restraint and understatement, a static quality, and a provocatively colourful effect resulting from composers' fascination with pure sound as a beautiful and mysterious end in itself. Technically, these characteristics often result from a static use of harmony, ambiguous tonality, a lack of sharp formal contrasts and of onward rhythmic drive, and a blurring of the distinction between melody and accompaniment. Although Impressionism has been considered a movement away from the excesses of Romanticism, the sources of many of its characteristics may be found in the works of composers who are also considered to be the Romantic precursors of Expressionism—*e.g.,* Franz Liszt, Richard Wagner, and Aleksandr Scriabin.

Consult the INDEX *first*

impressment, also called CRIMPING, enforcement of military or naval service on ablebodied but unwilling men through crude and violent methods. Until the early 19th century this practice flourished in port towns throughout the world. Generally impressment could provide effective crews only when patriotism was not an essential of military success. Impressed men were held to their duty by uncompromising and brutal discipline, although they seem to have fought with no less spirit and courage than those who served voluntarily.

The "recruiters" preyed to a great extent upon men from the lower classes who were, more often than not, vagabonds or even prisoners. Sources of supply were waterfront boardinghouses, brothels, and taverns whose owners victimized their own clientele. In the early 19th century the Royal Navy would halt U.S. vessels to search for British deserters and in the process would not infrequently impress naturalized American citizens who were on board. This practice was among the grievances that helped bring about the War of 1812.

Through the 19th century there was a gradual decline in the practice of impressment. As the manpower needs of the military continued to increase, more systematic methods of recruitment became necessary.

imprimatur (Latin: "let it be printed"), in the Roman Catholic Church, a permission, required by contemporary canon law and granted by a bishop, for the publication of any work on Scripture or, in general, any writing containing something of peculiar significance to religion, theology, or morality. Strictly speaking, the *imprimatur* is nothing more than the permission. But because its concession must be preceded by the favourable judgment of a censor (*nihil obstat:* "nothing hinders [it from being printed]"), the term has come to imply ecclesiastical approval of the publication itself. Nevertheless, the *imprimatur* is not an episcopal endorsement of the content, nor is it a guarantee of doctrinal integrity. It does indicate that nothing offensive to faith or morals has been discovered in the work.

imprinting, a form of learning in which a very young animal fixes its attention on the first object with which it has visual, auditory, or tactile experience and thereafter follows that object. In nature the object is almost invariably a parent; in experiments, other animals and inanimate objects have been used. Imprinting has been intensively studied only in birds, especially chickens, ducks, and geese, but a comparable form of learning apparently occurs in the young of many mammals and some fishes and insects.

In mallard ducklings and domestic chicks, imprinting can be accomplished in a few hours, but receptivity to imprinting stimuli vanishes at the age of about 30 hours.

impromptu, a 19th-century piano composition intended to produce the illusion of spontaneous improvisation. In keeping with this fundamental premise, there is no particular form associated with the impromptu, although ternary and rondo schemes are common. The style of the music is similar to that of other compositions of the period, with such designations as fantasie, caprice, and bagatelle.

The name impromptu first appeared in 1822 as the title of piano pieces by the Bohemian composer Jan Hugo Voříšek and the German Heinrich Marschner. Among the best known impromptus are those by Schubert (Opuses 90 and 142) and Chopin (Opuses 29, 36, and 51). Impromptus were also written by Beethoven, Robert Schumann, Franz Liszt, Gabriel Fauré, and Aleksandr Scriabin.

improvisation, also called EXTEMPORIZATION, in music, the extemporaneous composition or free performance of a musical passage, usually in a manner conforming to certain stylistic norms but unfettered by the prescriptive features of a specific musical text. Music originated as improvisation and is still extensively improvised in Eastern traditions and in the modern Western tradition of jazz.

Many of the great composers of Western classical music were masters of improvisation, especially on keyboard instruments, which offered such celebrated composer-performers as Bach, Mozart, Mendelssohn, and Chopin virtually boundless opportunities for the spontaneous unfolding of their rich musical imaginations. Many an idea so generated eventually appeared in a written composition. Some composers have regarded improvisation as an indispensable warm-up for their creative task.

Prior to the instrumental era in the West, improvisation within the systematized musical context was largely limited to ornamental variants of vocal parts in polyphonic compositions and to instrumental adaptations of vocal compositions, especially by lute and keyboard virtuosos. The monodic textures that originated about 1600, on the other hand, were ready-made, indeed in large measure intended, for improvisational enhancement, not only of the treble parts but also, almost by definition, of the bass, which was figured to suggest no more than a minimal chordal outline.

In essentially monophonic musical cultures, whether Western or non-Western, improvisation has been of paramount importance, if only because successful improvisation is always more readily achieved by soloists than by groups. A monophonic oral musical tradition, however, does not necessarily imply the prevalence of improvisational practices. Quite to the contrary, oral traditions have been prone to preserve the integrity of particular songs and dances from generation to generation with a degree of precision virtually unknown in literate musical contexts.

It is generally assumed that early European music from Roman Catholic chant to medieval polyphony was rooted in such improvisational practices as the exploration of motivic possibilities in the church modes (*see* church mode) and the addition of a second melody to a preexisting melody or cantus firmus. Modal improvisations have remained central to much non-Western music, including the chant of the Jewish synagogue, Islāmic *maqām* elaborations, and Indian raga performances.

In the West, cantus firmus improvisation inspired a great deal of instrumental music as well, beginning with late Renaissance improvisations over ostinato basses (relatively short repeated bass patterns) and maintained through the centuries especially by organists who embraced such popular ostinato genres as the passacaglia and chaconne. Organists have remained in the forefront of improvisation as a primary musical activity in no way at odds with written composition, while keyboard improvisation in turn has been responsible for compositions of a freely associative character of the sort found among hundreds of preludes, toccatas, and fantasies written during the past three centuries. Improvisations on Protestant hymn tunes gave birth to the important 17th- and 18th-century genre the chorale prelude. In the later 18th century, improvisation, often based on variation techniques but not excluding the strictly polyphonic procedures of canon and fugue, challenged the ingenuity of virtuoso-composers repeatedly in public improvisational contests, such as those that pitted Mozart against Clementi and Beethoven against Wölfl.

In modern times, improvisation survives as one of the chief distinguishing characteristics of jazz. Here, too, the process is usually inspired by, and structured (however loosely) in accordance with, salient characteristics of the model in question, be it a well-known show tune or a ground bass. During the second half of the 20th century, there arose among certain avant-garde composers and performers a tendency away from any vestige of traditional structure. A "composition" from this experimental school might be entirely devoid of conventional notation, consisting rather of a verbal instruction, a prescription for duration, or an idiosyncratic graphic code. Some works required performers to combine at random "building blocks" of brief musical phrases or entire sections presented by the composer; it has been asserted that such a process embodies a more profound creative collaboration between composer and performer than does the interpretation of a fully notated work or the express but limited freedom accorded performers at crucial moments in certain fixed compositions (*e.g.*, the da capo section of an 18th-century aria or the cadenza near the end of a solo concerto movement). *See also* aleatory music.

improvisation, in theatre, the playing of dramatic scenes without written dialogue and with minimal or no predetermined dramatic activity. The method has been used for different purposes in theatrical history. The theatrical form known as the commedia dell'arte was highly improvisational, although through repeated performances its characters developed stock speeches and stage business and its scenarios gained fairly standard form. Much of Asian dance and theatrical activity comprises improvised arrangements of stock scenes, movements, and speech.

In the 20th century a number of groups have used improvisation, usually working in intimate cabaret theatres and sometimes performing impromptu scenes based on ideas from the audience. Among the most prominent of these is the Second City Company in Chicago, begun in the late 1940s. Other major uses of improvisation are in theatrical rehearsals, to discover new nuances of interpretation, and in acting schools, to allow students to explore and broaden their emotional responsiveness to imaginative situations.

imram (Old Irish Gaelic: "rowing about," or "voyaging"), plural IMRAMHA, in early Irish literature, a story about an adventurous voyage. This type of story includes tales of Irish saints travelling to Iceland or Greenland, as well as fabulous tales of pagan heroes journeying to the otherworld (*echtrae*). An outstanding example of an *imram* is *Imram Brain,* or *The Voyage of Brân,* which describes a trip to the enchanted Land of Women. After what seems to be a year Brân and his colleagues return home to discover that their voyage lasted longer than any memories and is recorded only in ancient sources.

Imrédy, Béla (b. Dec. 29, 1891, Budapest—d. Feb. 28, 1946, Budapest), right-wing politician and premier of Hungary (1938–39), whose close collaboration with the Nazis during World War II led to his execution as a war criminal.

After being trained in law, Imrédy began working for the Ministry of Finances. In 1928 he became director of the National Bank of Hungary and participated in several international monetary conferences. He then served as finance minister (1932–35) under the extreme rightist Gyula Gömbös. After Gömbös died (Oct. 6, 1936) Imrédy resigned and became president of the National Bank.

Nazi Germany annexed Austria in March 1938, and Imrédy was made premier on May 14, 1938. Although he took measures against the extreme right and made several unsuccessful attempts to win support from the western powers, Imrédy oversaw the passage of many laws supported by the right wing, including two measures limiting the activity of Jews in business and the professions as well as laws restricting the right of assembly and freedom of the press. He also ultimately adopted a more definite pro-Axis foreign policy for Hungary. On Feb. 16, 1939, he resigned after the opposition had documented his Jewish ancestry; he retained leadership, however, in numerous rightist organizations and as minister of the economy in 1944 was instrumental in subordinating Hungarian economy to the German war effort. After the war Imrédy was sentenced for war crimes by the People's Tribunal and executed.

IMRO: *see* Internal Macedonian Revolutionary Organization.

İmroz Adası, historically IMBROS, island (*adası*) in the Aegean Sea. It constitutes İmroz *ilçe* (district) of Çanakkale *il* (province), Turkey. Commanding the entrance to the Dardanelles, the island is strategically situated 10 mi (16 km) off the southern end of the Gallipoli Peninsula. Herodotus and Homer mentioned Imbros as an abode of the Pelasgians in antiquity. It fell to the Ottoman Turks after

their conquest of Constantinople in the late 15th century AD. Occupied by Greek forces during the First Balkan War in 1912, it served as an important base for Allied operations during the Gallipoli campaign of World War I. The island was returned to Turkey in 1923.

With an area of 108 sq mi (279 sq km), the mountainous island contains some wooded areas. The town of Imroz lies in the eastern part of the island. The islands' products include grains, olives, wine, and grapes. Pop. (1980) town, 4,802; island, 5,978.

Consult the INDEX *first*

Imru' al-Qays, in full IMRU' AL-QAYS IBN ḤUJR (d. *c.* 550), Arab poet, acknowledged as the most distinguished poet of pre-Islāmic times by the Prophet Muḥammad, by 'Alī, the fourth caliph, and by Arab critics of the ancient Basra school; he is author of one of the seven odes in the famed collection of pre-Islāmic poetry *al-Muʿallaqāt.*

There is no agreement as to his genealogy, but the predominant legend cites Imru' al-Qays as the youngest son of Ḥujr, the last king of Kindah. He was twice expelled from his father's court for the erotic poetry he was fond of writing, and he assumed the life of a vagabond. After his father was murdered by a rebel Bedouin tribe, the Banū Asad, Imru' al-Qays was single-minded in his pursuit of revenge. He successfully attacked and routed the Banū Asad, but, unsatisfied, he went from tribe to tribe fruitlessly seeking further help. Through King al-Ḥārith of Ghassān (northern Arabia), Imru' al-Qays was introduced to the Byzantine emperor Justinian I, who agreed to supply him with the troops he needed to regain his kingdom. Legend has it that on his return to Arabia the emperor sent him a poisoned cloak, which caused his death at Ancyra (modern Ankara).

The philologists of the Basra school regarded Imru' al-Qays not only as the greatest of the poets of the *Muʿallaqāt* but also as the inventor of the form of the classical ode, or *qaṣīdah.* There were at least three collections (*dīwāns*) of his poetry made by medieval Arab scholars, numbering as many as 68 poems; the authenticity of most of them, however, is doubtful.

in medias res (Latin: "in the midst of things"), in narrative technique, the recommended practice of beginning an epic or other fictional form by plunging into a crucial situation that is part of a related chain of events; the situation is an extension of previous events and will be developed in later action. The narrative then goes directly forward, and exposition of earlier events is supplied by flashbacks. The principle is based on the practice of Homer in the *Iliad* and the *Odyssey.* The *Iliad,* for example, begins dramatically with the quarrel between Achilles and Agamemnon. The Latin poet and critic Horace has pointed out the immediate interest created by this opening in contrast to beginning the story *ab ovo* ("from the egg"), *i.e.,* from the birth of Achilles.

in nomine, in music, English instrumental genre of the 16th and 17th centuries, named after the setting by John Taverner (*c.* 1490–1545) of the *In nomine Domini* ("In the name of the Lord") section from the Benedictus of the *Missa Gloria tibi Trinitas.* Taverner's work served as a model for similar compositions based on the plainsong melody of the antiphon (a verse originally sung before and after a psalm) "Gloria tibi Trinitas" ("Glory to Thee, O Trinity") from the Vesper service for Trinity Sunday. Although instrumental styles changed, the title and cantus firmus remained in use until the time of Henry Purcell (*c.* 1659–95).

In Ruad Ro-fhessa (Celtic religion): *see* Dagda.

in vitro fertilization (IVF), also called TEST-TUBE CONCEPTION, the process of uniting two human germ cells (sperm and egg) outside the human body and in an artificial environment. In common usage, the term often includes the process of embryo transfer.

The first experiments involving in vitro fertilization and embryo transfer date to the late 19th century, but it was not until 1944 that human germ cells were used. The first successful human IVF birth occurred in England in 1978.

In vitro fertilization is generally only undertaken after an exhaustive infertility evaluation. Many of the candidates for IVF are women who suffer from blocked or absent fallopian tubes; others are men with low sperm counts or couples whose infertility is unexplained. IVF procedure includes the recovery (by needle aspiration) of mature eggs and the incubation of the eggs in a culture medium, as well as the collection and preparation of sperm and its addition to the medium. Fertilization generally occurs within 12 to 48 hours. The potential embryo is then placed in a growth medium, where it is observed periodically for division into two-cell, four-cell, and eight-cell stages. The embryo, at this point known as a blastocyst, is introduced through the cervix into the uterus, in which the blastocyst seems to float free for about three-and-a-half days. If the procedure is successful, the embryo implants itself in the uterine wall, and pregnancy begins.

Of the problems that have been noted in IVF procedure, successful implantation seems to be the weakest link. One possible explanation for this problem is that the in vitro zygote develops at a slower rate than the embryo in vivo (*i.e.,* within the body), and hence, the growth of the in vitro zygote and the development of the endometrial tissue are not perfectly synchronized.

Like a number of extraordinary procedures relating to conception and fertility, in vitro fertilization has raised several ethical questions. Greatest among them is the fear of experimentation with human fetuses. Related techniques, such as the freezing of eggs, sperm, or embryos for future implantation, have also raised a number of as yet unresolved moral issues.

in-yō (in Eastern philosophy): *see* yin-yang.

Inaccessible Island (Atlantic Ocean): *see* Tristan da Cunha.

Inanna (Mesopotamian deity): *see* Ishtar.

Inari, in Japanese mythology, god who protects rice cultivation; a god of prosperity, worshiped particularly by merchants and tradesmen; the patron deity of swordsmiths; and a deity also connected with brothels and entertainers.

In Shintō legends Inari is identified with Uka no Mitama no Kami ("August Spirit of Food"), son of the impetuous storm god, Susanoo. The rice god is also associated in some Shintō shrines with the goddess of food, Ukemochi no Kami; and there is considerable variation in the way in which Inari is depicted, as a bearded man riding a white fox or as a woman with long, flowing hair, carrying sheaves of rice.

The fox, symbolizing both benevolence and malevolence, is sometimes identified with the messenger of Inari, and statues of foxes are found in great numbers both inside and outside shrines dedicated to the rice god. Other characteristics of Inari shrines are their deep red buildings, long rows of votive *torii* (gateways), and the *hōshu-no-tama* (a pear-shaped emblem surmounted by flamelike symbols). Most renowned among the numerous Inari shrines throughout Japan is the Fushimi Inari Shrine near Kyōto.



Inari, wood figurine, Edo period (1603–1867); in the Musée Guimet, Paris

By courtesy of the Musee Guimet, Paris

Inari, Lake, largest lake in Lapin *lääni* (Lappi province), northern Finland, lying near the Soviet border. At an elevation of 389 feet (119 m), it is approximately 50 miles (80 km) long and 25 miles wide at its farthest points, has an area of 386 square miles (1,000 square km), and is about 200 feet (61 m) deep. The lake is fed by the Ivalo River from the southwest and drained by the Paats River on the east to the Arctic Ocean. The town of Inari, a Lapp trading centre, is on the southwestern shore. The lake's excellent fishing and boating attract many tourists.

Inazawa, city, Aichi *ken* (prefecture), Honshu, Japan, in the Owari plain. It was a small rural town during the Tokugawa period (1603–1867), producing vegetables for the market of nearby Nagoya. Increased urbanization in the area since World War II, however, sparked Inazawa's growth as a residential and industrial suburb of Nagoya. Textiles and machinery are produced. Pop. (1980) 90,890.

inbreeding, the mating of individuals or organisms that are closely related through common ancestry, as opposed to outbreeding, which is the mating of unrelated organisms. Inbreeding is useful in the retention of desirable characteristics or the elimination of undesirable ones, but it often results in decreased vigour, size, and fertility of the offspring because of the combined effect of harmful genes that were recessive in both parents.

The closest type of inbreeding is selfing, or self-fertilization, the union of male and female sex cells produced by the same organism. Linebreeding is a form of inbreeding that involves selection of mates on the basis of their relationships to a certain superior ancestor. The backcross (crossing a first-generation hybrid with one of the parental types) is a common method of inbreeding.

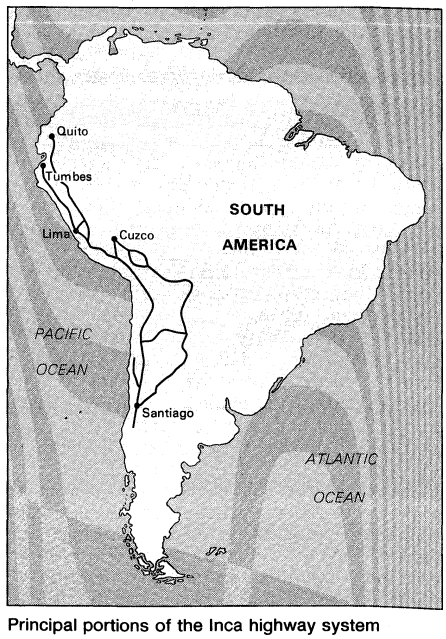
Inca, South American Indians who, at the time of the Spanish conquest in 1532, ruled an empire that extended along the Pacific coast and Andean highlands from the northern border of modern Ecuador to the Maule River in central Chile. The Inca established their capital at Cuzco in the 12th century. They began their conquests in the early 15th century and within 100 years had gained control of an Andean population of about 12,000,000 people.

A brief treatment of the Inca follows. For full treatment, *see* MACROPAEDIA: Pre-Columbian Civilizations.

In common with other Andean cultures, the Inca left no written records. Their history is known chiefly from the oral tradition that has been preserved through the generations by official "memorizers" and from the written records composed from them after the Spanish conquest. According to their tradition, the Inca originated in the village of Paqari-tampu, about 15 miles (24 km) south of Cuzco. The founder of the Inca dynasty, Manco Capac, led the tribe to settle in Cuzco, which remained thereafter their capital. Until the reign of the fourth emperor, Mayta Capac, in the 14th century, there was little to distinguish the Inca from the many other tribes inhabiting small domains throughout the Andes. Under Mayta Capac the Inca began to expand, attacking and looting the villages of neighbouring peoples and probably assessing some sort of tribute. Under Capac Yupanqui, the next emperor, the Inca first extended their influence beyond the Cuzco valley, and under Viracocha Inca, the eighth, they began a program of permanent conquest by establishing garrisons among the settlements of the peoples whom they had conquered.

The earliest date that can be confidently assigned to Incan dynastic history is 1438, when Pachacuti Inca Yupanqui, a son of Viracocha Inca, usurped the throne from his brother Inca Urcon. Under Pachacuti Inca Yupanqui (1438–71) the Inca conquered territory south to the Titicaca Basin and north to present-day Quito, making subject peoples of the powerful Chancas, the Quechua, and the kingdom of Chimú. A policy of forced resettlement of large contingents from each conquered people helped ensure political stability by distributing ethnic groups throughout the empire and thus making the organization of revolt very difficult. Local governors were responsible for exacting the labour tax on which the empire was based; the tax could be paid by service in the army, on public works, or in agricultural work.

Under Topa Inca Yupanqui (1471–93) the empire reached its southernmost extent in central Chile, and the last vestiges of resistance on the southern Peruvian coast were eliminated. His death was followed by a struggle for the succession, from which Huayna Capac (1493–1525) emerged successful. Huayna Capac pushed the northern boundary of the empire to the Ancasmayo River before dying in an epidemic that may have been brought by a tribe from the east that had picked it up from the Spanish at La Plata. His death set off another struggle for succession, which was still unresolved in 1532, when the Spanish arrived in Peru; by 1535 the empire was lost.



Principal portions of the Inca highway system

Inca society was highly stratified. The emperor ruled with the aid of an aristocratic bureaucracy, exercising authority with harsh and often repressive controls. Inca technology and architecture were highly developed, although not strikingly original. Their irrigation systems, palaces, temples, and fortifications can still be seen throughout the Andes. The economy was based on agriculture, its staples being corn (maize), white and sweet potatoes, squash, tomatoes, peanuts (groundnuts), chili peppers, coca, cassava, and cotton. They raised guinea pigs, ducks, llamas, alpacas, and dogs. Clothing was made of llama wool and cotton. Houses were of stone or adobe mud. Practically every man was a farmer, producing his own food and clothing.

The Inca built a vast network of roads throughout this empire. It comprised two north–south roads, one running along the coast for about 2,250 miles (3,600 km), the other inland along the Andes for a comparable distance, with many interconnecting links. Many short rock tunnels and vine-supported suspension bridges were constructed. Use of the system was strictly limited to government and military business; a well-organized relay service carried messages in the form of knotted cords at a rate of 150 miles (240 km) a day. The network greatly facilitated the Spanish conquest of the Inca Empire.

The Inca religion combined features of animism, fetishism, and the worship of nature gods. The pantheon was headed by Inti, the sun god, and included also Viracocha, a creator god and culture hero, and Apu Illapu, the rain god. Under the empire the Inca religion was a highly organized state religion, but, while worship of the sun god and the rendering of service were required of subject peoples, their native religions were tolerated. Inca rituals included elaborate forms of divination and the sacrifice of humans and animals. These religious institutions were destroyed by the Spanish conquerors' campaign against idolatry.

The descendants of the Inca are the present-day Quechua-speaking peasants of the Andes, who constitute perhaps 45 percent of the population of Peru. They combine farming and herding with simple traditional technology. Rural settlements are of three kinds: families living in the midst of their fields, true village communities with fields outside of the inhabited centres, and a combination of these two patterns. Towns are centres of mestizo (mixed-blood) population. An Indian community is close-knit, its families usually intermarrying. Much of the agricultural work is done cooperatively. Religion is a kind of Roman Catholicism infused with the pagan hierarchy of spirits and deities.

incandescent lamp, any of various devices that produce light by heating a suitable material to a high temperature. When any solid or gas is heated, commonly by combustion or resistance to an electric current, it gives off light of a colour (spectral balance) characteristic of the material.

In 1801 Sir Humphrey Davy demonstrated the incandescence of platinum strips heated in the open air by electricity; but the strips did not last long. Frederick de Moleyns of England was granted the first patent for an incandescent lamp in 1841; he used powdered charcoal heated between two platinum wires.

The first practical incandescent lamps became possible after the invention of good vacuum pumps. The Englishman Sir Joseph Wilson Swan in 1878 and the American inventor Thomas Alva Edison in the following year independently produced lamps with carbon filaments in evacuated glass bulbs. Edison has received the major credit because of his development of the power lines and other equipment needed to establish the incandescent lamp in a practical lighting system.

In 1911 the drawn tungsten filament was introduced; in 1913 filaments were coiled, and bulbs were filled with inert gas. Nitrogen alone was used first, and, later, nitrogen and argon in proportions varied to suit the wattage. These steps increased efficiency. Beginning in 1925, bulbs were "frosted" on the inside with hydrofluoric acid to provide a diffused light instead of the glaring brightness of the unconcealed filament.

The carbon-arc lamp, a very bright electric lamp used for spotlights and in motion-picture projection, consists of two carbon electrodes with a high-current arc passing between them. The light comes from heating of the electrodes and from the ionized gases in the arc.

Nonelectric incandescent lamps include the gas-mantle lamp. The mantle is a mesh bag of fabric impregnated with a solution of nitrates of cerium and one or more of the following metals: thorium, beryllium, aluminum, or magnesium. The mantle is fixed over an orifice carrying a flammable gas such as natural gas, coal gas, propane, or vaporized benzene or other fuel. When the gas is ignited, the mantle fabric burns away, leaving a brittle residual lattice of metal oxides. Light is produced when this lattice is heated to glowing by the gas combustion, although the mantle itself does not burn. Gas lamps may operate without mantles.

The limelight is a very bright gas lamp, invented in 1825 and widely used for theatrical lighting until about 1900. It consists of a block of lime (calcium oxide) heated in an oxyhydrogen flame.

Incarnation, central Christian doctrine that God became flesh, that God assumed a human nature and became a man in the form of Jesus Christ, the Son of God and the second Person of the Trinity. Christ was then truly God and truly man. The doctrine maintains that the divine and human natures of Jesus do not exist beside one another in an unconnected way but rather are joined in him in a personal unity that has traditionally been referred to as the hypostatic union. The union of the two natures has not resulted in their diminution or mixture; rather, the identity of each is believed to have been preserved.

The word Incarnation (from the Latin *caro,* "flesh") may refer to the moment when this union of the divine nature of the second Person of the Trinity with the human nature became operative in the womb of the Virgin Mary or to the permanent reality of that union in the person of Jesus. The term may be most closely related to the claim in the prologue of the Gospel According to John that the Word became flesh, that is, assumed human nature. (*See* logos.) The essence of the doctrine of the Incarnation is that the preexistent Word has been embodied in the man Jesus of Nazareth, who is presented in the Gospel According to John as being in close personal union with the Father, whose words Jesus is speaking when he preaches the gospel.

Belief in the preexistence of Christ is indicated in various letters of the New Testament but particularly in the Letter of Paul to the Philippians in which the Incarnation is presented as the emptying of Christ Jesus, who was by nature God and equal to God (*i.e.,* the Father) but who took on the nature of a slave and was later glorified by God.

The development of a more refined theology of the Incarnation resulted from the response of the early church to various misinterpretations concerning the question of the divinity of Jesus and the relationship of the divine and human natures of Jesus. The Council of Nicaea (AD 325) determined that Christ was

"begotten, not made" and that he was therefore not creature but Creator. The basis for this claim was the doctrine that he was "of the same substance as the Father." The doctrine was further defined by the Council of Chalcedon (AD 451), at which it was declared that Jesus was perfect in deity and in humanity and that the identity of each nature was preserved in the person of Jesus Christ. The affirmation of the oneness of Christ with God and with humanity was made while maintaining the oneness of his person.

Subsequent theology has worked out the implications of this definition, although there have been various tendencies emphasizing either the divinity or the humanity of Jesus. It has commonly been accepted that the union of the human nature of Christ with his divine nature had significant consequences for his human nature—for example, the grace of great sanctity. The union of the two natures has been viewed by theologians as a gift for other men, both in terms of its benefit for their redemption from sin and in terms of the appreciation of the potential goodness inherent in human activity that can be derived from the doctrine of the Incarnation.

Ince, Thomas H(arper) (b. Nov. 16, 1882, Newport, R.I., U.S.—d. Nov. 19, 1924, Hollywood, Calif.), pioneer American motion-picture director, who was the first to organize production methods into a disciplined system of filmmaking.

The son of a comedian, Ince was Daniel Frohman's office boy and first appeared on stage in 1894. In 1910 Ince began his career at D.W. Griffith's Biograph studio as an actor and director of one-reel shorts. Within five years he was internationally famous as the director of westerns starring William S. Hart, the first film-cowboy hero.

In 1915 Ince formed Triangle Pictures Production Company in partnership with two prominent directors, Mack Sennett and D.W. Griffith. At Inceville studios he initiated the system of production by which the staff was divided into units. Each unit was headed by a production manager who supervised the filming from a detailed shooting script approved by Ince in its final form. Ince also did most of the final editing on his films. By this system he controlled many pictures at one time. After 1915 his only personally directed film was *Civilization* (1916).

The story was the preeminent aspect of Ince's pictures. Films such as *The Gangsters and the Girl* (1914), *The Italian* (1915), and *The Clodhopper* (1917) are excellent examples of the tight dramatic structure that resulted from his masterful editing.

After Triangle Pictures closed at the end of World War I, Ince continued directing for other studios.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

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incense, grains of resins (sometimes mixed with spices) that burn with a fragrant odour, widely used as an oblation. It is commonly sprinkled on lighted charcoal contained in a censer, or thurible.

Incense-bearing trees were imported from the Arabian and Somali coasts into ancient Egypt, where incense was prominent in religious ritual—*e.g.*, at the daily liturgy before the cult image of the sun god Amon-Re and in the mortuary rites, when the souls of the dead were thought to ascend to heaven in the flame. Incense was employed to counteract disagreeable odours and drive away demons and was said both to manifest the presence of the gods (fragrance being a divine attribute) and to gratify them. The Babylonians used it extensively while offering prayer or divining oracles. It was imported into Israel before the Babylonian Exile (586–538 BC) and was assigned miraculous powers; later, in the 5th century BC, altars were set apart for incense offerings. Incense no longer has any role in the Jewish liturgy, however.

Hindus, especially the Śaivas, use incense for ritual and domestic offerings, and so do Buddhists, who burn it at festivals and initiations as well as at daily rites. In China incense was burned during festivals and processions to honour ancestors and household gods, and in Japan it was incorporated into Shintō ritual.

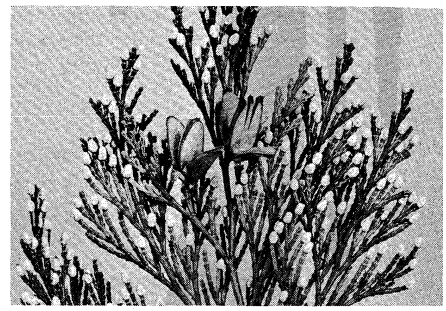
In Greece from the 8th century BC, woods and resins were burned as an oblation and for protection against demons, a practice adopted by the Orphics. In Rome fragrant woods were replaced by imported incense, which became important in public and private sacrifices and in the cult of the emperor.

In the 4th century AD the early Christian church began to use incense in eucharistic ceremonial, in which it came to symbolize the ascent of the prayers of the faithful and the merits of the saints. Until the European Middle Ages its use was more restrained in the West than in the East. After the Reformation incense was employed sporadically in the Church of England until widely restored under the influence of the Oxford Movement in the 19th century. Elsewhere in both Eastern and Western Catholic Christendom, its use during divine worship and during processions has been continuous.

Historically, the chief substances used as incense were such resins as frankincense and myrrh (*qq.v.*), along with aromatic wood and bark, seeds, roots, and flowers. The incense used by the ancient Israelites in their liturgy was a mixture of frankincense, storax, onycha, and galbanum, with salt added as a preservative. In the 17th and 18th centuries, natural substances began to be supplanted by chemicals used in the perfume industry, and this trend toward the use of synthetic substitutes in incense continues to the present day.

incense burner, container generally of bronze or pottery, fitted with a perforated lid, in which incense is burnt. Although incense burners were used in Europe, they were far more widespread in the East. In China during the Han dynasty (206 BC–AD 220), a type of vessel known as a hill censer was used. It consisted of a shallow, circular pan, in the centre of which was an incense container with a pierced lid constructed as a three-dimensional representation of the Taoist Isles of the Blest. Incense burners of the Ming dynasty (1368–1644) were made in two basic forms: a square vessel on four feet, fitted with two handles and a pierced lid, and a circular tripod vessel, also fitted with a perforated lid. If the original lids were lost, it was customary to replace them with wooden lids carved in imitation of the original metal piercing. In Japan in the 19th century a number of large, bronze incense burners were made for export. Their decorative designs, often incorporating dragons, are distinguished by high relief, and the vessels were usually given artificial patinas. *See also* thurible.

incense cedar, also called WHITE CEDAR (species *Calocedrus decurrens*), ornamental and timber evergreen conifer of the cypress family (Cupressaceae). It is native primarily to the western slopes of the Cascade and Sierra Nevada mountain ranges of North America, at altitudes of 900 to 2,500 m (2,950 to 8,200 feet). The incense cedar, named for the odour its leaves emit when bruised, may grow 30 to 45 m (100 to 150 feet) tall and up to 5.5 m (18 feet) in diameter. The tree has a straight trunk, with reddish, furrowed bark, and spreading branches that end in sprays of branchlets, covered with dark green leaves. Both juvenile and mature leaves are usually present. Timber from incense cedar is used



Incense cedar (*Calocedrus decurrens*)
Winton Patnode—Photo Researchers/EB Inc.

for carpentry, pencils, storage chests, interiors, and fence posts.

inceptisol, soil type in which soil horizons are just beginning to develop. Ranked third, in terms of land area, among the 10 worldwide soil orders, inceptisols are found in every climatic zone but are especially prevalent in the Arctic tundras of North America, Europe, and Asia. In many places they are permanently frozen below a certain depth and display microrelief forms at the surface, caused by repeated freezing and thawing. Inceptisols are also found on volcanic ash in the tropics. These soils are considered to be forerunners of ultisols, altisols, and oxisols and are extensively used in the tropics for the cultivation of sugarcane and coffee.

incest, sexual relations between persons who, because of the nature of their kin relationships, are prohibited by law or custom from intermarrying. Because, cross-culturally, incest is more an emotional than a legal issue, the term taboo is generally preferred over prohibition. The incest taboo is acknowledged in anthropology as universal, although it is imposed differently in different societies and knowledge of its breach provokes widely different reactions from society to society.

Generally speaking, the closer the genetic relationship between two people, the stronger and more highly charged is the taboo prohibiting or discouraging sexual relations between them. Thus, sexual intercourse between a father and daughter, a mother and son, or a brother and sister is almost universally forbidden. Sexual relations between an uncle and niece or between an aunt and nephew are also generally taboo, and relations between first cousins are prohibited as well in some societies.

Incest taboos beyond immediate family members can vary enormously, however. In matrilineal societies in Melanesia, for example, the taboo is extended from biological brothers and sisters to include all so-called classificatory siblings who trace their descent through the same matriline. Thus, in Melanesian society, the incest taboo makes a distinction among persons—all of whom would be called first cousins in American or European kinship systems—some being expressly forbidden as sexual partners, others considered ideal marital mates. A different type of cultural consideration is evident in Balinese traditions, which held the birth of opposite-sex twins to low-caste parents to be evidence of incest, based on the belief that the neonates had the opportunity to engage in sexual activity while in the womb. Twins of opposite-sex born into the caste of the ruling class, however, were enjoined to marry. Beliefs such as these caution anthropologists against narrow biogenetic explanations for the incest taboo and pose severe impediments to a universal definition.

Nonetheless, a few general statements can be made: (1) incest is almost universally con-

demned and is usually viewed with horror; (2) rare, culturally sanctioned abrogations of the incest taboo are known, one of the foremost being the mandatory marital union of royal siblings; (3) as the immediacy of biological relationship decreases, sanctions against sexual intimacy may be relaxed or disappear.

In anthropology, most research on incest consists of analysis and interpretation of the structure, function, and, to a lesser degree, origin of incest taboos. For sociobiologically oriented anthropologists, the question of incest, and the related questions of exogamous and endogamous marriage, are primarily a matter of genetics. Highly inbred populations have diminished reproductive success and become gene pools for hereditary disorders.

In functional terms, some scholars view the incest taboo as preserving the nuclear family from the disharmony engendered by sexual jealousy, and this argument is extended in its application to explain rules of exogamy. Evolutionary theorists argue that the prohibition on incest within a group and the corresponding rules of exogamy require males to seek sexual and marital partners outside the group, thereby establishing functional alliances with the men of other groups with whom they have exchanged women.

Another theory, emphasizing socialization, argues that the taboo is an important method of regulating the erotic impulse in children, preparing them to function with mature restraint in adult society. The psychoanalytic explanation of Sigmund Freud speculated that the horror of incest derived from the combination of ambivalent emotions toward one's immediate family and repressed forbidden desires to commit sexual acts with family members of the opposite sex.

Contemporary scholars, in their attempts to account for either the origin or the perpetuation of the incest taboo, have been careful to avoid monistic explanations, whether genetic, historical, or social. The question has also been raised whether a unitary phenomenon of incest exists, suggesting that brother-sister, mother-son, and father-daughter sexual unions might be better understood as theoretically distinct.

inch, unit of British Imperial and U.S. Customary measure equal to 1/36 of a yard. The unit derives from the old English *unce,* or *ynche,* which came from the Latin *uncia,* meaning "one-twelfth." (The same Latin word was the source of the name of another English unit, the ounce.) The old English *ynche* was defined by King David I of Scotland about 1150 as the breadth of a man's thumb at the base of the nail. To help maintain consistency of the unit, the measure was usually achieved by adding the thumb breadth of three men—one small, one medium, and one large—and then dividing the figure by three. During the reign of King Edward II, in the early 14th century, the inch was defined as "three grains of barley, dry and round, placed end to end lengthwise." At various times the inch has also been defined as the combined lengths of 12 poppyseeds. Since 1959 the inch has been defined officially as 2.54 centimetres.

Inchbald, Elizabeth, *née* SIMPSON (b. Oct. 16, 1753, Suffolk, Eng.—d. Aug. 1, 1821, London), English novelist, playwright, and actress whose highly successful prose romances, *A Simple Story* (1791) and *Nature and Art* (1796), are early examples of the novel of passion.

At 18 Simpson ran away to London to seek her fortune on the stage, married Joseph Inchbald, an actor, and played the provincial theatres with him. She continued to act after his death in 1779 and also began to adapt plays and write original farces and comedies, *e.g., I'll Tell You What* (1785). She was not a great actress but was greatly admired for her beauty and personality.

Inchcape Rock (reef, North Sea): *see* Bell Rock.

Inch'ŏn, port city, Kyŏnggi *do* (province), northwestern South Korea. It lies near the mouth of the Han River, 25 miles (40 km) west-southwest of Seoul, with which it is connected by highway and railroad. It serves as the capital's chief seaport. In 1981 Inch'ŏn was given the status of a special city, with administrative status equal to a province. The Inch'ŏn district includes the small fishing village of Chemulpo.

A fishing port since the Yi dynasty (1392–1910), Inch'ŏn became one of three treaty ports, which opened in 1883, and developed as an international commercial port before the Japanese occupation (1910–45). During the occupation, modern industries and port facilities were developed and tidal basins constructed to overcome the 33-foot (10-metre) difference in tide level. The successful United Nations troop landing at Inch'ŏn in mid-September 1950 crippled the North Korean invasion, and, to commemorate it, a huge statue of General Douglas MacArthur was erected in the city park. After the Korean War, a plate-glass factory, an iron and steel plant, an oil refinery factory, and a new dock were built. Other industries are chemicals, lumber, and salt manufacturing. Inha Institute of Technology is located there. Part of Inch'ŏn's seaside and nearby islands are used for bathing and other public recreation. Pop. (1989 est.) 1,604,000.

inchworm: *see* measuring worm.

incidental music, music written to accompany or point up the action or mood of a dramatic performance on stage, film, radio, television, or recording; to serve as a transition between parts of the action; or to introduce or close the performance. Because it is written to enhance a nonmusical medium, most incidental music makes little impression on public taste. But some incidental music survives in its own right. Significant examples of such lasting work are Ludwig van Beethoven's music for J.W. von Goethe's *Egmont* (1810), Felix Mendelssohn's music for Shakespeare's *A Midsummer Night's Dream,* Georges Bizet's *L'Arlésienne* suite for Alphonse Daudet's play, and Edvard Grieg's incidental music for Henrik Ibsen's *Peer Gynt.*

The origin of incidental music cannot be firmly established. It is possible that it dates to Greek, Roman, or ancient Oriental theatre, but there is not enough evidence to support such an assertion. It is known that 16th-century English drama, such as Nicholas Udall's *Ralph Roister Doister* (about 1535), began to include songs and music to connect one act to another; music also served as an essential accompaniment to the 16th- and 17th-century form of dramatic entertainment known as the masque. Many of Shakespeare's works, *e.g., Much Ado About Nothing, The Tempest, The Merchant of Venice,* and *As You Like It,* incorporated incidental music—mostly popular tunes, improvised instrumental flourishes, or other music assembled for the purpose of a given performance. The great Restoration composer Henry Purcell (1659–95) owes his reputation largely to the incidental music he wrote for plays and adaptations of plays by Shakespeare, John Dryden, Francis Beaumont and John Fletcher, and William Congreve, among many others. In France, Jean-Baptiste Lully (1632–87) composed incidental music for the royal *comédies-ballets,* anticipating the development of the French opera and opéra-comique.

The 19th century contributed greatly to the orchestral repertoire in the genre of incidental music and established a tradition that carried into the 20th century and interlinked such figures as the poet and playwright Paul Claudel with the composer Darius Milhaud (*Christophe Colomb,* 1928) and the composer Benjamin Britten with the poet W.H. Auden.

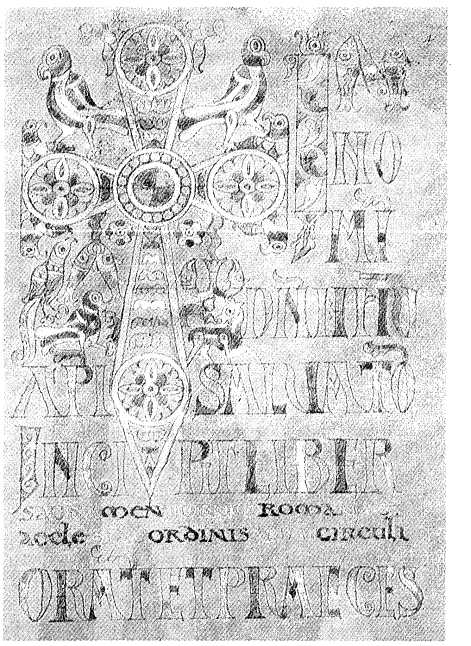
But most important to the expansion of incidental music in the 20th century has been the development, first, of the motion picture and, second, of television, both mediums that rely heavily on fragmented music to aid in story development or in setting a mood. For example, Stanley Kubrick's movie *2001: A Space Odyssey* blended the opening bars of Richard Strauss's symphonic poem *Also sprach Zarathustra,* Johann Strauss the Younger's waltz *The Blue Danube,* and electronically mixed sounds to produce an aura of fantasy and timelessness. Much contemporary incidental music is trivial and is stored for instant retrieval and disposal. There has been a trend in movies and television to do without incidental music altogether. Nonetheless, it remains a field of broadening opportunity for experimentation and creativity.

incinerator, container for burning refuse, or plant designed for large-scale refuse combustion. In the second sense, an incinerator consists of a furnace into which the refuse is charged and ignited (usually by a gas burner), a secondary chamber in which burning at a high temperature is continued to complete the combustion process, and flues to convey the gases to a chimney. Auxiliary equipment may include steam boilers for using waste heat to generate electricity or to heat nearby buildings and devices for removing ash and other pollutants from the flue gases.

Incinerator plants usually include facilities for unloading and storing refuse for short periods to permit uniform charging of the furnaces and, sometimes, rough sorting or classification of the refuse.

Incineration facilitates refuse disposal by reducing the solid waste of a community to about 10 percent of the original volume; but it often creates a pollution problem.

incipit, the opening word or words of a medieval Western manuscript by which, in the absence of a title page, the text may be recognized, referred to, and recorded. As in the title pages or main divisions of later printed books, incipits (Latin for "here begins") provide an



Incipit page from the *Sacramentary of Gelasius,* Frankish, 750–770; in the Vatican Library (MS. Reg. Lat. 316, fol. 4r)

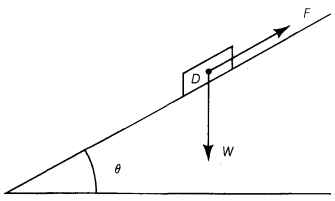
By courtesy of the Biblioteca Apostolica Vaticana

occasion for display letters and a fanfare of calligraphic ornament.

The end of the text in a medieval manuscript was announced by the word *explicit* (Latin for "unrolled"), a reminder of the scroll form of the book used in the West before the codex format was adopted in about AD 700.

Consult the INDEX *first*

inclined plane, simple machine consisting of a sloping surface, used for raising heavy bodies. The force required to move an object up the incline is less than the weight being raised, discounting friction. The steeper the slope, or incline, the more nearly the required force approaches the actual weight. Expressed mathematically, the force F required to move a block D up an inclined plane without friction is equal to its weight W times the sine of the angle the inclined plane makes with the horizontal. Referring to the Figure, $F = W \sin \theta$.



Inclined plane

The principle of the inclined plane is used widely—for example, in screws and bolts, where a small force acting along a slope can produce a much larger force.

inclosure (land tenure): *see* enclosure.

Incomati River (Mozambique): *see* Komati River.

income and employment theory, a body of economic analysis concerned primarily with understanding how the level of operation of the economy, *i.e.,* the relative levels of output, employment, and prices, is determined. The practical aim of understanding the interrelation of these factors is to furnish predictions on which policies of economic stabilization can be based.

A brief treatment of income and employment theory follows. For full treatment, *see* MACROPAEDIA: Economic Theory.

Modern income and employment theory has developed since the publication of J.M. Keynes's *General Theory of Employment, Interest and Money* in 1936. Interest in the subject was triggered by the severity of the Great Depression in the United States and in Europe and the failure of the economic analyses of the time to explain the persistence of high levels of unemployment and the low levels at which business was operating. Classical economic thinking failed to explain the paradox and, indeed, aggravated the problem by recommending that taxes be raised steeply and the money supply be allowed to fall sharply.

To understand fluctuations in the level of economic activity, one must examine the relationship between income, output, and expenditure. Since transactions are two-sided, in that one person's income is another person's expenditure, the relationship could be expressed in the form of a simple equation: $Y = O = D$, where Y is the national income, O is the value national output, and D is national expenditure. What this equation means is that effective demand is equal to income (*i.e.,* purchasing power) as well as to output. Since consumers can either spend or save their income, $Y = C + S$, where C is consumption and S is savings. Similarly, on the output side, production is either sold to final customers or invested in inventory or new capital equipment and plant. So $O = C + I$, where C represents sales to final customers and I investment. Thus, $C + S = C + I$ and, therefore, $S = I$. However, while savings and investment may thus be equated from an accounting standpoint, in fact actual planned savings and planned investment may differ. Within this discrepancy lie the seeds of economic instability.

Suppose that in a given period savings rise above the previous level; the effect of this is a reduction in present demand with the prospect of increased future demand. If by coincidence additional capital formation (investment, such as in inventory) rises by the same amount, productive resources will continue to operate at capacity; there will be no change in the level of activity, and the economy will remain in equilibrium. However, if capital formation does not rise, then productive resources are wasted or idled; *i.e.,* workers become unemployed and lose their current income. The fall in incomes further reduces consumer demand and also the rate of savings. Provided manufacturers do not alter their investment plans, equilibrium will eventually be achieved at a lower level of income. In reality it is not savings that are unstable but the level of investment, and a fall in investment will produce exactly the same kind of reaction as an increase in savings; conversely, a rise in investment or an increase in consumer spending will have the opposite effect.

This simple income model explains the changes in national income in response to a change in planned savings or investment, but it does not show the extent of the change. The degree of change is determined by what Keynes called the "consumption function," *i.e.,* the marginal proportion of income spent. For illustration assume that, on average, consumers save 10 percent of their income. If the equilibrium is disturbed by an unplanned rise in investment, additional income and additional savings would be generated as described previously until a new equilibrium is reached at a higher level. At each stage the increase in savings will be 10 percent of the increase in income. The increase in income will eventually be 10 times the expansion of investment. This factor of 10 is called the multiplier, and it is the reciprocal of the ratio of savings to income (the marginal propensity to save).

Keynes's primary aim in developing his theory was to show that, under certain conditions, the economy could become stuck in a disequilibrium, with productive resources in surplus (*i.e.,* high level of unemployment) but income and output unable to rise sufficiently to reach an equilibrium. Put simply, his argument was that when business was unwilling or unable to increase investment because of ineffective (unfunded) demand, additional government spending would have the same effect of pulling the economy away from the point of disequilibrium. The use of fiscal policy (*q.v.*), such as an increase in government expenditure or a reduction in taxation, was the remedy prescribed to offset the lack of private demand.

A competing theory of income and employment places the quantity of money in the controlling role. The analysis of the effects of increasing or decreasing the money supply is approximately parallel to that of the consumption-and-savings relation. The rules of thumb derived from the two theories may, in fact, be combined: an excess demand for goods or an excess supply of money (two phenomena that may be seen as aspects of but one) is associated with rising income; an excess supply of goods or an excess demand for money (similarly) is associated with falling income. Proponents of the money, or quantity, theory advocate monetary policy (*q.v.*) as the proper countercyclical tool of government.

A third theory, far more complex even in its simplest form, relates the previous two through the nexus of the financial market and its principal characteristic, the market rate of interest.

income tax, a levy imposed by public authority on the incomes of persons or corporations within its jurisdiction. In advanced private-enterprise nations, the income tax is the chief source of revenue for government.

A brief treatment of income tax follows. For full treatment, *see* MACROPAEDIA: Taxation.

While they share some general features, corporate and personal income taxes are so different in rationale, application, and difficulties that they are best treated separately.

Corporation income tax. Virtually all countries assess income taxes on the net profits of corporations, although they differ widely in details and rates. In the United States the federal corporation income tax was adopted in 1909. Until World War II the corporation tax usually yielded more revenue than the individual income tax, but the individual tax thereafter surpassed the corporation tax and by the 1960s produced more than twice as much revenue. Three-fourths of the states also levy corporation income taxes.

Corporation income taxes are mainly flat-rate levies, rather than extensively graduated taxes with rates rising according to income. Rates on the order of 50 percent are common in industrialized nations, sometimes with reduced rates for small corporations. Corporation taxes may be graduated according to the rate of return on invested capital, rather than the absolute size of profits. This is accomplished by an excess-profits tax. Serious difficulties arise, however, in determining accurately the value of invested capital and in selecting an appropriate normal rate of return.

The economic effects of the corporation income tax are a matter of controversy. The traditional view is that the tax is not reflected in prices in the short run and hence must be paid out of profits. If firms try to maximize their profits, which in classical theory depend on prices alone, the tax will give them no reason to change their prices. This reasoning applies equally to competitive and to less competitive or wholly monopolized industries. This theory, however, does not specify what the long-run effects of the tax would be. An alternative view holds that in many industries prices are decisively influenced by the actions of a few leading firms, which have as their objective not maximum profits in the short run but a target rate of return over a period of years. When the rate of corporation income tax is increased, the leading firms will raise their prices in order to maintain the target return, and other firms will follow. This debate has not been resolved by empirical research. If the corporation income tax falls on the returns on capital, it will be generally progressive; to the extent that the tax is shifted through higher prices, it will fall mainly on consumers and be regressive with respect to income.

The adverse effect of the corporation income tax on investment can be lessened by accelerating the rate at which the cost of new machinery and buildings is written off against taxable income through depreciation allowances. The tax credit reduces the income tax payable by a certain percentage of the cost of eligible forms of new investment. Investment allowances, tax credits, and similar schemes reduce the cost of new plants and equipment and thus make investment more attractive. Outlays for research and development are intended to yield returns over a period of years and are frequently given special treatment. In the United States, corporations and individual taxpayers may choose between deducting research-and-development expenditures in full when made or capitalizing them and writing them off over their useful life. Such incentive provisions can be enhanced by permitting net

accounting losses incurred in one year to be carried back against income of prior years or carried forward to future years.

Personal income tax. Personal income taxes are levied on individuals or family units on the basis of income received. They are usually classified as direct taxes because the burden is on the individuals who pay them.

The first country to enact a general income tax was Great Britain in 1799 to finance the Napoleonic Wars. It was alternately repealed and reimposed until the 1880s, by which time it was generally accepted as a permanent levy. In the United States an income tax was first tried during the Civil War. Although it had already expired, it was held to be constitutional by the Supreme Court in 1881. Another income tax imposed in 1894 was, however, declared unconstitutional by the court. In 1913 the 16th Amendment to the Constitution was ratified, and the personal income tax was made permanent.

The fairness of personal income taxation is based on the premise that an individual's income is the best single index of his ability to contribute to the support of the government. Before a tax on personal income can be considered completely fair, it must meet the tests of horizontal and vertical equity. Horizontal equity provides that persons with the same income will, under like circumstances, pay the same amount of tax. Vertical equity considers how much graduation there should be in taxes paid by individuals at different income levels and over what range of personal incomes such graduation should extend. Progressive tax rates have been variously justified. The benefit theory holds that the taxes a person pays ought to bear some close relation to the benefits he enjoys from the operation of government. The sacrifice theory holds that an equitable tax is one that imposes equal sacrifices on individuals at different income levels. Horizontal equity requires that when persons are not similarly situated, their tax liabilities should differ. To accomplish this, the income tax statutes usually provide for personal allowances or exemptions, which differentiate between small and large family units, and deductions that give preferential treatment to certain types of expenditures. Practice with respect to deductions varies widely. In the United States, for example, individual income tax deductions include interest paid on home mortgage debt, abnormal medical expenses, philanthropic contributions, and state and local income and property taxes. In Great Britain, on the other hand, virtually no deductions are granted that do not bear some direct relation to the production of earned income. Some countries allow deductions for certain kinds and limited amounts of personal saving.

It has been argued that an income tax is less favourable to economic growth than a tax on expenditures because an income tax does (and an expenditure tax does not) fall on income that is saved and thus available for investment. It is also argued that a steeply progressive income tax reduces the incentive to work. Progressive income taxes are sometimes said to have an adverse effect on investment in risky ventures, but, so long as the tax is basically one on realized income and does not require an assessment to be made of unrealized capital gains and losses, it is generally held to be an easier tax to administer than either an expenditure tax or a wealth tax. The enforcement of the income tax in many countries, such as the United States, has been made easier by the practice of withholding the tax from wages and salaries.

incomes policy, collective governmental effort to control the incomes of labour and capital, usually by limiting increases in wages and prices. The term often refers to policies directed at the control of inflation, but it may also indicate efforts to alter the distribution of income among workers, industries, locations, or occupational groups.

Countries with highly centralized methods of setting wages tend to have the greatest degree of public or collective regulation of wage and price levels. In The Netherlands, wage settlements are subject to government approval before becoming operative, and price increases are investigated by the Ministry of Economic Affairs. Centralized wage negotiation in the Scandinavian countries functions to set limits for local bargaining rather than to fix the actual wage rate paid; as a result, local wage rates tend to drift away from the centrally determined one. In Norway and Sweden the government has no formal role in bargaining procedures, but its influence is nevertheless felt in negotiations.

France, the United Kingdom, Germany, Austria, and the United States have also sought ways of restraining wage and price increases. They have usually preferred to seek the voluntary cooperation of management and labour rather than to establish administrative machinery. Incomes policies are generally unpopular among trade unionists because they are thought to bear more heavily upon wages than upon other forms of income.

incompatible mating: *see* heterospecific mating.

incongruent melting, liquefaction of a solid accompanied by decomposition or by reaction with the melt to produce another solid and a liquid that differs in composition from the original solid. For example, enstatite, a magnesium silicate ($MgSiO_3$), melts incongruently at low pressures to form forsterite, which is another magnesium silicate (Mg_2SiO_4), and a liquid enriched in silica (SiO_2). At pressures between 2.5 and 5.5 kilobars, the melting of enstatite is congruent.

incrusted cameo (glass): *see* crystallo ceramie.

incubation, the maintenance of uniform conditions of temperature and humidity to ensure the development of eggs or, under laboratory conditions, of certain experimental organisms, especially bacteria. The phrase incubation period designates the time from the commencement of incubation to hatching. It also is the time between the infection of an animal by a disease organism and the first appearance of symptoms.

Controlled incubation is practiced by a few snakes (*i.e.,* pythons), all birds, and monotremes (platypus and echidna). Usually the temperature of the eggs is maintained by body heat, but a few species use decaying vegetation, solar heat, or even volcanic heat.

incubator, an insulated enclosure in which temperature, humidity, and other environmental conditions can be regulated at levels optimal for growth, hatching, or reproduction. There are three principal kinds of incubators: poultry incubators, infant incubators, and bacteriological incubators.

Poultry incubators are used to keep the fertilized eggs of chickens warm until they are ready to hatch. These are the oldest type of incubators; rooms heated by fires were used by the ancient Egyptians and Chinese to hatch chicken eggs, and later incubators used kerosene lamps to heat air or water in proximity to the eggs. Modern incubators are rooms heated by electricity. Large electric fans circulate the air to maintain uniform temperatures, and the eggs are turned automatically at least eight times daily. The larger commercial incubators may hold as many as 75,000 eggs at one time.

Infant incubators are used to provide a warm environment for babies born prematurely or for other infants who are unable to maintain a normal body temperature. The infant incubator is a relatively small, glass-walled box that may have portholes fitted with long rubber gloves through which nurses can handle and care for the infant. Most infant incubators are fitted with special devices that can control the concentration of oxygen inside the incubator; this is necessary because some infants need either greater or lesser amounts of oxygen owing to particular diseases they may have. Infant incubators also regulate the humidity inside the enclosure.

Bacteriological incubators provide a controlled environment in order to promote the growth of bacteria or other microorganisms in various culture media. They are insulated enclosures that are thermostatically regulated to maintain a constant temperature. Hot air is circulated over racks or shelves containing the Petri dishes, flasks, or other culture media. In medicine, such incubators are used to identify disease-causing microorganisms taken from patients. A sample of the patient's blood, sputum, mucus, or other secretion is placed in a culture medium inside the incubator, and, after the microorganisms in the sample have multiplied, they can be identified with greater certainty. Bacteriological incubators are also used in microbiology and biochemistry, in the dairy and other food-processing industries, and in water and sewage treatment plants.

incubator bird: *see* megapode.

incubus, demon in male form that seeks to have sexual intercourse with sleeping women; the corresponding spirit in female form is called a succubus. In medieval Europe, union with an incubus was supposed by some to result in the birth of witches, demons, and deformed human offspring. The legendary magician Merlin was said to have been fathered by an incubus. Parallels exist in many cultures. The word incubus is derived from the Latin *incubus* ("nightmare") and *incubare* ("to lie upon, weigh upon, brood"). In modern psychological usage, the term has been applied to the type of nightmare that gives one the feeling of a heavy weight or oppression on the chest and stomach.

incunabula (Latin: "cradles"), books printed during the earliest period of typography—*i.e.,* from the invention of the art in Europe in the 1450s to the end of the 15th century. The word seems to have been first used of early printing generally in 1653. The limit is convenient but arbitrary, since no special development in the printing art can be connected with it.

The first comprehensive attempt to catalog incunabula in general was made by Georg Wolfgang Panzer in the five volumes of his *Annales Typographici ab Artis Inventae Origine ad Annum MD.* (Nürnberg, 1793–97); this listed the books chronologically under printing centres, which were alphabetically arranged. Many others followed in all languages as interest in book collecting developed.

The total number of editions produced by the 15th-century European presses is generally put at about 35,000 or upward, to which must be added a considerable percentage for ephemeral literature (*e.g.,* single sheets, cheap romances, ballads, and devotional tracts), which has either perished completely or exists only in fragments of waste lining bindings and in other hiding places.

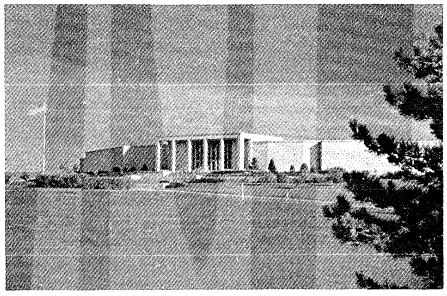
Indefatigable Island (Galápagos Islands): *see* Santa Cruz Island.

Independence, city, seat (1870) of Montgomery county, southeastern Kansas, U.S., on the Verdigris River, near Elk City Lake (dammed for flood control and irrigation). It was founded in 1869 by a company that purchased a portion of an Osage Indian reservation. The town had temporary economic booms with the discoveries of natural gas in

1881 and oil fields in 1903. Independence is now a trade and processing centre for agricultural products (wheat and beef and dairy cattle) and for the production of oil and natural gas. Cement, boats, machinery, and electronic equipment are manufactured. Independence Community Junior College was established in 1925. Nearby is Montgomery State Fishing Lake. Former residents include Alfred M. Landon, presidential candidate in 1936, and playwright William Inge. Inc. 1870. Pop. (1988 est.) 10,337.

Independence, city, seat of Jackson county, western Missouri, U.S., immediately east of Kansas City. It is the hometown of President Harry S. Truman (who was born at Lamar [*q.v.*], 100 miles [160 km] south). Settled in 1827, the county was named for Andrew Jackson, and the city recalled his love of independence. Near the western terminus of transportation on the Missouri River, Independence was the starting point for the Santa Fe, Oregon, and California trails and later became a rendezvous for wagon trains to the California gold mines. Mormon settlers arrived in 1831, but local resentment drove them out in 1833. During the American Civil War, the town was occupied by Union troops and was the scene of two skirmishes with Confederates.

The crescent-shaped Harry S. Truman Library and Museum (1957), housing the former president's private papers and mementos, has a Thomas Hart Benton mural, "Independence and the Opening of the West"; Truman's grave is in the courtyard. His mid-19th century Victorian home and his courtroom and office are preserved. The Auditorium in Independence (completed 1962) is the centerpiece of the World Headquarters of the (Mormon) Reorganized Church of Jesus Christ of Latter Day Saints. A balanced agricultural and manufacturing economy prevails. Inc. 1849. Pop. (1988 est.) 114,035.



Harry S. Truman Library and Museum, Independence, Mo.
Josef Muench

Independence, Declaration of, in U.S. history, document that was approved by the Continental Congress on July 4, 1776, and that announced the separation of 13 North American British colonies from Great Britain. It explained why the Congress on July 2 "unanimously" by the votes of 12 colonies (with New York abstaining) had resolved that "these United Colonies are, and of right ought to be Free and Independent States." Accordingly, the day on which final separation was officially voted was July 2, although the 4th, the day on which the Declaration of Independence was adopted, has always been celebrated in the United States as the great national holiday—the Fourth of July, or Independence Day.

On April 19, 1775, when armed conflict began between Britain and the 13 colonies (the nucleus of the future United States), the Americans claimed that they sought only their rights within the British Empire. At that time few of the colonists consciously desired to separate from Britain. As the War of Independence proceeded during 1775–76 and Britain undertook to assert its sovereignty by means of large armed forces, making only a gesture toward conciliation, the majority of Americans increasingly came to believe that they must secure their rights outside the empire. The losses and restrictions that came from the war greatly widened the breach between the colonies and the mother country; moreover, it was necessary to assert independence in order to secure as much French aid as possible.

On April 12, 1776, the revolutionary convention of North Carolina specifically authorized its delegates in Congress to vote for independence; and on May 15 the Virginia convention instructed its deputies to offer the motion that was finally adopted on July 2. The motion was brought forward in the Congress by Richard Henry Lee on June 7. By that time the Congress had already taken long steps toward severing ties with Britain. It had denied Parliamentary sovereignty over the colonies as early as Dec. 6, 1775, and it had declared on May 10, 1776, that the authority of the king ought to be "totally suppressed," advising all the several colonies to establish governments of their own choice.

The passage of Lee's resolution was delayed for several reasons. Some of the delegates had not yet received authorization to vote for separation; a few were opposed to taking the final step; and several men, among them John Dickinson, believed that the formation of a central government, together with attempts to secure foreign aid, should precede it. However, a committee consisting of Thomas Jefferson, John Adams, Benjamin Franklin, Roger Sherman, and Robert R. Livingston was promptly chosen on June 11 to prepare a statement justifying the decision to assert independence, should it be taken. The document was prepared, and on July 1 nine delegations voted for separation, despite warm opposition on the part of Dickinson. On the following day, with the New York delegation abstaining only because it lacked permission to act, the Lee resolution was adopted. (The convention of New York gave its consent on July 9, and the New York delegates voted affirmatively on July 15.) On July 19 the Congress ordered the document to be engrossed as "The Unanimous Declaration of the Thirteen United States of America." It was accordingly put on parchment, probably by Timothy Matlack of Philadelphia. Members of the Congress present on August 2 affixed their signatures to this parchment copy on that day, and others later. The last signer was Thomas McKean of Delaware, whose name was not placed on the document before 1777.

The Declaration of Independence was written largely by Jefferson, who had displayed talent as a political philosopher and polemicist in his *A Summary View of the Rights of British America,* published in 1774. At the request of his fellow committee members he wrote the first draft. The members of the committee made a number of merely verbal changes, and they also expanded somewhat the list of charges against the king. The Congress made more substantial changes, deleting a condemnation of the British people, a reference to "Scotch & foreign mercenaries" (there were Scots in the Congress), and a denunciation of the African slave trade (this being offensive to some Southern and New England delegates).

It can be said, as John Adams did, that the declaration contained nothing really novel in its political philosophy, which was derived from John Locke, Algernon Sidney, and other English theorists. It may also be asserted that the argument offered was not without flaws in history and logic. Substantially abandoning contention on the basis of the rights of Englishmen, the declaration put forth the more fundamental doctrines of natural rights and of government under social contract. Claiming that Parliament never truly possessed sovereignty over the colonies and that the crown of right exercised it only under contract, the declaration contended that George III, with the support of a "pretended" legislature, had persistently violated the agreement between himself as governor and the Americans as the governed. A long list of accusations was offered toward proving this contention. The right and duty of revolution were then invoked.

Few will now claim that government arose among men as Locke and Jefferson said it did, and the social-contract theory has lost vogue among political scientists. It is likewise true, from a British viewpoint, that Parliament and crown could not be separated and that the history of the colonies after 1607 was not entirely consistent with the assertion that Parliament had never as of right possessed sovereignty over them. Furthermore, the specific charges brought against the king were partisan and not uniformly defensible, and the general accusation that he intended to establish an "absolute Despotism" is hardly warranted. It should be added that several of the heaviest specific complaints condemned actions of the British government taken after the beginning of hostilities.

The defects in the Declaration of Independence are not sufficient to force the conclusion that the document is unsound. On the contrary, it was in essence morally just and politically valid. If the right of revolution cannot be established on historical grounds, it nevertheless rests solidly upon ethical ones. The right of the colonists to government ultimately of their own choice is valid. Some of the phrases of the declaration have steadily exerted profound influence in the United States, especially the proclamation that, "We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness." Although the meanings of these phrases, together with conclusions drawn from them, have been endlessly debated, the declaration has served to justify the extension of American political and social democracy.

The Declaration of Independence has also been a source of inspiration outside the United States. It encouraged Antonio de Nariño and Francisco de Miranda to strive toward overthrowing the Spanish empire in South America, and it was quoted with enthusiasm by the Marquis de Mirabeau during the French Revolution. It remains a great historical landmark in that it contained the first formal assertion by a whole people of their right to a government of their own choice. What Locke had contended for as an individual, the Americans proclaimed as a body politic; moreover, they made good the argument by force of arms.

Since 1952 the original parchment document of the Declaration of Independence has resided in the National Archives exhibition hall in Washington, D.C.

Independence, United States War of: *see* United States War of Independence.

Independence Day, also called FOURTH OF JULY, in the United States, anniversary of the adoption of the Declaration of Independence by the Second Continental Congress (July 4, 1776); it is the greatest secular holiday of the United States. Although Congress actually approved the resolution of independence from Britain on July 2 and the Declaration was not publicly read until July 8, it was on July 4 that the Declaration was drafted by Congress. The first anniversary of the Declaration was marked by a festive impromptu celebration in Philadelphia, but celebration became common only after the War of 1812. Thereafter, civic-minded groups worked to link the ideals of democracy and citizenship to the pa-

Declaration of Independence [1776]

In Congress, July 4, 1776

The Unanimous Declaration of the Thirteen United States of America

When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.—We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.—That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed,—That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and Happiness. Prudence, indeed, will dictate that Governments long established should not be changed for light and transient causes; and accordingly all experience hath shown, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same Object evinces a design to reduce them under absolute Despotism, it is their right, it is their duty, to throw off such Government, and to provide new Guards for their future security.—Such has been the patient sufferance of these Colonies; and such is now the necessity which constrains them to alter their former Systems of Government. The history of the present King of Great Britain is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute Tyranny over these States. To prove this, let Facts be submitted to a candid world.—He has refused his Assent to Laws, the most wholesome and necessary for the public good.—He has forbidden his Governors to pass Laws of immediate and pressing importance, unless suspended in their operation till his Assent should be obtained; and when so suspended, he has utterly neglected to attend to them.—He has refused to pass other Laws for the accommodation of large districts of people, unless those people would relinquish the right of Representation in the Legislature, a right inestimable to them and formidable to tyrants only.—He has called together legislative bodies at places unusual, uncomfortable, and distant from the depository of their public Records, for the sole purpose of fatiguing them into compliance with his measures.—He has dissolved Representative Houses repeatedly, for opposing with manly firmness his invasions on the rights of the people.—He has refused for a long time, after such dissolutions, to cause others to be elected; whereby the Legislative powers, incapable of Annihilation, have returned to the People at large for their exercise; the State remaining in the mean time exposed to all the dangers of invasion from without, and convulsions within.—He has endeavoured to prevent the population of these States; for that purpose obstructing the Laws for Naturalization of Foreigners; refusing to pass others to encourage their migration hither, and raising the conditions of new Appropriations of Lands.—He has obstructed the Administration of Justice, by refusing his Assent to Laws for establishing Judiciary powers.—He has made judges dependent on his Will alone, for the tenure of their offices, and the amount and payment of their salaries.—He has erected a multitude of New Offices, and sent hither swarms of Officers to harrass our people, and eat out their substance.—He has kept among us, in times of peace, Standing Armies, without the Consent of our legislatures.—He has affected to render the Military independent of and superior to the Civil power.—He has combined with others to subject us to a jurisdiction foreign to our constitution, and unacknowledged by our laws; giving his Assent to their Acts of pretended Legislation:—For quartering large bodies of armed troops among us:—For protecting them, by a mock Trial, from punishment for any Murders which they should commit on the Inhabitants of these States:—For cutting off our Trade with all parts of the world:—For imposing Taxes on us without our Consent:—For depriving us in many cases, of the benefits of Trial by Jury:—For transporting us beyond Seas to be tried for pretended offences:—For abolishing the free System of English Laws in a neighbouring Province, establishing therein an Arbitrary government, and enlarging its Boundaries so as to render it at once an example and fit instrument for introducing the same absolute rule into these Colonies:—For taking away our Charters, abolishing our most valuable Laws, and altering fundamentally the Forms of our Governments:—For suspending our own Legislatures, and declaring themselves invested with power to legislate for us in all cases whatsoever.—He has abdicated Government here, by declaring us out of his Protection and waging War against us.—He has plundered our seas, ravaged our Coasts, burnt our towns, and destroyed the lives of our people.—He is at this time transporting large Armies of foreign Mercenaries to compleat the works of death, desolation and tyranny, already begun with circumstances of Cruelty & perfidy scarcely paralleled in the most barbarous ages, and totally unworthy the Head of a civilized nation.—He has constrained our fellow Citizens taken Captive on the high Seas to bear Arms against their Country, to become the executioners of their friends and Brethren, or to fall themselves by their Hands.—He has excited domestic insurrections amongst us, and has endeavoured to bring on the inhabitants of our frontiers, the merciless Indian Savages, whose known rule of warfare, is an undistinguished destruction of all ages, sexes and conditions. In every stage of these Oppressions We have Petitioned for Redress in the most humble terms: Our repeated Petitions have been answered only by repeated injury. A Prince, whose character is thus marked by every act which may define a Tyrant, is unfit to be the ruler of a free people. Nor have We been wanting in attentions to our Brittish brethren. We have warned them from time to time of attempts by their legislature to extend an unwarrantable jurisdiction over us. We have reminded them of the circumstances of our emigration and settlement here. We have appealed to their native justice and magnanimity, and we have conjured them by the ties of our common kindred to disavow these usurpations, which, would inevitably interrupt our connections and correspondence. They too have been deaf to the voice of justice and of consanguinity. We must, therefore, acquiesce in the necessity, which denounces our Separation, and hold them, as we hold the rest of mankind. Enemies in War, in Peace Friends.—

We, therefore, the Representatives of the United States of America, in General Congress, Assembled, appealing to the Supreme Judge of the world for the rectitude of our intentions, do, in the Name, and by Authority of the good People of these Colonies, solemnly publish and declare, That these United Colonies are, and of Right ought to be Free and Independent States; that they are Absolved from all Allegiance to the British Crown, and that all political connection between them and the State of Great Britain, is and ought to be totally dissolved; and that as Free and Independent States, they have full Power to levy War, conclude Peace, contract Alliances, establish Commerce, and to do all other Acts and Things which Independent States may of right do.—And for the support of this Declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other our Lives, our Fortunes and our sacred Honor.

John Hancock

New Hampshire
Josiah Bartlett
Wm. Whipple
Matthew Thornton

Massachusetts Bay
Saml. Adams
John Adams
Robt. Treat Paine
Elbridge Gerry

Rhode Island
Step. Hopkins
William Ellery

Connecticut
Roger Sherman
Sam'el Huntington
Wm. Williams
Oliver Wolcott

New York
Wm. Floyd
Phil. Livingston
Frans. Lewis
Lewis Morris

New Jersey
Richd. Stockton
Jno. Witherspoon
Fras. Hopkinson
John Hart
Abra. Clark

Pennsylvania
Robt. Morris
Benjamin Rush
Benja. Franklin
John Morton
Geo. Clymer
Jas. Smith
Geo. Taylor
James Wilson
Geo. Ross

Delaware
Caesar Rodney
Geo. Read
Tho. M'Kean

Maryland
Samuel Chase
Wm. Paca
Thos. Stone
Charles Carroll of Carrollton

Virginia
George Wythe
Richard Henry Lee
Th. Jefferson
Benja. Harrison
Ths. Nelson, Jr.
Francis Lightfoot Lee
Carter Braxton

North Carolina
Wm. Hooper
Joseph Hewes
John Penn

South Carolina
Edward Rutledge
Thos. Heyward, Junr.
Thomas Lynch, Junr.
Arthur Middleton

Georgia
Button Gwinnett
Lyman Hall
Geo. Walton

Note.—Mr. Ferdinand Jefferson, Keeper of the Rolls in the Department of State, at Washington, says: "The names of the signers are spelt above as in the facsimile of the original, but the punctuation of them is not always the same; neither do the names of the States appear in the facsimile of the original. The names of the signers of each State are grouped together in the facsimile of the original, except the name of Matthew Thornton, which follows that of Oliver Wolcott."—*Revised Statutes of the United States,* 2nd edition, 1878, p. 6.

triotic spirit of the day. Many undertakings of public interest have been initiated on July 4: digging the Erie Canal, 1817; building the Baltimore and Ohio Railroad (first railway in the country), 1828; laying the cornerstone of the Washington Monument, 1850; and formal recognition of the Philippines' independence, 1946.

Independence Island (Kiribati): *see* Malden Island.

Independent, also called SEPARATIST, any of the English Christians in the 16th and 17th centuries who wished to separate from the Church of England and form independent local churches. They were eventually called Congregationalists. Independents were most influential politically in England during the time of the Commonwealth (1649–60) under Oliver Cromwell, the lord protector, an Independent. Subsequently, they survived repression and gradually became an important religious minority in England.

One group of Separatists left England for Holland in 1608, and in 1620 some of them, the Pilgrims, settled at Plymouth, Mass. The Plymouth Separatists cooperated with the Puritans (nonseparating Independents) who settled Massachusetts Bay (1630). In England the Puritans had hoped to purify the Church of England, but in New England they accepted the congregational form of church government in which each local church was independent. Thus, the churches of the Separatists and the Puritans became the Congregationalists of the United States.

A fundamental belief of the Independents was the idea of the gathered church, which was in contrast to the territorial basis of the Church of England whereby everyone in a certain area was assigned to the parish church. Independents believed that the foundation of the church was God's Spirit, not man or the state. Those who were definitely Christian believers, therefore, should seek out other Christians and gather together to make up a particular church. This belief was the basis for the autonomous local church of the Independents, which became a principal tenet of Congregationalism.

Independent Christian Churches: *see* Undenominational Fellowship of Christian Churches and Churches of Christ.

Independent Fundamental Churches of America, fellowship of conservative, independent churches stressing biblical truth. It was organized in Cicero, Ill., U.S., in June 1930 as the successor of the American Conference of Undenominational Churches. Member churches are forbidden to affiliate with any denomination, and the fellowship, administered by annually elected trustees, cannot organize itself as a denomination. Individuals may also seek membership, and those who do are usually ministers, missionaries, Bible teachers, evangelists, editors of Christian periodicals, or students. Each year members profess 16 articles of faith that include the original Five Points of Fundamentalism. From its headquarters in Wheaton, Ill., the organization publishes *The Voice,* a monthly magazine.

Independent Television (ITV), in the United Kingdom, television network consisting of a consortium of private companies in competition with the British Broadcasting Corporation. It is regulated by the Independent Broadcasting Authority, which was originally the Independent Television Authority. The ITV network was authorized by act of Parliament in 1954, when the BBC's monopoly over radio and television broadcasting was modified to permit a single channel to operate by selling air time to advertisers.

The innovation came into existence amid fierce political controversy. ITV differed from the American commercial-television model in that there was only one channel for the independent facility, and its broadcasts were subject to much greater regulation of advertising and involved a greater range of variety and program content.

There were four original contractors who were to share ITV's single network: Rediffusion, Granada, ATV, and ABC. All were based on established cinema and show-business interests, and they quickly set about providing the popular peak-time viewing: variety shows, big-money quizzes, pop-music programs, and open-ended drama serials, or "soap operas." ATV's *Sunday Night at the London Palladium* remained a staple of the weekend viewing diet for 13 years; Granada's *Coronation Street,* a twice-weekly saga of working-class life in Northern England, achieved great popularity. ATV in particular, under the dynamic leadership of Lew Grade (later Lord Grade), embarked on a series of fast-moving adventure programs, beginning with *The Saint* and *Danger Man.*

The immediate popularity of ITV had a devastating effect on the BBC, and ITV revenues soared from an initial £2,000,000 to more than £60,000,000. The BBC reacted by adding popular programming in prime viewing hours, and ITV programmers greatly enhanced their reputation by developing superiority in coverage of current affairs and in some documentary areas.

Indes, Compagnie Française des (French: "French Company of the Indies"), one of the companies known as the French East India Company (*q.v.*).

Indes occidentales: *see* West Indies.

Indes Orientales, Compagnie Française des (French: "French Company of the East Indies"), one of the companies known as the French East India Company (*q.v.*).

indeterminacy principle (physics): *see* uncertainty principle.

indeterminate sentence, in law, term of imprisonment with no definite duration within a

prescribed maximum. Eligibility for parole is determined by the parole authority. In this respect, an indeterminate sentence differs from a definite one in that statutes prescribing the latter usually provide for parole eligibility after a specified fraction of the full term—in most countries, from one-half to two-thirds of the original sentence.

Indeterminate sentences were pioneered in the reformatory movement of the last quarter of the 19th century. Release was determined by progress made under the program of training rather than by a judicially established sentence. In current practice, release on parole from an indeterminate sentence is initiated by the recommendation of prison staff personnel, field parole officers, and the parole authorities. Evaluation of the offender's conduct in prison, the nature of his offense, his life history, his prospects in the community, his general personality, and his attitude determine his suitability for parole.

index fossil, any animal or plant preserved in the rock record of the Earth that is characteristic of a particular span of geologic time or environment. A useful index fossil must be distinctive or easily recognizable, abundant, and have a wide geographic distribution and a short range through time. Index fossils are the basis for defining boundaries in the geologic time scale and for the correlation of strata. In marine strata, index fossils that are commonly used include the single-celled Protista with hard body parts and larger forms such as ammonoids. In terrestrial sediments of the Cenozoic era, which began about 66.4 million years ago, mammals are widely used to date deposits. All of these animal forms have hard body parts, such as shells, bones, and teeth, and evolved rapidly.

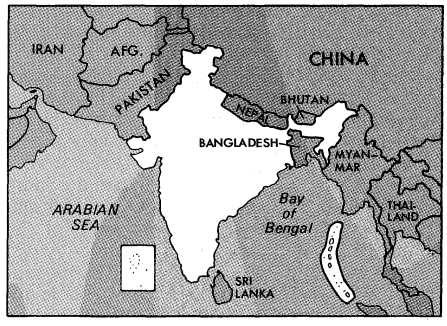
Index Librorum Prohibitorum (Latin: "Index of Forbidden Books"), list of books once forbidden by Roman Catholic church authority as dangerous to the faith or morals of Roman Catholics. Publication of the list ceased in 1966, and it was relegated to the status of a historic document.

Compiled by official censors, the *Index* was an implementation of one part of the teaching function of the Roman Catholic church: to prevent the contamination of the faith or the corruption of morals through the reading of theologically erroneous or immoral books. It was not, therefore, equivalent to the total legislation of the church regulating reading by Roman Catholics; nor was it ever a complete catalog of forbidden reading. Until 1966, canon law prescribed two main forms of control over literature: the censorship of books by Roman Catholics in advance of publication, in regard to matters of faith and morals (a practice still followed); and the condemnation of published books that were judged to be harmful. The works appearing on the *Index* are only those that ecclesiastical authority was asked to act upon.

The origin of the church's legislation concerning the censorship of books is unclear, but books were a source of concern as early as the scriptural account of the burning of superstitious books at Ephesus by the new converts of St. Paul (Acts 19:19). The decree of Pope Gelasius I about 496, which contained lists of recommended as well as banned books, has been described as the first Roman Index. The first catalog of forbidden books to include in its title the word index, however, was published in 1559 by the Sacred Congregation of the Roman Inquisition (a precursor to the Congregation for the Doctrine of the Faith). The last and 20th edition of the *Index* appeared in 1948. The list was suppressed in June 1966.

indexation, in fiscal policy, a means of offsetting the effect of inflation or deflation on social security payments and taxes by measuring the "real value" of money from a fixed point of reference, usually a price index. Without indexing, recipients of social security benefits, for example, would suffer during times of inflation if their benefits remained at a fixed rate. Indexation in this case would also apply to taxes levied to support the program. Indexation is used in some countries to offset "bracket creep," which occurs in any progressive tax (*q.v.*) system when inflation pushes taxpayers into higher income tax brackets. Indexation may also refer to the linking of wage rates and financial instruments to a price index.

India, officially REPUBLIC OF INDIA, Hindi BHARAT, or BHĀRATAVARSHA, republic of southern Asia, the seventh largest and second most populous nation in the world, covering an area of 1,222,559 square miles (3,166,414 square km). The capital is New Delhi. India is bordered on the northwest by Pakistan (and by the disputed state of Jammu and Kashmir); on the northeast by China, Nepal,



India

and Bhutan; and on the east by Myanmar (Burma) and Bangladesh. It fronts the Bay of Bengal on the southeast and the Arabian Sea on the southwest. Offshore, to the southeast across the Gulf of Mannar and the Palk Strait, lies the island republic of Sri Lanka. The population of India in 1990 was estimated at 853,373,000, or about one-sixth of the world's population.

A brief treatment of India follows. For full treatment, *see* MACROPAEDIA: India.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. India may be divided into three major physiographic regions from south to north: the Deccan Plateau, the plains region, and the Himalayas. Geologically, the plateau region is the oldest part of India's land surface and is separated from the Indo-Gangetic Plain to the north by the Vindhya Range.

The plains region, a contiguous lowland surrounding the plateau region, comprises the northwestern deserts, the Ganges Basin in the northeast, and the western and southeastern coastal plains (together making up nearly half the land area). The plains areas lie mostly at elevations below 1,000 feet (300 m) and support most of India's agricultural activity. Nearly 80 percent of the Ganges River Basin lies below 500 feet (150 m). The Thar (Great Indian) Desert in the northwest covers about 8 percent of the country.

The Himalayas, which extend from the northwest to the northeast and surmount the Indian subcontinent, account for the remaining portion of the country's area. Some of the highest mountains in the world are found in the Himalayas; many exceed 25,000 feet (7,600 m) in elevation. The dramatic 5-mile (8-kilometre) contrast in relief represented in the Indian landscape ranges from tropical monsoon coastal lowlands to the mountains of the Himalayan region.

The Ganges River dominates not only India's hydrology but much of the country's economic life as well; it is one of three major river systems emanating from the Himalayas to form the Great Plain. Besides the Ganges, there are the Indus River, which flows southwestward into Pakistan, and the Brahmaputra River, which flows southward from Assam and joins the Ganges in a single major delta system in Bangladesh emptying into the Bay of Bengal. The Godāvari and Krishna are the two major river systems in southern India. The combined area of the Indian portion of these five major river basins accounts for about half of India's total area.

The climate of India is governed by the tropical monsoon regime. Four seasons are recognized: that of cold weather (December to March); that of hot weather (April and May); the rainy (monsoon) season (June to September); and the season of the retreating southwest monsoon (October and November). Rainfall varies from an annual average of 450 inches (11,430 mm) at Cherrapunji in Assam to less than 4 inches (100 mm) annually in the Thar Desert. Rainfall throughout the Ganges Basin averages between 40 and 80 inches (1,000 to 2,000 mm) a year. Temperatures vary primarily with elevation: at hill stations in the Himalayan region annual average temperatures range between 54° and 57° F (12° and 14° C) and in the rest of the country between 79° and 83° F (26° and 29° C).

Almost three-fifths of the country's total land area is arable, and nearly a fourth of the cultivated land is irrigated. About one-fourth of the country is forested, supporting a variety of wildlife including tiger, panther, bear, antelope, wild goats and sheep, elephant, and rhinoceros.

The people. The peoples of India are largely the product of successive invasions that have swept into the country from prehistoric times. The main ethnic strains that have mingled in various combinations are the Caucasoid, Mongoloid, Australoid, and Negroid. India is the birthplace of many religions and has become the home of many others. More than four-fifths of the population are Hindu, more than one-tenth are Muslim, followed by Christians, Sikhs, Buddhists, and Jains. Language, rather than ethnic origin, is the primary distinction among India's peoples. The principal languages spoken are Hindi, one of two official languages, Telugu, Bengali, Marāṭhī, Tamil, and Urdū. English, also an official language, is widely spoken. India's largest cities include Calcutta, Bombay, Delhi, Madras, Bangalore, Ahmadābād, and Hyderābād.

About two-fifths of the populace is under 15 years old, burdening government and working-age population with providing adequate health services, food, and education. The Indian government, with international assistance, has vigourously promoted family planning (since 1977 known as family welfare) programs; it is increasingly funding programs involving family planning education and birth control methods and information. But India's birth rate remains higher than the world average. Its death rate is about equal to the world average, resulting in an annual rate of growth still too high for India's expanding economy to provide marked gains in per capita measures of economic well-being for the majority of the population. The number of infant deaths also remains very high by world standards at about 100 per 1,000 live births.

The economy. India has a developing mixed economy in which both the public and private sectors participate. Agriculture and services are the largest sectors of the economy, but manufacturing industries have expanded considerably since 1947. The gross national product (GNP) per capita, which began declining in the mid-1980s, is among the lowest in the world.

Agriculture accounts for approximately one-

third of the GNP and employs three-fifths of the work force. Land reform has benefited only a limited number of peasants, and subsistence farming is widely prevalent. Harvests of rice and wheat, the main staples, have increased dramatically since 1969, partly because of higher-yielding strains introduced during the Green Revolution of the 1960s and 1970s. India produces about one-fifth of the world's rice, but yields vary sharply from state to state and are generally far from optimum. The chief cash crops are jute, tea, sugarcane, oilseeds, and cotton. India's population of cattle, goats, and buffalo is the largest in the world, but most animals are undernourished and produce little milk. The government manages most forests, but forestry is underdeveloped.

The central government controls most mineral industries, which are dominated by the production of bituminous coal, cement, iron ore, manganese, bauxite, chromite, sheet mica, and copper. Production of petroleum meets about three-fourths of domestic demand.

Manufacturing industries account for approximately one-sixth of the GNP and employ one-tenth of the work force. The government has invested heavily in the development of heavy industries and directly manages many companies. Principal manufactures include automobiles, iron and steel, pharmaceuticals, shipbuilding, textiles, bicycles, electrical appliances, and diesel engines. Electricity is generated mainly from thermal and hydroelectric plants with small quantities from nuclear reactors. Several thousand local labour unions are associated with the Indian National Trade Union Congress, the largest trade union organization in the country; Bharatiya Mazdoor Sabhā is a younger but fast-growing confederation of unions.

India's balance of trade has tended to be unfavourable and has been only partially offset by remittances from Indians working abroad. India's chief trading partners include the Soviet Union, the United States, Japan, Saudi Arabia, and the United Kingdom.

Administrative and social conditions. India is a democratic republic made up of 24 states (excluding Jammu and Kashmir) and 7 union territories. Its 1950 constitution derives from several sources but is mainly influenced by the British concept of parliamentary government. Legislative power is vested in a bicameral Parliament; its Council of States (Rājya Sabhā) has not more than 250 members, up to 12 of whom are nominated by the president and the remainder are indirectly elected to six-year terms, one-third every two years. The term of the House of the People (Lok Sabhā) is five years, and its not more than 550 members are directly elected. The president, the constitutional head of state, is elected to a five-year term by an electoral college, but his duties are primarily ceremonial. Executive power is exercised by the appointed Council of Ministers under the leadership of the prime minister, who is designated by the majority party or coalition in Parliament and then formally appointed by the president. Except for a few years in the late 1970s, the government has been dominated since independence by the Congress Party, which in 1978 split into two Congress parties identified by the initials of their leaders. The judicial system is headed by a Supreme Court appointed by the president. The army is the largest branch of the armed forces, followed by the air force and navy.

Public health is primarily the responsibility of the state governments, with some federal support. Despite improvements, health conditions remain poor; life expectancy is only slightly more than 55 years. The country is plagued by such serious diseases as malaria, tuberculosis, cholera, filariasis, dysentery, and influenza. Many rural villages lack potable water. With a major proportion of India's population living in poverty, malnutrition is a serious problem.

Education is primarily the responsibility of the state governments and has shown slow but measurable progress since 1950. Education is geared to development and, though not compulsory, in most states is free between the ages of 6 and 14. Basic education, an activity-centred curriculum modeled on Gandhi's educational theories, was introduced into elementary schools soon after independence, while secondary schools offer instruction in Hindi, English, and the appropriate regional dialect. Higher education is provided in colleges, universities, and technical institutes. Social education programs combat adult illiteracy.

Since independence India's press has generally enjoyed a high degree of freedom. The diversity of languages has produced a large number of newspapers, which, with a few exceptions, have relatively small circulations. Because only about two-fifths of the population is literate, radio and television are the most influential media. Both are operated by a state monopoly.

Cultural life. The cultural heritage of India is one of the richest and most ancient in the world. (*See* Indian architecture; Indian dance; Indian literature; Indian music; Indian philosophy; Indian sculpture.)

History. Aryan peoples invaded India across the Iranian plateau between 1500 and 1200 BC and began the urbanization of the Ganges Valley, developing a centre of Aryan power around present-day Delhi. There Brahmanism grew out of the Aryans' Vedic religion, and Sanskrit developed into India's national language, lasting for 2,000 years.

Buddhism and Jainism emerged late in the 6th century BC. Northern India coalesced into the first Hindu empire, the Maurya dynasty (c. 321–185 BC), under Candra Gupta. His grandson, Aśoka (d. 238 BC), extended it to two-thirds of the Indian peninsula. The Mauryan Empire dissolved into a number of small kingdoms, and Northern India was reunited by the Gupta dynasty (AD 320–480).

Muslim invasions began about AD 1000, and the sultanate of Delhi was extended by Muhammad ibn Tughluq in the early 14th century. Muslim hegemony in the north continued into the early 16th century. In the south the Muslim Bahmanī dynasty was established in 1347 and endured until 1527. The Hindu kingdom of Vijayanagar coexisted in the south (1336–1556).

Vasco da Gama's voyage to India (1497–98) opened Portugal's century of monopolizing Indian trade with Europe. During the 17th century Portugal was forced to compete with the English, French, and Dutch for that trade.

In the early 16th century the Muslim Mughal Empire began to dominate most of India. The empire was established under Bābur in 1526 and expanded under Akbar the Great (1556–1605), but the Hindu Marāṭhās began to challenge Mughal supremacy in the late 17th century and carved out their own empire.

Meanwhile the influence of the British East India Company rose as it ousted rival colonial powers and then subdued the Mughals in 1757 and the Marāṭhās in 1818, controlling India until 1858, when the British government instituted the direct rule of India following the 1857 Indian Mutiny.

Early expressions of nationalism that finally culminated in Indian independence and in the partition of the subcontinent first crystallized in the Indian National Congress (1885) and the All-India Muslim League (1906). For nearly 60 years following the 1857 mutiny, the vast majority of Indians cooperated with British rule, but after World War I many Hindus as well as some Muslims began to oppose British authority. In 1920 the Indian National Congress, led by Mohandas K. Gandhi (later called Mahatma), began his program of noncooperation with British rule. The British granted India limited powers of self-government in 1919 and 1935 (the Government of India Acts), but Gandhi and others pressed for a fully independent and united India.

Independence was granted in 1947, but Hindu and Muslim unity was not achieved. A largely Hindu India and a Muslim Pakistan were created by partition of the subcontinent, with the Punjab and Bengal divided along religious-demographic boundaries between the two, and Kashmir remained in dispute.

Jawaharlal Nehru became prime minister of India, and general elections chose a national parliament and assemblies in 1952. Brief border wars erupted with China in 1962 and Pakistan in 1965, both over disputed territory. In 1967 Indira Gandhi, Nehru's daughter, became prime minister with the support of the Congress Party. War erupted again with Pakistan on two fronts in 1971. The war ended shortly, and the new nation of Bangladesh was created out of East Pakistan.

Indira Gandhi remained the dominant figure in Indian politics until 1984, when she was assassinated by Sikh members of her personal guard in apparent retaliation for government policy toward the Sikh minority. Her son Rajiv Gandhi then became prime minister as leader of the Congress-I Party.

India, Air- (airline): *see* Air-India.

India, Casa da (Portuguese trading house): *see* Guinê, Casa da.

India ink, also called CHINESE INK, black pigment in the form of sticks that are moistened before use in drawing and lettering, or the fluid ink consisting of this pigment finely suspended in a liquid medium, such as water, and a glutinous binder. The sticks or cakes consist of specially prepared lampblack, or carbon black, mixed with a gum or glue, and sometimes perfume. India ink was used in China and Egypt centuries before the Christian Era and is still valued for the opacity and durability that make it one of the finest of inks.

In India, the carbon black from which India ink is produced is obtained by burning bones, tar, pitch, and other substances.

India rubber plant, also called INDIA RUBBER TREE (*Ficus elastica*), large tree in its native southeast Asia and in other warm areas but a common indoor pot plant elsewhere. It has large, thick, oblong leaves, up to 30 cm (12 inches) long, and figlike fruits in pairs along the branches. The milky sap, or latex, was once an important source of an inferior natural rubber.

Young plants available in the florist's trade are durable and grow well under less than ideal indoor conditions. Among the cultivated varieties offered are 'Decora,' with broader and darker green leaves, and a few variegated strains, with marbled gray, cream, and white leaves or green leaves with white or yellow margins.

Indian: *see* American Indian; American Indian geographical race.

Indian Airlines, the domestic and regional airline of India, founded in August 1953. Whereas Air-India (*q.v.*) provides a broader international service, Indian Airlines serves the Indian subcontinent—India, Afghanistan, Pakistan, Nepal, Bangladesh, Burma, and Sri Lanka. Headquarters are in New Dehli.

Indian architecture, the past and present building traditions of the Indian subcontinent.

A brief treatment of Indian architecture follows. For full treatment, *see* MACROPAEDIA: South Asian Arts.

Indian architecture dates back to at least the 2nd millennium BC and has been primarily religious in function, serving Buddhism, Hin-

duism, Islām, and Jainism. The earliest Indian buildings were Buddhist and Hindu temples made of wood and then of brick; other temples were carved out of solid rock and are called cave temples. By the 4th century BC, stone had become the accepted material for buildings, and successive Indian cultures acquired great skill in the carving and construction of stone buildings. Large stupas, or dome-shaped Buddhist shrines, and rectilinear temples and monasteries were built during the the Maurya period (4th–2nd century BC), along with cave temples. The Gupta period (4th–6th centuries AD) marked the beginning of the zenith of Indian architecture and the emergence of its most characteristic structure, a temple with a square base and a pyramidal tower that has either a straight or curving outline and is heavily decorated with architectural and figural ornament. This temple form was brought to its stylistic height during the 7th–11th centuries AD, and the Hindu temple complexes themselves became larger and more elaborate in plan, layout, and building type. A rich variety of regional building styles developed at this time, all concentrating on the temple complex.

The extension of Islām into India in the 11th and 12th centuries introduced typical Muslim architectural forms such as the dome, the pointed arch, and Islāmic decoration into mosques, tombs, and other structures. This period is viewed by some scholars as a decline relative to the splendour of the previous indigenous architecture, but such marvels as the Tāj Mahal resulted from the rule of the Muslim Mughal dynasty in the 16th to the 18th centuries. The period of European colonization and then of British rule in India resulted in the introduction and imitation of European building styles in India, and, by the time of Indian independence in the mid-20th century, Indian architecture was almost entirely modern in its form, style, and materials.

Indian Association, nationalist political group in India that favoured local self-government and served as a preparatory agent for the more truly national Indian National Congress. The association was founded in Bengal in 1876 by Surendranath Banerjea and Ananda Mohan Bose; it soon displaced the Indian League, which had been founded the year before, and rivaled the long-standing British Indian Association, which it regarded as a reactionary body of landlords and industrialists. The association was supported mainly by younger professional men among the Bengali intelligentsia. It spread beyond Bengal to other parts of India but remained Bengali in character, using expatriate Bengali communities as centres for its provincial branches.

The association found an issue in opposing the lowering of the age limit for civil service examinations (1877), which was disadvantageous to Indian candidates; and in 1878 it objected to the Vernacular Press Act, which stifled the Indian press. It advocated local self-government and tenant rights, and, when the Bengal Tenancy Act was finally passed in 1885, it demanded representative government. After the Indian National Congress was founded in 1885, the association gradually lost ground; it was not heard of after 1888.

Indian Botanic Garden, formerly ROYAL BOTANIC GARDEN, botanical garden in Calcutta, famous for its enormous collections of bamboos, palms, and shrublike trees of the screw pine group called Pandanus. The garden covers more than 109 hectares (270 acres), on which about 1,700 plant species are cultivated. It was founded in the 1780s by the East India Company, primarily for the purpose of acclimatizing new plants of commercial value and growing spices for trade. A major change in policy, however, was introduced by the botanist William Roxburgh after he became superintendent of the garden in 1793. Roxburgh brought in plants from all over India and developed an extensive herbarium. This collection of dried plant specimens eventually became the Central National Herbarium of the Botanical Survey of India, which comprises 2,500,000 items. Over the years attractive display gardens for the public have been developed and many kinds of plants have been cultivated for scientific observation. During the 1970s the garden initiated a program to introduce improved food plants and other varieties of economic benefit to the people of India. The best-known landmark of the garden is an enormous banyan tree that is more than 300 m (1,000 feet) in circumference and thought to be two centuries old.

Indian buffalo: *see* water buffalo.

Indian corn: *see* corn.

Indian dance, the dance traditions and styles of India.

A brief treatment of Indian dance follows. For full treatment, *see* MACROPAEDIA: South Asian Arts.

Indian dance can be divided into classical, folk, and modern types. The classical tradition is at least 2,000 years old, and in the course of history its influence has diffused throughout much of Southeast Asia. India evolved a type of classical dance drama that combines movement, gesture, singing, music, and costumes. The dancer dances out the story by using stylized gestures that are both highly symbolic and emotionally suggestive. The stories that are enacted are based on Hindu religion and mythology. The classical dance drama is both aesthetically appealing and highly psychological in its approach. It has attained world recognition as one of the most exquisite forms of classical dance.

Indian folk dancing is highly varied, differing as it does from region to region and from one ethnolinguistic group to another. Dance is also an integral, even an indispensable, element in many of the productions of India's vast motion-picture industry.

Indian Evidence Act, act passed by the British Parliament in 1872 that set forth the rules of evidence admissible in Indian courts and that had far-reaching consequences for the traditional systems of caste government. Since ancient times, the way of resolving intracaste disputes had been by discussing the grievances in open meetings of the caste council. All information that might possibly bear on the case, however indirect, was allowable. As the persons involved normally knew one another well, possible partiality could easily be identified and obviated. The defendant knew and approved of the circumstances and procedures of his trial. But much of the evidence was hearsay, the entire proceedings were oral, and there was no documentary evidence at all.

The procedures of state justice under the Indian Evidence Act put in the place of caste justice an unfamiliar system in which an outsider (a British judge) with no knowledge of the caste and the circumstances of the case would sit in judgment and adjudicate it according to rules that were often incomprehensible to the litigants. Though the act represented an attempt to introduce greater efficiency and uniformity into judicial procedures, it enabled relatively wealthy Indians (who could afford to hire lawyers) to bypass the caste court entirely and take their cases directly to the state court of justice. This undermined, to a certain extent, the judicial functions and authority of the *pañcāyat*s, the governing councils of the castes, and resulted in a kind of tug-of-war between custom and law. A number of castes continue to hold their own trials of caste members, independent of the verdicts handed down in state courts.

Indian grass (*Sorghastrum nutans*), tall perennial forage grass of the family Poaceae and one of the important constituents of the North American tall grass prairie. It bears narrow, greatly branched flower clusters. Each



Indian grass (*Sorghastrum nutans*)
Douglas David Dawn

yellow spikelet is fringed with white hairs, giving the plant a silver-and-gold appearance. It is a close relative of *S. elliottii* and *S. secundum.*

Indian hemp (plant of the pea family): *see* sunn.

Indian hemp, also called HEMP DOGBANE (*Apocynum cannabinum*), North American plant of the dogbane family Apocynaceae (order Gentianales). It is a branched perennial that grows up to 1.5 m (5 feet) tall and has smooth opposite leaves and small greenish white flowers. Indians used the fibres from the stem to make bags, mats, nets, and cordage. Its milky juice, or latex, yields rubber, and the dried roots of Indian hemp and a related plant (*A. androsoemifolium*) make a drug that acts as a heart stimulant. True hemp (*Cannabis sativa*) is sometimes called Indian hemp.

Indian languages, languages spoken in the Indian subcontinent. The languages of the region are generally classified as belonging to the following families: Indo-European (the Indo-Iranian branch in particular), Dravidian, Austro-Asiatic (Munda in particular), and Sino-Tibetan. Fourteen languages are mentioned in the constitution of India: Hindi, Urdu, Panjabi, Bengali, Oriya, Marathi, Gujarati, Sanskrit, and Assamese, all belonging to the Indo-Aryan group of the Indo-Iranian branch of Indo-European; Kashmiri, belonging to the Dardic group of the Indo-Iranian branch of Indo-European; and Telegu, Tamil, Kannada (or Kanarese), and Malayalam, belonging to the Dravidian language family. The Manipuri language of Assam and the Newari language of Nepal are usually classified, along with languages of the Bodo group, as belonging to the Tibeto-Burman branch of the Sino-Tibetan language family. Among the Munda languages (classified as a branch of the Austro-Asiatic language family), Santali and Khasi have the most speakers.

Languages used in Pakistan include the Sindhi, Panjabi, and Urdu languages, which belong to the Indo-Aryan group, and Brahui, which is a Dravidian language. Bengali is the language of Bangladesh. *See* Indo-Aryan languages; Indo-Iranian languages.

Indian law, the legal practices and institutions of India. The general history of law in India is a well-documented case of reception as well as of grafting. Foreign laws have been "received" into the Indian subcontinent—for

example, in the demand by the Hindus of Goa for Portuguese civil law; and the enactment by independent India of statutes such as the Estate Duty Act (1953), the Copyright Act (1957), and the Merchant Shipping Act (1958), which substantially reproduce English models. Foreign laws have also frequently been "grafted" upon indigenous laws, as is seen in both Anglo-Muslim and Hindu law. Legal institutions introduced by foreign governments were accepted readily by the Indians, either because they were compatible with existing trends or because they met new needs. Independence in 1947 brought an intensification of these processes.

Indian law thus draws on a number of sources. The Hindu law system began with the Vedas and contemporary non-Aryan customs 3,000 years ago. Slowly, it evolved through blending, comparison, and analysis. After the Arab invasions in the 8th century AD, Islāmic law was introduced in some areas, particularly in the north. The English common law is the residual law in the high courts of Bombay, Calcutta, and Madras; and, at times with the aid of relevant British statutes, it is the residual law also in all other jurisdictions representing the old East India Company's courts, in which, since 1781, "justice, equity and good conscience" have supplied the rule of law when no Indian statute or rule of personal law (*e.g.,* Hindu law) covered the point. The Portuguese and French used their own laws in their colonies. In British India some British statutes applied, and a few have remained in force. All powers adapted their laws to local conditions, and the famous Anglo-Indian codes, passed in India at intervals from 1860 to 1882, reflected the influence of French and American as well as English and Anglo-Indian models. During that period Roman, or civil, law and continental juridical theory were widely cited, particularly in the Madras high court, to give India the benefit of the best law available; but through codification and other influences this source was soon exhausted. Interpretation of the constitution has resulted in the introduction of some American principles, and welfare and industrial statutes are construed in the light of case law decided elsewhere in the Commonwealth. Western influence is also present in the treatment of personal law.

Generally speaking, Hindu law is the personal law applying to 85 percent of the population and constituting the main juridical product of Indian civilization. The word Hindu does not imply a strict religious orthodoxy and is more ethnic than creedal in its emphasis. Nevertheless, since independence India has aimed at abolishing the personal laws in favour of a civil code (constitution, article 44), which would unify, as far as practicable, the diverse Hindu schools and customs applicable to the various communities. Modern Hindu law is the creation of the Hindu Marriage Act (1955), and of the Hindu Minority and Guardianship Act, Hindu Succession Act, and Hindu Adoptions and Maintenance Act (all of 1956). Until 1955–56 Hindus were entitled to claim exemption from the personal law if a custom could be proved of sufficient certainty, continuity, and age and was not contrary to public policy. Very little scope is now allowed to custom. As an example of the changes, the Special Marriage Act (1954) provided that any couple might marry, irrespective of community, in a civil, Western-type manner, and their personal law of divorce and succession automatically would become inapplicable. In the new divorce law they have, in addition, a right of divorce by mutual consent after they have lived apart for a year and have waited an additional year.

Indian criminal law, on the other hand, has been very little changed since the Indian Penal Code was enacted in 1861. Thomas Babington Macaulay's original draft of that code, which remains its nucleus, was not based on the contemporary English law alone, and many of the definitions and distinctions are unknown to English law, while later developments in English law are not represented. Yet Indian courts frequently consult English decisions in order to construe sections of the code. In spite of the fact that the wording of the code, when strictly construed, enables many wrongdoers to escape, India has modified it in only marginal respects. This is remarkable in view of the extreme rarity of the code's coincidence with the criminal laws in force in India prior to 1861. The Criminal Procedure Code (1898), by contrast, is a true Anglo-Indian amalgam and has been amended further to suit peculiarly Indian conditions and the climate of opinion.

Indian literature, writings of the Indian subcontinent, produced there in a variety of languages, including Sanskrit, Prākrit, Pāli, Bengali, Bihārī, Gujarati, Hindi, Kannada, Kashmiri, Malayalam, Oriya, Punjabi, Rajāsthānī, Tamil, Telugu, Urdu, and Sindhi.

A brief treatment of Indian literature follows. For full treatment, *see* MACROPAEDIA: South Asian Arts.

The earliest Indian literature took the form of the canonical Hindu sacred writings, known as the Veda, which were written in Sanskrit. To the Veda were added prose commentaries such as the Brāhmaṇas and the Upaniṣhads. The production of Sanskrit literature extended from about 1400 BC to AD 1200 and reached its height of development in the 1st to 7th centuries AD. In addition to sacred and philosophical writings, such genres as erotic and devotional lyrics, court poetry, plays, and narrative folktales emerged.

Because Sanskrit was identified with the Brahminical religion of the Vedas, reform movements such as Buddhism and Jainism adopted other literary languages, *e.g.,* Pāli and Ardhamāgadhī, respectively. Out of these and other derivative languages there evolved the modern languages of northern India. The literature of those languages depended largely on the ancient Indian background, which includes the Sanskrit epics, the *Mahābhārata* and *Rāmāyaṇa,* the Krishna story as told in the *Bhāgavata-Purāṇa,* the other Puranic legends, and the fable anthologies. In addition, the Sanskrit philosophies were the source of philosophical writing in the later literatures, and the Sanskrit schools of rhetoric were of great importance for the development of court poetry in many of the modern literatures. The South Indian language of Tamil is an exception to this pattern of Sanskrit influence because it had a classical tradition of its own. Urdu and Sindhi are other exceptions, having arisen out of an Islāmic background.

Beginning in the 19th century, British and Western literary models in general had a great impact on Indian literature, the most striking result being the introduction of the use of vernacular prose on a major scale. Such previously unknown forms as the novel and short story began to be adopted by Indian writers, as did realism and a new interest in social questions and psychological description. *See also* specific Indian literatures.

Indian Museum, in Calcutta, oldest museum in India and one of the most comprehensive in the Orient; its collections depict the cultural history of India from prehistoric to Muslim times. The present building, opened in 1875, comprises sections devoted to geology, zoology, industry, archaeology, art, and ethnology. The coin room contains the largest collection of Indian coins in the world.

The art section is noted for its textiles, carpets, lacquer-work, glass and pottery. The gallery displays examples of Persian and Indian paintings, and the geological section is the largest in Asia and one of the most important in the world. There is a large collection of statues and bronzes from various Asian civilizations, including life-size models of people and animals of the regions of India.

Indian music, the musical traditions, forms, and styles of the peoples of the Indian subcontinent.

A brief treatment of Indian music follows. For full treatment, *see* MACROPAEDIA: South Asian Arts.

Indian music comprises a wide variety of instrumental and vocal traditions, among which are classical, religious, popular, theatrical, and modern ones. The best-known of these internationally is classical music, however; that of North India (and Pakistan) is called Hindustani music, and that of South India is called Karnatic music.

Indian classical music is based on the raga, which is a melodic framework for improvisation based on a given set of notes; and on tala, which is a concept that can be equated with time measure or metre. The music is generally performed by small ensembles of not more than five or six musicians. Improvisation plays a major part in the performance, the most characteristic feature of which is the gradual acceleration of tempo leading to a final climax. The melodic improvisation can be produced by a variety of plucked string instruments such as the sitar or vina; violins; oboelike instruments; or flutes. A droning lutelike instrument called the tamboura meanwhile establishes and maintains the tonic, or ground note, of the composition, while tablas or other small finger-played drums provide a rhythmic accompaniment. Classical music also encompasses a variety of vocal forms, and these too make use of improvisation.

Indian Mutiny, also called SEPOY MUTINY, (1857–58), widespread but unsuccessful rebellion against British rule in India begun by Indian troops (sepoys) in the service of the British East India Company. It began in Meerut and then spread to Delhi, Āgra, Cawnpore, and Lucknow.

To regard the rebellion merely as a sepoy mutiny is to underestimate the increasing pace of Westernization after the establishment of British paramountcy in India in 1818. Hindu society was being affected by the introduction of Western ideas. Missionaries were challenging the religious beliefs of the Hindus. The humanitarian movement led to reforms that went deeper than the political superstructure. Lord Dalhousie had made efforts for the emancipation of women and had introduced a bill to remove all legal obstacles to the remarriage of Hindu widows. Converts to Christianity were to share with their Hindu brethren in the property of the family estate. There was a widespread belief that the British aimed at breaking down the caste system. The introduction of western methods of education was a direct challenge to orthodoxy, both Hindu and Muslim. To these problems may be added the growing discontent of the noble Brahmans, many of whom had been dispossessed of their revenues or had lost lucrative positions. Everywhere the old Indian aristocracy was being replaced by British officials.

The mutiny broke out in the Bengal army because it was only in the military sphere that Indians were organized. The pretext for revolt was the introduction of the new Enfield rifle; to load it the sepoys had to bite off the ends of lubricated cartridges. There appears to be some foundation for the sepoys' belief that the grease used to lubricate the cartridges was a mixture of pigs' and cows' lard; thus, to have oral contact with it was an insult to both Muslims and Hindus. Late in April 1857, sepoy troopers at Meerut refused the cartridges; as punishment, they were given long prison terms, fettered, and put in jail. This pun-

ishment incensed their comrades, who rose on May 10, shot their British officers, and marched to Delhi, where there were no European troops. There the local sepoy garrison joined the Meerut men, and by nightfall the aged pensionary Mughal emperor Bahādur Shāh II had been nominally restored to power by a tumultuous soldiery.

The seizure of Delhi provided a focus and set the pattern for the whole mutiny, which then spread throughout northern India. With the exception of the Mughal emperor and his sons and Nana Sahib, the adopted son of the deposed Marāṭhā peshwa, none of the important Indian princes joined the mutineers.

From the time of the mutineers' seizure of Delhi, the British operations to suppress the mutiny were divided into three parts. First came the desperate struggles at Delhi, Cawnpore, and Lucknow during the summer; then the operations around Lucknow in the winter of 1857–58 directed by Sir Colin Campbell; and finally the "mopping up" campaigns of Sir Hugh Rose in early 1858. Peace was officially declared on July 8, 1858.

A grim feature of the mutiny was the ferocity that accompanied it. The mutineers commonly shot their British officers on rising but were also responsible for massacres at Delhi, Cawnpore, and elsewhere. The murder of women and children enraged the British, but in fact some British officers began to take severe measures before they knew that any such murders had occurred. In the end the reprisals far outweighed the original excesses. Hundreds of sepoys were shot from cannons in a frenzy of British vengeance (though some British officers did protest the bloodshed).

The immediate result of the mutiny was a general housecleaning of the Indian administration. The first change was the abolition of the East India Company in favour of the direct rule of India by the British government. In concrete terms this did not mean much, but it introduced a more personal note into the government and removed the unimaginative commercialism that had lingered in the Court of Directors. The financial crisis caused by the mutiny led to a reorganization of the Indian administration's finances on a modern basis. The Indian army was also extensively reorganized.

Another significant result of the mutiny was the beginning of the policy of consultation with Indians. The Legislative Council of 1853 had contained only Europeans and had behaved arrogantly as if it had been a full-fledged Parliament. It was widely felt that lack of communication with Indian opinion had helped to precipitate the crisis. Accordingly, the new council of 1861 was given an Indian-nominated element. The educational and public works programs, roads, railways, telegraphs, and irrigation continued with little interruption; in fact some were stimulated by the thought of their value for the transport of troops in a crisis. But insensitive, British-imposed social measures that affected Hindu society came to an abrupt end.

Finally, there was the effect of the mutiny on the people of India themselves. Traditional society had made its protest against the incoming alien influences, and it had failed; the princes and other natural leaders had either held aloof from the mutiny or had proved for the most part incompetent. From this time all serious hope of a revival of the past or an exclusion of the West diminished. The traditional structure of Indian society began to break down and was eventually superseded by a westernized class system, from which emerged a strong middle class with a heightened sense of Indian nationalism.

Indian National Congress, byname CONGRESS PARTY, broadly based political party of India, founded in 1885. It dominated the Indian movement for independence from Great Britain and formed India's government without interruption from 1947 to 1977 and from 1980 to 1989.

The first Congress met in December 1885. Its yearly meetings passed moderate reform resolutions until 1917, when the group's "extremist" Home Rule wing took over under B.G. Tilak and Annie Besant. In the 1920s and '30s the Congress, led by Mahatma Gandhi, promoted noncooperation movements to protest what was considered to be the feebleness of the constitutional reforms of 1919 and Britain's manner of carrying them out. Another wing of the organization, which believed in working within the system, contested elections in 1923 and 1937 as the Swaraj (Home Rule) Party, with particular success in the latter year. When World War II began and Britain made India a belligerent without consulting Indian elected councils, the Congress declared that India would not support the war effort until granted complete independence. In 1942 the organization sponsored mass civil disobedience to support the demand that the British "quit India." In 1947 an Indian independence bill became law, and in January 1950 India's constitution as an independent state took effect.

From 1951 until his death in 1964, Jawaharlal Nehru dominated the Congress Party, which won overwhelming victories in the elections of 1951–52, 1957, and 1962. In 1964 the party united to elect Lal Bahadur Shastri, and in 1966 Indira Gandhi (Nehru's daughter), to the posts of party leader and prime minister. In 1967, however, Indira Gandhi had to overcome open opposition to retain her posts, and in 1969 she broke with a group of party leaders—the "Syndicate"—who expelled her from the party. The elections of 1971, however, brought a landslide victory for her New Congress Party.

From 1975 Mrs. Gandhi's government grew increasingly more authoritarian, and unrest among the opposition grew. Parliamentary elections in March 1977 proved a landslide victory for the opposition Janata Party, which secured 295 seats against 153 for the Congress; Mrs. Gandhi herself lost to her Janata opponent. On Jan. 2, 1978, she and her followers seceded and formed what they called the "real" Indian National Congress, popularly called the Congress (I) ("I" for Indira). In November she regained a parliamentary seat and in 1980 again became prime minister. Her son Rajiv Gandhi became nominal head of the party in 1982; and, upon the assassination of Indira Gandhi in October 1984, he became prime minister. Rajiv Gandhi and the Congress (I) Party lost the general election of November 1989 and relinquished power to a governing coalition led by the Janata Party.

Indian National Trade Union Congress (INTUC), largest trade union federation in India. INTUC was established in 1947 in cooperation with the Indian National Congress, which favoured a less militant union movement than the All-India Trade Union Congress (*q.v.*). INTUC is largely anticommunist; it is affiliated with the International Confederation of Free Trade Unions (*q.v.*).

Indian Ocean, body of salt water, covering approximately one-fifth of the total ocean area of the world and extending between Africa in the west, Australia in the east, Asia in the north, and Antarctica in the south.

Including the Red Sea and the Persian Gulf, the Indian Ocean constitutes the world's third largest ocean after the Pacific and Atlantic oceans and has an area of about 28,400,000 square miles (73,600,000 square km). It meets the Atlantic Ocean in the southwest and the Pacific Ocean in the east and southeast. The Indian Ocean has an average depth of 12,760 feet (3,890 m); the greatest depth (24,442 feet [7,450 m] below sea level) is in the Java Trench, south of Java. The chief marginal seas include the Arabian Sea, Andaman Sea, Bay of Bengal, and the Timor and Arafura seas. Its major islands and groups include Madagascar, Sri Lanka, and the Mascarenes (Mauritius, Réunion, and related islands).

The Indian Ocean continental shelf consists of a narrow, flat surface 60 miles (100 km) wide that broadens to about 600 miles (970 km) between Australia and New Guinea; the shelf varies in depth from 150 to 1,500 feet (45 to 450 m). The midoceanic ridge, a broad mountain system with an average subsurface elevation of 10,000 feet (3,000 m), divides the Indian Ocean floor into three major sectors, the African, Australasian, and Antarctic, which are subdivided into lesser basins. The abyssal plains (deep ocean basins with smooth bottom topography) are marked by deep-sea channels as long as 1,500 miles (2,400 km).

The surface-water movement of the Indian Ocean is governed by the prevailing winds. Two main water circulation systems dominate the Indian Ocean, a northern system (north of 10° S) where currents are directly related to the seasonal change of the monsoon winds, and a southern system (south of the Equator) where several major currents comprise a regular counterclockwise system.

The Indian Ocean is rich in minerals. Petroleum and natural gas are found on the continental shelves of the Persian Gulf and Red Sea. Iron ore- and copper-containing sediments have been discovered in the Red Sea, and huge accumulations of manganese and chromium nodules have been located on the ocean bed.

Indian paint brush, also called PAINTED CUP, PAINTED LADY, OR PAINT BRUSH, plants of the genus *Castilleja* (family Scrophulariaceae), which contains about 200 species of partially



Indian paint brush (*Castilleja*)
Franklin K. Anderson—EB Inc.

or wholly parasitic plants that derive nourishment from the roots of other plants. For this reason they are seldom cultivated successfully in the flower garden. The small, tubular flowers are irregular (two-lipped). They are surrounded by upper leaves that are brightly coloured either throughout or at the ends only, giving the plant an appearance of having been dipped in a pot of red, orange, yellow, pink, or white paint.

Indian philosophy, the systems of thought and reflection that were developed by the civilizations of the Indian subcontinent. Among the many concerns of Indian philosophy have been the nature of the world (cosmology), the nature of reality (metaphysics), logic, the nature of knowledge (epistemology), ethics, and religion.

A brief treatment of Indian philosophy follows. For full treatment, *see* MACROPAEDIA: Indian Philosophy.

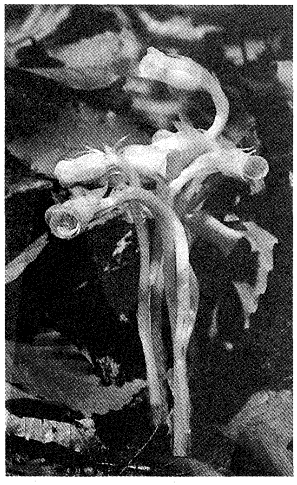
Three basic concepts form the cornerstone

of Indian philosophical thought: the self, or soul (atman), the moral efficacy of human actions (karma), and salvation (moksha) as the highest ideal. Indian philosophy is composed of six orthodox schools, or systems of thought; Mīmāṃsā, Vedānta, Nyāya, Vaiśeṣika, Saṃkhyā, and Yoga. There are also unorthodox schools, such as those of Buddhism and Jainism. The sacred texts of Hindu culture, principally the Vedas, the Upanishads, and the *Mahābhārata,* have long influenced Indian philosophical thinking, even after the creation of the six orthodox schools. Each of these schools of thought was systematized by sets of sutras, which reduced the doctrines of a particular system of thought into a number of brief but memorable aphorisms, formulas, or rules.

Of the six orthodox schools, Mīmāṃsā, or Pūrva-mīmāṃsā, is the system that gives rules for the interpretation of the Vedas and provides a philosophical justification for the observance of Vedic ritual. (The Vedas are the earliest sacred writings of India.) Vedānta forms the basis of most modern schools of Hinduism; it is concerned with the philosophical interpretation of the Vedas, rather than with their ritualistic aspects as is Mīmāṃsā. Vedānta is concerned with brahman, or the ultimate reality, and the relation between it and the finite individual. Its major texts are the Upanishads and the *Bhagavadgītā.* Nyāya worked out in profound detail the method of reasoning known as inference; this school is important for its analysis of logic and epistemology. Vaiśeṣika is important for its attempts to identify, inventory, and classify the entities of reality that present themselves to human perception. Saṃkhyā adopts a consistent dualism between the orders of matter and that of the self, or soul. In the Saṃkhyā school, right knowledge consists of the ability of self to distinguish itself from matter. Yoga has greatly influenced several of the other schools through its prescription of practical disciplines for intuitively realizing the metaphysical knowledge put forth by the Saṃkhyā system, to which Yoga is closely related.

Indian pipe, also called CORPSE PLANT, CONVULSION ROOT, or FITS ROOT (*Monotropa uniflora*), nongreen herb, of the family Monotropaceae, that is saprophytic in habit; *i.e.,* it lives upon the remains of dead plants. It occurs in Asia and throughout North America and is commonly found in moist, shady areas.

The plant arises from a tangled mass of rootlets, grows 15–25 cm (6–10 inches) tall, and is white, pinkish, or (rarely) red; if it dries out, it turns black. A single, odourless, drooping, cup-shaped flower with four or five petals is borne at the tip of the stalk. The leaves are represented only by small scales, and the fruit is an oval capsule.



Indian pipe (*Monotropa uniflora*)
G.J. Chafaris—EB Inc.

Indian region (zoographic area): *see* Oriental region.

Indian Removal Act (May 28, 1830), first major legislative departure from the U.S. policy of respecting the legal and political rights of the American Indians. The act authorized the president to grant Indian tribes unsettled western prairie land in exchange for their desirable territories within state borders (especially in the Southeast), from which the tribes would be removed. The rapid settlement of land east of the Mississippi River made it clear by the mid-1820s that the white man would not tolerate the presence of even peaceful Indians there. President Andrew Jackson (served 1829–37) vigorously promoted this new policy, which became incorporated in the Indian Removal Act of 1830. Although the bill provided only for the negotiation with tribes east of the Mississippi on the basis of payment for their lands, trouble arose when the United States resorted to force to gain the Indians' compliance with its demand that they accept the land exchange and move west.

A number of northern tribes were peacefully resettled in western lands considered undesirable for the white man. The problem lay in the Southeast, where members of what were known as the Five Civilized Tribes (Chickasaw, Choctaw, Seminole, Cherokee, and Creek) refused to trade their cultivated farms for the promise of strange land in the Indian Territory with a so-called permanent title to that land. Many of these Indians had homes, representative government, children in missionary schools, and trades other than farming. Some 100,000 tribesmen were forced to march westward under U.S. military coercion in the 1830s; up to 25 percent of the Indians, many in manacles, perished en route. The trek of the Cherokee in 1838–39 became known as the infamous "Trail of Tears" (*see* Cherokee). Even more reluctant to leave their native lands were the Florida Indians, who fought resettlement for seven years (1835–42) in the second of the Seminole Wars.

The frontier began to be pushed aggressively westward in the years that followed, upsetting the "guaranteed" titles of the displaced tribes and further reducing their relocated holdings.

Indian Reorganization Act (June 18, 1934), also called WHEELER–HOWARD ACT, measure enacted by the U.S. Congress, aimed at decreasing federal control of American Indian affairs and increasing Indian self-government and responsibility. In gratitude for the Indians' services to the country in World War I, Congress in 1924 authorized the Meriam Survey of the state of life on the reservations. The shocking conditions under the regimen established by the Dawes General Allotment Act (1887), as detailed in the Meriam report of 1928, spurred demands for reform.

Many of the Meriam report's recommendations for reform were incorporated in the Indian Reorganization Act. The act curtailed the future allotment of tribal communal lands to individuals and provided for the return of surplus lands to the tribes rather than to homesteaders. It also encouraged written constitutions and charters giving Indians the power to manage their internal affairs. Finally, funds were authorized for the establishment of a revolving credit program for tribal land purchases, for educational assistance, and for aiding tribal organization.

About 160 tribes or villages adopted written constitutions under the act's provisions. Through the revolving credit fund, many Indians improved their economic position. With the funds for purchase of land, millions of additional acres were added to the reservations. Greatly improved staffs and services were provided in health and education, with more than half of all Indian children in public school by 1950. The act awakened a wider interest in civic affairs, and Indians began asking for the franchise, which they had been technically granted in 1924.

The Reorganization Act remains the basis of federal legislation concerning Indian affairs. The act's basic aims were reinforced in the 1960s and '70s by the further transfer of administrative responsibility for reservation services to the Indians themselves, who continued to depend on the federal government to finance those services.

Indian sculpture, the sculptural traditions, forms, and styles of the civilizations of the Indian subcontinent.

A brief treatment of Indian sculpture follows. For full treatment, *see* MACROPAEDIA: South Asian Arts.

Sculpture was the favoured medium of artistic expression on the Indian subcontinent. Indian buildings were profusely adorned with it and indeed are often inseparable from it. The subject matter of Indian sculpture was almost invariably abstracted human forms that were used to instruct people in the truths of the Hindu, Buddhist, or Jain religions. The nude was used both to represent the body as a symbol of spirit and to reveal the imagined shapes of the gods. There is an almost complete suppression of individuality in Indian sculpture; this is because the figures are conceived of as shapes that are more perfect and final than anything to be found in the merely transitory appearance of human models. The multiple heads and arms of sculptured Hindu divinities were thought necessary to display the manifold attributes of these gods' power.

The tradition of Indian sculpture extends from the Indus Valley civilization of 2500 to 1800 BC, during which time small terra cotta figurines were produced. The great circular stone pillars and carved lions of the Maurya period (3rd century BC) gave way to mature Indian figurative sculpture in the 2nd and 1st centuries BC, in which Hindu and Buddhist themes were already well-established. A wide range of styles and traditions subsequently flourished in different parts of India over the succeeding centuries, but by the 9th–10th centuries AD, Indian sculpture had reached a form that has lasted with little change up to the present day. This sculpture is distinguished not by a sense of plastic volume and fullness but rather by its linear character; the figure is conceived from the standpoint of its outline, and the figure itself is graceful, slender, and has supple limbs. From the 10th century this sculpture was used mainly as a part of architectural decoration, with vast numbers of relatively small figures of mediocre quality being produced for this purpose.

Indian Shaker Church, Christianized prophet cult among Northwest American Indians; it is not connected with the Shaker communities developed from the teachings of Ann Lee. In 1881 near Olympia, Wash., John Slocum, a Squaxon logger and a baptized Roman Catholic, reported that he had visited heaven while in a coma and was commissioned to preach a new way of life. The following year his wife, Mary, experienced a shaking paroxysm, which was interpreted as the Spirit of God curing John of a further illness. The Shaker Church they founded effected reforms and replaced traditional Indian curing methods with spiritual healing through shaking and dancing rituals.

Christian elements of the Indian Shaker Church include belief in the Trinity and Sunday worship in plain churches furnished with a prayer table, handbells, and many crosses; Christian sacraments and festivals are not observed. Direct revelations replace the Bible, but a secession group cooperating with white

evangelicals accepted the Bible and the preaching of sermons. Earlier persecutions ceased after the church was incorporated in Oregon (1907), Washington (1910), and California (1932). A loose organization in the late 20th century united more than 20 congregations with some 2,000 adherents.

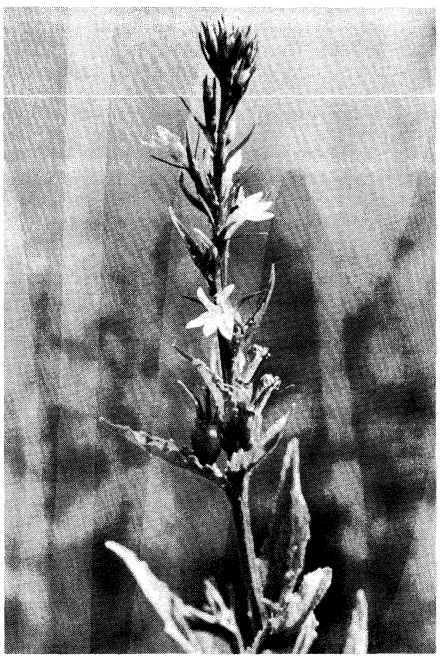
Indian summer, period of dry, unseasonably warm weather in late October or November in the central and eastern United States. The term originated in New England and probably arose from the Indians' practice of gathering winter stores at this time. This autumn warm period also occurs in Europe, where in Britain it is called All-hallown summer or Old Wives' summer. Indian summer may occur several times in some years and not at all in others; it often persists for a week or longer. The nights are cool and may bring frost, and the days have hazy skies and light winds. The lack of clouds causes the daytime hours to be warmer each succeeding day.

In the United States, an Indian summer period occurs when a cool, shallow polar air mass stagnates and becomes a deep, warm high-pressure centre. This centre is characterized by a strong low-level temperature inversion that produces a stable air stratification. As a result, vertical air motions are inhibited, and smoke and dust are concentrated near the ground, which accounts for the haziness.

Indian Territory, originally "all of that part of the United States west of the Mississippi, and not within the States of Missouri and Louisiana, or the Territory of Arkansas." Never an organized territory, it was soon restricted to the present state of Oklahoma, excepting the panhandle and Greer County. The Choctaw, Creek, Seminole, Cherokee, and Chickasaw tribes were forcibly moved to this area between 1830 and 1843, and an act of June 30, 1834, set aside the land as Indian country (later known as Indian Territory).

In 1866 the western half of Indian Territory was ceded to the United States, which opened part of it to white settlers in 1889. This portion became the Territory of Oklahoma in 1890 and eventually encompassed all the lands ceded in 1866. The two territories were united and admitted to the Union as the state of Oklahoma in 1907.

Indian tobacco (*Lobelia inflata*), annual plant of the family Lobeliaceae, native to open woodlands of North America. It was once considered a medicinal plant because of the emetic alkaloid present in the plant parts, especially the roots, but is now regarded as poisonous.



Indian tobacco (*Lobelia inflata*)
William D. Griffin

The Indian tobacco's leafy flower spike, about 1 m (3 feet) tall, begins blooming at the bottom and at maturity produces inflated, oval fruits. Its flowers are small, pale blue, and bilaterally symmetrical. Basal leaves are toothed and broadly oval; stem leaves are narrower. The plant is a lawn weed in some areas.

Indiana, constituent state of the United States of America, one of the Midwestern states lying in the north-central United States, bounded on the north by Lake Michigan, on the east by Ohio, on the south by Kentucky, and on the west by Illinois. The capital is Indianapolis.

A brief treatment of Indiana follows. For full treatment, *see* MACROPAEDIA: United States of America: *Indiana.*

Indiana was originally inhabited by Algonquian-speaking Indians whose major tribes included the Miami, the Potawatomi, and the Delaware. The French claimed the area in the late 17th century and established several forts. In 1763 the area passed to the British, then to the United States in 1783. The struggle with the Indians lasted until 1811, when General William Henry Harrison defeated them at the Battle of Tippecanoe, near present-day Lafayette. Indiana was admitted to the Union in 1816 as the 19th state. In 1820 Indiana University was founded, and in 1825 Robert Owen established his utopian settlement, New Harmony, on the lower Wabash River. The major Indian tribes left the area in 1820–40. Industrialization accelerated after the American Civil War, and the steel-making city of Gary was founded in 1906.

Indiana forms part of the east-central lowlands that slope downward from the Appalachian Mountains to the Mississippi River. The north, modified at one time by glacial action, presents a rolling landscape; the central plain is extremely fertile; and the south eroded. The highest elevation is along the Ohio border, at 1,257 feet (383 m) above sea level. The general slope and drainage pattern is toward the southwest; an almost imperceptible groundswell in the northeast forms a St. Lawrence–Mississippi divide. Among the notable features of Indiana's landscape are the sand dunes along Lake Michigan in the northwest.

The climate of Indiana is temperate, with four distinct seasons. January mean temperatures range from 37° F (3° C) in Jeffersonville to 25° F (−4° C) in South Bend. The corresponding July range is 78° F (26° C) to 73° F (23° C). Precipitation varies from 44 inches (1,120 mm) in the south to 35 inches (890 mm) in the north. Northern cities often report more than 100 inches (2,540 mm) of snow during the winter.

The people of Indiana are predominantly white, native-born Americans of native-born parents, most of whom trace their ancestry to England, Scotland, Ireland, and Germany. Blacks predominate in Gary, Poles in South Bend. Amish and Mennonite communities are found in and around Middlebury, Nappanee, and Goshen. The state's rate of population growth has been only about half the national average; the increase was due almost entirely to an excess of births over deaths.

Agriculture employs only a small percentage of the state's labour force, but agricultural output is high, and Indiana ranks in the top quarter nationally in cash receipts from farm marketings. Major crops include corn (maize), soybeans, and wheat, with tomatoes the principal vegetable crop. Hogs continue to be the most numerous livestock. Natural resources include coal in the southwest and quarry stone in the centre.

Manufacturing industries are the dominant source of income in the state and employ approximately one-third of the work force. The steel industry is a major component. Musical instruments are made in Elkhart and diamond cutting tools in Fort Wayne.

Indiana's transportation network is highly developed. The Ohio River carries large amounts of freight at low costs. The Port of Indiana on Lake Michigan connects with the St. Lawrence Seaway. Indiana ranks high nationally in road mileage per square mile of area and virtually all of its roads are paved. There is a relatively dense network of railway track. Indianapolis is served by more major highways than any other American city, and it is headquarters for some of the nation's largest moving companies.

The Indianapolis Civic Theater is the nation's oldest continuously operating theatrical organization. There is a well-known art colony in Nashville, and Columbus is internationally acclaimed for its rich and varied architecture. Indiana has turned out an exceptionally high number of popular entertainers, songwriters, and authors, including Cole Porter, Hoagy Carmichael, James Whitcomb Riley, Booth Tarkington, George Ade, Ernie Pyle, Red Skelton, and James Dean. The Indianapolis 500 is one of the world's most famous auto races. Notre Dame, near South Bend, is widely regarded as the leading Roman Catholic university in the United States. Area 36,185 square miles (93,720 square km). Pop. (1990 est.) 5,550,000.

Consult the INDEX *first*

Indiana Dunes, state park and national lakeshore, lying along the south shore of Lake Michigan in northern Indiana, U.S.

The state park, established in 1925, comprises 2,182 acres (883 hectares) of shoreline, marshland, dunes, and forests near Chesterton. In addition to a 3-mile (5-kilometre) white sand beach, it has facilities for camping, picnicking, fishing, and hiking. An outstanding feature is the Big Blowout in the east end of the park, where lake winds constantly drift sands over a wooded area, creating a "graveyard of trees." Shifting dunes, like Mount Tom, may reach heights of 200 feet (60 m).

The authorization of Indiana Dunes National Lakeshore in 1966 was the culmination of a 50-year fight to save the dunes from the encroachment of industrialization. It provided for the acquisition of 8,329 acres (3,370 hectares) of dunes and wetland. The national lakeshore, which is on a bird migratory route and includes and surrounds the state park on three sides, features long beaches, high dunes, deep swales, wooded ravines, and interdunal lagoons and swamps; unique features include fens and bogs that are remnants of Ice Age glaciers. In the dunes is found an unusual flora ranging widely in climatic type from Arctic mosses to tropical orchids and from wetlands loosestrife to desert cactus.

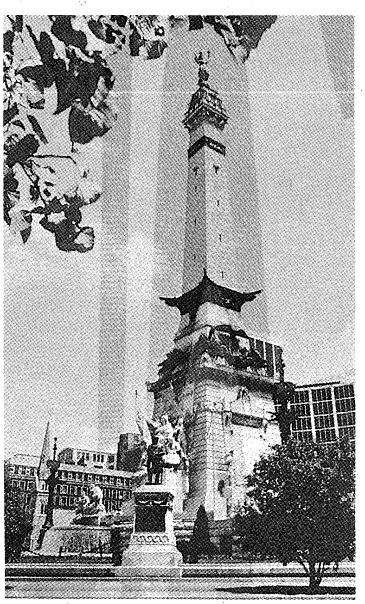
In the 1980s further dune acreage was acquired through the efforts of conservation groups, and development of the national lakeshore continued.

Indianapolis, city, capital of Indiana, U.S., and seat (1822) of Marion county, on the White River, near the centre of the state. A planned radial city (similar to Washington, D.C.), it was founded in 1821 as the state capital, which it officially became in 1825. Some impetus for growth was given by the routing of the Cumberland (or National) Road (Wash-

ington Street) across the city in 1827 and later by the arrival of the railroads. In the late 19th century the abundant supply of natural gas in the vicinity drew new industry, including automobile manufacture. The first 500-mi (805-km) automobile race at the Indianapolis Motor Speedway (a 2½-mi oval in the western suburb of Speedway and a by-product of the city's early auto industry) was won (1911) by a locally made Marmon. Since then, the annual Memorial Day (Indianapolis 500) race has become a celebrated international event attracting crowds of 300,000. The Speedway Hall of Fame Museum exhibits racing cars dating from 1909.

Indianapolis is one of the most populous cities in the world not located on navigable water, although it is a hub of road, rail, and air transportation. These facilities, and the city's position in the midst of the Corn Belt, near large coalfields and consumer markets, have combined to make it an important commercial, financial, and industrial centre. Pharmaceuticals, machinery, and transportation and electrical equipment (including telephones) are major products. It is a leading grain market.

A major educational and cultural centre, it is the seat of Butler University (1855), the Christian Theological Seminary (1924), Indiana Central University (1902), Indiana Vocational Technical College (1963), Lincoln Technical Institute (1926), Marian College (1851), and Indiana University–Purdue University at Indianapolis (including Herron School of Art [1902] and an internationally renowned medical centre). The hub of the city is Monument Circle (1901), site of the 284.5-ft (87-m) Soldiers' and Sailors' Monument. The World War Memorial Plaza (1927) is a five-block area honouring Indiana's war dead and includes the American Legion National Headquarters building. Clowes Memorial Hall (1963), a centre for the performing arts, is headquarters for the Indianapolis Symphony, and the city has a modern convention–exposition centre and museum of art. The State Capitol was constructed (1878–88) of Indiana limestone and has a central tower and dome 240 ft high. A domed stadium for indoor sports events and special attractions was opened in downtown Indianapolis in May 1984. The Baltimore Colts football team, a member of the National Football League, was moved to Indianapolis in 1984.

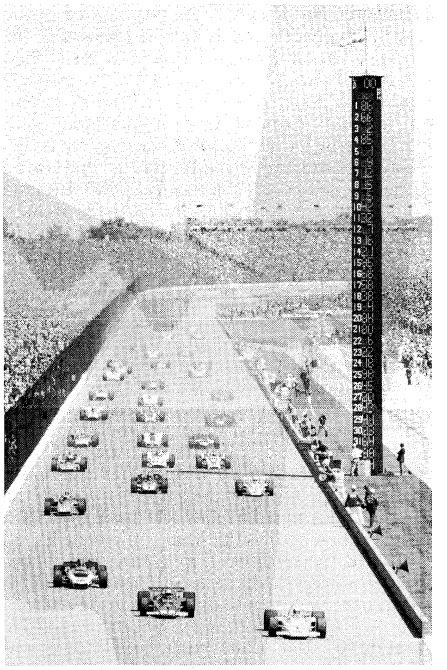


Soldiers' and Sailors' Monument, Indianapolis, Ind.
By courtesy of the Indiana Department of Commerce

The Indiana State Fairgrounds, with more than 70 permanent buildings, including the Coliseum, is a focus of trade and social activities. To the northeast is Ft. Benjamin Harrison, a U.S. Army post named after President Harrison, whose home (1872; preserved) was in Indianapolis. The poet James Whitcomb Riley; Charles Warren Fairbanks, vice president under Theodore Roosevelt; and the author Booth Tarkington also lived in the city, and the author Kurt Vonnegut was born there.

Uni-Gov, a unique city–county metropolitan government system, was introduced in 1970. Inc. town, 1836; city, 1847. Pop. (1980) city, 700,807; metropolitan area (SMSA), 1,116,929.

Indianapolis 500, byname INDY 500, U.S. automobile race held annually from 1911, except for the war years 1917–18 and 1942–45, at Indianapolis Motor Speedway, near Indianapolis, Ind. It was originally run on Memorial Day, May 30, but later began taking place on the preceding Saturday or Sunday.



Indianapolis 500 race, 1971
Authenticated News International

The track was designed in 1909, but before the first race it was paved with brick. Resurfacing with asphalt in 1935 and 1962 covered all but a historical 91 cm (36 in.) strip of the bricks. The 4.023-km (2½-mi) track has two 1,006-m (1,110-yd) straightaways, two 402-m (about 440-yd) straightaways, and four equally banked quarter-mile turns. From 1912 (except for 1931–33), 33 cars, qualified with the best times in four-lap trials, have started three abreast. Riding mechanics were mandatory only in the 1930s. In the period 1922–36 Miller and Duesenberg cars had a near monopoly on winning, and U.S. drivers prevailed. European cars and drivers had been well represented in the earlier races. After World War II, cars became more highly specialized.

Prize money (including lap money) had by the 1980s exceeded $1,500,000. Crowds in the augmented grandstand and infield reached 300,000. The race was supervised from 1956 by the United States Auto Club and before that by the American Automobile Association.

For winners, *See* Sporting Record: *Automobile racing.*

Indianista novel, Brazilian literary genre of the 19th century that idealizes the simple life of the South American Indian. The tone of the *Indianista* novel is one of languid nostalgia and *saudade,* a brooding melancholy and reverence for nature characteristic of Portuguese and Brazilian literature. The Indian had appeared as a fictional character in Brazilian literature from the late 18th century. It was not until the following century, however, that José de Alençar initiated the vogue of the Brazilian *Indianista* novel by contributing two of the most popular works to the genre, *O Guarany* (1857) and *Iracema* (1865), romantic tales of love between Indian and white and of the conflict between the Indians and their Portuguese conquerors.

Indianola, city, Warren County, south central Iowa, U.S., 17 mi (27 km) south of Des Moines. Founded in 1849 as the county seat, its name was taken from a newspaper account of a Texas town of the same name. Economic factors include feed milling, the manufacture of pickup campers, and Simpson College (founded there in 1860). Lake Ahquabi State Park is nearby. Indianola is the site of the National Hot Air Balloon Championship, held annually (August) on the college campus. Inc. 1863. Pop. (1980) 10,843.

Indias, Casa de las (Spanish trading house): *see* Contratación, Casa de.

Indias Occidentales: *see* West Indies.

Indic geographical race, also called HINDU GEOGRAPHICAL RACE, a group of human populations (local races and microraces) inhabiting the subcontinent of India. The Indic peoples range in physical type from that resembling the European (Caucasoid) in the north and west to the Australian Aborigine (Australoid) in the south (the so-called Veddic peoples); because of inbreeding over long periods of time, certain of the Indian social and religious castes can be considered local races. Characteristic of Indic peoples are medium to heavy skin pigmentation, straight to wavy hair, linear (slim, angular) body build, low bone density, high frequencies of blood type B (ABO system), and low frequencies of Rh-negative blood type. Although in appearance the majority of Indic peoples are quite European, in blood type they are very similar to their Mongoloid neighbours to the east.

Indic languages: *see* Indo-Aryan languages.

Indic local race, also called ARYAN LOCAL RACE, a subgroup, roughly equivalent to a breeding population in genetics, of the Indic (Hindu) geographical race, primarily comprising the Indo-European-speaking populations of northern and central India. The chief physical characteristics of these people include pale to dark-brown skin; moderate height; straight or wavy hair—usually black; narrow noses, often aquiline; and a high incidence of convergent eyebrows. There is cultural selection in this group toward lighter skin and more Caucasian features in the upper castes. *See also* local race.

Indic writing systems, those that include the syllabic Kharoṣṭī and semi-alphabetic Brāhmī scripts of ancient India. No systems of writing subsequently developed from the Kharoṣṭī script. Brāhmī, however, is thought to be the forerunner of all of the scripts used for writing the languages of India, Tibet, Southeast Asia, and Indonesia (exceptions include those areas in which native writing systems have been replaced by the Latin or Arabic alphabet or by Chinese).

A northern form of Brāhmī developed into the Gupta scripts, from which were derived the Tibetan and Khotanese writing systems. (Khotanese was also influenced by the Kharoṣṭī script.) From the Tibetan script were derived the writing system of the Lepchā (Rong), who are the aboriginal inhabitants of Sikkim, and the Passepa writing system used in the Chinese Imperial chancery under the Yüan dynasty

(1279–1368); the Passepa system is no longer in use.

A southern form of Brāhmī developed into the Grantha alphabet, from which in turn the writing systems of the Dravidian languages of southern India (*e.g.,* Tamil, Malayalam, Telugu, and Kannada) as well as the writing systems of the Sinhalese language of Ceylon, the Khmer and Mon languages of Southeast Asia, and the Kavi, or Old Javanese, system of Indonesia were developed. The Thai writing system is thought by scholars to be derived from that of the Khmer, the Burmese and Lao systems from that of Mon, and the Buginese and Batak systems of Indonesia from that of Kavi. The scripts used by speakers of the Tai dialects other than Shan and Lao are derived from the Burmese writing system. The ancient Cham inscriptions of the Austronesian (Malayo-Polynesian) speakers who formerly inhabited southern Vietnam are also written in a script of South Indic origin. *See also* Brāhmī; Grantha alphabet; Gupta scripts; Kharoṣṭī.

indicator (economics): *see* economic indicator.

indicator species, organism—often a microorganism or a plant—that serves as a measure of the environmental conditions that exist in a given locale. For example, greasewood indicates saline soil; mosses often indicate acid soil. Tubifex worms indicate oxygen-poor and stagnant water unfit to drink. The presence of certain species of plants suggests how well other species might grow in the same place.

Indicopleustes (ancient geographer): *see* Cosmas.

indiction, in ancient Rome, the fiscal year. During the inflation of the 3rd century AD the Roman government supplied court and army employees by ordering the requisition, or by compulsory purchase (*indictio*), of food and clothing. Such *indictiones* were irregular, often oppressive, and inequitable. Reform measures under Diocletian (AD 284–305) provided for the annual levy of *indictio* based on land and population censuses; hence, the institution of indiction, or fiscal year. Assessed over a 15-year cycle, indiction was reckoned from September 1, contrary to the civil (consular) year, which began January 1.

Roman Catholic popes until 1087 used the indictional year, generally reckoned from September 1, except in Italy after the 7th century, when indictional and civil years coincided. The indictional year, as adapted by the Anglo-Saxons, began on September 24, the autumnal equinox. After adoption by Charlemagne in the late 8th century, the indictional system was transmitted to France. It fell into disuse after the 16th century, although it still appears in some almanacs.

indictment, in the United States (and, until recently, in England), a formal written accusation of crime affirmed by a grand jury and presented by it to the court for trial of the accused. The grand jury system was eliminated in England in the mid-20th century, and current law there provides for a bill of indictment to be presented to the court when the person accused has been committed to trial by a magistrate and in certain other cases.

An indictment must establish the jurisdiction of the court to try the case, provide adequate notice to the defendant of the charges against him, enable the court to pronounce judgment upon conviction, and prevent a second prosecution for the same offense. The indictment at common law was an instrument of remarkable prolixity, and formal requirements concerning caption, commencement, and conclusion of the document and the modes of alleging elements of the offense were strictly enforced; amendments were not permitted. Modern indictments in England have been simplified as to form and language and consist of three parts: commencement, statement of the offense, and particulars of the offense. Each charge must be in a separate count, but any number of felonies and misdemeanours may be joined in the same indictment. A defective indictment may be amended unless "the required amendments cannot be made without injustice."

In the United States, the Federal Rules of Criminal Procedure (1946), applicable to federal district courts, provide that the indictment "shall be a plain, concise, and definite written statement of the essential facts constituting the offense charged." No formal requirements as to commencement or conclusion are made. The federal procedure, as well as that of many states, authorizes the granting of "bills of particulars" to defendants when additional details about matters alleged in the indictment are required in the interest of justice. In the United States, as in England, the indictment may contain several counts. Each count must adequately allege a single offense. Several counts may allege different versions of the same offense, but counts alleging different offenses may be joined in the same indictment. If the offenses charged are alleged to have been committed by more than one person, all persons charged may be tried on the same indictment.

Attacks on the indictment may include assertions that a count is duplicative (*i.e.,* charges more than one offense), that various formal errors were committed in drafting the instrument, that the language of the indictment does not sufficiently allege commission of the offense, and many others. Failure to raise objections to the indictment at the appropriate time ordinarily constitutes waiver of the objections except when the defects are fundamental; *e.g.,* when there is failure to show the jurisdiction of the court or to charge an offense.

In England, crimes are classified as indictable or summary offenses. Indictable offenses include treason, felonies, and some misdemeanours. Under modern English law, crimes designated as summary offenses may be tried on indictment if the prescribed penalties include imprisonment for more than three months. In the United States the indictment is only one of three principal methods of charging offenses, the others being the information (*i.e.,* a written accusation resembling an indictment, prepared and presented to the court by a prosecuting official) and, for petty offense, a complaint of the aggrieved party or of a police officer.

In the United States, there is disagreement as to when an accused may or must be tried by indictment. The Fifth Amendment to the Constitution provides that trial of "capital or otherwise infamous" crimes be based on indictment by the grand jury. "Infamous crimes" have been defined as offenses punishable by death or imprisonment in a penitentiary or by hard labour. Some, but not all, of the states permit waiver of the indictment by the defendant. Beginning in the 19th century, many states eliminated grand juries and authorized, with various regulations, the prosecution of all crimes by information.

Indies, Council of the, Spanish CONSEJO DE INDIAS, supreme governing body of Spain's colonies in America (1524–1834). Composed of between 6 and 10 councillors appointed by the king, the council prepared and issued all legislation governing the colonies in the king's name, approved all important acts and expenditures by colonial officials, and acted as a court of last resort in civil suits appealed from colonial courts. It lost much of its importance in the 18th century.

Indies, Laws of the, the entire body of law promulgated by the Spanish crown during the 16th, 17th, and 18th centuries for the government of its kingdoms (colonies) outside Europe, chiefly in the Americas; more specifically, a series of collections of decrees (cedulas) compiled and published by royal authorization, culminating in the *Recopilación de las leyes de los reinos de Indias* (1680). From the beginning of the colonization of the Americas, Castilian law constituted the basic private law in the colonies, but, because special conditions prevailed there, the Spanish crown legislated specifically for the Indies (America), in the area of public law. Thus, an important aspect of such legislation was the adaptation of Castilian administrative and judicial institutions to the governmental needs of the New World. The Laws of Burgos issued on Dec. 27, 1512, by Ferdinand II, the Catholic, of Aragon, regulated relations between Spaniards and the conquered Indians, particularly to ensure the spiritual and material welfare of the latter, who were often severely treated. The New Laws of the Indies (1542) of Charles I, which sought to correct the inadequacies of the previous code, met with armed resistance from the American colonists and were reissued in a weaker version in 1552. In the same year a commercial code was promulgated for the Casa de Contratación (Board of Trade). In 1563 the powers and procedures of the colonial *audiencias* (courts) were defined. The Ordinances Concerning Discoveries, issued in 1573, forbade unauthorized operations against independent Indian peoples.

Attempts at general codification in the 16th century proved inadequate. In 1624 work was begun on the code, which finally emerged as the *Recopilación.* The undertaking was supervised by two noted jurists: Rodrigo de Aguiar y Acuña and, later, Juan Solórzano Pereira. Before its eventual promulgation in 1681, it was further edited and abbreviated by Fernando Jiménez Paniagua. It contains 6,377 laws in nine books of uneven length, subdivided into 218 *títulos,* or chapters. In brief, the contents of the books are: (1) church government and education; (2) the Council of the Indies and the *audiencias;* (3) political and military administration—viceroys and captains general; (4) discoveries, colonization, and municipal government; (5) provincial government and lower courts; (6) Indians; (7) penal law; (8) public finance; and (9) navigation and commerce. Subsequent new legislation, especially that issued in the later 18th century under Charles III (1759–88) concerning commerce and administration, made the *Recopilación* obsolete. Recodification was begun in 1805 but never finished; instead, the last two editions printed in the 19th century (three were printed in the 18th century) contained only supplementary sections of revised legislation. In this form the code was applied to the remnants of Spain's old colonial empire (Cuba, Puerto Rico, and the Philippines) until their loss in 1898.

The *Recopilación* has been criticized for its many inconsistencies, periodic inexactness in phrasing, and excessive attention to trivial and ceremonial matters and to commercial regulations, which were virtually unenforcible, and for depriving colonials of a responsible role in government and commerce. Yet it was the most comprehensive law code ever instituted for a colonial empire and set forth humane (if often ignored) principles for treatment of Indians.

indifference, in the mathematical theory of probability, classical principle stated by Bernoulli and formulated (and named) by the English economist John Maynard Keynes in *A Treatise on Probability* (1921): two cases are equally likely if no reason is known why either case should be the preferable one, this principle being introduced in order to deal with problems concerning the range theory of probability, which dealt with all possible alter-

natives of a situation only by the number of such alternatives and not necessarily by their relative frequencies or probabilities.

indifference curve, in economics, graph showing various combinations of two things (usually consumer goods) that yield equal satisfaction or utility to an individual. Developed by the British economist Francis Y. Edgeworth, it is widely used as an analytical tool in the study of consumer behaviour, particularly as related to consumer demand. It is also utilized in welfare economics, a field that focusses on the effect of different actions on individual and general well-being.

The classic indifference curve is so drawn—downward from left to right and convex to the origin—that if a consumer were given his choice between any two points on it, he would not prefer one over the other. Because all of the combinations of goods represented by the points are equally desirable to him, he would be indifferent to the combination actually received. It is also possible to plot indifference curves for combinations of desirable and undesirable entities, which curves do not have the shape described above. An indifference curve is always constructed on the assumption that certain *ceteris paribus* (other things equal) factors remain constant. If any of the factors change, such as the consumer's income or his taste, then utility would be expressed by a different curve.

Indigenismo, movement in Latin America advocating a dominant social and political role for Indians in countries in which they constitute a majority of the population. A sharp distinction is drawn by its members between Indians and Europeans, or those of European ancestry, who have dominated the Indian majorities since the Spanish conquest in the early 16th century. In Mexico, beginning with the Revolution of 1911, the movement became very influential, particularly during the presidency of Lázaro Cárdenas (1934–40), when serious efforts were made to reconstitute the nation according to its Indian heritage. In Peru, where the movement is called Aprismo, its members have proposed that Latin America be renamed Indo-America.

indigestion, also called DYSPEPSIA, any or all of the unpleasant feelings and manifestations—abdominal discomfort, belching, flatulence, aversion to eating, nausea, vomiting, diarrhea, constipation, heartburn—that sufferers associate with the malfunctioning of their digestive apparatus. The causes are as varied as the symptoms: organic disease outside the digestive tract—*e.g.,* anemia, pulmonary tuberculosis, heart failure, urinary tract infections; organic disease within the digestive tract—*e.g.,* pancreatitis, gallbladder disease, cancer of the stomach, chronic appendicitis; or functional disorders—*e.g.,* psychogenic indigestion (indigestion associated with worry or fear, for example) or indigestion due to improper eating habits, excessive smoking, drinking excessive quantities of coffee or alcohol, or hypersensitivity to particular foods.

Indigirka River, river, Yakut Autonomous Soviet Socialist Republic, far eastern Russian S.F.S.R. It is one of the major rivers of northeastern Siberia. The Indigirka rises in the Verkhoyansk Mountains and flows 1,072 mi (1,726 km) north through the Chersky Range into the broad Indigirka lowland, most of which is in tundra vegetation, to enter the East Siberian Sea through an extensive delta. Its two main tributaries are the Moma and Selennyach. The Indigirka is navigable for 650 mi to Khonu on the Arctic Circle, but only from June to September, when it is free of ice. The Indigirka valley is sparsely populated, but fur, lumber, and other natural resources are being developed. There is a goldfield in its upper part.

indigo, in botany, any shrub or herb of the genus *Indigofera* within the pea family (Fabaceae). Most species occur in warm climates and are generally silky or hairy. The leaves are usually divided into smaller leaflets. The small rose, purple, or white flowers are borne in spikes or clusters. The fruit is a pod, usually with a thin partition between the seeds.

Some species, particularly *I. sumatrana* and *I. arrecta,* were once an important source of indigo dye. The cultivation of indigo plants and the extraction of the dyestuff were an important industry in India up to the beginning of the 20th century. Synthetic indigo, developed about that time, gradually replaced natural indigo as a dyestuff.



Indigo (*Indigofera*)
A to Z Botanical Collection—EB Inc.

indigo, an important and valuable vat dyestuff, obtained until about 1900 entirely from plants of the genera *Indigofera* and *Isatis.* The material was known to the ancients of Asia, Egypt, Greece, Rome, Britain, and Peru. It is used in the U.S. principally for dyeing cotton for work clothes; for a long time it was used to produce heavy (navy blue) shades on wool.

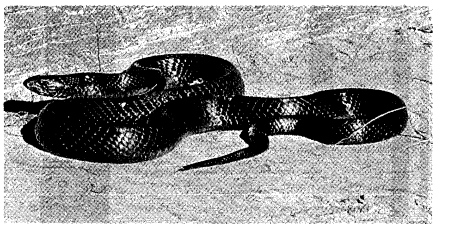
The naturally occurring precursor of indigo is indican, a colourless, water-soluble substance that is easily hydrolyzed to glucose and indoxyl; the latter is converted to indigo by mild oxidation, such as exposure to air.

The chemical structure of indigo was announced in 1883 by Adolf von Baeyer; a commercially feasible manufacturing process was in use by the late 1890s. The method, still in use throughout the world, consists of a synthesis of indoxyl by fusion of sodium phenylglycinate in a mixture of caustic soda and sodamide.

Indigo can be converted to numerous simpler compounds, but the only chemical reaction of practical importance is its reduction to the soluble yellow leucoindigo, in which form it is applied to textile fibres and reoxidized to indigo.

Tyrian purple, a dyestuff of great importance in antiquity, was obtained from a secretion of a sea snail (*Murex brandaris*) common in the Mediterranean. Its structure is very similar to that of indigo. It has never been produced synthetically on a commercial basis.

indigo snake (*Drymarchon corais*), docile, nonvenomous member of the family Colubridae found from the southeastern United States to Brazil. It is the largest snake in the United States—record length is 2.8 metres (9.2 feet)—and one of the largest of all colubrids. In the United States its colour is blue-black; southward it may have brown foreparts, and in the tropics members of the genus often are called brown snakes. It kills small vertebrate animals, including venomous snakes, by crushing with its jaws and the weight of its coils but is not a constrictor.



Indigo snake (*Drymarchon corais*)
Leonard Lee Rue III

In defense the indigo snake hisses and vibrates its tail but is loath to strike. It may share a burrow with a gopher tortoise (*Gopherus*) and is often called gopher snake. It had become so rare by the late 1970s that it was listed as an endangered species.

Indio, city, Riverside County, southern California, U.S., in the Coachella Valley, between Palm Springs (northwest) and the Salton Sea (southeast). Founded (1876) as Indian Wells, on the site of Palte-Wat Indian village by the Southern Pacific Railroad, it was later renamed Indio (Spanish: Indian). In the 1850s local artesian wells were utilized for irrigation and C.P. Huntington, president of the railway, successfully introduced Algerian date shoots. Indio developed as a desert spa and shipping point for agricultural produce, especially dates (a national date festival is held each February), citrus, grapes, vegetables, and cotton. After 1949 water via the All-American Canal gave added impetus to growth. The Giannini Research Institute (applied physics), and electronic and refrigeration industries were established there in the 1960s. The Joshua Tree National Monument is 25 mi (40 km) east. Inc. 1930. Pop. (1980) 21,611.

indirect relief printing: *see* dry offset.

indium (In), chemical element, rare metal of main Group IIIa, or boron group, of the periodic table. Of a brilliant, silvery-white lustre, indium was discovered (1863) by Ferdinand Reich and Theodor Richter while they were examining zinc ore samples. The presence of a predominant indigo spectral line suggested the name. Softer than lead and quite plastic, indium can be scratched with a fingernail and can undergo almost limitless deformation. Like tin, the pure metal emits a high-pitched "cry" when bent. Indium is about as rare as silver. The Earth's crust contains on the average about 0.1 part per million indium by weight. The element does not occur uncombined nor in independent minerals but as a trace in many minerals, particularly those of zinc and lead, from which it is obtained as a by-product.

Indium has the unusual property when molten of clinging to or wetting clean glass and other surfaces, which makes it valuable for producing hermetic seals between glass, metals, quartz, ceramics, and marble. Indium is used in coating aircraft engine bearings because it improves corrosion resistance and enables the surface to retain a more adherent oil film. Indium is an ingredient in some low-melting alloys used in sprinkler heads, fire-door links, and fusible plugs. The metal is extensively employed in the manufacture of semiconductor devices and for soldering various parts of germanium transistors and rectifiers. Indium also is used to measure the thermal neutron flux of nuclear reactors and to monitor neutrons for the protection of personnel and equipment. Natural indium is a mixture of two isotopes: indium-113 (4.28 percent) and indium-115 (95.72 percent).

Indium metal is unaffected by air at ordinary temperatures, but at a red heat it burns with a blue-violet flame to form the yellow oxide

In_2O_3. The metal dissolves in mineral acids but is unaffected by potassium hydroxide or boiling water. When heated in the presence of the halogens or sulfur, direct combination takes place. Though a few authentic indium(I) compounds have been prepared (*e.g.*, halides), indium is commonly trivalent in its compounds. With the main Group V elements, indium forms compounds (indium phosphide, arsenide, antimonide) that have semiconductor properties.

atomic number	49
atomic weight	114.82
melting point	156.61° C
boiling point	2,080° C
specific gravity	7.31 (20° C)
valence	1, 3
electronic config.	2-8-18-18-3 or (Kr)$4d^{10}5s^25p^1$

individual psychology, body of theories of the Austrian psychiatrist Alfred Adler, who held that the main motives of human thought and behaviour are individual man's striving for superiority and power, partly in compensation for his feeling of inferiority. Every individual, in this view, is unique, and his personality structure—including his unique goal and ways of striving for it—finds expression in his style of life, this life-style being the product of his own creativity. Nevertheless, the individual cannot be considered apart from society; all important problems, including problems of general human relations, occupation, and love, are social.

This theory led to explanations of psychological normality and abnormality: although the normal person with a well-developed social interest will compensate by striving on the useful side of life (that is, by contributing to the common welfare and thus helping to overcome common feelings of inferiority), the neurotically disposed person is characterized by increased inferiority feelings, underdeveloped social interest, and an exaggerated, uncooperative goal of superiority, these symptoms manifesting themselves as anxiety and more or less open aggression. Accordingly, he solves his problems in a self-centred, private fashion (rather than a task-centred, common-sense fashion), leading to failure. All forms of maladjustment share this constellation. Therapy consists in providing the patient with insight into his mistaken life-style through material furnished by him in the psychiatric interview.

individualism, political and social philosophy that places high value on the freedom of the individual and generally stresses the self-directed, self-contained, and comparatively unrestrained individual or ego. The French political commentator Alexis de Tocqueville, who coined the word, described it in terms of a kind of moderate selfishness, disposing human beings to be concerned only with their own small circle of family and friends.

As a philosophy, individualism involves a value system, a theory of human nature, a general attitude or temper, and belief in certain political, economic, social, and religious arrangements. The value system may be described in terms of three propositions: all values are man-centred—that is, they are experienced (but not necessarily created) by human beings; the individual is an end in himself and is of supreme value, society being only a means to individual ends; and all individuals are in some sense morally equal, this equality being best expressed by the proposition that no one should ever be treated solely as a means to the well-being of another person.

The individualistic theory of human nature holds that the interests of the normal adult are best served by allowing him maximum freedom and responsibility for choosing his objectives and the means for obtaining them, and acting accordingly. This belief follows from the conviction that each person is the best judge of his own interests and, granted educational opportunities, can discover how to advance them. It is also based upon the assumption that the act of making these choices contributes to the development of the individual and to the welfare of society—the latter because individualism is thought to provide the most effective incentive to productive endeavour. Society, from this point of view, is seen as only a collection of individuals, each of which is a self-contained and ideally almost self-sufficient entity.

As a general attitude, then, individualism embraces a high valuation on self-reliance, on privacy, and on respect for other individuals. Negatively, it embodies opposition to authority and to all manner of controls over the individual, especially when they are exercised by the state. It also anticipates and values "progress" and, as a means to this end, subscribes to the right of the individual to be different from, to compete with, and to get ahead of (or fall behind) others.

The institutional embodiment of individualism follows from these principles. Only the most extreme individualists believe in anarchy, but all believe that government should keep its interference with human lives at a minimum and that it should confine itself largely to maintaining law and order, preventing individuals from interfering with others, and enforcing agreements (contracts) voluntarily arrived at. The state tends to be viewed as a necessary evil and the slogan "That government that governs least governs best" is applauded.

Individualism also implies a property system according to which each person (or family) enjoys the maximum of opportunity to acquire property and to manage and dispose of it as he sees fit. Freedom of association extends to the right to join (or to refuse to join) any organization.

Although instances of individualism have occurred throughout history in many cultures and times, full-fledged individualism, as it is usually conceived to be, seems to have emerged first in England, especially after the publication of the ideas of Adam Smith and Jeremy Bentham and their followers in economic and political theory. Smith's doctrine of laissez-faire, based upon a profound belief in the natural harmony of individual wills and Bentham's utilitarianism, with the basic rule of "each to count for one and none for more than one," set the stage for these developments. On the economic side, Smith's "obvious and simple system of natural liberty" pictured exchange of goods and services in free and competitive markets as the ideal system of cooperation for mutual advantage. Such an organization should maximize efficiency as well as freedom, secure for each participant the largest yield from his resources to be had without injury to others, and achieve a just distribution, meaning a sharing of the social product in proportion to individual contributions.

Although economic individualism and political individualism in the form of democracy advanced together for a while, eventually they proved incompatible as newly enfranchised voters increasingly came to demand, in the course of the 19th century, governmental intervention in the economic process. In point of fact the reasons for the growing demand for intervention were inherent in the attempt to adhere rigorously to an economic theory based almost solely on individualistic assumptions. In economics as in all other phases of life these assumptions are inadequate. Man is a social animal. His nature, his wants, and his capacities are to a great extent the product of society and its institutions. His most effective behaviour is often through groups and organizations, running the gamut from the family through all manner of voluntary social and economically motivated associations to the state and international organizations. These units in varying ways interfere with the individualistic ideals of perfectly free association and of atomistic competition. Problems of monopoly and of technology, seasonal and cyclical unemployment, frequently associated in the public mind with individualistic economic theory, caused widespread dissatisfaction.

The prestige of individualistic ideas declined during the latter part of the 19th century and the first part of the 20th with the rise of large-scale social organization. One consequence of this was the emergence of theories calling for the organization of society on principles diametrically opposed to those of individualism (*see* collectivism). In liberal democracies, however, the notion of the importance of the individual has survived, providing a check on the tendency toward depersonalization that, some say, is a consequence of collectivist trends.

Indlandsis (Greenland): *see* Greenland Ice Sheet.

Indo-Aryan languages, also called INDIC, subgroup of the Indo-Iranian branch of the Indo-European language family, spoken in India, Sri Lanka, Pakistan, and Bangladesh. The earliest records of an Indo-Aryan language are of Sanskrit, now a classical and sacred language of the Hindus. From Sanskrit or related dialects, numerous Middle Indo-Aryan languages, the Prākrits, evolved. These in turn gave rise to the modern Indo-Aryan languages after about 1100.

The modern Indo-Aryan languages may be divided into five major groups. In the eastern group are Assamese, Bengali, and Oriya. The northwestern group includes Punjabi, Lahnda, Sindhi, Pahari, and Dardic. In the western and southwestern group are Gujarati, Marathi, Konkani, Maldivian, and Sinhalese, the official language of Sri Lanka. The midland group consists of the Hindi dialects, including Hindi, the national language of India; Urdu, the official language of Pakistan; and a variety of dialects classed as Eastern Hindi and Western Hindi. Shading from Western Hindi into Sindhi and Gujarati are dialects of Rajasthani, the fifth major group. Sometimes the Dardic languages are also included with the Indo-Aryan languages.

The Indo-Aryan languages have a long and rich literary history dating from the Ṛgveda, a collection of hymns written in Vedic Sanskrit (*c.* 1500 BC).

Indo-European languages, family of languages spoken in most of Europe and areas of European settlement and in much of Southwest and South Asia.

A brief treatment of the Indo-European languages follows. For full treatment, *see* MACROPAEDIA: Languages of the World.

The Indo-European languages are the descendants of a single unrecorded language, believed to have been spoken over 5,000 years ago in the steppe regions north of the Black Sea and to have split into a number of dialects by about the 3rd millennium BC. These dialects, carried by migrating tribes to Europe and Asia, developed in time into separate languages, a number of which have left written records of their various stages. These languages, past and present, can be grouped into the following main branches: Anatolian, the major representative of which is Hittite; Indo-Iranian, including Sanskrit, Avestan, and modern Hindi and Persian; Greek; Italic, including Latin and its modern representatives, the Romance languages consisting of French, Italian, Spanish, Portuguese, and others; Germanic, including Gothic, modern English, German, Dutch, and the Scandinavian languages; Armenian; Celtic, including Irish

and Welsh; Albanian; the extinct Tocharian; Baltic, including the extinct Old Prussian, and modern Latvian and Lithuanian; and Slavic, including Old Church Slavic, Russian, Czech, Polish, Serbo-Croatian, and others. Based on a number of shared features, a single Balto-Slavic protolanguage is often posited for the latter two groups.

In a genetic classification of languages, words suspected of being cognates are compared, and a system of regular sound correspondences is established. For each set of correspondences, a proto-segment is posited, and by the application of "sound laws," or phonetic rules, its development is traced down through the daughter languages. Similarity of sound or written form is in itself not diagnostic in establishing cognates: the French *feu* ("fire") and German *Feuer* ("fire") are unrelated, while Armenian *erku* ("two") is related in a very systematic way to English *two*.

The idea of a genetic relationship between certain of the Indo-European languages (Greek, Latin, Sanskrit, Germanic, and Celtic) was first proposed in 1786 by the British orientalist Sir William Jones, who suggested that these languages all derive from some single "common source." In the following century the detailed evidence underlying Jones's assertion was presented, and a number of other languages were shown to be members of the Indo-European family. A genetic relationship based on a phonological comparison was established in the early 19th century by the Dane Rasmus Rask and the German Jacob Grimm, who set up correspondences between the sounds of equivalent words in Germanic, on the one hand, and Greek and Latin, on the other.

In the course of the 19th century, statements of sound changes accounting for relationships between the parent language and the daughter languages became more accurate and refined. Previously unmotivated exceptions to a rule were shown to be regular themselves. Thus Grimm's Law, which establishes a correspondence between stop and spirant consonants in Germanic and the consonants of other Indo-European languages (for example, the stop in *p* in Latin *pater* corresponds to the spirant *f* in "father"), leaves a number of forms unaccounted for. These residues, however, were later explained by Grassman's Law, on the dissimilation of aspirates in Greek and Sanskrit, and Verner's Law, which showed the influence of the original place of stress on the reflexes of Indo-European consonants in Germanic. Encouraged by the apparent regularity of sound change, there arose a new school of linguists in the 1870s, the so-called Neogrammarians (*Junggrammatiker*). The latest full-scale treatment of the Indo-European family is found in the multivolume work of the Neogrammarian Karl Brugmann, *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen* (1897–1916; "Outline of Comparative Indo-European Grammar").

The Indo-European protolanguage possessed a rich, well-developed system of labial, dental, palatal, and velar stops, with voiceless, voiced, and voiced-aspirate articulations. Most scholars agree that the parent language had perhaps three or four additional stop or spirant consonants, for which the label laryngeal is used (H_1, H_2, H_3, H_4). Only Anatolian seems to provide direct evidence for laryngeals (H_2 and H_3 appear as *ḫ* in Hittite). Laryngeal reflexes show up indirectly in the other Indo-European languages in vowel length (when the vowel was followed by a laryngeal plus a consonant) and quality: it is believed that H_2 could "colour" an adjacent basic *e* vowel into *a* and that H_3 could colour an adjacent *e* into *o*.

The Indo-European sonorants are, in contrast to the obstruents, quite stable in the phonological development of the various dialects. The sonorants are those sounds which are resonant enough to be vowels and have enough occlusion to be consonants, and in fact the Indo-European sonorants *r, l, y, w, m, n* function syllabically in certain environments and nonsyllabically in others. (The syllabic variants are *r̥, l̥, i, u, m̥, n̥*.)

The vowel system was quite poorly represented. The basic vowel of the system was *e* ("normal grade"), and the changes it could undergo in certain grammatical environments were loss (zero-grade), changing to *o* (o-grade), lengthening to *ē* (lengthened grade), and lengthening plus change to *ō* (lengthened o-grade). This pattern of grammatically conditioned alternants is referred to as ablaut. Later vowels in the system are the products of laryngeal colouring.

Indo-Gangetic Plain, extensive middle section of the Indian subcontinent, extending from the Bay of Bengal on the east to the Afghan frontier and the Arabian Sea on the west. The region contains the subcontinent's richest and most densely populated areas. Most of the plain comprises alluvial soil, deposited by the Ganges and Brahmaputra rivers in the east and the Indus River in the west. The eastern part of the plain has light rains or drought in the winter, but in summer rainfall is so heavy that vast areas become swamps or shallow lakes. It becomes progressively drier toward the northwest and in western Pakistan it is a true desert.

Indo-Hittite languages, hypothetical family of languages composed of the Indo-European and Anatolian languages. The term Indo-Hittite was proposed by scholars who believed that Hittite and the other closely related Anatolian languages represented a language branch coordinate with all the other Indo-European languages combined, rather than forming another branch coordinate with the individual Indo-European branches (Celtic, Germanic, etc.). In other words, they proposed that at one time there existed a protolanguage (Indo-Hittite) that split into two branches, Anatolian and Indo-European (from which the various branches of Indo-European later evolved). Most scholars, however, consider the Anatolian languages, including Hittite, to be simply a branch of Indo-European.

Indo-Iranian languages, group of languages constituting the easternmost major branch of the Indo-European language family. The Indo-Iranian languages are usually divided into two major groups: Indo-Aryan (or Indic), spoken primarily in India, Pakistan, Bangladesh, Sri Lanka, and Nepal and other areas of the Himalayan region (the Gypsy, or Romany, dialects are also Indo-Aryan); and Iranian, spoken primarily in Pakistan, Iran, Afghanistan, and the southern Soviet Union.

A brief treatment of the Indo-Iranian languages follows. For full treatment, *see* MACROPAEDIA: Languages of the World.

Indo-Aryan and Iranian languages are closely related in grammar and vocabulary, sharing characteristic features that set them apart as a subgroup of the Indo-European language family. The original location of the Indo-Iranian group was probably north of modern Afghanistan in the area now known as Soviet Turkistan, where Iranian languages are still spoken. From there, some Iranians migrated south and west, while the Indo-Aryans migrated south and east. Reasons for the split of the Indo-Aryans and Iranians, which probably occurred before the beginning of the second millennium BC, are not known. Indo-Iranian languages have been used as both administrative and literary languages from at least the 1st millennium BC. Sacred texts of Buddhism, Jainism, and Hinduism are in Indo-Aryan languages, while Zoroastrian and Manichaean texts are in Iranian languages.

Indo-Aryan languages. Indo-Aryan languages are assigned to three major periods: Old, Middle, and New Indo-Aryan. Old Indo-Aryan dialects are referred to in common as Sanskrit. Middle Indo-Aryan includes Prākrit and Apabhraṃśa. New Indo-Aryan includes such modern vernaculars as Hindi and Bengali, which began to take shape about the 10th century AD.

The most archaic Sanskrit is that of the *Veda*s (*c.* 1500–1200 BC). One of the most distinctive features of Vedic Sanskrit is its accentual system, in which vowels have low, high, or circumflex pitch. As the Vedic language developed, vowel accent among other features fell into disuse, and the language became somewhat simpler. Classical Sanskrit is the result of such development. Approximately in the 6th century BC the grammarian Pāṇini composed a treatise that became the standard for correct usage of Classical Sanskrit. Major poetic works (*kāvya*), drama (*nāṭaka*), narratives, and technical treatises were composed in Sanskrit for centuries thereafter and even to the present day.

Saṃskṛta ("polished") was the language of the educated elite, but flourishing alongside it were the *Prākṛta* ("natural") languages, *i.e.*, the vernaculars, which are grouped under the heading of Middle Indo-Aryan. Prākrit languages were used in inscriptions from the 3rd century BC through the 4th century AD and in literature as well. The most archaic literary Prākrit is Pāli, in which the Buddhist cannon was composed about the 5th century BC. The early Jaina canonical texts are in Ardhamāgadhī, while later Jaina texts are in Apabhraṃśa, and noncanonical Jaina texts are in Mahārāṣṭrī. Epic poems, dramas, and narratives are extant in various Prākrits.

New Indo-Aryan languages developed regionally from Middle and Old Indo-Aryan, and some have literary traditions stretching back to the 10th century AD. Bengali, Assamese, Hindi, Marathi, Gujarati, and Kashmiri all have extant literary works from the 14th century or earlier. The recent creation of nations in South Asia, as well as states in India, that are based on linguistic groups has reinforced the use of standard dialects for more widespread communication. Linguistic diversity continues to thrive, however; India's attempt to establish Hindi as the single national language has been thwarted by speakers of other languages.

In general, the tendency of linguistic development from Old and Middle to New Indo-Aryan was toward simplification. The number of nominal cases was reduced, but in Hindi and some other languages, post-positions have appeared. The dual number was dropped, and some verbal tenses were eliminated.

Iranian languages. Iranian languages are divided into three categories: Ancient, Middle, and Modern Iranian.

Two Ancient Iranian languages are known from texts and inscriptions dating from the 6th century BC: Avestan and Old Persian. Avestan was probably spoken in northeastern Iran, and Old Persian in southwestern Iran. Evidence indicates that other Ancient Iranian languages also existed, *e.g.*, Median. Avestan is the language in which the sacred texts of the Zoroastrians were written. The poems composed by Zoroaster (or Zarathustra) in the 7th or 6th century BC constitute the oldest portion of the extant Ancient Iranian. Old Persian was the language of the Achaemenid court and is known primarily from the cuneiform inscriptions of Darius I and Xerxes I. While Avestan was no longer spoken after the Ancient period, considerable continuity exists between Old and Middle Persian.

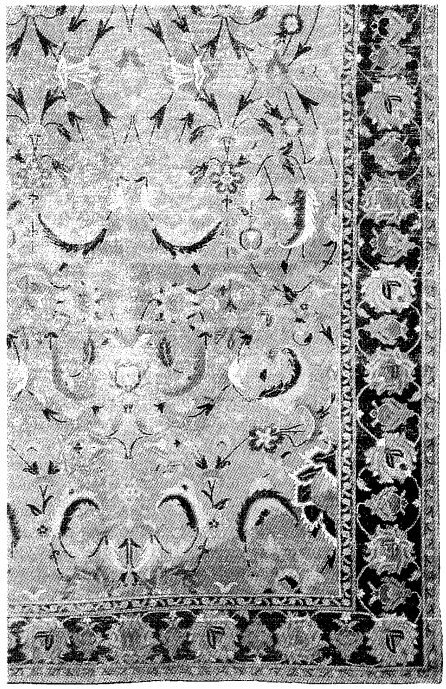
Middle Iranian languages include Middle Persian and Parthian. Middle Persian, the official language of the Sāsānian court (3rd to 7th century AD), was also used in Zoroastrian and Manichaean texts of the 3rd to 10th cen-

turies. Parthian was spoken in northeastern and northwestern Iran, but little record of it has survived. These two languages were mutually intelligible; but very different from them were other Middle Iranian languages including Sogdian, Saka, Khotanese, Khwārezmian, Bactrian, and Old Ossetic.

Of the Modern Iranian languages, by far the most widely spoken is Persian, which developed as a koine from a Middle Persian dialect and includes many words from other languages. Persian (Fārsī) is the official language of Iran and is recognized as the second language of Afghanistan, where the eastern Iranian language Pashto is the national language. Kurdish and Baluchi are other Modern Iranian languages spoken by millions of people scattered over several nations.

In general, Iranian languages have simplified the inherited Indo-European inflectional system by reducing the number of cases and similarly reducing the conjugational system for verbs. Many different scripts have been used in writing Iranian languages.

Indo-Isfahan carpet, type of floor covering ranging from small to extremely large, handmade in India, primarily in the 17th century, as free imitations of Herāt designs (*see* Herāt carpet). The name Isfahan was applied in the belief that Persian carpets sold better than



Detail of the field design and border of an Indo-Isfahan carpet, 17th century; in the Corcoran Gallery of Art, Washington, D.C.

By courtesy of the Corcoran Gallery of Art, Washington, D.C., W.A. Clark Collection; photograph, Otto E. Nelson—EB Inc.

Indian. They appear to have been exported in quantity to Europe, especially to Portugal and the Low Countries, by the various East India companies and are frequently seen in 17th-century Dutch paintings. The usual field design consists of elaborate vine-leaf and floral palmettes in pairs, pointing in opposite directions and connected by scrolling vines, together with curving, feathery lancet leaves, cloud bands, and a host of small floral motifs on a ground of slightly purplish wine red. A blue or blue-green border often shows similar palmettes placed transversely in alternation with groups of five small palmettes.

These carpets may have been made in Āgra, where similar ones were still being produced in the 19th century. Carpets in more fanciful patterns may have been produced in the Deccan and not exported. The borders introduce varied arrangements of arabesques and of lancet leaves. The term Indo-Isfahan has also been used for a group of 19th-century Indian carpets with rather arid and impoverished patterns derived from those of the 17th-century.

Indo-Scyth (ancient Asian people): *see* Yüeh-chih.

Indochina, also called (until 1950) FRENCH INDOCHINA, French INDOCHINE FRANÇAISE, the three states of Vietnam, Laos, and Kampuchea (Cambodia) formerly associated with France first within its empire and later within the French Union. The term Indochina refers to the intermingling of Indian and Chinese influences in the culture of the region.

After gradually establishing suzerainty over Indochina between 1858 and 1893, the French created the first Indochinese Union to govern it. Except in Cochinchina (French Cochindochine), the southernmost portion of Vietnam, the original Vietnamese, Cambodian, and Laotian royal houses continued under a federal-type central government that had exclusive authority in foreign affairs, finance, defense, customs, and public works and was headed by a French governor general responsible to the French minister for trade. In Cochinchina the administration was under a prefect and a French bureaucracy.

In 1940 the Japanese occupied the Tonkin area of northern Vietnam and in the following year the rest of Indochina. But, except for Vietnam and the western provinces of Cambodia, which the Japanese ceded to their Thai ally, Indochina was unaffected by the Japanese invasion. The local French Vichy government was even allowed to remain in office until March 1945, when the Japanese interned the local French personnel and proclaimed the autonomous state of Vietnam.

This regime collapsed after the Japanese surrender in August 1945, and in the north a party called the Viet Minh under the Vietnamese nationalist leader Ho Chi Minh at once proclaimed a Democratic Republic of Vietnam and assumed power. The monarchies in Laos and Cambodia hesitated to follow suit, and they were soon reoccupied by the French. The French then founded the Indochinese Federation, which was to be part of a new, greater French Union and in which the Democratic Republic of Vietnam was to be treated as an independent state. The French Union, however, was not established for several years, and then it provided for control of the area from Paris.

The conflict known as the First Indochina War soon erupted, and, during a lull in the fighting in 1949–50, the French, in an attempt to retain their holdings in the area, ratified separate treaties that recognized Vietnam, Laos, and Cambodia as independent, self-governing states within the French Union. Thus ended the conception that these states were united to form "French Indochina." The leaders of the states were puppet rulers; real independence did not come to the region until after the Geneva Conference of 1954, which finally ended the fighting between the French and the Viet Minh.

Indochina wars, 20th-century conflicts in Vietnam, Laos, Thailand, and Cambodia (now Kampuchea), with the principal involvement of France (1946–54) and later the United States (beginning in the 1950s). The wars are often called the French Indochina War and the Vietnam War (*q.v.*), or the First and Second Indochina wars. The latter conflict ended in April 1975.

In the latter half of the 19th century Vietnam was gradually conquered by the French, who controlled it as a colony (1883–1939) and then as a possession (1930–45). Vietnamese rule did not return to the country until Sept. 2, 1945, when Ho Chi Minh proclaimed its independence. From 1946 to 1954, the French opposed independence, and Ho Chi Minh led guerrilla warfare against them in the first Indochina War that ended in the Vietnamese victory at Dien Bien Phu on May 7, 1954. An agreement was signed at Geneva on July 21, 1954, providing for a temporary division of the country, at the 17th parallel of latitude, between a Communist-dominated north and a U.S.-supported south. Activities of pro-Communist rebels in South Vietnam led to U.S. intervention and the second Indochina War, or Vietnam War (1965–75), which caused great destruction and loss of life. It came to a brief halt in 1973, when a cease-fire agreement was signed (January 27) and U.S. troops began to be withdrawn. The war was soon resumed. In 1975 the South Vietnamese government collapsed and was replaced (April 30) by a regime dominated by the Communists. On July 2, 1976, the two Vietnams were reunited as the Socialist Republic of Vietnam.

Cambodia had been a French protectorate since 1863 and achieved independence in 1953 under the leadership of Prince Norodom Sihanouk. Sihanouk adopted a position of neutrality in the Vietnam conflict, and tacitly permitted Vietnamese Communists to use sanctuaries inside Cambodia. On March 18, 1970, however, he was deposed in a coup by right-wing elements in the armed forces. On May 1, 1970, U.S. and South Vietnamese forces invaded Cambodia in an effort to destroy Communist sanctuaries along the Cambodia-Vietnam border. Cambodia's new leaders by then faced a growing threat from Cambodian Communists called the Khmer Rouge (Red Khmers). The U.S. launched a series of intensive bombing raids of rural areas of Cambodia until 1973 in an effort to disrupt Khmer Rouge activities, but after a five-year civil war, the Cambodian capital, Phnom Penh, fell to the Khmer Rouge on April 17, 1975. Vietnamese forces invaded Cambodia in January 1979 and installed a puppet government soon afterward.

Laos had been a French protectorate since the turn of the century. It achieved independence in a series of steps between 1949 and 1954. Control of the government changed hands between rightists and neutralists several times until 1962, when a coalition government between them and the Laotian Communists called the Pathet Lao (Lao Country) was formed under the leadership of Prince Souvanna Phouma. The coalition continued to govern while Communists and non-Communists vied for control of the outlying provinces of the country. After the fall of South Vietnam in 1975, the Pathet Lao, supported by the North Vietnamese, established control over the whole of Laos.

indole, also called BENZOPYRROLE, a heterocyclic organic compound occurring in some flower oils, such as jasmine and orange blossom, in coal tar, and in fecal matter. It is used in perfumery and in making tryptophan, an essential amino acid, and indoleacetic acid (heteroauxin), a hormone that promotes the development of roots in plant cuttings.

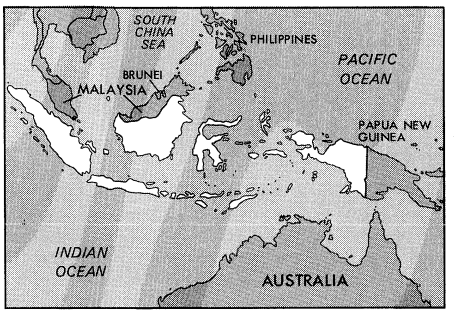
Indole, first isolated in 1866, has the molecular formula C_8H_7N, and it is commonly synthesized from phenylhydrazine and pyruvic acid, although several other procedures have been discovered.

In addition to tryptophan, indigo, and indoleacetic acid, numerous compounds obtainable from plant or animal sources contain the indole molecular structure. The best known group of these compounds is the indole alkaloids, members of which have been isolated from plants representing more than 30 families. Psilocin, psilocybin, reserpine, and strychnine belong to this group.

Indole is a colourless solid having a pleasant fragrance in highly dilute solutions. It melts at 52.5° C (126.5° F).

indomethacin, analgesic with potent action against inflammation. Effective in the treatment of rheumatoid arthritis and gout, indomethacin is indicated for individuals whose pain cannot be controlled successfully with aspirin. Among the side effects associated with its use, however, are gastrointestinal disturbances, mental confusion, and severe morning headache.

Indonesia, officially REPUBLIC OF INDONESIA, Indonesian REPUBLIK INDONESIA, island republic in southeastern Asia, composed of some 13,670 islands, and covering an area of 752,400 square miles (1,948,700 square km). The capital of Indonesia is Jakarta. Indonesia extends approximately 3,200 miles (5,100 km) from the island of Sumatra in the west to that of New Guinea in the east, and about 1,000 miles (1,600 km) from north to south. It is bordered by Papua New Guinea and the Arafura Sea in the east, the Indian Ocean in the south and west, the Andaman Sea in the northwest,



Indonesia

and the Strait of Malacca, the South China Sea, the Celebes Sea, and the western Pacific Ocean in the north. The population in 1990 was estimated to be 182,650,400, making Indonesia the fifth most populous country in the world.

A brief treatment of Indonesia follows. For full treatment, *see* MACROPAEDIA: Indonesia.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. The major Indonesian islands comprise rugged volcanic mountains that are covered by dense tropical forests. The outer or southern sides of the chain of islands (west to east) includes Sumatra, Java, Bali, Lombok, Sumbawa, Flores, and Timor. North of the chain is Borneo, the Indonesian portion of which is called Kalimantan. It is the third largest island in the world and is generally hilly and mountainous. The curiously shaped island of Celebes (Sulawesi) lies to the east of Borneo. To the east of Celebes are the northern Moluccas, and farther east lies the island of New Guinea, the western half of which is the part of Indonesia called Irian Jaya. Indonesia has some 220 active volcanoes, including the world-famous Krakatoa (Krakatau), which erupted in 1883 from the seabed of the Sunda Strait between Sumatra and Java.

Indonesia's tropical climate is generally hot and humid. Average temperatures are highest along the coasts, ranging from 74° to 88° F (23° to 31° C). The country receives heavy precipitation throughout the year, much of it in afternoon thunderstorms due to the monsoon.

Only about one-tenth of the country's land area is arable, and half of this portion is devoted to wet-rice cultivation, including some double-cropping in north-central Java and southwestern Sumatra. Tropical rain forests occupy about two-thirds of Indonesia's land area. Temperate upland forests are found above 5,000 feet (1,500 m), and mangrove swamps along the coastlines of Sumatra, Kalimantan, and southeastern Irian Jaya.

Indonesia belongs to two faunal regions, the Asian in the west and the Australian in the east. The Asian animal community includes the rhinoceros, orangutan, tapir, tiger, and elephant. Animals related to Australian fauna include such birds as the cockatoo, the bowerbird, and the bird of paradise.

Indonesia's principal mineral resources are petroleum, natural gas, tin, manganese, copper, nickel, bauxite, and coal. There are also deposits of iron, sulfur, gold, and silver.

The people. The diverse ethnic populations of Indonesia may be grouped into three broad groups: the Hinduized wet-rice growers of inland Java and Bali; the ethnically heterogeneous Islāmic coastal peoples, including the Malays of Sumatra and the Makasarese of southern Celebes; and the tribal peoples, such as the Dayak of Kalimantan, who practice shifting cultivation in areas where the rainfall will not support wet-rice cultivation. The largest nonindigenous group is the Chinese, who have been present in Indonesia for generations. Europeans, Indians, and Arabs are relatively few in numbers, although their influence in business and other elements of Western culture is apparent in the major cities. Most of the languages spoken in Indonesia have an Austronesian base. The official language, Bahasa Indonesia, evolved from a Malay dialect spoken in the Jambi area of eastern Sumatra. The major religions were all introduced on the coast and, except in such open areas as Java and southern Sumatra, penetrated slowly inland. More than four-fifths of the population professes Islām, which in most cases is strongly influenced by Hinduism, Buddhism, and older animistic beliefs. The Hindus live mainly on Bali, and most Chinese practice Buddhism and Confucianism. In remote areas some tribal religions are practiced.

The distribution and density of the population vary considerably from region to region; the islands of Java, Bali, and Madura account for nearly two-thirds of the total population. Overall, the population nearly doubled from 1960 to 1990, with a moderately high rate of growth, but there have been significant regional contrasts in this rate. In Java, for example, population growth has been significantly less than in the outer islands. The country's birth and death rates are above the average for Asia. A sharp decline in fertility rate has been in progress throughout Indonesia. The rates of infant and child mortality have also declined; two-fifths of the population is under 15 years of age. Life expectancy at birth is about 55 years for males and 58 years for females.

Economy. Indonesia has a developing, mixed economy that is based largely on agriculture and mining. The gross national product (GNP) is growing more rapidly than the population; the GNP per capita, however, is low.

Agriculture accounts for one-fourth of the gross domestic product (GDP) but employs more than one-half of the work force. Independent peasant farmers account for most of the production, although there is an important estate sector that produces cash crops mainly for export. Indonesia is a major supplier of natural rubber; other cash crops include coffee, tea, tobacco, copra, spices (cloves and nutmeg), and oil palm products. The staple crop is rice, and government efforts at estate modernization have increased rice yields substantially.

Indonesia's timber industry has grown, and wood products are among the major export items, along with petroleum and natural gas. Rapid exploitation has markedly reduced the country's vast rain forests and has prompted the Indonesian government to curtail clear cutting of trees and to implement reforestation programs.

Industry and mining, accounting for approximately one-fourth of the GDP and employing about one-tenth of the work force, is dominated by petroleum production. Petroleum is mainly produced in Sumatra and Kalimantan. Ownership of all petroleum resources remains with the Indonesian government, and foreign oil companies act as development contractors, supplying the necessary skilled labour and capital. Refinery production is in the hands of Pertamina, the state oil company. Natural gas, particularly in liquefied form, is an increasingly important export item, and production facilities are expanding. Other minerals produced include nickel, bauxite, copper, iron ore, and tin.

Aside from petroleum production, industrial development has taken place very slowly. Pertamina has initiated a number of major manufacturing projects, and the government is encouraging foreign investment. Chief manufactures include chemicals, electronic components, cement, rubber tires, and textiles. A well-developed commercial sector, dominated by the Chinese community, has been formed.

State banks utilize high interest rates and a tight credit policy to control inflation. Tax revenues from petroleum and natural gas exports have not kept pace with demands on government funds for development and wages and salaries. Budget shortfalls are made up by foreign borrowing. A strong effort has been made in recent years to deregulate the economy and to encourage private enterprise.

In general, Indonesia exports raw materials in return for manufactured goods. Oil, timber products, and rubber are the country's major exports. Imports largely consist of capital equipment, consumer goods, and foodstuffs. Indonesia's most important trading partners are Japan, the United States, and Singapore.

Government and social conditions. Indonesia is a republic based on a 1945 constitution. Executive power is vested in the president, who is elected every five years by the People's Consultative Assembly (Majelis Permusyawaratan Rakyat; MPR), the highest authority in the state. This body meets at least once in every five years and formulates the overall principles of the government. The House of People's Representatives (Dewan Perwakilan Rakyat; DPR), with about one-fifth of its members appointed by the respective groups as representatives of political parties and functional groups and the rest directly elected, exercises the legislative authority. The Joint Secretariat of Functional Groups (Sekretariat Bersama Golongan Karya, also called Sekber Golkar, or Golkar), a government-sponsored organization of nonaffiliated functional groups (such as nonparty associations of peasants, students, the armed forces, and veterans), dominates national politics. The Supreme Court of Indonesia is the final court of appeal.

Indonesia suffers from a shortage of medical personnel. The country also faces a chronic problem of malnutrition, especially among children. The educational system provides six years of primary education, followed by three years of junior and three years of senior secondary. About three-fourths of the population is literate. Higher education is conducted in numerous public and private universities, institutes, and teacher-training colleges.

There are about 100 daily newspapers and several weeklies. Radio and television are mainly controlled by the government, but there is some independent radio broadcasting locally. Indonesia's communications satellites handle radio, telephone, and television signals and effectively link all communications systems in the nation.

Cultural life. Centuries of cultural assimilation has produced a rich diversity of cultural forms. From the 8th through the 10th century AD, extensive Hindu temple complexes,

as well as the great Mahāyāna Buddhist monument, Borobudur, were built in central Java. Music, dance, and drama are combined in a notable puppet show (wayang) on Java and Bali. Decorative arts include metalwork and carving in stone, wood, bone, and ivory; batik is a traditional fabric-dying technique in which pigment-resistant wax is used to create complex designs. The country's literary tradition includes both oral and written literature.

History. During the Neolithic period until about 1000 BC Proto-Malay peoples who spoke Austronesian languages migrated to the islands of Indonesia from mainland Asia. These were the ancestors of much of Indonesia's present population. About the beginning of the Christian era, commercial relations with China began, and Hindu and Buddhist cultural influences from India began to take hold in the islands. Between the 9th and the 13th century the Malay kingdom of Śrivijaya flourished in the Malay Peninsula, western Java, and Sumatra. By the end of the 12th century, Śrivijaya was reduced to a small kingdom, and the Javanese Majapahit kingdom began to dominate Indonesia.

In the 13th century, Islām was brought to northern Sumatra by Indian Muslim traders, and this religion spread to the other islands in the ensuing two centuries, except for Bali, which retained its Hindu religion and culture. By the late 15th century the Majapahit era had come to an end. During the 16th century newly founded Muslim trading kingdoms contended among themselves and with inland aristocracies for supremacy in the islands. When the Portuguese arrived in the Moluccas (Spice Islands) in 1511, followed by Spaniards, Dutch, and British, they easily seized control by setting local rulers against each other. The Dutch East India Company, intent on trade, eventually acquired colonial control over Java, Sumatra, and the Moluccas. The company's headquarters were established in Batavia (now Jakarta).

By the end of the 17th century the Dutch had established economic and political control over almost all of the islands. The Dutch controlled Indonesia with only a brief interruption (1811–16) until the mid-20th century. In 1927 the Indonesia Nationalist Party was formed under the chairmanship of Sukarno. In their pursuit of national independence from The Netherlands, Sukarno and other leaders were arrested in 1929. In 1942 the Japanese invaded Indonesia with limited opposition since they were regarded as liberators from Dutch colonialism.

After the Japanese surrender to the Allies in 1945, Sukarno declared the independence of Indonesia. During the next four years the Dutch tried to regain control, but in 1949 they granted Indonesia independence with nominal union to The Netherlands. The United States of Indonesia were formed, and Sukarno became president. The future of Irian Barat (West New Guinea; now called Irian Jaya) was left unresolved in the 1949 agreement and proved detrimental to Dutch-Indonesian relations. In view of continuing Dutch control of Irian Barat, Indonesia dissolved the union with The Netherlands in 1954. In 1962 the Dutch transferred Irian Barat transitionally to the United Nations, and in 1969 it was annexed to Indonesia. In 1965 a coup d'état put General Suharto in power, and he became president in 1968. The Suharto government incorporated the formerly Portuguese East Timor into Indonesia in 1975–76. Suharto was named to a fifth five-year term in 1988.

Indonesia Botanical Gardens, Indonesian KEBUN RAYA INDONESIA, tropical garden in Bogor, western Java, Indonesia. The 87-hectare (215-acre) garden was first used by the Dutch for introducing tropical plants from other parts of the world into the region. In 1817 it was officially converted into a botanical garden and served as a training ground for specialists in tropical botany. A large area of the original rain forest on which the garden was founded has been preserved in its natural state, providing excellent specimens for scientific study. The garden also has outstanding collections of palms, bamboos, cacti, orchids, and ornamental trees. The Kebun Raya administers three other gardens: the Purwodadi Botanical Garden in southeastern Java, the Cibodas Mountain Garden in western Java, and the "Eka Karya" Botanical Garden on the island of Bali.

Indonesian language, Indonesian BAHASA INDONESIA, the official language of Indonesia. It is the primary language of about 40,000,000 Indonesians and is used as a second language by much of the rest of the country's population. It is based on Malay, or Bahasa Melayu, which was at one time the dominant trade language and became the common denominator between Indonesians speaking different dialects and local languages. Bahasa Indonesia was declared the official language in 1945. Many of its speakers are multilingual and use it as a second, academic, or professional language, augmenting the local language. The language is written in the Latin alphabet.

Indonesian languages, also called WESTERN AUSTRONESIAN LANGUAGES, linguistic branch consisting of most of the Austronesian languages spoken west of New Guinea as well as the Chamorrow and Palauan groups of Micronesia. Indonesian languages are contrasted to the eastern Austronesian branch, usually called Oceanic. The languages are located primarily in Malaysia, West Indonesia, the Philippines, Madagascar, the northern Celebes, and in Vietnam and Kampuchea (the Chamic group). The most widely used Indonesian language, Javanese, has more than 80,000,000 speakers.

Indonesian literatures, the poetry and prose writings in Javanese, Malay, Sundanese, and other languages of the peoples of Indonesia. They include works orally transmitted and then preserved in written form by the Indonesian peoples, oral literature recorded by Western anthropologists and ethnologists, and the modern literatures that began to emerge in the early 20th century as the result of Western influence.

Many of the Indonesian songs, or poems, that were orally transmitted by professional priest-singers embody traditions that have a religious function. Improvisation played a great part in this kind of poetry, and there is reason to believe that in its present form much of it is of no great age. Indonesian orally transmitted prose forms are highly varied and include myths, animal stories and "beast fables," fairy tales, legends, puzzles and riddles, and anecdotes and adventure stories. The divine heroes and epic animals of these tales show the influence of Indian literature and the written literatures of other neighbouring cultures.

Written literature in Indonesia has been preserved in the various languages of Sumatra (Achinese, Batak, Redjang, Lampong, and Malay), in the languages of Java (Sundanese and Madurese as well as Javanese), in Bali and Lombok, and in the more important languages of South Celebes (Makasarese and Buginese). By far the most important in both quantity and quality are the literatures in Javanese and Malay.

The earliest extant examples of Javanese literature date from the 9th or 10th century AD. An important position in this early literature is occupied by Javanese prose and poetic versions of the two great Hindu epics, the *Mahābhārata* and the *Rāmāyaṇa.* The Javanese also borrowed from India's sophisticated court poetry in Sanskrit, in the process making it Javanese in expression, form, and feeling.

When Islām reached Java in the 15th century, the mystical tendencies in it were incorporated by the Javanese into their own markedly mystical religious literature. Muslim influence was especially fertile during the early 17th century in Aceh, where Malay for the first time became an important written literary language. In Java, Muslim legends of saints were combined with Hindu-derived mythologies and cosmologies to produce strangely imaginative works of historical narrative in which magico-mystical elements play a prominent role.

The Javanese and Malayan literatures declined under the impact of Dutch colonial domination in the 18th and 19th centuries. Only in the 20th century did a modern Indonesian literature arise, closely linked as it was to the nationalist movement and to the new ideal of a national language, Bahasa Indonesia. After 1920 a modern Indonesian literature rapidly came into existence. Muhammad Yamin and other prominent poets at this time were influenced by the forms and expressive modes of Romantic, Parnassian, and Symbolist verse from Europe. The first Indonesian novels also appeared in the 1920s and '30s; these were typical regional works by Abdul Muis and others in which the central theme is the struggle between the generations, between the stifling burden of traditionalism and the impulse for modern progress.

In 1933, with the appearance of the review *Pudjangga Baru* ("The New Writer"), a new generation of intellectuals began to assess whether to maintain traditional values or to consciously accept Western norms in the effort to establish a modern but genuinely Indonesian culture. This discussion was interrupted by the Japanese occupation of Indonesia in 1942, which eventually broke up a generation that was still closely bound to Indonesia's colonial situation.

With the Indonesian nationalist revolution of 1945, a new generation of fervently nationalistic and idealistic young writers came to the forefront who professed a universal humanism. Their inspiration and leader was the great poet Chairil Anwar, who died in 1949 at the age of 27.

Under the rule of Sukarno during the 1950s and early '60s, free literary expression was curtailed. The political coup of 1965 removed many of the limitations on the country's writers, and by the late 1960s more attention was being given to rediscovering the traditional roots of Indonesian literature and culture.

Indonesian Union (student organization): *see* Perhimpunan Indonesia.

Indore, also spelled INDUR, city, western Madhya Pradesh state, central India. The city is a major trunk road and rail junction and is located on the Saraswatī and Khān streams, which are tributaries of the Siprā River.

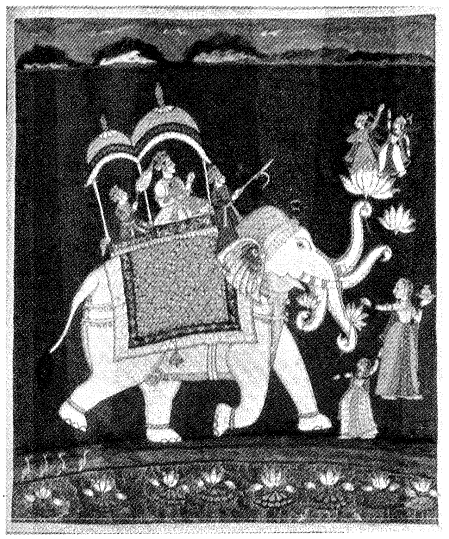
Indore was founded in 1715 as a trade mart on the Narmada Valley route by local landowners, who erected Indreshwar temple (1741), from which the name Indore is derived. It became the capital of the former Indore princely state of the Marāṭhā Holkars, and it was the headquarters of the British Central India Agency and the summer capital of Madhya Bhārat (1948–56).

The largest city in the state, Indore is the chief collecting and distributing centre for western Madhya Pradesh as well as a commercial and industrial centre. Major industries include grain milling; the manufacture of tile, cement, hosiery, blankets, chemicals, tents, furniture, and sporting goods; a brass and iron foundry; auto and cycle workshops; and engineering works.

Indore is the seat of the University of Indore (established 1964), with numerous constituent and affiliated colleges in the city. Pop. (1981) 829,937.

Indra, chief of the Vedic gods of India. A warlike, typically Aryan god, he conquered innumerable human and demon enemies, vanquished the sun, and killed the dragon Vṛtra, who had prevented the monsoon from breaking.

His weapons are lightning and the thunderbolt, and he is strengthened for these feats by drinks of the elixir soma, the offering of the sacrifice. Among his allies are the Rudras (or Maruts), who ride the clouds and direct storms; the Aśvins, twin horsemen; and Vishnu, who later evolved into one of the three principal gods of Hinduism. In later Hinduism, Indra plays little part except in his role as god of rain, regent of the heavens, and guardian of the east. The *Purāṇa*s (Ancient Lore) record some rivalry between Indra and Krishna, who persuaded the cowherders of Vraja (Braja, in modern Uttar Pradesh) to stop their worship of Indra. Enraged, he sent down torrents of rain, but Krishna lifted Mt. Govardhana on his fingertip and gave the people shelter under it for seven days until Indra relented and paid him homage. Indra is father to Arjuna, hero of the *Mahābhārata* war. Indra is sometimes referred to as "the thousand-eyed," because of the thousand marks on his body resembling eyes (actually yonis, or symbols of the female sexual organ), a result of a curse by a sage whose wife Indra seduced. In painting and sculpture he is often depicted riding on his white elephant Airāvata.



Indra on his elephant, Rajasthani painting, 18th century AD; in a private collection
Pramod Chandra

Indra also plays a part in the Jaina and Buddhist mythology of India. As chief of the gods he received into his hands the hair of the Jaina prophet Mahāvīra when he cut it off to signify his renunciation of the world.

Indraditya, also called INDRAPATINDRADITYA (Thai king of Sukhothai): *see* Sri Indraditya.

Indravarman I (fl. 9th century, Cambodia), ruler of the Khmer kingdom of Angkor (Cambodia) from 877 to 889.

Indravarman may have usurped the throne from his cousin Jayavarman III. During his reign a large artificial lake was constructed around the city of Angkor. The lake was the first part of a vast system of reservoirs, canals, and irrigation channels eventually built to control the river system of the region and to permit the cultivation of rice on lands that would otherwise have remained unproductive.

Indre, *département,* Centre region, central France, created from the western part of the historic province of Berry (*q.v.*) and from small areas of Orléanais, Marche, and Touraine (*qq.v.*). Its area of 2,617 sq mi (6,778 sq km) slopes northwestward from the Massif Central and is drained by the Indre River, a tributary of the Loire. The Indre flows from the southeast through Châteauroux (*q.v.*), Indre's capital, and past Buzançais to Châtillon in the northwest corner. The Creuse River, to the south, flows roughly parallel to it and is fed from the south by the Anglin. The western part of the *département,* known as Brenne, is covered with small lakes and marshland. The centre and north are wooded, while the northeast is agricultural land. The hilly, wooded south, known as Boischaut, embraces the Creuse Valley, which has a dam and hydroelectric plant north of Éguzon. The climate in the centre and north is mild, but in the south it is more severe. Most of the activity of Indre is agricultural. Industry (aircraft, textiles, metalworks, leather) is dispersed but is mainly in the Châteauroux area. The valley of the Creuse is much frequented by tourists, who also visit the north near the châteaus of the Loire. Valençay has a magnificent Renaissance château which belonged to the statesman Talleyrand. At Neuvy-Saint-Sépulchre is an 11th-century circular church, and other medieval churches are located in the west and centre. The château of the writer George Sand, which is now a museum, is situated in the village of Nohant. The *département* has four *arrondissements*—Châteauroux, Le Blanc, La Châtre, and Issoudun—and is in the educational division of Orléans. Pop. (1982) 243,191.

Indre-et-Loire, *département,* Centre region, west central France, occupying most of the historic province of Touraine (*q.v.*) and fragments of Orléanais and Anjou. Known as the "Garden of France," it has an area of 2,364 sq mi (6,124 sq km). It is crossed by the Loire River, which flows through Tours (*q.v.*), its capital, and is joined from the southeast by the Cher, Indre, and Vienne rivers (*qq.v.*). The contrast is striking between the fertile valleys and the sparsely wooded plateaus that separate them, especially in the Gâtine de Touraine between the Loire and the Loir.

The climate is temperate, with warm summers and mild winters. The valleys, displaying lush pastures, orchards, vineyards, and market gardens, abound with France's most famous châteaus, among them Amboise, Chenonceaux, Loches, Azay-le-Rideau, Langeais, and Chinon (*qq.v.*). Tours is the centre of tourism for the château country. The vines produce such well-known wines as Vouvray, Bourgueil, and Montlouis. Industry (chemical, pharmaceutical, electrical) has developed in the Tours region, and, indeed, overdeveloped to the point that planning for the Tours region is in terms of decentralization. A nuclear station is located in Avoine. The writers Honoré de Balzac, Alfred de Vigny, and Georges Courteline were all born in the *département,* which has three *arrondissements*—Tours, Chinon, and Loches—and is in the educational divisions of Orléans and Poitiers. Pop. (1982) 506,097.

Indre River, river, west central France, a left-bank tributary of the Loire River. Rising on the northern flanks of the Massif Central, it flows 165 mi (265 km) northwestward through the Indre and Indre-et-Loire *départements,* joining the Loire northwest of Chinon and draining a basin of about 5,200 sq mi (13,500 sq km). It flows exclusively through agricultural regions, crossing La Châtre, and passing near Nohant where George Sand, the French 19th-century novelist who described the countryside in her novels, lived and died. Circling round Châteauroux, the river then flows through the gentle countryside of Touraine, below the medieval castle of Loches. At Montbazon, south of Tours, the Indre veers westward past woods and lush meadows, encircling the 16th-century château of Azay-le-Rideau and passing the 15th-century château of Ussé before joining the Loire at the Avoine-Chinon nuclear power station.

indri (*Indri indri*), slender, long-limbed primate, family Indriidae, found in Madagascan forests. The largest of existing Madagascan lemurs, the indri is about 70 centimetres (28 inches) long; has a rudimentary tail; large hands and feet; and a round head with pointed face and round, furry ears. Colour is usually black with white on the head, throat, forearms, and buttocks. Diurnal and thoroughly arboreal, the indri clings and climbs in an upright position and feeds, presumably, on shoots, fruit, and other plant material.



Indri (*Indri indri*)
Painting by Don Meighan

The indri, now limited to remote parts of the northeastern forests of Madagascar, is listed in the *Red Data Book* as being in immediate danger of extinction. It is protected by law.

Indriidae, family of arboreal Madagascan primates; *see* avahi; indri; sifaka.

indriya (Sanskrit: "faculty"), according to Indian philosophy, the instruments of man's direct perception of the outside world. They are of two kinds, motoric and sensory. The motoric faculties are those of speaking, grasping, walking, ejaculating, and evacuating. The sensory faculties, or senses, are hearing, touching, seeing, tasting, and smelling. Both sets of faculties are correlated with the five elements, respectively: ether, wind, fire, water, and earth. Simultaneous separate impressions of the senses are coordinated in the "mind" (*manas*), often called the 11th faculty, which ensures that it is the same object that man may discretely sense.

inductance, property of a conductor (often in the shape of a coil) that is measured by the size of the electromotive force, or voltage, induced in it, compared with the rate of change of the electric current that produces the voltage. A steady current produces a stationary magnetic field; a steadily changing current, alternating current, or fluctuating direct current, produces a varying magnetic field, which, in turn, induces an electromotive force in a conductor that is present in the field. The size of the induced electromotive force is proportional to the rate of change of the electric current. The proportionality factor is called the inductance and is defined as the value of the electromotive force induced in a conductor divided by the magnitude of the rate of change of the current causing the induction.

If the electromotive force is induced in a conductor that is different from the one in which the current is changing, the phenomenon is called mutual induction, exemplified in a transformer. A changing magnetic field caused by a varying current in a conductor, however, also induces an electromotive force in the very conductor that carries the changing current.

Such a phenomenon is called self-induction, and the quotient of the induced electromotive force and the rate of change of the current is specified as self-inductance.

A self-induced electromotive force opposes the change that brings it about. Consequently, when a current begins to flow through a coil of wire, it undergoes an opposition to its flow in addition to the resistance of the metal wire. On the other hand, when an electric circuit carrying a steady current and containing a coil is suddenly opened, the collapsing, and hence diminishing, magnetic field causes an induced electromotive force that tends to maintain the current and the magnetic field and may cause a spark between the contacts of the switch. The self-inductance of a coil, or simply its inductance, may thus be thought of as electromagnetic inertia, a property that opposes changes both in currents and in magnetic fields.

Inductance depends on the size and shape of a given conductor, the number of turns if it is a coil, and the kind of material near the conductor. A coil wound on a soft iron core far more effectively chokes the increase of a current than the same coil with an air core. The iron core increases the inductance; for the same rate of change of the current in the coil, a greater opposing electromotive force (back emf) is present to choke the current.

The unit of magnetic inductance is the henry, named in honour of the 19th-century American physicist Joseph Henry, who first recognized the phenomenon of self-induction. One henry is equivalent to one volt divided by one ampere per second. If a current changing at the rate of one ampere per second induces an electromotive force of one volt, the circuit has an inductance of one henry, a relatively large inductance.

induction, in embryology, process by which the presence of one tissue influences the development of others. Certain tissues, especially in very young embryos, apparently have the potential to direct the differentiation of adjacent cells. Absence of the inducing tissue results in lack of or improper development of the induced tissue. The converse is often true as well; *i.e.,* the addition of extra inducing tissue in an abnormal position in an embryo often results in aberrantly located induced tissue.

An example of induction is the development of the eye lens from epidermis under influence of the eye cup, which grows toward the skin from the brain. As the eye cup contacts any neighbouring epidermis, it transforms that particular region into a lens. The exact nature of the stimulus for lens induction is not known, although ribonucleic acid (RNA) has been implicated as a messenger.

The range of the inductive effect is not unlimited—only certain tissues are capable of being induced by a given structure and then only at certain times.

induction, in enzymology, a metabolic control mechanism with the effect of increasing the rate of synthesis of an enzyme. In induction, synthesis of a specific enzyme, called an inducible enzyme (*e.g.,* β-galactosidase in *Escherichia coli*), occurs when cells are exposed to the substance (substrate) upon which the enzyme acts to form a product.

Formation of β-galactosidase has been shown to be controlled by a so-called regulator gene presumed to specify a protein, called a repressor protein, that binds to the region of deoxyribonucleic acid (DNA) responsible for directing the synthesis of the enzyme. If substrate is present, it acts as an inducer by combining with the repressor so as to prevent its binding to DNA. As a result, the enzyme is synthesized; *i.e.,* its formation by the microorganism is induced.

Such mechanisms are important in the cell because they prevent the synthesis of enzymes a cell cannot use; *e.g.,* β-galactosidase is needed only when its substrate (lactose or galactose) is present.

induction, in logic, method of reasoning from a part to a whole, from particulars to generals, or from the individual to the universal; as it applies to logic in systems of the 20th century, the term is obsolete. Traditionally, logicians distinguished between deductive logic (inference in which the conclusion follows necessarily from the premise, or drawing new propositions out of premises in which they lie latent) and inductive logic, but the problems earlier subsumed under induction are considered to be concerns of the methodology of the natural sciences, and logic is generally taken to mean deductive logic.

induction, electromagnetic, in physics, the induction of an electromotive force in a circuit by varying the magnetic flux linked with the circuit. *See* Faraday's law of induction.

induction, electrostatic: *see* electrostatic induction.

induction heating, method of raising the temperature of an electrically conductive material by subjecting it to an alternating electromagnetic field. The electric currents induced in the object (although it is electrically isolated from the source of the field) bring about dissipation of power in the form of heat. Induction-heating methods are applied most widely in metalworking to heat metals for soldering, tempering, and annealing. The method is also employed in induction furnaces for melting and processing metals.

The principle of the induction-heating process resembles that of the transformer. A water-cooled coil, or inductor, acting as the primary winding of a transformer, surrounds the material to be heated (the workpiece), which acts as the secondary winding. Alternating current flowing in the primary coil induces eddy currents in the workpiece, causing it to become heated. The depth to which the eddy currents penetrate, and therefore the distribution of heat within the object, depends on the frequency of the primary alternating current and the magnetic permeability, as well as the resistivity, of the material. Induction hardening, a technique widely used to increase the resistance of steel objects to wear, can be effected by brief exposure to a high-frequency field.

The related method of producing heat in nonconductors is called dielectric heating.

indulgence, in Roman Catholicism, a remission before God of the temporal punishment due for sins forgiven in the sacrament of penance.

The origin of indulgences is a matter of debate among Roman Catholic theologians. It can be said, however, that the theology of indulgences is based upon the concept that sin is always evil and that, even though the crime and the eternal punishment are forgiven in the sacrament of penance through the satisfaction of Christ, God's charity and justice demand that the sinner pay for his crime. The fault and the eternal guilt, once forgiven sacramentally, are wiped away; yet some punishment remains to be satisfied in this life or in purgatory. This temporal punishment is at least partially removed by the performance of the canonical penance imposed at the time of confession. In the ancient penitential discipline of the church, this was often severe, lasting for years or even for life.

The growth of the ideas of the communion of saints and of the spiritual treasury of the church (consisting of the infinite merits of Christ and the finite merits of Mary and the martyrs) led the church to grant to the spiritually needy some of these merits. At first a particular good work (prayers, almsgiving, or fasting) could be performed to shorten the length of the canonical public penance imposed, and the prayers of all the members were asked to assist the errant individual making reparation for his faults. In the modern concept the same understanding of the solidarity of the church is accepted, and the supplication of the entire church is applied to an individual through his performance of certain specified good actions.

In the past, abuses of indulgences led to corrections. In the 14th century the use of *quaestores* ("commissioners," or "promoters") to popularize indulgenced works, particularly almsgiving for the erection of cathedrals and universities, led to many abuses both in the handling of funds and in pulpit extravagances. These were decried by the Reformers, both Protestant and Roman Catholic, and at the Council of Trent (1562) the abusive practices were ended. Five years later Pius V revoked all indulgences for which money payments or alms were prescribed.

Indulgences may be either plenary (remission of all temporal punishment due to sin), first granted by Pope Urban II for participation in the First Crusade in 1095, or partial, normally given in terms of years, months, days, or quarantines (Lenten periods). Such numbers refer not to a time of punishment but to a time of penance so that an indulgence of seven years corresponds to seven years lived under the penitential discipline of the early church.

In order to gain an indulgence it is necessary that the person be in the state of grace (*i.e.,* that he have no unabsolved mortal sin upon his conscience), that he have the intention of gaining the indulgence, and that he personally fulfill the prescribed good work. Indulgences may be applied to the souls of the dead. In such cases, however, the church cannot grant directly; indulgences can be offered for the dead only *per modum suffragii* (*i.e.,* in supplication), not *per modum absolutionis* (*i.e.,* as a grant).

Indur (Andhra Pradesh, India): *see* Nizāmābād.

Indur (Madhya Pradesh, India): *see* Indore.

induration, hardening of rocks by heat or baking; also the hardening of sediments through cementation or compaction, or both, without the introduction of heat. The classic example is the rock called hornfels, which is formed at contacts with igneous intrusions and in which heat and fluids from the intruding magma reconstitute the original wall rock into a hardened, flinty rock with a dense texture; it also is commonly formed by induration of carbonate sedimentary rocks and shales.

Indus River, great trans-Himalayan river of South Asia and one of the longest rivers in the world, having a length of 1,800 miles (2,900 km).

A brief treatment of the Indus River follows. For full treatment, *see* MACROPAEDIA: Asia.

The Indus rises in southwestern Tibet at an elevation of 16,000 feet (4,900 m) and flows in a northwesterly direction along the slopes of the Himalayas, crossing into Jammu and Kashmir from the southeast. The Zāskār, Shyok, Shigar, Hunza, Gilgit, Astor, and other streams carry snow and glacial melt waters to the Indus from the main Himalayan range, the Karakoram Range, the Nānga Parbat Massif, and the Kohistān Ranges. The river crosses the western Kashmir border and then turns south and southwest to enter Pakistan. In Pakistan it emerges from the mountain highlands and flows as a rapid stream between the Swāt and Hazāra regions, and across the Salt Range to the enter semiarid Punjab Plains. The Indus receives its most notable tributaries from the Punjab ("land of five rivers") to the east, including the Jhelum, Chenāb, Rāvi, Beās, and Sutlej rivers. After receiving the waters of the Punjab rivers the Indus becomes much wider

and flows at a slow speed, depositing large quantities of silt along its course. Embankments have been built to prevent flooding, but occasionally these give way and large areas are damaged by overflow. Near Tatta the Indus begins its deltaic stage and breaks into distributaries that reach the Arabian Sea at various points southeast of Karāchi.

The Indus drains an area of 450,000 sq mi (1,165,500 sq km), and its annual flow is twice that of the Nile. Because the principal rivers of the Indus drainage network are snow fed, their flow varies greatly at different times of the year. While the discharge is at a minimum during the winter months, there is a rise of water in spring and summer, and floods occur in the rainy monsoon season from July to October. Their flow is most rapid where they emerge from the foothills, because little surface water is added in the plains and much water is lost by evaporation and seepage.

The Indus is moderately rich in fish. The best known and most important edible variety is called the *palla*. Tatta, Kotri, and Sukkur, all in the Pakistani province of Sind, are the leading fishing centres. Irrigation from the Indus waters has provided the basis for successful agriculture on the semi-arid plains of Pakistan since early times. One of the great modern canal irrigation systems in the world was created by the British administration after 1850. Experience has proved, however, that unless it is carefully controlled, canal irrigation can cause much damage to cultivated land due to waterlogging and salinity. Until about 1880 the Indus network carried some navigation, but the advent of the railways and expansion of irrigation works eliminated all but small craft on the Lower Indus.

Indus Valley Civilization, also called INDUS CIVILIZATION, OR HARAPPĀN CIVILIZATION, the earliest known urban culture of the Indian subcontinent, first identified in 1921 at Harappā in the Sāhiwāl district of the Punjab and then in 1922 at Mohenjo-daro, near the Indus River in the Lārkāna district of Sind, now both in Pakistan. Subsequently, vestiges of the civilization were found as far apart as Sutkāgen Dor, near the shore of the Arabian Sea 300 miles (480 kilometres) west of Karāchi, and Rūpar at the foot of the Simla Hills, 1,000 mi to the northeast. Later exploration established its existence southward down the west coast as far as the Gulf of Cambay, 500 mi southeast of Karāchi and as far east as the Yamuna Basin, 30 mi north of Delhi. It is thus decidedly the most extensive of the three earliest civilizations, the other two being those of Mesopotamia and Egypt, both of which began somewhat before it.

The civilization is known to have comprised two large cities, Harappā and Mohenjo-daro, and more than 100 towns and villages, often of relatively small size. The two cities were each more than 3 mi in circuit, and their outstanding magnitude suggests political centralization, either in two large states or in a single great empire with alternative capitals, a practice for which there are analogies in Indian history. Or again it may be that Harappā succeeded Mohenjo-daro, which is known to have been devastated more than once by exceptional floods. The southern region of the civilization in Kāthiāwār and beyond appears to be of later origin than the major Indus sites. The civilization was literate, and its script, with some 250 to 500 characters, has been partly and tentatively deciphered; the language has been tentatively identified as Dravidian. The nuclear dates of the civilization appear to be about 2500–1700 BC, though southern sites may have lasted later in the 2nd millennium BC.

The Indus civilization apparently evolved from the villages of neighbours or predecessors, using the Mesopotamian model of irrigated agriculture with sufficient skill to reap the advantages of the spacious and fertile Indus River Valley while controlling the formidable annual flood that simultaneously fertilizes and destroys. Having once obtained a secure foothold on the plain and mastered its more immediate problems, the new civilization, doubtless with a well-nourished and increasing population, would find expansion along the flanks of the great waterways an inevitable sequel. The civilization subsisted primarily by farming supplemented by an appreciable but often elusive commerce. Wheat and six-rowed barley were grown; field peas, mustard, sesame, and a few date stones have also been found, as well as some of the earliest traces of cotton known. Domesticated animals included dogs and cats, humped cattle, shorthorns, domestic fowl, and possibly pigs, camels, and buffaloes. The elephant was probably also domesticated, and its ivory was freely used. Minerals, unavailable from the alluvial plain, were brought in sometimes from far afield. Gold was imported from southern India or Afghanistan, silver and copper from Afghanistan or northwestern India (now Rājasthān), lapis luzuli from Afghanistan, turquoise from Iran (Persia), and a jadelike fuchsite from southern India.

Perhaps the best known artifacts of the Indus civilization are a number of seals, generally made of steatite, which are distinctive in kind and unique in quality. The usual seal was square, with sides from ¾ to 1¼ in. (19 to 32 mm) and with a perforated boss at the back for handling and suspension. Carved on the seals with a small chisel and a drill are intaglio designs of great beauty. They include a wide variety of animals, both real—such as elephants, tigers, rhinoceros, and antelopes—and fantastic, often composite, creatures. Sometimes human forms are included. A few examples from Mohenjo-daro are of special interest in that they appear to be prototypical depictions of the great god Śiva of the later Hindu religion. Most of the seals also bear a short inscription in the Indus script previously described.

About a dozen examples of Indus stone sculpture were found. All are small, and, save for two exceptions, they represent humans or gods. Only a few works in bronze have survived, notably a lifelike figurine of a buffalo and a well-known statuette of a dancing girl. There are great numbers of small terra-cotta figures, including countless oxen and buffaloes, that were generally used as trade goods. Other terra-cottas depict humans, generally unclothed women wearing jewelry and, occasionally, headdresses. Certain of these figures may have been votive.

Significant contrasts between the Indus and the Mesopotamian cultures extend to the tool types of the two regions. Throughout the Indus civilization the common domestic implement was a parallel-sided chert blade struck from a prepared core. Stone maceheads also were found, as were maceheads of copper and bronze. Other copper–bronze implements include spears, knives, short swords, arrowheads, axes; and fishhooks. Implements such as bowls, cups, and dishes were sometimes made of copper.

Unlike the tools, however, beads found in Mohenjo-daro give evidence of a clear link to Mesopotamia, Crete, and Egypt. Round gold beads, segmented faience beads, and etched carnelian beads have been found at both western and Indus Valley sites.

Indus pottery, usually wheel-turned and of pinkish ware with a bright red slip, is decorated mostly in black, either with simple horizontal lines or with more pictorial motifs. Forms include a large jar with S-profile and ledged rim, the so-called dish-on-stand, or fruit-dish (a widespread Asian type), small vessels bearing a knobbed decoration, large slender-footed bowls, cylindrical perforated strainers, and cream-coloured goblets. Indus pottery, inlays, and occasionally seals occur in southern Mesopotamia, but much of the traffic was presumably in objects such as cotton and certain kinds of wood.

How and when the civilization came to an end remains uncertain. In fact, no uniform ending need be postulated for a culture so widely distributed. But the end of Mohenjo-daro is known and was dramatic and sudden. It was attacked toward the middle of the 2nd millennium BC by raiders who swept over the city and then passed on, leaving the dead lying where they fell. Who the attackers were is matter for conjecture. The episode would appear to be consistent in time and place with the earlier Aryan onslaught upon the Indus region as reflected in the older books of the Rigveda, in which the newcomers are represented as attacking the "walled cities" or "citadels" of the aborigines and the Aryan war-god Indra as rending "forts as age consumes a garment." However, one thing is clear: the city was already in an advanced stage of economic and social decline before it received the coup de grace. Deep floods had more than once submerged large tracts of it. Houses had become increasingly shoddy in construction and showed signs of overcrowding. The final blow seems to have been sudden, but the city was already dying. As the evidence stands, the civilization was succeeded in the Indus Valley by poverty-stricken cultures, deriving a little from a sub-Indus heritage but also drawing elements from the direction of Iran and the Caucasus—from the general direction, in fact, of the Aryan invasions. For many centuries urban civilization was dead in the northwest of the Indian subcontinent.

In the south, however, in Kāthiāwār and beyond, the situation appears to have been very different. Here it would seem that there was a real cultural continuity between the late Indus phase and the Chalcolithic cultures that characterized central and western India between 1700 BC and the first millennium. These cultures form a material bridge between the end of the Indus Valley Civilization proper and the developed Iron Age Civilization that arose in India in about 1000 BC.

Industrial Bank of Japan Ltd., Japanese NIPPON KOGYO GINKO, major Japanese commercial bank operating a general banking and foreign exchange business with branches in Japan and overseas. Headquarters are in Tokyo.

Established in 1902, the bank specializes in medium- and long-term financing of industrial development. Both its main office and its foreign branches are active in the foreign exchange markets. Its subsidiaries provide commercial banking, international banking, trust services, and non-bank financing around the world.

industrial design, design of products made by large-scale industry for mass distribution. Designing such products means, first, planning their structure, operation, and appearance, then planning these to fit efficient production, distribution, and selling procedures. Clearly, appearance is but one factor in such a complex process. Nevertheless, in consumer goods especially, appearance design is widely accepted as the principal virtue of industrial design; it is that portion of the whole least subject to rational analysis and, like craft secrets of the past, most advantageous in commercial competition. On the other hand, design of equipment for production, for services, and for sports is expected to demonstrate utility; but in these products, too, appearance design is increasingly important.

Industrial design is supplied to manufacturers by three kinds of designers: staff designers, fully employed by one firm; designers under

contract, who may serve several clients simultaneously, generally avoiding conflicts of interest; and free-lancers, who sell designs, often with royalty agreements, to the best-paying manufacturer.

The first industrial designer recognized as such worked under admirable conditions: Peter Behrens (1868–1940) in 1907 was hired by the Allgemeine Elektrizitäts-Gesellschaft in Germany to be their architect, industrial designer, and graphic designer—in fact, to give unified visible character to the numerous activities of a giant enterprise. Behrens had other clients and professional duties besides. A member of the architectural profession, Behrens applied its standards and ethics to his work as industrial designer, founding in 1907, with others, an important association of designers and businessmen, the Deutscher Werkbund. As a direct result, a number of these German and Swiss associations became well-established professional organizations of industrial designers. In the United States and Great Britain industrial designers initiated legally recognized professional associations, with codes of conduct, educational standards, etc. In London the Royal Society of Arts designates qualifying practitioners as Royal Designers for Industry; in the United States both the American Society of Industrial Designers and the Industrial Designers' Institute grant memberships only to those subscribing to codes and limitations of practice. In Britain the Council of Industrial Design was established in 1944 to advise on design, recommend designers, and provide courses in design appreciation for trade and exhibitions for the public. The International Council of Societies of Industrial Design was founded in London in 1957, and within 25 years it had members in more than 40 countries.

Industrial design has evolved no unified style, even for industries in which handwork is minimized. There have been, however, four significant style trends. The first of these is an emphasis on impersonality that Behrens was the first to establish. Design for industry, whether determined by an individual or by a group, shows a certain neutrality of expression. Impersonality has, on the one hand, been acclaimed as a natural aspect of mass production and marketing, of average taste in a democratic community; on the other hand, it has been criticized as submission to the machine, contradictory to free, individual expression. The style has, so far, persisted. A second trend in industrial design is packaging, such that the designer provides a protective case for a product, leaving the inner workings to engineers. Complicated mechanical and electronic assemblies that have come into common use require protective shells for safety, cleanliness, and orderly appearance. In this instance, industrial designers are sometimes accused of superficial embellishment of a sort suitable to package design and fashion. The third trend is streamlining, a design principle pioneered by Raymond Loewy and others in the 1930s and still widely employed, although the term itself has fallen out of fashion. As the name suggests, streamlining is characterized by contours designed to minimize resistance to motion through a fluid (as air). Originally associated with trains, automobiles, and other vehicles, the bullet shapes and sleek lines of streamlining were seized by industrial designers and applied to objects intrinsically unassociated with speed. The fourth trend is artificially accelerated obsolescence, that is, design changes that intentionally tempt owners to replace goods with new purchases more frequently than would be necessary as a result of normal wear and tear or established custom. Beginning in the field of fashion, artificial obsolescence has become something of a custom itself in industrialized countries. It operates through public opinion molded by advertising, through price changes, and through improvement and change in utility as well as through appearance change provided by designers. Its assessment must be established on wide social and economic considerations, not on design values alone. Especially in the design of automobiles and large home appliances, artificial obsolescence has aroused strong criticism; yet, because of its demonstrable economic effectiveness, it is used increasingly. It is an essential aspect of fashion and has met with wide approval in the form of disposability in health and hygiene products.

Industrial design is a growing force, influencing and influenced by world economy, private efficacy and enjoyment, the arts, engineering, and, not least, education. It has contributed more to economic activity than to aesthetic achievement, and many see the latter as its greatest challenge. The Museum of Modern Art, New York City, among other institutions, has sought to recognize outstanding contributions to industrial design.

industrial diamond, any diamond that is too badly flawed, irregularly shaped, poorly coloured, or small to be of value as a gem. Industrial uses of diamond are so important that a deficiency of industrial diamonds would cause a breakdown in the modern metalworking industry and seriously undermine mass production. Three natural varieties exist: ballas, bort, and carbonado.

Ballas, or shot bort, is composed of concentrically arranged, spherical masses of minute diamond crystals. Ballas is extremely hard, tough, and difficult to cleave. Principal sources are Brazil and South Africa. Brazilian ballas is said to be the harder of the two.

Bort is a gray to black massive diamond, the colour of which is caused by inclusions and impurities. The name is also applied to badly coloured, flawed, or irregularly shaped diamond crystals that are unsuited for gem purposes. Drilling bort is composed of small, round stones averaging 20 to the carat and is used in diamond drill bits. Crushing bort, the lowest grade of diamond, is crushed in steel mortars and graded into abrasive grits of various sizes; 75 percent of the world's crushing bort comes from Zaire. Its chief use is in the manufacture of grinding wheels for sharpening sintered carbide metal-cutting tools, but it also is used as loose grains suspended in oil or water for lapping and polishing.

Carbonado, known in the trade as carbon, is black, opaque diamond. It is as hard as crystallized diamond but less brittle; and because its structure is slightly porous, it has a lower specific gravity (3.51 to 3.29). Carbonado has no cleavage and therefore is valuable for use in diamond-set tools. It usually occurs in small masses in the diamond-bearing gravels of Bahia, Braz., and in Borneo. Rock-coring drills, widely used in exploring for new mineral deposits, are made by mounting diamonds around the rim of a hollow metal drill crown. Other important applications include saws for cutting rock and other hard materials, lathe and other types of cutting tools, glass cutters, phonograph needles, hardness testers, and wire-drawing dies.

Industrial diamonds also are produced synthetically (*see* synthetic diamond).

industrial engineering, application of engineering principles and techniques of scientific management to the maintenance of a high level of productivity at optimum cost in industrial enterprises.

A brief treatment of industrial engineering follows. For full treatment, *see* MACROPAEDIA: Industrial Engineering and Production Management; Engineering; Work and Employment.

In the 1880s Frederick W. Taylor, considered the father of modern industrial engineering, pioneered in the scientific measurement of work. After numerous work studies he presented his company with a formula for obtaining maximum production, which was later applied to many manufacturing concerns. At about the same time, Frank and Lillian Gilbreth were refining their time-and-motion studies. As a result of these studies (in which the procedures of production were minutely analyzed), unnecessary motions or steps were eliminated, and essential steps were simplified to require as little time as possible. Thus the production process was simplified, enabling workers to increase production.

The industrial, or management, engineer draws upon the fields of systems engineering, management science, operations research, and human-factors engineering. Among his responsibilities are the selection of tools and materials for production that are most efficient and least costly to the company. The industrial engineer may also determine the sequence of production and the design of plant facilities or factories.

Many of the decisions of an industrial engineer draw upon management expertise. For example, it is this engineer who conducts time-and-motion studies, who determines wage scales based on an assessment of job skills, and who institutes the quality-control procedures necessary for production of a competitive product.

Consult the INDEX *first*

industrial espionage, acquisition of trade secrets from business competitors. A by-product of the technological revolution, industrial espionage is a reaction to the efforts of many businessmen to keep secret their designs, formulas, manufacturing processes, research, and future plans in order to protect or expand their shares of the market.

A considerable amount of data on what the competition is doing comes from routine and undramatic sources. Some large retail chains, for example, employ corps of agents to check on prices and products of competitors by comparative shopping. Equally fruitful are regular lines of communication, such as salesmen's reports, trade magazines, newsletters, business conventions, trade fairs and exhibits, and contacts with suppliers. Analysis of competitor products is yet another source of important commercial intelligence.

Actual trade secrets may find their way into the open market through several channels. The disloyal employee may furtively seek out competitors and peddle confidential data to the highest bidder. A more common technique is the group conspiracy: several employees, usually technicians and others of high managerial calibre, leave a company and set up a competitive firm capitalizing on confidences they gained while on the payroll of their former employer. A variation of this occurs when a competitor lures away a valuable employee with offers of more money and benefits, in the hope that the pirated worker will make his store of secrets available to his new employer.

An employer who discovers that his trade secrets have been adopted by a competitor usually takes legal steps to prevent further invasions of his commercial privacy. The penalties against companies found guilty of usurping trade secrets may be an injunction against further use of the knowledge, an accounting and payment of all profits made from the utilization of pilfered information, or additional punitive damages if a violation of the company's rights has been flagrant.

industrial medicine, also called OCCUPATIONAL MEDICINE, the branch of medicine concerned with the maintenance of health and

the prevention and treatment of diseases and accidental injuries in working populations.

A brief treatment of industrial, or occupational, medicine follows. For full treatment, *see* MACROPAEDIA: Occupational Diseases and Disorders.

Historically, industrial medicine was limited to the treatment of injuries and diseases occurring to production workers while at work. Over the years this has changed, and everyone at a plant, factory, or office may now be eligible for medical services. College or school health programs might be considered as extensions of occupational medicine.

Diseases directly related to occupations were recognized by early Egyptian and Roman physicians. Modern industrial medicine may be said to have started with Bernadino Ramazzini, an Italian physician of the 17th century, who strongly advised that the physician inquire into the occupations of his patient if he wished to learn about the causation of the patient's complaint. With the Industrial Revolution the number of persons exposed to potential hazards at work increased rapidly. Traumatic injuries became frequent, and diseases due to inhaled dusts and noxious gases and vapours were recognized, often by nonmedical persons.

Initially, occupational medical programs were directed toward the treatment of injuries or diseases that resulted from or during work. It was soon apparent that prevention was more economical than treatment. Protective devices were developed and placed around moving parts of machinery. Control programs were developed by engineers to remove harmful dusts and vapours by proper ventilation of work areas or by substitution of less toxic materials. When the engineers could not control the environment the process was contained to prevent or at least minimize the exposure of workers. As a last resort protective devices such as masks and special clothing were worn by the workers.

With the development of preventive controls the amount of occupational disease decreased. The development of new processes and new materials, however, produced new hazards at an ever-increasing rate, and constant vigilance was necessary. For example, the recognition that a pulmonary disease can result from exposure to beryllium demonstrated the need for a continued awareness of potentially toxic materials. It also demonstrated that a material once believed nontoxic may actually be toxic; this shift may be caused by a change in the physical or chemical characteristics of the material, an alteration in the method by which the material is used, a change in the amount of exposure of individuals to the material, and possible synergism with other materials.

The concern with diseases due to occupation led to concern with the general health of the workers, not only because of an interest in their welfare but also because it was good business. A good industrial medical program improved labour–management relations and reduced absenteeism; labour turnover decreased and productivity increased. In many instances the savings produced by the reduction in premiums paid for workmen's compensation insurance paid for the occupational medical program. The types of programs varied greatly; some of the large industries had broad coverage, while small plants usually had no medical program. The comprehensive programs, in addition to providing treatment of diseases and injuries, might include preemployment examinations and periodic examinations during employment.

Throughout the world there is inadequate knowledge and reporting of industrial disease, and the data are suspect. Published figures for occupational illnesses, for instance, are smaller than for injuries because occurrence of job-related illness is less spectacular than, for example, an explosion of a mine causing a number of deaths. It may take a number of years of observation and research to discover that some particular dust, chemical, or type of physical energy is harmful.

In addition, physicians may have difficulty in deciding that an illness is attributable to the job. Many industrial diseases mimic sickness from other causes, and little is known of the ill effects and signs of continued small exposures to toxic chemicals. Another difficulty arises from the fact that although job-related disease may be suspected, doctors often lack tests to identify such disease as specific. As a result, against every diagnosed case of occupational disease there may be many incipient or unrecognized cases from the same causes. Introduction of materials of unknown toxicity, as well as changes in industrial operations, may create unrecognized problems in preventing harmful effects until after workers have been affected.

industrial melanism, the darkness—of the skin, feathers, or fur—acquired by a population of animals living in an industrial region where the environment is soot-darkened (*see* peppered moth). The melanization of a population increases the probability that its members will survive and reproduce; it takes place in the course of many generations as the result of natural selection of the lighter, more conspicuous, animals by predators.

Industrial Organizations, Congress of: *see* American Federation of Labor–Congress of Industrial Organizations.

industrial psychology, also called OCCUPATIONAL PSYCHOLOGY, application of the concepts and methods of experimental, clinical, and social psychology to industry. The primary concern of industrial psychology is with the basic relations in industry between worker and machine and the organization.

Industrial psychology was first developed in the United States in the early 1900s and has come to be applied, usually through personnel and office administrations, to industrial management in industries in other parts of the world, particularly in those countries where a concern has developed for the systematic and scientific examination of the problems of workers in industry.

industrial relations, also called ORGANIZATIONAL RELATIONS, the study of human behaviour in the workplace, with an emphasis on the influence such relations have on an organization's productivity.

A brief treatment of industrial relations follows. For full treatment, *see* MACROPAEDIA: Work and Employment.

Classical economists treated workers as an instrument of production, subject to the same economic laws of supply and demand as raw materials and finished goods. In the 1890s the U.S. industrial engineer Frederick Winslow Taylor devised a system of "scientific management" that carried this conception to its logical extreme. Taylor used time and motion studies to analyze jobs by breaking them down into their constituent tasks and timing each movement. From such studies, Taylor derived the most efficient approach to both individual tasks and the organization of a factory as a whole. This individualistic approach did not consider how workers might be encouraged to work together more efficiently.

In the late 1920s Elton Mayo studied productivity at Western Electric Company's Hawthorne Works in Cicero, Ill. Mayo hoped to discover optimum levels of plant illumination and proper timing of rest periods by experimenting with selected groups of workers. He discovered that it did not matter how the workers' environment was altered; merely being chosen for an experiment improved their productivity (the Hawthorne effect). Although this conclusion has been challenged, it nonetheless marked the beginning of the systematic study of industrial relations. Workers came to be seen as responding to psychosocial, as well as economic, stimuli.

The Industrial Revolution brought large numbers of workers together under anonymous, frequently unpleasant circumstances. As industrial firms grew larger, a hierarchy of managers and foremen became increasingly necessary to discipline and coordinate workers. A variety of management strategies evolved.

Management styles fall into two major schools, the laissez-faire and the paternal. The former is characterized by a devotion to the rigours of the free market; such managers feel no obligation to their employees outside the workplace, since the primary aim of a firm is the maximization of profit. The paternal style of management, however, assumes that the firm has obligations to its workers outside the workplace and to the larger community.

Cultural factors influence management styles as well. Many U.S. firms are characterized by managerial decentralization, reflecting the population's mobility and a cultural preference for individualistic self-reliance. In Latin America and Europe, decision making is more centralized, and hierarchy is comparatively rigid. Japanese managers emphasize cooperation and consultation; workers often think of their firm and fellow workers as a second family. Japan's economic success has forced U.S. managers to encourage more cooperation among workers and managers, although cultural differences make this difficult.

Workers are motivated by a number of factors besides wages and fringe benefits. Incentive systems, which adjust pay according to productivity, can be important spurs to worker performance. Management discipline is an important variable; the amount of direct supervision and the ratio of supervisors to workers varies from firm to firm.

The relations of management with labour unions involve elements of both conflict and cooperation. Most unions have been organized to demand from management improvement in pay scales and working conditions. Negotiation has become a chief function of union representatives, and most negotiators are willing to compromise, especially if management moves to temper conflicts. Some firms continue to fight unions, from the first stirrings of organization through every subsequent negotiation.

The relations between managers of different divisions of a firm and the relations of managers to their superiors are as complex as manager–worker relations. For example, sales executives must be concerned with quality control, production schedules, and customer service; plant managers must answer to vice presidents as well as foremen. Thus, managers find themselves subject to a complicated set of demands.

An individual firm's style of management is determined on every level by the nature of the industry as a whole; the firm's profitability, competitive situation, and "culture" or style; the personalities and preferences of senior managers; and the characteristics of the firm's home country or region.

Industrial Revolution, process of change from an agrarian, handicraft economy to one dominated by industry and machine manufacture. This process began in England in the 18th century and from there spread to other parts of the world. Although used earlier by French writers, the term Industrial Revolution was first popularized by the English economic historian Arnold Toynbee (1852–83) to describe England's economic development from 1760 to 1840. Since Toynbee's time the term has been more broadly applied.

The main features involved in the Industrial Revolution were both technological and socioeconomic-cultural. The technological changes included the following: (1) the use of new basic materials, chiefly iron and steel; (2) the use of new energy sources, including both fuels and motive power, such as coal, the steam engine, electricity, petroleum, and the internal-combustion engine; (3) the invention of new machines such as the spinning jenny and the power loom that permitted increased production with a smaller expenditure of human energy; (4) a new organization of work known as the factory system, which entailed increased division of labour and specialization of function; (5) important developments in transportation and communication, including the steam locomotive, steamship, automobile, airplane, telegraph, and radio; and (6) the increasing application of science to industry. These technological changes made possible a tremendously increased use of natural resources and the mass production of manufactured goods.

There were also many new developments in nonindustrial spheres, including the following: (1) agricultural improvements that made possible the provision of food for a larger nonagricultural population; (2) economic changes that resulted in a wider distribution of wealth, the decline of land as a source of wealth in the face of rising industrial production, and increased international trade; (3) political changes reflecting the shift in economic power, as well as new state policies corresponding to the needs of an industrialized society; (4) sweeping social changes, including the growth of cities, the development of working-class movements, and the emergence of new patterns of authority; and (5) cultural transformations of a broad order. The worker acquired new and distinctive skills, and his relation to his task shifted; instead of being a craftsman working with hand tools, he became a machine operator, subject to factory discipline. Finally, there was a psychological change: man's confidence in his ability to use resources and to master nature was heightened.

The First Industrial Revolution. In the period 1760 to 1830 the Industrial Revolution was largely confined to Britain. Aware of their head start, the British forbade the export of machinery, skilled workers, and manufacturing techniques. The British monopoly could not last forever, especially since some Britons saw profitable industrial opportunities abroad, while continental European businessmen sought to lure British know-how to their countries. Two Englishmen, William and John Cockerill, brought the Industrial Revolution to Belgium by developing machine shops at Liège (*c.* 1807), and Belgium became the first country on the Continent to be transformed economically. Like its English progenitor, the Belgian Industrial Revolution centred in iron, coal, and textiles.

France was more slowly and less thoroughly industrialized than either Britain or Belgium. While Britain was establishing its industrial leadership, France was immersed in its Revolution, and the uncertain political situation discouraged large investments in industrial innovations. By 1848 France had become an industrial power, but, despite great growth under the Second Empire, it remained behind England.

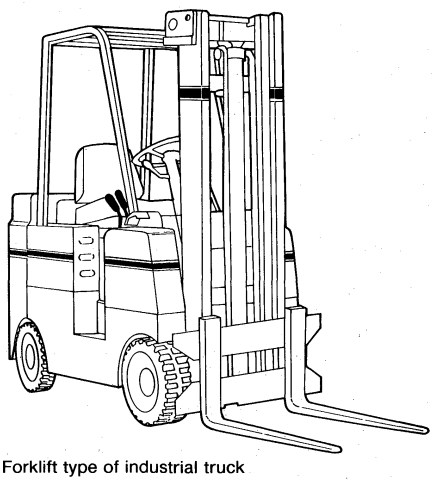
Other European countries lagged far behind. Their bourgeoisie lacked the wealth, power, and opportunities of their British, French, and Belgian counterparts. Political conditions in the other nations also hindered industrial expansion. Germany, for example, despite vast resources of coal and iron, did not begin its industrial expansion until after national unity was achieved in 1870. Once begun, Germany's industrial production grew so rapidly that by the turn of the century that nation was outproducing Britain in steel and had become the world leader in the chemical industries. The rise of U.S. industrial power in the 19th and 20th centuries also far outstripped European efforts. And Japan too joined the Industrial Revolution with striking success.

The eastern European countries were behind early in the 20th century. It was not until the five-year plans that the Soviet Union became a major industrial power, telescoping into a few decades the industrialization that had taken a century and a half in Britain. The mid-20th century witnessed the spread of the Industrial Revolution into hitherto nonindustrialized areas such as China and India.

The Second, or "New," Industrial Revolution. Despite considerable overlapping with the "old," there is mounting evidence for a "new" Industrial Revolution in the 20th century. In terms of basic materials, man has begun to exploit many natural and synthetic resources not hitherto utilized: lighter metals, new alloys, and synthetic products such as plastics, as well as new energy sources. Combined with these are developments in machines, tools, and computers that have given rise to the automatic factory. Although some segments of industry were almost completely mechanized in the 19th century, automatic operation, as distinct from the assembly line, first achieved major significance in the second half of the 20th century.

Ownership of the means of production also underwent changes. The oligarchical ownership of the means of production that characterized the Industrial Revolution in the 19th century gave way to a wider distribution of ownership through purchase of common stocks by individuals and by institutions such as insurance companies. Many countries of Europe socialized basic sectors of their economies. There was also a change in political theories: instead of the laissez-faire ideas that dominated the economic and social thought of the classical Industrial Revolution, governments generally moved into the social and economic realm to meet the needs of their more complex industrial societies.

industrial truck, carrier designed to transport materials within a factory area with maximum flexibility in making moves. Most industrial trucks permit mechanized pickup and deposit of the loads, eliminating manual work in lifting as well as transporting. Depending on their



Forklift type of industrial truck
By courtesy of Allis-Chalmers, Industrial Truck Division

means of locomotion, industrial trucks may be classified as hand trucks or power trucks.

Hand trucks with two wheels permit most of the load to be carried on the wheels, but some of the load must be assumed by the operator to balance the truck during movement. Common two-wheel hand trucks include the barrel, box, drum, hopper, refrigerator, paper-roll, and tote-box trucks. Four-wheel hand trucks are found in many more varieties, including dollies, high- and low-bed flat trucks, carts, rack carriers, wagons, and various hand-lift trucks having mechanical or hydraulic lifting mechanisms for raising and lowering a load.

Power trucks are propelled by batteries and an electric-motor drive or by an internal-combustion engine with either a mechanical drive or a generator and electric-motor drive. Propane and diesel engines are used in place of gasoline engines on some types. The non-lift platform truck is used simply for hauling, but other power trucks are provided with mechanisms, usually hydraulic, for lifting the loads. Forklift trucks are equipped with a forklike mechanism on the front end designed to pick up loads on specially designed platforms, called pallets, elevate the load to the desired height, transport it, and deposit it at the desired location and height. Ram trucks have a single protruding ram for handling coiled material. The crane truck is a portable boom crane mounted on an industrial truck; it may be used with hooks, grabs, and slings for bundled or coiled material. The straddle truck resembles a gantry crane on four pneumatic-tired wheels; the operator rides above the inverted U-frame, within which the load—lumber, bar steel, or pipe—is carried on elevating bolsters. Other common types include high- and low-lift platform trucks, motorized pedestrian-led, side-clamp, tractor, and side-loading trucks.

industrial union, trade union that combines all workers, both skilled and unskilled, employed in one industry. Excluded from the early unions of skilled craftsmen, the semiskilled and unskilled workers in the mass production industries began organizing around the end of the 19th century in Great Britain; similar developments occurred a little later in other countries. The new unions in their struggle for recognition tended to employ more aggressive tactics than the craft unions.

Today few unions are organized uniquely on a craft or industrial basis; large industrial unions may set up special divisions for particular occupational groups within their jurisdictions, or craft unions may become industrial as they organize additional nonskilled workers in new industries. *See* craft union.

Industrial Workers of the World (IWW), byname WOBBLIES, radical labour organization founded in Chicago in 1905 by representatives of 43 groups in opposition to such policies of the American Federation of Labor as its acceptance of capitalism and its refusal to include unskilled workers in craft unions. Among the founders of the IWW were William D. Haywood of the Western Federation of Miners, Daniel DeLeon of the Socialist Labor Party, and Eugene V. Debs of the Socialist Party. In 1908 the IWW split into two factions, one advocating political action to attain its goals, the other eschewing politics and advocating general strikes, boycotts, and sabotage. The latter faction, under the leadership of Haywood, prevailed; and the IWW became a revolutionary organization dedicated to gaining control of the means of production by the workers. Its tactics often led to arrests and sensational publicity; when IWW organizer Joe Hill was executed in 1915 on a disputed murder charge, he became a martyr and folk hero in the labour movement. The organization won its greatest victories in the mining and lumbering industries of the Pacific Northwest.

The IWW was the only labour organization to oppose U.S. participation in World War I, and during the war IWW leaders sought to tie up copper production in western states. The federal government responded by prosecuting and convicting some of those leaders under newly enacted Sabotage and Espionage Acts.

In the postwar years, the IWW was subject to harassment and further prosecution by local officials responding to widespread antiradical sentiments. By 1925 membership in the IWW had dwindled to insignificance.

industry, a group of productive enterprises or organizations that produce or supply goods, services, or sources of income. In economics, industries are customarily classified as primary, secondary, and tertiary; secondary industries are further classified as heavy and light.

Primary industry. This sector of a nation's economy includes agriculture, forestry, fishing, mining, quarrying, and the extraction of minerals. It may be divided into two categories: genetic industry, including the production of raw materials that may be increased by human intervention in the production process; and extractive industry, including the production of exhaustible raw materials that cannot be augmented through cultivation.

The genetic industries include agriculture, where crop rotation, fertilizers, pest controls, irrigation, green-house cultivation, cross-fertilization, scientific improvements of crops through crossbreeding, and other processes increase harvest yields; forestry, where regulated, selective cutting, tree farming, pest control, and scientifically improved reforestation can produce higher timber yields; and livestock and fishing, where management, scientifically controlled crossbreeding, improved feed, and fish farming can produce larger and heavier animals and fish.

The extractive industries include the mining of mineral ores, the quarrying of stone, and the extraction of mineral fuels.

Primary industry tends to dominate the economies of undeveloped and developing nations, but as secondary and tertiary industries are developed, its share of the economic output tends to decrease.

Secondary industry. This is also called manufacturing industry, in economics, referring to the sector of a nation's economy that includes the processing of raw materials supplied by primary industries into consumer goods, or production goods that other secondary industries transform into products, components of products, or capital goods used to manufacture consumer and non-consumer goods. Secondary industry also includes such industries as hydroelectric, geothermal, solar, wind, and other electrical power generation that require generators or other specialized equipment to convert raw energy into electricity; and it also includes the construction industry.

Secondary industry may be divided into heavy, or large-scale, and light, or small-scale, industry. Large-scale industry generally requires heavy capital investment in plants and machinery, serves a large and diverse market including other manufacturing industries, has a complex industrial organization and frequently a skilled specialized labour force, and generates a large volume of output. Examples would include petroleum refining, steel and iron manufacturing, motor vehicle and heavy machinery manufacture, cement production, nonferrous metal refining, meat-packing, and hydroelectric power generation.

Light, or small-scale, industry may be characterized by the nondurability of manufactured products and a smaller capital investment in plants and equipment, and it may involve nonstandard products, such as customized or craft work. The labour force may be either low skilled, as in textile work and clothing manufacture, food processing, and plastics manufacture, or highly skilled, as in electronics and computer hardware manufacture, precision instrument manufacture, gemstone cutting, and craft work.

Secondary industries tend to dominate advanced developing economies and are prominent in developed economies. Light and small-scale industries tend to be the dominant industry in less developed economies and in countries with large, relatively unskilled labour forces where labour-intensive industry is advantageous or where labour costs for low-skill industries with low product-profit margins are lower than in more heavily industrialized nations.

Tertiary industry. This is also called service industry and includes the section of a nation's economy embracing industries that provide services or intangible gains or generate wealth but that produce no tangible goods. In free market and mixed economies this sector generally has a mix of private and government enterprise.

The industries of this sector include banking, finance, insurance, investment, and real estate services; wholesale, retail, and resale trade; transportation, information, and communications services; professional, consulting, legal, and personal services; tourism, hotels, restaurants, and entertainment; repair and maintenance services; education and teaching; and health, social welfare, administrative, police, security, and defense services.

Administration, health, social welfare, and education tend to account for a proportionately larger share of national income in economies following a socialist plan of development where these industries are centralized by the government. Some of the wealthier, more industrialized nations, such as the U.S., Germany, France, and Japan, have entered into a post-industrial phase, that is, they are tending to show the most rapid growth in information and communication, banking, finance, insurance, real estate, professional, consulting, and legal services industries, all of which have been revolutionized by high-technology secondary industries in computers and electronics. Meanwhile, their older, heavy-industrial secondary industries have stopped growth or begun to decline because of increased production costs, including high labour cost, outdated technology, and stiff competition from nations that manufacture the same heavy industrial products at lower cost. This has often resulted in an unwillingness to retool or update the technology in nations in the post-industrial phase.

A few small countries, such as Panama, the Bahamas, Hong Kong, Singapore, Cyprus, and Bahrain, have deliberately developed their economies predominantly with tertiary industries, especially offshore banking and financial services, by developing excellent transportation, communications, and information services in order to avail themselves of strategic geographical locations or to compensate for poor, limited resource bases. To ensure their prosperity, they depend heavily on regional security and stable governments that promote investor confidence, and they offer special incentives such as liberal banking and investment policies.

For international statistical data on industrial activity, see BRITANNICA WORLD DATA in the current *Britannica Book of the Year.*

Indy, (Paul-Marie-Theodore-) Vincent d' (b. March 27, 1851, Paris—d. Dec. 1, 1931, Paris), French composer and teacher, remarkable for his attempted, and partially successful, reform of French symphonic and dramatic music along lines indicated by César Franck.

D'Indy studied under Albert Lavignac, Antoine Marmontel, and Franck (for composition). In 1874 he was admitted to the organ class of the Paris Conservatoire, and in the same year his second *Wallenstein Overture* was performed. He considered French 19th-century music and the tradition of the Paris Opéra, of the Paris Conservatoire, and of French "decorative" symphony to be superficial, frivolous, and unworthy to compete with the Teutonic Bach–Beethoven–Wagner tradition. The character of his own music revealed meticulous construction but also a certain lyricism. His harmony and counterpoint were laboriously worked out, but in his later work, free and unorthodox rhythms came easily and fluidly.

D'Indy's most important stage works were *Le Chant de le Cloche* (1883), *Fervaal* (1895), *Le Légende de Saint Christophe* (1915), and *Le Rêve de Cinyras* (1923). Among his symphonic works, *Symphonie sur un chant montagnard français* (1886), with solo piano, based entirely on one of the folk songs d'Indy had collected in the Ardeche district, and *Istar* (variations; 1896) represent his highest achievements. His 105 scores also include keyboard works, secular and religious choral writings, and chamber music. Among the latter are some of his best compositions: *Quintette* (1924); a suite for flute, string trio, and harp (1927); and the *Third String Quartet* (1928–29). He also made arrangements of the hundreds of folk songs that he collected in the Vivarais.

In 1894 d'Indy became one of the founders of the Schola Cantorum in Paris. It was through courses at this academy that he spread his theories and initiated the revival of interest in Gregorian plainchant and music of the 16th and 17th centuries. D'Indy also published studies of Franck (1906), Beethoven (1911), and Wagner (1930). In France, Paul Dukas, Albert Roussel, and Déodat de Sévérac were among his disciples. Outside France, particularly in Greece, Bulgaria, Portugal, and Brazil, his influence was lasting upon composers interested in shaping folk music into symphonic forms.

Indy 500: *see* Indianapolis 500.

Ine, also spelled INI (d. 726 or after), Anglo-Saxon king of the West Saxons, or Wessex, from 688 to 726. One of the most powerful West Saxon rulers before Alfred the Great, Ine was the first West Saxon king to issue a code of laws which are an important source for the structure of early English society.

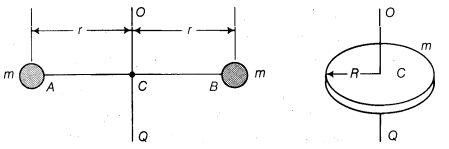
Ine succeeded to the throne upon the retirement of King Caedwalla, and in 694 he forced the men of Kent to pay compensation for slaying Caedwalla's brother Mul. In 710 Nunna, the king of the South Saxons, or Sussex, lent Ine aid against the Cornish Britons, but in 722 and 725 he took up arms against the South Saxons, who were harbouring a rival claimant to his throne. He abdicated and retired to Rome in 726.

Ine's code, preserved as an appendix to Alfred's laws, deals mainly with judicial procedures, listing the punishments to be inflicted for various offenses. His laws show that people of British origin had been incorporated into the West Saxon social system.

inertia, property of a body by virtue of which it opposes any agency that attempts to put it in motion or, if it is moving, to change the magnitude or direction of its velocity. Inertia is a passive property and does not enable a body to do anything except oppose such active agents as forces and torques (turning moments). A moving body keeps moving not because of its inertia but only because of the absence of a force to slow it down, change its course, or speed it up.

There are two numerical measures of the inertia of a body: its mass, which governs its resistance to the action of a force, and its moment of inertia (*q.v.*) about a specified axis, which measures its resistance to the action of a torque about the same axis.

inertia, moment of, in physics, quantitative measure of the rotational inertia of a body; *i.e.,* the opposition that the body exhibits to having its speed of rotation about an axis altered by the application of a torque (turning force). The axis may be internal or external



Moment of inertia

and may or may not be fixed. The moment of inertia (I), however, is always specified with respect to that line and is defined as the sum of the products obtained by multiplying the mass of each particle of matter in a given body by the square of its distance from the line. The Figure shows two steel balls that are welded to a rod AB that is attached to a bar OQ at C. Neglecting the mass of AB and assuming that all particles of the mass m of each ball are concentrated at a distance r from OQ, the moment of inertia I equals the product of those, and the arrangement is $I = 2mr^2$.

The unit of moment of inertia is a composite unit of measure. In the International System (SI), m is expressed in kilograms and r in centimetres, with I having the dimension kilogram-centimetre square. In the English system, m is in slugs (1 slug = 32.2 pounds) and r in feet, with I expressed in terms of slug-foot square.

The moment of inertia of any body having a shape that can be described by a mathematical formula is commonly calculated by the integral calculus. The moment of inertia of the disk in the Figure about OQ could be approximated by cutting it into a number of thin concentric rings, finding their masses, multiplying the masses by the squares of their distances from OQ, and adding up these products. Using the integral calculus, the summation process is carried out automatically; the answer is $I = (mR^2)/2$.

For a body with a mathematically indescribable shape, the moment of inertia can be obtained by experiment. One of the experimental procedures employs the relation between the period (time) of oscillation of a torsion pendulum and the moment of inertia of the suspended mass. If the disk in the Figure were suspended by a wire OC fixed at O, it would oscillate about OC if twisted and released. The time for one complete oscillation would depend on the stiffness of the wire and the moment of inertia of the disk; the larger the inertia, the longer the time.

inertial force, also called FICTITIOUS FORCE, any force invoked by an observer to maintain the validity of Newton's second law of motion in a reference frame (*q.v.*) that is rotating or otherwise accelerating at a constant rate. For specific inertial forces, *see* centrifugal force; Coriolis force; d'Alembert's principle.

inertial guidance system, electronic system that continuously monitors the position and acceleration of a vehicle, usually a submarine or missile, and thus provides navigational data or control without need for communicating with a base station.

The basic components of an inertial guidance system are gyroscopes, accelerometers, and a computer. The gyroscopes provide fixed reference directions, and accelerometers measure changes in the velocity of the system. The computer processes information on changes in direction and acceleration of the vehicle and feeds its results to the vehicle's navigation system.

A typical inertial guidance system, such as might be used on board a missile, uses three gyroscopes and three accelerometers. The three gimbal-mounted gyroscopes establish a reference frame in terms of the vehicle's roll, pitch, and yaw for the orientation of the three accelerometers. The accelerometers measure velocity changes in each of these three directions. The computer performs two separate integrations on the data it receives from the inertial guidance system. First, it integrates the acceleration data to get the current velocity of the vehicle; then, it integrates the computed velocity to determine the current position. This information is compared continuously to the desired (predetermined and programmed) course.

Minute errors in the measuring capabilities of the accelerometers or in the balance of the gyroscopes can introduce large errors into the information the inertial guidance system provides. These instruments must, therefore, be constructed and maintained to strict tolerances.

infallibility, papal: *see* papal infallibility.

infamy, public disgrace or loss of reputation, particularly as a consequence of criminal conviction. In early common law, conviction for an infamous crime resulted in disqualification to testify as a witness. The criterion for considering a crime infamous was whether or not it stamped the offender as untrustworthy. The concept was, therefore, at first limited to so-called *crimen falsi,* originally perjury, but extended to any crime involving fraud or corruption. Eventually, all felonies came to be treated as infamous. Testimonial incompetency for infamy, however, has been abolished by statute in England and generally in the U.S. as well.

The Fifth Amendment to the U.S. Constitution requires grand jury indictment for any "capital or otherwise infamous crime." Infamy, for this purpose, depends on the character of the punishment that may be imposed rather than on the nature of the crime. In general, any crime punishable by imprisonment in a state penitentiary is infamous, and any federal crime that may be punished by imprisonment for more than a year is also an infamous crime. In both instances the accused may not be tried without having been indicted by a grand jury.

infant school: *see* kindergarten.

infante (masculine), feminine INFANTA, the title borne from the 13th century by the children of the Spanish and Portuguese monarchs. The title infante was borne by the sons of the sovereign, and the title infanta was given to the daughters and to the wife of an infante. From the reign of John I of Castile (1379–90) there began the custom of calling the sovereign's eldest son *príncipe* (prince) *de Asturias* and not infante. Correspondingly, until the severance of Brazil from the Portuguese monarchy, the eldest son was *príncipe de Brasil.* Although a son or daughter of the sovereign of Spain was by right infante or infanta of Spain, the sovereign could grant the title, alone, to other members of the blood royal.

infanticide, the killing of the newborn. It has often been interpreted as a primitive method of birth control and a means of ridding a group of its weak and deformed children; but most societies actively desire children, and put them to death (or allow them to die) only under exceptional circumstances. Among the Eskimo, for example, conditions of life were so severe that it was sometimes the practice to kill female children shortly after birth, lest there not be husbands able to support them. In Polynesia, where populations often reached high density, similar practices prevailed. Children also have been allowed to die or have been killed with cultural sanction because of irregular mating (such as incest or conception out of wedlock), or abnormal births, or for similar reasons. In many advanced societies, children have been killed in the belief that it would ensure health, good fortune, and general fertility. Religious offerings, especially of the firstborn, are known from the Bible, as well as from the histories of Egypt, Greece, and Rome. Up to the 19th century, firstborn sacrifice was common among many peoples in India; here the motive was the offering of one's most precious possession to the deities. In modern societies the regulation of population with contraceptives or through abortion has tended to reduce the frequency of infanticide.

infantile cortical hyperostosis, also called CAFFEY'S SYNDROME, a disease of infants, characterized by swellings of the periosteum (the bone layer where new bone is produced) and cortex of bones of the upper arms, shoulder girdle, and lower jaw. It is accompanied by fever and irritability; after a series of periodic exacerbations, it subsides spontaneously. Infantile cortical hyperostosis is a heritable disease.

infantile paralysis: *see* poliomyelitis.

infantry, troops who fight on foot, even though transported to battle by motorized vehicles, on horseback, or by other means. Infantry has existed since the beginning of organized warfare—from the earliest infantry armed with swords, bows, or spears through the modern variety equipped with automatic rifles and rocket launchers. With the exception of such mounted forces as the Mongol armies of the 12th century—in which the foot soldier's combat role was almost negligible—the infantry has been the largest single element in armies since ancient times. As foot soldiers their objective has always been to seize and hold ground and, when necessary, to occupy enemy territory.

infarction, death of a section of tissue when blood supply to the section fails as the result of obstruction of a blood vessel. The obstruction may be due to a blood clot or may result from narrowing of the blood vessel channel. The dead tissue is called an infarct or an infarction. Myocardial infarction (*q.v.*), death of a section of heart muscle, results from obstruction to a coronary artery; the condition often accompanies coronary thrombosis. Other serious infarctions occur in the lungs—pulmonary infarction—and the brain (*see* stroke syndrome). Poor circulation in the mother during pregnancy can result in placental infarction (*q.v.*); usually the baby is not harmed.

infection, in medicine, the invasion of the body by any of thousands of infectious agents—including bacteria, viruses, fungi, protozoans, and worms—and the reaction of the body to them or to their toxins. When health is not altered, the process is termed a subclinical infection. When health is altered, the process is called an infectious disease. *See also* inflammation.

A brief treatment of infections and infectious diseases follows. For full treatment, *see* MACROPAEDIA: Infectious Diseases.

There are various routes that infectious agents can take into the human body. Conditions such as influenza and the common cold occur when their respective viruses attack the mucous membranes that line the upper respiratory tract. Pneumonias, diseases of the lower respiratory tract, can be caused by almost any infectious agent. If bacteria, viruses, or other agents get into the bloodstream, they can attack the cardiovascular and central nervous systems, producing such diseases as rheumatic fever or meningitis. Gastrointestinal diseases, ranging from salmonella food poisoning to life-threatening typhoid fever and cholera, usually result from the ingestion of contaminated food or water. Sexually transmitted (venereal) diseases are acquired during intercourse or other sexual activity. Bacteria can invade the bones and joints, causing osteomyelitis or septic arthritis, or the skin, causing impetigo or leprosy. Other diseases, such as tetanus, occur

when a skin wound is contaminated—in this case, with soil carrying tetanus bacilli. A few diseases can arise via more than one route. Different forms of anthrax, for example, are produced when anthrax bacilli are breathed in, acquired through skin abrasions, or ingested.

Insects are responsible for injecting some infectious agents through the skin into the human bloodstream. The plasmodia that cause malaria and the viruses that cause yellow fever are transmitted by mosquitoes. Typhoid fever and several other diseases can be spread by human carriers who harbour the microbes long after they have recovered from infection. Animals also act as reservoirs for microbes. Rabies virus can be contracted from the bite of a rabid animal, and leptospirosis is caused by bacteria that pass between human beings and other mammals.

Following local infection or entrance of a microorganism into the bloodstream, white blood cells attack the invader, and antibodies or antitoxins are produced as needed. The resulting active immunity can be lifelong, as that against measles, or short-lived. This process provides the theoretical basis for long-lasting active immunization by vaccination with a variety of antigens. Passive immunity, the introduction of antibodies or antitoxins into the body, is temporary because the body eventually eliminates them as foreign substances. Body temperature often rises in response to infection.

Although newly recognized microbes emerge occasionally (such as *Legionella pneumophila,* the cause of Legionnaire's disease, in 1976), and there are serious difficulties in arresting the spread of some conditions (particularly sexually transmitted ones), some diseases have largely been conquered. Smallpox became virtually extinct in the late 1970s, and diseases such as measles, diphtheria, and poliomyelitis are rare in regions in which modern medical techniques are available. Still, the burden of illness and death attributable to infectious organisms remains massive, particularly in areas of poor sanitation, poor nutrition, and crowding. Tuberculosis, which kills some 500,000 people in India each year, still causes widespread epidemics, and 1,500,000 lives are lost in India annually as a result of diarrheal diseases produced by microorganisms. These and other scourges, such as cholera, typhoid fever, filariasis, and schistosomiasis, continue to afflict mankind on a vast scale.

infectious enteritis (disease of cats): *see* feline distemper.

infectious jaundice: *see* leptospirosis.

infectious mononucleosis, also called GLANDULAR FEVER, common infection in man, believed to be caused by the Epstein-Barr (EB) virus. The disease occurs predominantly in persons from 10 to 35 years old, but it is known to appear at any age. Infection of young children usually causes little or no illness, although it does confer immunity.

Infectious mononucleosis is transmitted primarily by oral contact with exchange of saliva, hence its popular name, "the kissing disease." The incubation period is thought to be about 30 to 40 days. The commonest symptoms are malaise and sore throat. Enlargement of the lymph nodes in all parts of the body is frequent; those in the neck are most often affected. Fever is usual. In some cases the only signs of the disease are fever and generalized discomfort; in these cases, the diagnosis is made by study of the blood. The throat is often red; a membrane, white to dark gray in colour and resembling that of diphtheria, may be present; ulceration of the pharynx occurs occasionally. There is a petechial rash on the soft palate in many cases.

In about two-thirds of patients, the spleen is enlarged; death has occurred in rare cases from rupture of this organ. A rash consisting of multiple small hemorrhages or resembling that of measles or scarlet fever sometimes appears. Pneumonia is present in about 2 percent of the cases. Involvement of the liver, as shown by chemical tests, is almost universally present; severe disease of the liver with jaundice is rare. Encephalitis, meningitis, or peripheral neuritis occurs uncommonly; death has followed the encephalitis. The heart is rarely affected. Swelling of the upper eyelids is a common finding. In rare cases the urine may contain blood.

Infectious mononucleosis usually lasts for about 7 to 14 days. In some instances it may persist for several weeks, especially when the liver or nervous system is affected. Relapse occurs uncommonly, and second attacks are probably very rare. There is no specific therapy. Antibiotics are of value only for the secondary bacterial infections of the throat that occur in some cases.

infectious myxomatosis, also called MYXOMATOSIS CUNICULI, a highly fatal infectious viral disease of rabbits. It is characterized by fever, swelling of the mucous membranes, and the presence on the skin of tumours composed of mucous tissue. The disease exists naturally in populations of certain South American rabbits of the genus *Sylvilagus* and has been introduced into western Europe and Australia as a means of rabbit population control.

inference, in logic, derivation of conclusions from given information or premises by any acceptable form of reasoning. Inferences are commonly drawn by deduction, which, by analyzing valid argument forms, draws out the conclusions implicit in their premises; by induction, which argues from many instances to a general statement; by probability, which passes from frequencies within a known domain to conclusions of stated likelihood; and by statistical reasoning, which concludes that, on the average, a certain percentage of a set of entities will satisfy the stated conditions. *See also* deduction; implication.

inference, in statistics, the process of drawing conclusions about a particular parameter of a statistical distribution. One principal approach of statistical inference is the Bayesian estimation, in which conclusions are based upon posterior judgments about the parameter given an experimental outcome (that is, prior judgments about the parameter and about the chances of the experimental outcome conditional to values of the parameter are assumed). A second is the likelihood approach, in which all conclusions are based upon the likelihood function of the parameter given the experimental outcome—that is, the emphasis is on the distribution function of the experimental outcome conditioned on the parameter considered as a function of the possible parameter values, instead of considering the distribution function as a function of the experimental outcome.

In nonparametric inference, estimators of information about the distribution function do not depend on the mathematical form of the distribution function; hence they are called nonparametric in contrast to parametric estimators, which are used to estimate parameter values of an unknown distribution having an unknown functional form.

Inferior Oolite Series, division of Middle Jurassic rocks in Great Britain. (The Jurassic Period began about 190,000,000 years ago and lasted about 54,000,000 years.) Rocks consist of clays, sandstones, and the dominant Inferior Oolite Limestone. Abundant and varied Jurassic fossils occur in the limestone, including echinoids, brachiopods, and gastropods; ammonites are rare and make zonation (division into shorter time spans) difficult. The Inferior Oolite Series overlies the Upper Lias and underlies the Great Oolite Series.

inferiority complex, a feeling of inferiority that is wholly or partly unconscious. The term has been used by some psychiatrists and psychologists, particularly the followers of the early psychoanalyst Alfred Adler, who held that many outstanding achievements, some antisocial behaviour, and other continuing aspects of the personality could be traced to overcompensation for this feeling. The use of "complex" later gained acceptance to denote the group of emotionally toned ideas, partially or even wholly repressed, organized around and related to such feelings of inferiority. The term inferiority complex has lost much of its significance through imprecise, popular misuse—for example, as an attempt at a facile explanation of any show of ambition by a man of small physical stature.

infiltration, military tactic involving penetration of enemy lines at many points by individuals and small groups who seek to avoid heavily defended positions rather than overcome them, in order to penetrate enemy lines at weak points. A tactic perfected by German forces in World War I, it is characterized by rapid advance of infantry-artillery teams seeking vulnerable points in enemy defenses, through which advancing troops are able to attack the enemy's stronger positions from flanks and rear. In conjunction with frontal assaults by the main attacking forces, the tactic creates isolated pockets of resistance that can be overcome at leisure.

infinite series, the sum of infinitely many numbers related in a given way and listed in a given order. Since the notion of addition is defined only for finitely many numbers, the idea of infinite series falls outside the scope of elementary arithmetic. Infinite series are enormously useful in various parts of mathematics and in such disciplines as physics, chemistry, biology, and engineering.

A brief treatment of infinite series follows. For full treatment, *see* MACROPAEDIA: Analysis (in Mathematics): *Infinite Series.*

If $a_1 + a_2 + a_3 + \ldots$ is an infinite series, then a quantity $s_n = a_1 + a_2 + \ldots + a_n$ (n is any chosen natural number), which involves adding only finitely many terms, is called a partial sum of the series. If these numbers s_n approach a fixed number S as n becomes larger and larger, the series is said to converge. In this case, S is called the sum of the series. An infinite series that does not converge is said to diverge. In the case of divergence, no value of a sum is assigned. For example, in the infinite series $1 + 1 + 1 + \ldots$, the nth partial sum, the result of adding the first n terms, is $s_n = n$. As more terms are added, the partial sums fail to approach any finite value (they grow without bound). Thus, the series diverges. A basic example of a convergent series is

$$1 + \frac{1}{2} + \frac{1}{4} + \cdots + \frac{1}{2^n} \text{ for which } s_n = 2 - \frac{1}{2^{n-1}}.$$

As n becomes large, these s_n approach 2, which is the sum of this infinite series. In fact, the series $1 + r + r^2 + r^3 + \ldots$ converges to the sum $1/(1-r)$ if $0 < r < 1$ and diverges if $r \geq 1$. This series is called the geometric series with ratio r and is one of the most important in mathematics.

Certain standard tests can be applied to determine the convergence or divergence of a given series, but such a determination is not always possible. In general, if the series $a_1 + a_2 + \ldots$ converges, then it must be true that the number a_n approaches 0 as n becomes large. Furthermore, adding or deleting a finite number of terms from a series never affects whether or not the series converges. If, in a series $a_1 + a_2 + \ldots$, all the a_n are positive, then the partial sums will increase, either ap-

proaching a finite quantity or growing without bound. This observation leads to what is called the comparison test: if $0 \le a_n \le b_n$ for all n, and if $b_1 + b_2 + \dots$ converges, then so does $a_1 + a_2 + \dots$. If the comparison test is applied to a geometric series, then the operation, reformulated slightly, is called the ratio test: if $a_n > 0$ and if $a_{n+1}/a_n \le r$ for some $r < 1$ for every n, then $a_1 + a_2 + \dots$ converges. For example, the ratio test proves the convergence of the series $1 + \frac{1}{2} + \frac{1}{3 \cdot 2} + \frac{1}{4 \cdot 3 \cdot 2} + \cdots$ since $\frac{a_{n+1}}{a_n} = \frac{1}{n+1} \le \frac{1}{2}$ for all n. Other tests determine convergence or divergence of series whose terms are not all positive.

One of the most important applications of series is the expansion of certain mathematical functions. The trigonometric functions $f_1(x) = \cos x$, $f_2(x) = \cos 2x, \dots, f_k(x) = \cos kx$, and $g_1(x) = \sin x$, $g_2(x) = \sin 2x, \dots, g_k(x) = \sin kx$, are 2π-periodic, which means that $f_k(x + 2\pi) = f_k(x)$ and $g_k(x + 2\pi) = g_k(x)$ for all values of x. If $a_0, a_1, \dots$ and $b_1, b_2, \dots$ are given numbers, then the equation

$$f(x) = a_0 + (a_1 \cos x + b_1 \sin x) + (a_2 \cos 2x + b_2 \sin 2x) + \cdots$$

defines a function $f(x)$ provided that the infinite series in question converges for every x. Essentially any function whatsoever, as long as it is 2π-periodic, can be written as such an infinite sum of sines and cosines. Many mathematical problems depending on a given function can be solved directly and easily when the given function is a sine or cosine function. The process of breaking up a rather arbitrary function into a series like $f(x)$ is called Fourier analysis and has numerous applications in the study of various wave phenomena.

infinitesimal, in mathematics, quantity less than any finite quantity, yet not zero. Even though no such quantity can exist in the real number system, many early attempts at the calculus were based on sometimes dubious reasoning about infinitesimals: derivatives were defined as ultimate ratios of infinitesimals, and integrals were calculated by summing rectangles of infinitesimal width. As a result, differential and integral calculus was originally referred to as the infinitesimal calculus. This terminology gradually disappeared as the concepts of limit, continuity, and real numbers became clarified.

inflammation, in general, the local reaction of living tissues—especially the small blood vessels, their contents, and their associated structures—to injury. The passage of blood constituents through the vessel walls into the tissues is the hallmark of inflammation, and the tissue collection so formed is termed the exudate. Any noxious process that damages living tissue—infection with bacteria, excessive heat, cold, mechanical injury such as crushing, acids, alkalis, irradiation, or infection with viruses—can cause inflammation. The organ or tissue involved makes only minor differences to the inflammatory process.

Although the number and diversity of diseases of animals and man classed as inflammatory would seem to exceed the limits of even so broad a definition, it may be shown that tissue reactions ranging from burns to pneumonia, leprosy, tuberculosis, and rheumatoid arthritis, all examples of inflammation, do in fact fit within this description. In ancient times inflammation was recognized as an entity by virtue of simple observation. Thus Celsus (Roman physician of 1st century AD) listed the four cardinal signs of inflammation as *calor, rubor, turgor,* and *dolor* (heat, redness, swelling, and pain). As a description it still cannot be bettered, although a fifth, loss of function, is sometimes added.

The inflammatory process. The first event after injury to a tissue occurs is a fleeting constriction, or narrowing, of the nearby arterioles, *i.e.,* the tiny blood vessels that carry blood from the larger arteries to the network of microscopic vessels called capillaries. This constriction soon wears off, however, and is replaced by a dilation, or widening, of the arterioles, and the resulting increase in blood flow flushes the entire network of capillaries with blood. White blood cells, called leukocytes, then leave their normal position in the centre of the arterial bloodstream and adhere to the walls of the blood vessels. These leukocytes then somehow penetrate the walls of the vessels, pass through them to the exterior, and come to lie in the injured tissues near the vessel walls.

Long before the migration of white cells forms a cellular exudate, however, a fluid exudate has collected. The walls of the small vessels concerned are normally freely permeable to water and salts but allow only small quantities of the proteins in blood plasma to pass through them. In inflammation the walls of venules and capillaries lose their relative impermeability to plasma proteins, which, as a result, escape from the blood into the tissues. There, because of the proteins' ability to take up and hold water, it leads to an accumulation of fluid (edema) at the site of the injury. The increase of the permeability of blood vessel walls is triggered and mediated by substances such as histamine and leukotaxine, which are released by the tissue cells that have been injured.

It is thus possible to provide an explanation of the four cardinal signs of inflammation. Redness is due to dilated blood vessels; swelling results partly from vessel dilation but mainly from exudate formation; heat is produced by an increased blood flow; pain is caused in part by local swelling and pressure and also by the chemical substances that are liberated in the inflammatory process and that act on nerve endings.

The cellular and fluid constituents of the exudate perform a variety of therapeutic functions at the site of the tissue injury. The leukocytes attack and ingest any bacteria and other foreign particles (antigens) and cellular debris at the site of the damage. Fibrinogen, a constituent of the blood plasma proteins accumulating at the site, is transformed at the wound into fibrin, which coagulates and clots the blood when bleeding occurs. Gamma globulins, another blood plasma protein, contain antibodies, which react specifically with an antigen. The antibodies leaked into tissues infected by bacteria help to clump the bacteria and to dissolve them or accelerate their ingestion by leukocytes. The leaked blood plasma also delivers oxygen and food materials to the injured tissues and may also dilute or wash away toxic substances at the site.

All inflammation begins as simple acute, "short-lived," inflammation, which proceeds in one of four directions: resolution, organization (building up of new tissue), suppuration (formation of pus), or chronic—long-lasting—inflammation.

The essence of uncomplicated acute inflammation is that the injury should not be sufficiently severe to cause abscess formation or scarring, nor should it be sufficiently difficult to eradicate as to lead to chronicity. Mild burns, mechanical injury, frostbite, chemical irritation, bacterial or viral infection, or hypersensitivity (allergy) all come within this compass. (*See* allergy.)

Acute inflammation is commonly accompanied by a rise in the number of leukocytes circulating in the blood (leukocytosis), by fever, and by an increase in the rate at which the red corpuscles of the blood settle under gravity (raised ESR, or erythrocyte sedimentation rate). All three are widely used as diagnostic tests in medical practice.

The expected fate of simple acute inflammation is resolution, a term that implies disappearance of the exudate and the return of the affected part to normal function and structure. An important preliminary change in resolution is the gradual replacement within the exudate of polymorphonuclear leukocytes, or granulocytes (characterized by the irregular or polymorphic nature of the nucleus and by the presence of digestive and bactericidal granules), by mononuclear leukocytes. These latter cells begin as monocytes, which are large phagocytic cells with a plain round, oval, or slightly indented nucleus. Usually their emigration from the blood commences at the same time or shortly after that of the granulocytes. When the injurious stimulus ceases or is overcome by the body's defenses, emigration comes to a stop. The granulocytes have a short life span and are highly motile so that they die, disintegrate, or leave the site of inflammation within a few hours. The monocytes, on the other hand, mature into macrophages once they have entered the tissue. Macrophages have greater phagocytic capabilities and can live as long as 75 days. They are thus ideally suited to clear the area of debris and restore a normal picture.

When an acute inflammatory reaction progresses to the local formation of pus, an abscess is said to be formed and the process is known as suppuration. Pus is a viscous liquid formed of the digested bodies of dead leukocytes and tissue cells. Pus is usually creamy yellow or green in colour but may be tinged with blood or mixed with clear mucus. Pus is formed whenever the injurious stimulus is such that it induces large numbers of granulocytes to emigrate into the affected area and whenever the injurious stimulus, because of its toxicity, leads to massive killing of these leukocytes and of tissue cells. The commonest cause of suppuration is infection of the tissues with certain bacteria, notably the so-called pyogenic cocci. Of these bacteria, *Staphylococcus aureus* is perhaps the most important. There are many other pus-producing microorganisms, however. The killing of the leukocytes and tissue cells is accomplished by toxins within the bacteria or produced by them. The liquefaction of the dead cells is brought about by enzymes either of bacterial origin or derived from the dead cells themselves.

When injury damages a part of the body sufficiently to cause not only inflammation but also destruction of tissue, it is necessary for the site of damage to be repaired. This is accomplished by the dual processes of regeneration and organization, which together constitute healing. Regeneration involves the repeated division of surviving tissue cells until the breach is made good. Tissues vary widely in their regenerative capacity and some, notably the brain and other nervous system components, totally lack this ability. In other instances of damage there is a large defect of connective tissue or a mass of blood clot or exudate to be replaced by some form of permanent structure. Organization deals with these problems and is the process whereby new blood vessels and connective-tissue-forming cells (fibroblasts) grow into such an area to form first vascularized connective tissue and then scar tissue. Even trivial inflammation—*e.g.,* infected lesions of acne vulgaris—may lead to organization and scarring, but the most dramatic scarring is seen after the extensive destruction of connective tissue that occurs after burns or trauma.

Chronic inflammation denotes a reaction that is long lasting, but because such persistence has characteristic microscopic features, it is these as much as the patient's history that are used by pathologists as a criterion. Chronic inflammation is a category into which fall some of the greatest scourges of humankind, such as tuberculosis, leprosy, yaws, syphilis, and

rheumatoid arthritis. Other conditions such as chronic nephritis or cirrhosis of the liver or chronic cholecystitis should also properly be included.

The essence of chronic inflammation is that the cause of tissue injury, whether it be the bacillus of tuberculosis or leprosy or a "foreign body" (*i.e.,* irritant solid material of extraneous origin), or a fungus, or of unknown nature, be such that it neither quickly kills the patient nor is itself rapidly destroyed or removed by the body's defenses. In the case of living microorganisms—*e.g.,* those of tuberculosis or leprosy—a symbiotic relationship is thus established between invader and host.

The main pathological feature of chronic inflammation, the more severe varieties of which for historical reasons are termed granulomatous, is infiltration of the affected area by certain types of cells. These are macrophages, epithelioid cells, lymphocytes, plasma cells, giant cells, and fibroblasts, the nature of the exudate varying ith the cause of inflammation. Thus in tuberculosis epithelioid cells are prominent, and in syphilis, plasma cells.

The main reason for inflammation's becoming chronic is failure of macrophages to digest and thereby eliminate the irritant (*e.g.,* bacilli) that they have ingested. In some cases bacilli thrive and multiply within macrophages, as in leprosy and tuberculosis. The cause of the failure is unknown; it may lie in the chemical composition of certain microorganisms or in deficiencies in the digestive apparatus of some or all of the phagocytes, or in some immunological defect or allergic mechanism as yet obscure. It is possible that, even in foreign body reactions, the body may become hypersensitive to some of its own inflammatory products and that the reaction is prolonged and aggravated as a result.

Therapy. Wherever possible, treatment is aimed at eliminating the cause of inflammation. Thus bacterial inflammation is dealt with by the administration of antibiotics such as penicillin or tetracycline. Such therapy is usually effective but has become increasingly hampered by the appearance of antibiotic-resistant strains of microorganisms. Chronic infections such as tuberculosis are also treated by antibiotics such as streptomycin, sometimes in combination with other antituberculous drugs such as isoniazid. Foreign-body reactions are dealt with by surgical removal of the irritant object.

When the cause of inflammation is unknown or not amenable to such specific therapy it is the practice to use anti-inflammatory drugs—*i.e.,* substances that lessen the signs and symptoms of inflammation without necessarily affecting the cause. Such drugs may be given by mouth or by injection, or applied locally. They include, among others, the corticosteroids such as cortisone and the salicylates such as aspirin. Simpler symptomatic treatment of inflammation hallowed by long usage includes the use of hot or cold compresses or hot poultices, or local application of anodynes or counterirritants. Although it is desirable to lessen pain and tissue destruction, no therapy should disregard the defensive role of the inflammatory response.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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inflation, in economics, collective increases in the supply of money, in money incomes, or in prices. Inflation is generally thought of as an inordinate rise in the general level of prices.

From a theoretical view, at least four basic schemata commonly used in considerations of inflation can be distinguished.

The quantity theory. The first of these and the oldest is the view that the level of prices is determined by the quantity of money. The ratio of the stock of money that people want to hold to the value of the transactions they perform each year (or the inverse of this ratio, called the velocity of circulation) is supposed, in the simplest version of this view, to be fixed by such factors as the frequency of wage payments, the structure of the economy, and saving and shopping habits. So long as these remain constant, the price level will be directly proportional to the supply of money and inversely proportional to the physical volume of production. This is the celebrated quantity theory, going back at least as far as David Hume in the 18th century. But the theory assumes that productive capacity is fully employed, or nearly so. Because, in fact, the extent to which productive capacity is used varies a great deal—indeed, sometimes more than the level of prices—the quantity theory fell into disfavour between World Wars I and II, when the level of activity provided more reasons for anxiety than did the long-run movement of prices.

In a refined version, the quantity theory was revived by Milton Friedman and other University of Chicago economists in the 1950s and '60s. Their basic contentions were that short-period changes of the money supply are, in fact, followed (after a varying interval) by changes in money income and that the velocity of circulation, though it fluctuates to some extent with the money supply, tends to be fairly stable, especially over long periods. From this, they concluded that the money supply, while not a reliable instrument for controlling short-term movements in the economy, can be effective in controlling longer term movements of the price level and that the prescription for stable prices is to increase the money supply regularly at a rate equal to that at which the economy is estimated to be expanding.

Against this, it has been argued that in highly developed economies the supply of money varies largely with the demand for it and that the authorities have little power to vary the supply through purely monetary controls. The correlations observed by this so-called Chicago school between money supply and money income are attributed by their critics to variations in the demand for money to spend, which elicit partial responses from supply and are followed after an interval by corresponding changes in money income. The relative stability of the velocity of circulation is attributed by them to the facility with which the supply of money accommodates itself to demand; they argue that insofar as supply may be restricted in the face of rising demand, velocity will increase, or (what really amounts to the same thing) new sources of credit, such as trade credit, will be exploited.

The Keynesian theory. The second basic approach is represented by J.M. Keynes's theory of income determination. The key to it is the assumption that consumers tend to spend a fixed proportion of any increases they receive in their incomes. For any level of national income, therefore, there is a gap of a predictable size between income and consumption expenditure, and to establish and maintain that level of national income it is only necessary to fix expenditure on all nonconsumption goods and services at such a level as to fill the gap. Apart from government outlays, the main constituent of this nonconsumption expenditure is private investment. Keynes supposed investment to be fairly sensitive to the rate of interest. The latter, in turn, he supposed to be negatively related, up to a point, to the stocks of "idle" money in existence—in effect, positively related to the velocity of circulation of money. He held, moreover, that there is a floor below which long-term interest rates will not fall, however low the velocity of circulation. These relationships between interest and idle money (or the velocity of circulation) have been pretty well supported empirically.

The chief importance of the Keynesian approach and various elaborations of it is that they provide a framework in which governments can endeavour to manage the level of activity in the economy by varying their own expenditures and receipts or by influencing the level of private investment. This has been a principal basis of policy in many industrialized countries in recent decades. Difficulties in practice have sprung from uncertainty about, or changes in, the underlying quantitative relationships and the existence of uncertain time lags in their operation, which make it hard to deal effectively with unforeseen contingencies. The uncertainty and weakness of the relation between interest rates and private investment are another source of difficulty. Many economists believe, however, that the approach has led to better control over short-term changes in employment and real income.

In the form in which it has just been stated, however, the Keynesian approach does not offer much insight into movements of the price level. The simplest variant of it that will do so is based on the view that inflation arises entirely from attempts to buy more goods and services than can be supplied—*i.e.,* more than can be produced at the "full employment" level of activity. If, for example, government expenditure is higher than the difference between production and consumption at the level corresponding to full employment, there is an "inflationary gap." The market process closes this gap by a bidding up of prices to the point at which the difference between income and consumption, in money terms, is big enough to accommodate the government expenditure. (In an economy open to foreign trade, the gap may be closed wholly or in part by the creation of an import surplus). The theory fails to account for the experience in the decades after World War II of continuous inflation in conditions that do not suggest the existence of an inflationary gap.

The "cost-push" theory. A third approach in the analysis of inflation assumes that prices of goods are basically determined by their costs, whereas supplies of money are responsive to demand. In these circumstances, increasing costs may create an inflationary pressure that becomes continuous through the operation of the "price-wage spiral." The supposition is that wage earners and profit receivers (neglecting for the moment other groups in the economy) aspire to incomes that add up to more than the total value of their production at full employment. One or both groups must, therefore, be dissatisfied at any given time. The wage earners, if dissatisfied, demand wage increases. These are conceded (at least in part) by employers in the course of the bargaining process, initially at the expense of profits. Later, employers increase prices to reflect their higher costs, and, while this restores profits, it also reduces wage earners' real incomes, sowing the seeds of a further round of wage demands. If the supply of money were fixed, this process would lead to increasing monetary stringency; it would become increasingly difficult to finance increases in wages and purchases of goods the prices of which had just been raised or, indeed, to finance production and distribution generally—though, as noted earlier, there are some circumstances in which the velocity of circulation can rise drastically and make a limited money stock go a long way. In practice, money supply responds to demand, partly because monetary authorities do not wish to see the dislocation of capital markets that would follow if monetary stringency produced very large rises in rates of interest.

In the 1960s there was much discussion of a relation named after the British economist A.W. Phillips (though in a rudimentary form it can be traced to earlier writers), whereby the rate of increase of wages was shown to vary negatively with the level of unemployment. This can be interpreted as signifying that the price–wage spiral proceeds more rapidly at high levels of economic activity than at low ones. The empirical evidence for the "Phillips curve" was not entirely satisfactory, and the hopes that had been excited in some quarters that a higher but still politically tolerable level of unemployment would reduce or end inflation were shaken by the rapid wage inflation that occurred during the severe recessions of the 1970s and 1980s.

The structural theory. The fourth basic approach to the inflationary process is not entirely independent of some of those just discussed; its distinguishing feature is its emphasis on structural maladjustment in the economy. One version of it depends upon the simple proposition that resistance to reductions of money wages is so strong that they hardly ever take place. If this is so, then all adjustments of wages to take account of relative changes in the supply of, and demand for, labour in different industries or occupations have to be accomplished through the absolute raising of all wages except those of the group of workers whose market position is weakest. The rate of wage inflation as a whole is then seen as proportional to the rate of structural change in the economy.

Another version, held to be appropriate to some developing countries, focuses on the gap between imports and exports. Imports tend to increase faster in those countries (because of the rising demand for manufactured goods) than the ability of the traditional exporting industries to pay for them. Difficulty is experienced in substituting home manufactures for imports, partly because home markets are often too small to support the required industries and partly because the development of manufacturing itself requires extensive imports of machinery and structural materials. Consequently, there is a continuous downward pressure on the international value of the country's currency; this is felt in a continuous upward pressure on the country's internal prices. Alternatively, inflation in such countries may result from social and political pressures to provide employment for the overflow into the towns of a rapidly growing rural population; since there is a shortage of savings, this leads to excessive creation of new credit in one way or another and thus to a straightforward "demand–pull" inflation. The chronic inflationary tendencies in some Latin-American countries have been attributed to mechanisms of these kinds.

inflection, also called FLECTION, formerly ACCIDENCE, in linguistics, the change in the form of a word (in English, usually the addition of endings) to mark distinctions of tense, person, number, gender, mood, voice, and case. English inflection indicates noun plural—"cat," "cats"; third person singular present tense—"I, you, we, they buy," "he buys"; past tense—"we walk," "we walked"; verbals—"called," "calling"; and comparatives—"big," "bigger," "biggest." Changes within the stem, or main word part, are another type of inflection, as in "sing," "sang," "sung," and "goose," "geese." The paradigm of the Old Icelandic *u*-stem noun *skjǫldr* ("shield"), for example, includes forms with both internal change and suffixation; the nominative singular form is *skjǫldr*, the genitive singular is *skjaldar*, and the nominative plural is *skildir*. Many languages, such as Latin, Spanish, French, and German, have a much more extensive system of inflection. For example, Spanish shows verb distinction for person and number, "I, you, he, they live," *vivo, vives, vive, viven.* Many languages, especially non-Indo-European ones, inflect with prefixes and infixes, word parts added before a main part or within the main part. Inflection differs from derivation by not changing the part of speech. Derivation uses prefixes and suffixes (*e.g., in-, -tion*) to form new words (*e.g.,* "inform," "deletion"), which can then take inflections.

The terms inflecting and inflectional are sometimes used more narrowly in the typological classification of languages to refer to a subtype of synthetic language (*q.v.*), such as Latin. All synthetic languages have inflection in the broader and more widespread sense of the term.

inflorescence, in a flowering plant, a cluster of flowers. Inflorescence may be either of two types, indeterminate or determinate. In a determinate inflorescence the peduncle (main axis) of the cluster terminates in a flower bud, thus arresting the growth of the peduncle. An example of such a cluster is known as a cyme (*e.g.,* phlox). In indeterminate inflorescences, the outer or lower flower buds open first, and the youngest flowers will be at the apex. The cluster tip grows continuously, producing more buds. Indeterminate inflorescences continue to develop new flowers for a long period of time, and they take any one of several forms, described below, including raceme, spike, catkin, panicle, head (capitulum), corymb, or umbel.

In a raceme, each flower of the cluster is borne on a pedicel (short stem), all pedicels being about equal in length. The peduncle is elongated, and buds appear at regular intervals, developing from the axil (upper angle between stem and branch) of a modified leaf (*e.g.,* snapdragon).

A spike is like a raceme, but the flowers are without a pedicel (*e.g.,* plantain).

In a catkin, all the flowers in the cluster are staminate (bearing male reproductive organs) or pistillate (bearing female reproductive organs), but not both (*e.g.,* cottonwood).

A panicle is a branched raceme in which each branch has more than one flower (*e.g.,* lilac).

A head (capitulum) is a short dense spike. All the flowers in the cluster are borne in a disklike mass (*e.g.,* dandelion).

A corymb is like a raceme, but those flowers borne lower on the peduncle have longer pedicels than those borne higher on the peduncle, thus creating a rather flat-topped cluster (*e.g.,* candytuft).

In an umbel, the pedicels of all flowers in the cluster arise from about the same point at the top of the peduncle (*e.g.,* onion).

influence, sphere of, in international politics, the claim by a state to exclusive or predominant control over a foreign area or territory. The term may refer to a political claim to exclusive control, which other nations may or may not recognize as a matter of fact, or it may refer to a legal agreement by which another state or states pledge themselves to refrain from interference within the sphere of influence.

It is in the latter, legal significance that the term first gained currency in the 1880s when the colonial expansion of the European powers in Africa and Asia was nearing its completion. The last stage of that expansion was characterized by the endeavour of all major colonial powers to carry on the mutual competition for colonies peacefully through agreed-upon procedures. Agreements on spheres of influence served this purpose. Thus, the agreement between Great Britain and Germany in May 1885, the first to make use of the term, provided for "a separation and definition of their respective spheres of influence in the territories on the Gulf of Guinea." This agreement was followed by many of a similar nature, of which article VII of the agreement between Great Britain and Germany of July 1, 1890, concerning East Africa may be regarded as typical. Its text is as follows: "The two Powers engage that neither will interfere with any sphere of influence assigned to the other by Articles I to IV. One Power will not in the sphere of the other make acquisitions, conclude Treaties, accept sovereign rights or Protectorates, nor hinder the extension of influence of the other. It is understood that no Companies nor individuals subject to one Power can exercise sovereign rights in a sphere assigned to the other, except with the assent of the latter."

When colonial expansion came to a close after World War I, spheres of influence in the legal sense lost much of their importance. From then on, the term was used more for the unilateral political claims of great powers to a predominant position in the territories of other nations, especially those adjacent to their own. Thus, it can be said that the Monroe Doctrine, especially in its application since the presidency of Theodore Roosevelt, established the Western Hemisphere as a sphere of influence for the United States. In the aftermath of World War II, the Soviet Union created a sphere of influence as a political fact in the territories of the nations of eastern Europe.

influence fuze (military): *see* proximity fuze.

influenza, also called GRIPPE, or FLU, an acute viral infection of the upper or lower respiratory tracts that is marked by fever, chills, and a generalized feeling of weakness and pain in muscles, together with varying signs of soreness in the respiratory tract, head, and abdomen. Influenza is caused by any of several strains of myxoviruses, categorized as types A, B, and C. The type A virus is the most frequent cause of influenza; this type occurs in numerous strains that are clinically differentiated on the basis of the viruses' surface proteins, their geographic origin, date of isolation, and other factors. The major types of influenza viruses generally produce similar symptoms but are completely unrelated antigenically, so that infection with one type confers no immunity against another. Influenza tends to occur in wavelike epidemics throughout the world: influenza A tends to reappear in cycles of two to three years and influenza B in cycles of four to five years; the subtype of influenza A known as H2N2, or Asian flu, for instance, apparently began in East Asia early in 1957, and by midyear it had circled the globe.

Influenza may affect individuals of all ages, though the highest incidence of the disease is among children and young adults. Influenza is generally more frequent during the colder months of the year. The influenza infection is transmitted from person to person through the respiratory tract, by such means as inhalation of infected droplets resulting from coughing and sneezing. As the virus particles gain entrance to the body, they selectively attack and destroy the ciliated epithelial cells that line the upper respiratory tract, bronchial tubes, and trachea. The incubation period of the disease is one to two days, after which the onset of symptoms is abrupt, with sudden and distinct chills, fatigue, and muscular aches. The temperature rises rapidly to from 101° to 104° F (38° to 40° C). A diffuse headache and severe muscular aches throughout the body are experienced, often accompanied by irritation or a sense of rawness in the throat. In three to four days the temperature begins to fall and the patient begins to recover. Symptoms associated with respiratory tract infection, such as coughing and nasal discharge, become more prominent and may be accompanied by lingering feelings of weakness and debility. Mortality from the disease is commonly low, although it varies in

different outbreaks. Death is caused, in most cases, by complications such as pneumonia or bronchitis, usually among older people who are weakened by other debilitating disorders.

The antiviral drug amantadine has a beneficial effect on cases of influenza involving the A virus type. Other than this, bed rest and the use of aspirin or other analgesics to control fever remain the standard treatment. Individual protection against influenza may be bolstered by injection of a vaccine of influenza viruses. These viruses are produced in chick embryos and rendered noninfective; standard commercial preparations in the United States ordinarily include the type B influenza virus and several of the A subtypes. Protection from one vaccination seldom lasts more than a year, and yearly vaccination may be recommended, particularly for those individuals who are unusually susceptible to influenza or whose weak condition could lead to serious complications in case of infection. Routine immunization in healthy people, however, is no longer generally recommended by the medical profession.

Influenza epidemics have a long history; the first clear description of one is that of the epidemic of 1610. The most severe outbreaks in modern times have been those of 1889–90 and 1918. The 1918 epidemic was the most destructive influenza outbreak in history; in fact, it ranks with the Black Death as one of the severest holocausts of disease ever encountered. It is estimated that 20,000,000 persons died of the disease in a few months and more than 50 times as many were sick. In India alone, 12,500,000 persons are believed to have perished, while in the United States, where mortality rates were much lower, about 550,000 died. Subsequent outbreaks of the disease have been much less severe, largely owing to the use of preventive vaccinations.

informal school, also called FREE SCHOOL, school in which the teaching system is based on an environment structured to encourage the child to become actively involved in the learning process. The informal school stresses individualized rather than group instruction, and children proceed from one step to another at their own rate of development. The school day is not divided into rigid timetables as in a traditional classroom. At the teacher's discretion and under his guidance, children are engaged individually or in small groups in a wide variety of activities for longer periods of time than the usual class meeting. Talking and moving about are not forbidden—in fact, physical activity and conversation are necessary to this type of learning.

In Great Britain the method has become common since the end of World War II. It is also widely used in the United States, where such schooling is known as open classroom.

information processing, the acquisition, recording, organization, retrieval, display, and dissemination of information. In recent years, the term has often been applied to computer-based operations specifically.

A brief treatment of information processing follows. For full treatment, *see* MACROPAEDIA: Information Processing and Information Systems.

During the past few centuries tremendous advances have been made in the human capability to record, store, and reproduce information, beginning with the invention of printing from movable type in 1450, followed by the development of photography and telephony, and culminating in the mass production of electronic digital computers in the latter half of the 20th century. New technologies for preserving and transmitting aural and visual information (*e.g.,* optical disc storage and fibre optics, respectively) have further enhanced information processing.

The high-speed digital computer, together with its peripheral equipment, provides an extremely efficient means of manipulating and modifying stored data. As a consequence, information systems based on such computers are able to carry out diverse tasks. They can, for example, perform scientific and engineering calculations, translate technical material from one natural language to another, conduct searches of bibliographic literature, provide tutorial instruction in various subjects, assist in design and manufacturing activities, or make decisions for solving complex nonnumerical problems (*e.g.,* those related to medical diagnosis or mineral exploration) with so-called expert software systems. Moreover, anything that can be done anywhere in the world with any computer system can be done at any operator's terminal, provided that the proper communications connections have been established and the computer data files and programs have been modified to permit general access from remote points.

All of these technological advances together have made information a new basic resource, ranking alongside material and energy resources in importance. There are, in fact, those who believe that control of information stores and processing facilities may well become more important than natural resources as a source of social and economic power.

information science, discipline that deals with the processes of storing and transferring information. It attempts to bring together concepts and methods from various disciplines such as library science, computer science, linguistics, cybernetics, and other technologies in order to develop techniques and devices to aid in the handling—that is, in the storage, control, and retrieval—of information.

A brief treatment of information science follows. For full treatment, *see* MACROPAEDIA: Information Processing and Information Systems.

The transfer of information through time requires the existence of some storage medium, which is designated as a document—hence the term documentation. Historically, "documentation" emerged as a distinct discipline in the early 20th century, paralleling the rise of empirical research, which was to provide its main source of subjects. The discipline grew in response to the growth of the periodical and journal as the prevalent media for scientific reports. Whereas books required control through cataloging and classification, periodicals required indexes and abstracts that would bring together for the researcher primary information originally published in divergent sources.

The roots of the discipline of information science lay in three post World War II developments: the Shannon-Weaver information theory model, Norbert Wiener's conception of the science of cybernetics, and rapid advances in the design and production of electronic computers. These innovations pointed to a new field of study in which many disciplines could be merged under the unifying idea of "information." After the Georgia Institute of Technology established the first formal information science program in 1962, the discipline quickly became entrenched at most major universities either as an independent field of study or as a specialty within such departments as library science, computer science, or engineering.

Of continuing interest to information scientists has been the creation of adequate systems of surrogates of documents necessary for retrieval and dissemination of information. These surrogates include descriptors (key words), indexes, abstracts, microcopies, etc. Another area of continuing interest has been classification systems.

Once the modern array of information storage systems—including computer, microform, and laser technology—has been fully developed, the primary attention of information scientists could shift from storage and retrieval per se to the management and manipulation of information. Research by information scientists in these areas has led to several important information management structures, including information analysis centres, in which data is stored, synthesized, analyzed, and distributed; data bases, in which source and reference materials are stored and processed in computerized systems and disseminated by telecommunication and computer links; and expert systems, in which artificial intelligence programs enable computers to mimic human decision-making processes as a means of solving complex and practical problems.

information theory, a mathematical representation of the conditions and parameters affecting the transmission and processing of information. The theory stems from pioneering work done by the American electrical engineer Claude E. Shannon, who published his seminal work in 1948. Since then, information theory has developed rapidly, affecting not only the design of communications systems but also such areas as automation, information science, psychology, linguistics, and thermodynamics.

A brief treatment of information theory follows. For full treatment, *see* MACROPAEDIA: Information Theory.

The basic elements of any general communications system include a source of information; a transmitting device that transforms the information, or "message," into a form suitable for transmission by a particular means; the means, or channel, over which the message is transmitted; a receiving device, which decodes the message back into some approximation of its original form; the destination or intended recipient of the message; and a source of noise (*i.e.,* interference or distortion), which changes the message in unpredictable ways during transmission. It is important to note that "information" as understood in information theory has nothing to do with any inherent meaning in a message; it is rather a degree of order, or non-randomness, that can be measured and treated mathematically much as mass or energy or other physical quantities are.

A mathematical characterization of the generalized communication system yields a number of important quantities, including the rate at which information is produced at the source, the capacity of the channel for handling information, and the average amount of information in a message of any particular type. To a large extent the techniques used with information theory are drawn from the mathematical science of probability. Estimates of the accuracy of a given transmission of information under known conditions of noise interference, for example, are probabilistic, as are the numerous approaches to encoding and decoding that have been developed to reduce uncertainty or error to minimal levels.

infrared astronomy, study of astronomical objects through observations of the infrared radiation they emit. Various types of celestial objects, including the planets of the solar system, stars, nebulae, and galaxies, give off energy at wavelengths in the infrared region of the electromagnetic spectrum (*i.e.,* from about one micrometre to one millimetre). The techniques of infrared astronomy enable investigators to examine many such objects that cannot otherwise be seen from the Earth because the light of optical wavelengths they emit is blocked by intervening dust particles.

Infrared astronomy originated in the early 1800s with the work of the English astronomer Sir William Herschel, who discovered the existence of infrared radiation while studying sunlight. The first systematic infrared observations of stellar objects were made by the

American astronomers W.W. Coblentz, Edison Pettit, and Seth B. Nicholson in the 1920s. Modern infrared techniques, such as the use of cryogenic detector systems (to eliminate obstruction by infrared radiation released by the detection equipment itself) and special interference filters for ground-based telescopes, were introduced during the early 1960s. By the end of the decade, Gerry Neugebauer and Robert Leighton of the United States had surveyed the sky at the relatively short infrared wavelength of 2.2 micrometres and identified approximately 20,000 sources in the northern hemispheric sky alone. Since that time, balloons, rockets, and spacecraft have been employed to make observations of infrared wavelengths from 35 to 350 micrometres. Radiation at such wavelengths is absorbed by water vapour in the atmosphere, and so telescopes and spectrographs have to be carried to high altitudes above most of the absorbing molecules. Specially instrumented high-flying aircraft such as the Kuiper Airborne Observatory (*q.v.*) have been designed to facilitate infrared observations near microwave frequencies.

In January 1983 the United States, in collaboration with the United Kingdom and The Netherlands, launched the Infrared Astronomical Satellite (IRAS), an unmanned orbiting observatory equipped with a 57-centimetre (22-inch) infrared telescope sensitive to wavelengths of 8 to 100 micrometres in the infrared spectrum. At these wavelengths, IRAS made a number of unexpected discoveries. The most significant of these were clouds of solid debris around Vega, Fomalhaut, and several other stars, the presence of which strongly suggests the formation of planetary systems similar to that of the Sun. Other important findings included various clouds of interstellar gas and dust where new stars are being formed and an object, designated 1983TB, thought to be the parent body for the swarm of meteoroids known as Geminids.

infrared radiation, that portion of the electromagnetic spectrum that extends from the long wavelength, or red, end of the visible-light range to the microwave range. Invisible to the eye, it can be detected as a sensation of warmth on the skin. The infrared range is usually divided into three regions: near infrared (nearest the visible spectrum), with wavelengths 0.78 to about 2.5 micrometres (a micrometre, or micron, is 10^{-6} metre); middle infrared, with wavelengths 2.5 to about 50 micrometres; and far infrared, with wavelengths 50 to 1,000 micrometres. Most of the radiation emitted by a moderately heated surface is infrared; it forms a continuous spectrum. Molecular excitation also produces copious infrared radiation but in a discrete spectrum of lines or bands.

infrared source, in astronomy, any of various celestial objects that radiate measurable quantities of energy in the infrared region of the electromagnetic spectrum. Such objects include the Sun and the planets, certain stars, nebulae, and galaxies. A number of known infrared sources can be observed at the wavelengths of visible light and in certain cases at radio and X-ray wavelengths as well.

The Sun emits roughly half its energy in the form of infrared rays, with the rest mainly as visible light. Its radiation heats up the planets and renders them bright infrared sources. Jupiter, Saturn, and Neptune also have their own internal heat source, which doubles their infrared brightness.

At short infrared wavelengths of about 2 micrometres, the brightest objects observed beyond the solar system are the large, cool red supergiant stars such as Betelgeuse in the constellation Orion. They are true infrared sources, but investigators have also detected stars emitting at these wavelengths that are not in fact cool. Such stellar objects are brilliant at all wavelengths and are naturally brightest in the visible or ultraviolet. The dust in the interstellar medium, however, blocks their radiation of shorter wavelengths, so that they can only be detected by their infrared emissions, which flow around the dust particles.

Most infrared sources that emit at wavelengths of 10 to 20 micrometres are clouds of dust warmed by neighbouring stars from the average ambient temperature of interstellar space (−270° C) to about room temperature. Such sources fall into two categories. One type consists of a shell of dust ejected from a very old supergiant. The other is a denser patch of dust that lies within a nebula from which stars are forming and is heated by adjacent newly born stars. The disk of the Milky Way Galaxy includes many such regions of active star formation. A notable example is the Orion Nebula, an HII region (one of ionized hydrogen) in the constellation Orion. Interestingly, this nebula is associated with one of the most curious infrared sources yet discovered, the so-called Becklin–Neugebauer object. Located in a giant molecular cloud behind the Orion Nebula, it radiates very intensely in the infrared but scarcely at all in the optical. Many investigators hypothesize that the object may be an incipient massive star.

Investigators have observed rapidly moving clouds of ionized gas near the nucleus of the Milky Way system at a wavelength of 10 micrometres. The velocities of these hot gaseous clouds strongly suggest the presence of a supermassive object, perhaps a black hole (*q.v.*), at the galactic centre. Strong infrared emissions also are evident at the centres of many external galaxies, notably spiral systems with active nuclei (*e.g.*, Seyfert galaxies). This has fueled speculation that the hot accretion disk that surrounds a black hole may be the source of the infrared radiation from such galaxies, as is the case of the Milky Way.

Infrared radiation of longer wavelength—about 100 micrometres—has been detected from dust diffusely spread throughout the Milky Way system. Measurements indicate that at least as much mass is present in this very cold dust as there is in the interstellar dust analyzed by scattered starlight in the visible portion of the spectrum. Depending on its ultimate mass, this large cold dust component could very well prove to constitute a fairly substantial portion of the "missing mass" of the Milky Way that astronomers have long sought.

infrasonics, vibrational or stress waves in elastic media, having a frequency below those of sound waves that can be detected by the human ear—*i.e.*, below 20 hertz. The range of frequencies extends down to geologic vibrations that complete one cycle in 100 seconds or longer.

A brief treatment of infrasonics follows. For full treatment, *see* MACROPAEDIA: Sound.

Naturally occurring infrasonic vibrations take the form of tidal motion or earth tremors. The monitoring of very small earth tremors using a seismograph has value as a means of providing early warning of volcanic activity or of serious earthquake shocks. Artificial tremors may be generated with underground explosions in order to identify and map underlying rock structures. With an array of seismic detectors, a computational form of holography may be achieved. The development of extremely sensitive detectors has provided a means of monitoring underground nuclear-explosion tests, thus contributing to the maintenance of the nuclear test ban treaty. Often associated with severe earthquakes are infrasonic disturbances of the atmosphere that may extend to 50 km (30 miles) above the Earth's surface. These waves can travel considerable distances around the globe.

Human perception of low-frequency sound waves propagating in air does not have a well-defined cutoff point. Above about 18 hertz sound waves appear to have tonality; below this frequency the individual compression waves may be distinguished. Driving an automobile with an open window may generate an infrasonic resonance. The sonic boom of supersonic aircraft contains significant levels of infrasound. In certain circumstances occupational exposure to infrasound may be severe: transformer rooms, compressor plants, and engine rooms may all produce levels that are extremely high and cause discomfort. The mechanisms by which infrasonics may be perceived by humans and their physiological effects are incompletely understood.

Inga Falls, rapids on the lower Congo (Zaire) River and site of one of the world's largest hydroelectric-dam projects, in western Zaire, about 25 miles (40 km) above the port of Matadi. At a sharp bend in the river between Sikila Island and the mouth of the Bundi River (a Congo River tributary), the Congo falls 315 feet (96 m) in 9 miles (14 km) and flows at a rate of about 1,500,000 cubic feet (43,000 cubic m) per second. The first phase of the hydroelectric project, completed in 1972, provides power for a uranium-enrichment facility at the site. The second phase, constructed in conjunction with a high-tension transmission line to Shaba region in southeastern Zaire and completed in 1979, was designed to supply electricity for Shaba's industries. The third and most ambitious phase was to involve blocking the river's flow and creating a large reservoir.

Ingalik, Athabascan-speaking Indian tribe of interior Alaska, in the basins of the upper Kuskokwim and lower Yukon rivers. Their region is mountainous, with both woodlands and tundra, and is fairly rich in fish, caribou, bear, moose, and other game on which the Ingalik subsisted—fish, fresh or dried, being central to their diet. Much of their culture was strongly influenced by Eskimo customs and technology: they wore parkas, trousers, and other Eskimo apparel; built semisubterranean sod houses similar to those of the western Eskimo; and used harpoons, spear throwers, and other weapons like those of the Eskimo. They favoured birch canoes over skin-covered boats.

The various groups of Ingalik lived in villages, some permanent and some seasonal, such as summer fish camps for one or two families and winter settlements for an entire group. The centre of village life was a large semisubterranean lodge called a kashim, which served primarily as a sweathouse for daily use by the men but which also served as a council chamber, entertainment club, funeral home, religious house for the rituals of medicine men or shamans, and a centre for various other public activities—largely for men only. Women remained in the several family dwellings. The Ingalik were much given to games and sports, ceremonies, and potlatches, the last being gift-giving festivities for marking such events as marriage and death and especially for acquiring prestige.

Although the Ingalik believed in a creator, in a devil, and in other worlds beyond the living, they were more concerned with a kind of supernatural spirit that pervaded all things animate and inanimate in the world. There were several ceremonies, taboos, and superstitions relating to animals and the hunt and to the care of tools and other economic items; survival and success required good relations with the things of nature.

Only a few hundred Ingalik remain, mostly assimilated to modern Western culture.

Ingathering (English festival): *see* Harvest Home.

Ingavi (Paraguay): *see* Mayor Pablo Lagerenza.

Inge I HARALDSSON, Inge also spelled INGI, byname INGE THE HUNCHBACK, Norwegian INGE KROKRYGG (b. 1135, Norway—d. Feb. 1, 1161, Norway), king of Norway (1136–61), who maintained his claim to the throne against the illegitimate sons of his father, the Norwegian king Harald IV Gille (reigned 1130–36), and represented the interests of the higher nobles and clergy in the second part of the Norwegian civil wars.

The only legitimate son of Harald IV, Inge succeeded to the throne as an infant jointly with his half brother, Sigurd II, at their father's death. The brothers and their supporters then defeated the forces of Sigurd Slembi and the former ruler Magnus IV the Blind, who were both pretenders to the throne. In 1142 Inge and Sigurd II were joined by Eystein, who also claimed to be a son of Harald IV and was given a third of his kingdom. Inge soon became the most powerful of the three rulers because of his strong ties with the higher nobles and clergy.

In 1150 Inge called a meeting at Bergen of all secular and religious leaders, anticipating the founding of an archbishopric at Nidaros (Trondheim) in 1152 by the English cardinal Nicholas Breakspear (later Pope Adrian IV). The archbishopric included five dioceses in Norway and six in Norwegian colonies, all previously under the jurisdiction of the archbishopric of Lund, Denmark.

In 1155 Inge's half brothers Sigurd II and Eystein plotted to overthrow him, but both were killed within the next two years by Inge's supporters. Between 1157 and 1161 Inge fought off the challenge of the pretender Haakon, an illegitimate son of Sigurd II (later king as Haakon II the Broadshouldered), in what is now called the second phase of the Norwegian civil wars. Their struggle, essentially a class conflict in which Inge represented the higher nobility and Haakon the freeholders, differed from the earlier phase of the civil war period, in which various pretenders competed for the throne. Inge was finally defeated and killed by Haakon's forces.

Inge, William (Motter) (b. May 3, 1913, Independence, Kan., U.S.—d. June 10, 1973, Hollywood Hills, Calif.), American playwright best known for his plays *Come Back, Little Sheba* (1950; filmed 1952); *Picnic* (1953; filmed 1956), for which he won a Pulitzer Prize; and *Bus Stop* (1955; filmed 1956).

Inge was educated at the University of Kansas at Lawrence and at the George Peabody College for Teachers in Nashville, Tenn. He taught school from 1937 to 1949, also serving as drama editor of the *Star-Times* in St. Louis, Mo., from 1943 to 1946. His first play, *Farther Off from Heaven* (1947), was produced in Dallas, Texas, at the recommendation of Tennessee Williams, to whom Inge had sent the script; 10 years later it was revised for Broadway as *The Dark at the Top of the Stairs* (filmed 1960).

Inge was one of the first American dramatists to deal with the quality of life in the small towns of the Midwest, and he achieved notable success throughout the 1950s. His later plays—*A Loss of Roses* (1960; filmed as *The Stripper,* 1963), *Natural Affection* (1963), *Where's Daddy?* (1966), and *The Last Pad* (1970)—were less successful. Inge received an Academy Award for his original screenplay *Splendor in the Grass* (1961). His shorter works included *Glory in the Flower* (1958), *To Bobolink, for Her Spirit* (1962), *The Boy in the Basement* (1962), and *Bus Riley's Back in Town* (1962).

Inge, William Ralph (b. June 6, 1860, Crayke, Yorkshire, Eng.—d. Feb. 26, 1954, Wallingford, Berkshire), British divine, Christian Platonist, and dean of St. Paul's Cathedral, London. He was noted for his keen intellect and for his pessimistic views, which earned him the title "gloomy dean."

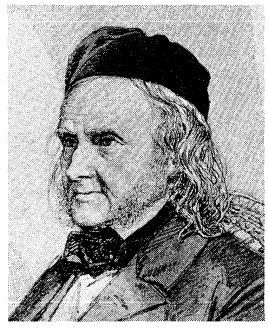
Inge was educated at Eton and at King's College, Cambridge. He became assistant master at Eton (1884–88), a fellow of King's College (1886–88), a tutor of Latin and Greek and fellow of Hertford College, Oxford (1889–1904), and Lady Margaret professor of divinity and fellow of Jesus College, Cambridge (1907–11). By 1911, when appointed dean of St. Paul's, he had already written several books, including *Christian Mysticism* (1899), *Truth and Falsehood in Religion* (1906), and *Faith* (1909), which were to become theological classics. At St. Paul's, where he remained until his retirement in 1934, he became a national figure, and for 25 years he contributed to the London *Evening Standard.*

Of Inge's dozens of books, probably the most important was *The Philosophy of Plotinus* (1918), a collection of his lectures. *Outspoken Essays,* 2 vol. (1919 and 1922), and *Lay Thoughts of a Dean,* 2 vol. (1926 and 1931), are also notable.

BIBLIOGRAPHY. Biographies include Adam Fox, *Dean Inge* (1960); and Robert M. Helm, *The Gloomy Dean* (1962).

Ingemann, Bernhard Severin (b. May 28, 1789, Torkilstrup, Den.—d. Feb. 24, 1862, Sorø), historical novelist and poet whose works glorifying Denmark's medieval past were popular for generations. Most of Ingemann's works have not won enduring acclaim, but his simple *Morgen og aftensange* (1837–39; "Morning and Evening Songs") and his patriotic verse cycle *Holger Danske* (1837; "Holger the Dane") are much admired in Denmark.

Ingemann studied at the University of Copenhagen, traveled in Germany and Italy, and later settled at Sorø Academy as a teacher (1822) and director (from 1846). There he produced a series of six historical novels, of which the first, *Valdemar den store og hans Mænd* (1824; "Waldemar the Great and his Men"), and the last, *Dronning Margrethe*



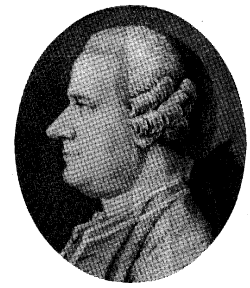
Ingemann, detail of a pencil and watercolour drawing by H. Olrik, 1860

By courtesy of the Nationalhistoriske Museum paa Frederiksborg, Denmark

(1836; "Queen Margrethe"), are in verse, the other four in prose. He is also the author of a hymn, "Through the Night of Doubt and Sorrow," well-known in English translation.

Ingenhousz, Jan (b. Dec. 8, 1730, Breda, Neth.—d. Sept. 7, 1799, Bowood, Wiltshire, Eng.), Dutch-born British physician and scientist who is best known for his discovery of the process of photosynthesis, by which green plants in sunlight absorb carbon dioxide and release oxygen.

As a physician in London (1765–68), Ingenhousz was an early proponent of variolation, or the inoculation against smallpox through the use of live, unmodified virus taken from patients with mild cases of the disease. In 1768 he traveled to Vienna to inoculate the family of the Austrian empress Maria Theresa and subsequently served as court physician. Returning to London in 1779, he published the results of an ingenious study on the chemical effects of plant physiology, *Experiments Upon Vegetables, Discovering Their Great Power of Purifying the Common Air in Sunshine, and of Injuring It in the Shade and at Night.* The English chemist Joseph Priestley had already shown that plants restore to the air a property



Ingenhousz, detail of an engraving

BBC Hulton Picture Library

necessary to—but destroyed by—animal life. Ingenhousz found that (1) light is necessary for this restoration (photosynthesis); (2) only the green parts of the plant actually perform photosynthesis; and (3) all living parts of the plant "damage" the air (respire), but the extent of air restoration by a green plant far exceeds its damaging effect.

A man of varied scientific interests, Ingenhousz also invented an improved apparatus for generating large amounts of static electricity (1766) and made the first quantitative measurements of heat conduction in metal rods (1789).

Ingersoll, Robert G(reen) (b. Aug. 11, 1833, Dresden, N.Y., U.S.—d. July 21, 1899, Dobbs Ferry, N.Y.), American politician and orator known as "the great agnostic" who popularized the higher criticism of the Bible, as well as a humanistic philosophy and a scientific rationalism.

Although he had little formal education, Ingersoll was admitted to the Illinois bar in 1854, and he subsequently enjoyed a lucrative law practice in Peoria, Ill., New York City, and Washington, D.C. After service in the American Civil War (1861–65), he became a staunch Republican, serving as Illinois attorney general (1867–69) and as a party spokesman in presidential campaigns. In spite of his outstanding contribution to his political party, his unorthodox religious views deterred Republican administrations from appointing him to the Cabinet or to the diplomatic posts that he desired. Nationally known as a lecturer, Ingersoll was in great demand and received as much as $3,500 for a single evening's performance, in which with brilliant oratory and wit he sought to expose the orthodox superstitions of the times.

Ingersoll's principal lectures and speeches, published as *Some Mistakes of Moses* (1879) and *Why I Am Agnostic* (1896), are found in *The Works of Robert G. Ingersoll,* 12 vol. (1902), edited by Clinton P. Farrell.

Ingham, town, northeastern Queensland, Australia, 19 miles (31 km) upstream from the mouth of the Herbert River. Founded in 1864, it was gazetted a shire in 1879. On a rail line and the Bruce Highway from Brisbane (745 miles [1,199 km] southeast), the town serves important sugarcane plantations, pioneered in the 1870s by William Ingham, for whom the town is named. The area also yields tobacco, beef, and timber. Pop. (1986) 5,202.

Ingi I (Norwegian king): *see* Inge I.

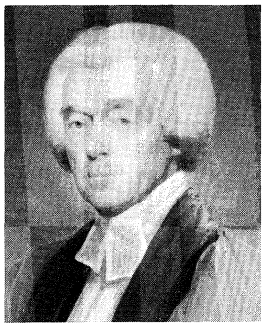
inglenook, wooden seat or settle built into the space on either side of the wide fireplaces common in 17th-century English houses and cottages. The word is of Scottish origin, "ingle" meaning a housefire burning on a hearth. This type of built-in furniture fell out of favour

upon the introduction of more sophisticated flues, which allowed for a smaller fire-burning area, but it was reintroduced with the revival of cottage-style architecture in the late 19th century, though in this context it was a deliberate archaism.

Inglewood, city, Los Angeles County, California, U.S., southwest of downtown Los Angeles. Settled by Daniel Freeman in 1873, it was laid out by the Centinela-Inglewood Land Company in 1887 and became a poultry-raising centre. It developed with the Los Angeles metropolitan area and is the site of the Hollywood Park racetrack. La Casa de la Centinela Adobe (built in 1836) is a historical landmark. Los Angeles International Airport is adjacent (southwest). Northrop University was founded there in 1942 as an aeronautical institute, and Western States College of Engineering was established there in 1946 as Electronic Technical Institute. Inc. city, 1908. Pop. (1980) 94,245.

Inglis, Charles (b. 1734, Glencolumbkille, County Donegal, Ire.—d. Feb. 24, 1816, near Halifax, Nova Scotia), Canadian clergyman and educator who became the first Anglican bishop of Nova Scotia.

Inglis went to North America and became a master in a church school in Lancaster, Pa., in 1757. In 1758, in England, he was ordained deacon and priest. Sent to Dover, Del., he undertook evangelical work among the Mohawk Indians. In 1765 he was appointed assistant



Inglis, detail of an oil painting by Robert Field, 1810; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

to the rector of Trinity Church in New York City. Because he supported the British during the U.S. War of Independence (1775–83), his church was burned and his property confiscated; in 1783 he went to Nova Scotia.

In 1787 Inglis was consecrated the first Anglican bishop of Nova Scotia and its dependencies—Newfoundland, Prince Edward Island, Quebec, and Bermuda. The church academy he founded at Windsor, Nova Scotia, in 1789 was granted a royal charter in 1802 and later became the University of King's College (since 1923 in Halifax). In 1796 he retired to a farm near Halifax to write, and in 1809 he was made a member of the council of Nova Scotia.

Ingolstadt, city, Bavaria *Land* (state), southern Germany, on the Danube and Schutter rivers. First mentioned in 806 as a crown estate, villa Ingoldestat, it was chartered in 1250 and became a ducal seat in 1392. The duchy of Bavaria-Ingolstadt passed to the Bavaria-Landshut line in 1447 and to the Bavaria-Munich line of the Wittelsbachs in 1503. The Bavarian university, important in the German Humanist movement and in the Counter-Reformation, was founded in Ingolstadt in 1472 but was moved to Landshut in 1802 and to Munich in 1826. A garrison and fortress town in the 19th century, the city was damaged considerably in World War II but, with reconstruction, has expanded rapidly.

The old town is partly surrounded by 14th-century walls, including the picturesque Cross Gate, and there are many medieval houses and churches. Notable landmarks are the massive brick late Gothic Cathedral of Our Lady (1425–1500), the ducal castle (1420), housing a military museum, the former university buildings, and the late Baroque Church of Maria de Victoria (1732–36). A ring of parks separates the old town from the surrounding industrial and residential districts.

Ingolstadt is a centre for heavy industry, rail traffic, and petroleum refining. Oil pipelines link it to Genoa and Trieste (Italy) and Marseilles (France). Pop. (1989 est.) 97,702.

ingot, mass of metal cast into a size and shape such as a bar, plate, or sheet convenient to store, transport, and work into a semifinished or finished product; or a mold in which metal is so cast. Gold, silver, and steel, particularly, are cast into ingots for further processing.

Steel ingots range in size from small rectangular blocks weighing a few pounds to huge, tapered, octagonal masses weighing more than 500 tons.

Tin ingots are the starting material for many products, whether the tin is to be alloyed with other metals, converted to other physical forms, applied to other metal surfaces, or converted to chemical compounds.

Ingram, John Kells (b. July 7, 1823, Temple Carne, County Donegal, Ire.—d. May 1, 1907, Dublin), Irish historical economist who also achieved fame as a scholar and poet.

Ingram graduated from Trinity College (Dublin) in 1843. He showed considerable promise in both mathematics and classics and achieved early popularity as a poet. In 1852 he became professor of oratory at Trinity College and wrote extensively on Shakespeare's plays. He then became Regius Professor of Greek (1866) and librarian (1879).

Economics had always been one of his main interests, and in 1847 he helped to found the Dublin Statistical Society. His early writings dealt mainly with the Poor Law, which in theory was to provide relief for the poor but in reality did little to alleviate the distress in Ireland. Under the influence of the French sociologist Auguste Comte, who greatly affected his religious beliefs also, he rejected classical economic methodology, which attempts to isolate economic phenomena, and instead sought to build a unified social science along Comtean lines, in which laws of development would emerge. His most famous essay on this topic is "Present Position and Prospects of Political Economy" (1878).

Despite his own mathematical talents, he belittled the use of deductive and mathematical procedures in economics. His work in the history of economic thought later influenced the economist Richard T. Ely.

Ingres, Jean-Auguste-Dominique (b. Aug. 29, 1780, Montauban, Fr.—d. Jan. 14, 1867, Paris), leader of the French tradition of Neoclassical painting after the death of Jacques-Louis David. Ingres's cool, crystalline, carefully balanced works were the antithesis of the contemporary Romantic school. Particularly notable are his portraits (*e.g.,* "Mme d'Haussonville," 1845). His obsession with line and contour (as in "The Grand Odalisque," 1819), however, reveals a sensuality unique to Neoclassicism.

Early life and works. Ingres's rise from his modest provincial beginnings to his eminence as a life senator and holder of innumerable honours was slow and fitful, yet from the beginning he was sure of himself, his talents, and his chosen path. His father, a decorative sculptor of considerable talent, a modest portrait painter, a musician, and a member of the local learned academy, was his earliest instructor in the arts. Ingres's actual schooling began when he was six. He was then sent to the Brothers of Christian Doctrine (the Marists). Unfortunately, the disruptions of the French Revolution closed that school four years later. Ingres's formal education was over. The abrupt ending left a lasting mark. He spent his lifetime in never-ending study, in an attempt to secure the learning he desired.

In 1791 he was sent by his father, a native of Toulouse, to artist friends in that city. The youthful Ingres was entered in the Academy of Toulouse to study drawing, figure painting, and landscape. In his first year, "Ingres fils," as he signed some early portrait drawings made during his Toulouse stay, won third prize in figure drawing. For nearly three years, from the age of 13 to 16, he supported himself, occupying the post of second violin in the orchestra of the Capital (the opera). Ingres's violin remained with him until his death, and he continued to play it for pleasure.

In the late summer of 1797 he set out for Paris, where he was received by the leading Neoclassical painter, Jacques-Louis David, as a student in his famous and lively atelier. Two years later Ingres was accepted in the department of painting at the École des Beaux-Arts. In February 1800 he won the school's first prize for a torso and, in October, the second prize in the Prix de Rome. He and his artist contemporaries were exempted that year from military service. A year later he won the first Prix de Rome with his painting "The Envoys from Agamemnon." The French treasury, however, strained by Bonaparte's wars, was then unable to pay the prize. Instead they provided him with a studio in the former convent of the Capuchins and a modest allowance. In 1804 he signed the "Bonaparte as First Consul," commissioned for the city of Liège (now in Belgium), and painted a portrait of his father (Montauban) and his own self-portrait (Chantilly, Fr.). The following year he completed the three portraits of the Rivière family—father, mother, and daughter—and a year later the curiously hieratic and powerful "Napoleon I on the Imperial Throne."

Mature life and works. He had become engaged to Anne-Marie-Julie Forestier, the daughter of a judge, who was also a student in David's atelier. When the money for his Rome sojourn finally came through, in the late summer of 1806, he immediately left Paris, arriving in Rome in October. The day after Christmas he was given a studio in the small pavilion of San Gaetano at the edge of the Villa Medici property on the Pincian Hill, a studio with wonderful views over Rome and the villa's extensive gardens. His paintings shown in the Salon of 1806, an exhibition



Ingres, self-portrait, oil on canvas, *c.* 1800; in the Musée Conde, Chantilly, Fr.

Giraudon—Art Resource/EB Inc.

that opened after his departure, were severely criticized as "bizarre" and "revolutionary," criticism that he received with bitterness; but, undeterred by the criticism, he passed four productive years at the villa, fulfilling his obligations by sending the required number of paintings to Paris, among them the famous "Valpinçon Bather."

At the end of his term as a *pensionnaire,* instead of returning to France, he moved to a studio nearby in the Via Gregoriana. His engagement to Forestier had been broken in 1807, when he courteously but firmly refused her father's command that he return to Paris immediately. Through his friend the engraver Jacques-Edouard Gatteaux, Ingres became acquainted with the French officials ruling occupied Rome. Several of them, such as Charles-François Marcotte, not only gave him commissions but became lifelong friends. In the convent Sta. Trinità dei Monti he painted for the French authorities two large historical canvases, "Romulus Victorious over Acron" and "Virgil Reading the Aeneid" (version revised later). The Roman years were the ones in which he supplemented his meagre income by making the majority of the pencil portrait drawings that are so much sought after and admired today, although they were scorned by their author as potboilers. An almost uncanny control of delicate yet firm line, an unending inventiveness in posing his sitters in a manner to reveal personality through shrewdly observed characteristic gestures, combined with a capacity to record not only an exact likeness but also the precise social rank and even the nationality of the sitters, make this category of Ingres's drawings unique.

In 1813 he had married Madeleine Chapelle, a milliner of Chéret, whom he had never met before her arrival in Italy. She came to Rome at Ingres's request and upon the suggestion of her cousin, Mme de Lauréal, who was a friend of the artist. The marriage, although childless after the death of their firstborn, was one of mutual felicity.

With Napoleon's downfall in 1815, Ingres was left without official orders for paintings, until the new ambassador, some months later, commissioned the "Christ Giving the Keys to St. Peter" (Montauban). During 1816 and 1817 Ingres drew the portraits of many English visitors to Rome. His entries in the Salon of 1819, "The Grand Odalisque" (Louvre, Paris), "Philip V Decorating Marshall Berwick" (Duke of Alba, Madrid), and "Roger Delivering Angelica" (Louvre), were as severely attacked as his earlier work had been. Grieved and unhappy, the artist accepted the invitation of his former studio mate and musical companion, the sculptor Lorenzo Bartolini, and moved to Florence, where he remained from 1820 to 1824. Orders from friends for painted as well as drawn portraits and the commission for a large altarpiece, the "Vow of Louis XIII," for the cathedral of Montauban, as well as his work on a number of smaller historical paintings, kept him busy. In the autumn of 1824, he left Florence, taking the large "Vow of Louis XIII," rolled, with him to Paris. He was so uncertain of his welcome that he left his devoted wife behind in Florence. To his surprise the painting was a tremendous success. Charles X personally decorated him with the Cross of the Legion of Honor at the Salon's close. In June of the following year he was elected a member of the Académie des Beaux-Arts, and, at the year's end, he opened a studio for students. Soon he had more than 100 pupils, among them his future biographer Eugène-Emmanuel Amaury-Duval. Stern, exacting, touchy, and apparently humourless, Ingres yet had qualities that held his followers to him in bonds of friendship and admiration broken only by death.

In 1827, as a member of the Académie des Beaux-Arts, he and his wife were given an apartment at the Institut de France. The same year he finished and saw put in place, in the Louvre, the ambitious and complicated "Apotheosis of Homer." In 1829 he was named professor at the École des Beaux-Arts, and in 1833 he served as vice president and in 1834 as president; but, when, toward the close of that year, his Salon offering, "The Martyrdom of St. Symphorien," was coolly received, the unhappy artist asked for and received an appointment as director of the French Academy in Rome. He arrived in Rome in January 1835, jubilantly received by the students and staff. During his directorship (1835–41) he restored and enlarged the villa, increased the library, and established a course in archaeology. He also took part in many concerts, more than once accompanying on his violin the young piano-playing Charles Gounod, then one of the *pensionnaires.* His portrait drawing of the youthful composer is in the Art Institute of Chicago. Before his return to Paris in 1841, he completed for Marcotte the "Odalisque with Slave," for the Duc d'Orléans the "Antiochus and Stratonice' (1840; Musée Conde, Chantilly, Fr.), and for Tsar Nicholas I "The Virgin with the Host" (1841; State Pushkin Museum of Fine Arts, Moscow).

Late life and works. His return to Paris was a triumph. It included a large banquet in his honour, an invitation to visit Louis-Philippe at Versailles and Neuilly, and a pass for life to the Comédie-Française, which he proudly used for years. His portrait of the Duc d'Orléans was completed in 1842, two months before the death of the Duc, following a carriage accident. The next year Ingres began work for the Duc de Luynes at Dampierre on a great decorative scheme of two allegorical panels, "The Golden Age" and "The Iron Age." The paintings were still unfinished when, in July 1849, Mme Ingres died from a blood ailment. The despairing artist could not bring himself to return alone to Dampierre to complete the commission, so in 1850 the Duc de Luynes released him from the agreement. (A reduced replica of "The Golden Age," signed and dated 1862, is in the Fogg Art Museum, Cambridge, Mass.) A year later, he resigned from the École des Beaux-Arts.

In the spring of 1852, on the advice of friends, he married the 43-year-old Delphine Ramel, a relative of his old friend Marcotte. Like his first marriage, the second was also happy. (Three portrait drawings depicting Delphine [1855], her father [1852], and her mother [1852] are in the Fogg Art Museum.) In 1853 he received the commission for an "Apotheosis of Napoleon I" for the ceiling of the Emperor's salon in the Hôtel de Ville. The Emperor, the Empress, and their entourage came to Ingres's studio a year later to view the completed work (destroyed in May 1871, with Delacroix's "Peace," in the fire of the Commune). During the late 1840s and 1850s, Ingres painted an impressive number of superb portraits of men and women, as well as his "Self-Portrait" (1858) for the Uffizi (variant of 1859 in the Fogg Art Museum). In 1862 he was appointed senator (some years previously he had been raised to the grade of grand Officer of the Legion of Honor), and in 1865 he was made a member of the Belgian Royal Academy of Fine Arts.

Although he never knew Greek and had only rudimentary Latin, he was, through translations, as intimately familiar with the works of his heroes of antiquity, the poets Homer and Virgil, as he was with the paintings of his idol, Raphael. His steady, earnest, private study and his warm friendships with such learned men as the archaeologists Quatremère de Quincy and Désiré Raoul-Rochette more than filled the lacunae of his early education. Present-day scholars have only recently begun to uncover the allusions, allegories, and symbols of such paintings as the "Napoleon I on the Imperial Throne," the "Stratonice," and the "Virgil Reading the Aeneid." He was still studying the old masters at the age of 87. His last drawing, a tracing after a photograph of a composition by the Florentine painter Giotto de Bondone, was made a week before his death.

Ingres bequeathed to Montauban, his native city, the contents of his studio. In addition to about 4,000 drawings (the studies, sketches, and working drawings of a lifetime), the bequest included such paintings as the coldly classical "Jesus Among the Doctors," finished in 1862 but still in his studio when he died, and the "Dream of Ossian" (signed and dated 1813), which he bought back in 1835 with the idea of reworking the painting; also included were the early oil studies of the nude and two of his three known small landscapes in circular form, made in Rome in 1807, as well as the reference library he had assembled for his own use, the paintings he had collected, his *cahiers,* or notebooks, the little wooden models for his classical structures, and his famous violin. All of this is now housed in the Musée Ingres.

Assessment. For the second third of the 19th century, Ingres was a champion of line and of firm contour, of subtly graded, clear colour, and of carefully balanced composition. He viewed with contempt the dramatic chiaroscuro (treatment of light), the turbulent movement, and the tense emotional context of his chief enemy, the Romantic painter Delacroix.

Time has dimmed the acrimony of the quarrels of his epoch and made clearer the quality of his genuine, if still curiously troubling, genius. His position as one of the great masters in the Western tradition is now secure, and his considerable influence upon August Renoir, and Pablo Picasso, is acknowledged.

(Ag.M.)

MAJOR WORKS. "The Envoys from Agamemnon" (1801; École des Beaux-Arts, Paris); "Bonaparte as First Consul" (1804; Musée des Beaux-Arts, Liège, Belg.); "Monsieur Philibert Rivière" (1805; Louvre, Paris); "Mme Philibert Rivière" (1805; Louvre); "Mlle Rivière" (1805; Louvre); "Napoleon I on the Imperial Throne" (1806; Musée de l'Armée, Paris); "François-Marcus Granet" (*c.* 1806; Musée Granet, Aix-en-Provence, Fr.); "Valpinçon Bather" (1808; Louvre); "Oedipus and the Sphinx" (1808; Louvre); "Monsieur Marcotte" (1810; National Gallery of Art, Washington, D.C.); "Romulus Victorious over Acron" (1812; École des Beaux-Arts, Paris); "Virgil Reading the Aeneid" (*c.* 1812; Musée des Augustins, Toulouse, Fr.); "Roger Delivering Angelica" (1819; Louvre); "Paolo and Francesca" (1819; Musée des Beaux-Arts, Angers, Fr.); "The Sistine Chapel" (1820; Louvre); "Count Gouriev" (1821; Hermitage, Leningrad); "Monsieur Leblanc" (1823; Metropolitan Museum of Art, New York City); "Mme Leblanc" (1823; Metropolitan Museum of Art); "Vow of Louis XIII" (1824; Cathedral, Montauban, Fr.); "The Apotheosis of Homer" (1827; Louvre); "Monsieur Louis-François Bertin" (1832; Louvre); "The Martyrdom of St. Symphorien" (1834; Cathedral, Autun, Fr.); "Odalisque with Slave" (1839; Fogg Art Museum, Cambridge, Mass.); "Duc d'Orléans" (1842; Count of Paris, Louveciennes, Fr.); "Mme d'Haussonville" (1845; Frick Collection, New York City); "Mme Reiset" (1846; Fogg Art Museum); "Mme Moitessier Seated" (1856; National Gallery, London); "La Source" (1856; Louvre); "Self-Portrait, Aged 79" (1859; Fogg Art Museum); "The Turkish Bath" (1862; Louvre).

Drawings. "The Family of Lucien Bonaparte" (1815; Fogg Art Museum); "Study of Horseman for St. Symphorien" (1827; Nelson Gallery and Atkins Museum of Fine Arts, Kansas City, Mo.); "Mme Désiré Raoul-Rochette" (1830; Cleveland Museum of Art); "Charles Gounod" (1841; Art Institute of Chicago); "Portrait of Monsieur Étienne-Jean Delécluze" (1856; Fogg Art Museum).

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Art, 1926), is an adequate biography. Walter Pach, *Ingres* (1939, reprinted 1973), is an artist's appreciative interpretation. The standard reference work (in English) on the paintings is Georges Wildenstein, *Ingres* (1954). Robert Rosenblum, *Jean-Auguste-Dominique Ingres* (1967), reissued 1985), is a lively, original, and perceptive stylistic analysis of the most important paintings, with illustrations. Two useful exhibition catalogs are Agnes Mongan and Hans Naef, *Ingres Centennial Exhibition, 1867–1967* (1967), with critical text on each illustration and an appendix on the artist's drawing technique; and Patricia Condon, *Ingres,* in *Pursuit of Perfection* (1983), which includes illustrated essays on his methods.

ingress, in astronomy, the apparent entrance of a smaller body upon the disk of a larger one as the smaller passes between the larger and the observer—*e.g.,* the entrance of a satellite or its shadow on the disk of a planet. The term is also applied to the Moon's entrance into the Earth's shadow at the start of a lunar eclipse and to the Sun's entrance into a zodiacal constellation.

Inguri Dam, one of the world's highest arch dams (completed 1980), located on the Inguri River near the point at which the river leaves the Caucasus Mountains on its way to the Black Sea, Georgian S.S.R. It is a huge 892-foot- (272-metre-) tall double-curvature arch dam with a crest length of 2,231 feet (680 m). The dam was built of interlocking stacks of concrete monoliths laid over reinforced limestone bedrock. The five-unit power plant associated with the dam has a planned power capacity of 1,600 megawatts.

Ingvar (Kievan prince): *see* Igor.

INH (drug): *see* isoniazid.

inhalation therapy: *see* respiratory therapy.

Inhambane, town, southeastern Mozambique, eastern Africa. The town is a commercial seaport on Inhambane Bay, an inlet of the Mozambique Channel (Indian Ocean). It is a market centre, and industry consists mainly in the processing of cashew nuts.

The surrounding region, with its subtropical climate and its physiography of littoral lowland, marshy rivers, and small lakes provides suitable conditions for rice production. Cashew trees and mafura trees (used for soap production) are commercially exploited. South of the Save River, grasses abound and cattle are raised by the Tsonga people, the dominant ethnic group in the region. The Chopi, another ethnic group, live primarily along the coast. Apart from rice and cashew nuts, the principal agricultural products of the region are copra, beans, and corn (maize). Pop. (1986 est.) 64,274.

inheritance, also called SUCCESSION, the devolution of property on an heir or heirs upon the death of its owner. The term inheritance also designates the property itself.

A brief treatment of the law of inheritance follows. For full treatment, *see* MACROPAEDIA: Inheritance and Succession.

The laws of inheritance are a body of principles and regulations governing the means by which assets and liabilities may be transferred, after death, to designated successors to the decedent's estate. In civil-law countries this area of law is referred to as law of succession, while in the Anglo-American system it is more commonly known as probate law, law of decedents' estates, or, more generally, law of inheritance.

The concept of inheritance depends upon a common acceptance of the notion of private ownership of goods and property. In early societies a dead man's relics were buried with him as a ritual practice or apportioned to relatives and other tribesmen. Under many systems, including some contemporary socialist governments, land is considered communal property, and rights to it are redistributed, rather than bequeathed, upon the death of a community member.

A will, sometimes called a testament, refers either to the actual process by which the posthumous apportionment of an estate is legally specified or to the document that serves as an authorized record of it. Though an oral will is acceptable under limited circumstances, the more common written form is either holographic—written entirely in the testator's hand and unwitnessed—or printed or typed and attested to by witnesses who are not beneficiaries or by a notary. A will whose execution meets all formal legal standards cannot be invalidated unless it is proven that the testator was coerced into making it or was mentally incompetent when he made it. A will can be revoked before the testator's death by destroying the document itself or by replacing it with a revised version.

Prior to the evolution of the will as a legal instrument of testation, the course of inheritance could be directed through a mock sale of the estate to a third party, to be distributed as specified following the seller's death—a common Roman practice until the 1st century BC. In medieval continental Europe the church was instrumental in maintaining testamentary inheritance, though the practice was not permanently established throughout Europe until the mid-16th century. Freedom to bequeath by will has traditionally been limited in order to protect beneficiaries from unreasonable conditions of succession and to prevent complete and unjustified disinheritance of surviving dependents. In many countries, though not all, this is provided for by the indefeasible share system, which specifies a minimum portion of the estate that must be assigned to the surviving spouse and, often, to the progeny as well. In the United States, common-law states allow the spouse to take action against the will, guaranteeing that spouse a specific percentage of the property.

The practice of primogeniture, in regard to the passing of real property to a single heir, dominated English inheritance law for most of its history. Because this system was commonly used by the aristocracy as a means of maintaining family estates intact, the institution of entails was established, which prohibited the distribution or other disposal of real property by the heir; thus the land would stay within the family. The inflexibility and economic inefficiency of this practice in modern times resulted in its complete collapse.

Intestacy laws, which govern the succession of estates whose distribution is not directed by a will, universally view kinship between the decedent and the beneficiary as a primary consideration. The Roman system codified by the emperor Justinian, a strong influence on later English law, followed a hierarchy of successors that began with the decedent's offspring and continued from his ascendants to full-blood, then half-blood siblings; English law provided more substantially for the surviving spouse and abandoned the distinction between full- and half-blood siblings. Recent trends in Anglo-American common-law practice have deemphasized traditional concerns with strictly familial succession and have for the most part ceased to distinguish between legitimate and illegitimate offspring as legal heirs.

The regulations governing the succession of a decedent's debts along with his estate are referred to generally as laws of transfer. Under the civil-law system that prevails in much of continental Europe, rightful heirs may decline succession to an estate if its assets are not sufficient to cover its liabilities: in the event of an heir's acceptance, responsibility for inherited debts is limited to the value of the estate. Under the system presently in use in England, a personal representative specified in the will is granted responsibility for its fulfillment by the probate division of the High Court, while in the United States the administrator of the will is appointed by the probate court and is authorized to act only under its close scrutiny. As a result of the enactment of the Uniform Probate Code of 1969, some of the formalities of court supervision can be eliminated by selecting one of several procedures suited for inheritance cases of varying degrees of complexity.

inheritance tax, levy on the property accruing to each beneficiary of the estate of a deceased person. It is usually calculated by reference to the amount received and the relationship (if any) of the beneficiary to the deceased. In some systems the value of the property already owned by the beneficiary also enters into the calculation. Inheritance tax may be more difficult to administer than estate tax because the value passing to each beneficiary must be fixed, and this often requires complex actuarial calculations.

Inheritance taxes are one of the oldest forms of taxation, dating back to the Roman Empire, which levied a one-twentieth-portion tax on inherited property in order to pay pensions of veteran soldiers. The basis of the modern inheritance tax, however, was established during the Middle Ages in the feudal arrangement whereby all land and property was ultimately owned by the sovereign, whose permission was required to transfer any property upon death of the owner. If there were no direct descendants, relatives of the deceased could obtain the property through payment of a "relief." In many European countries, including England, The Netherlands, Spain, and Portugal, modern inheritance taxes can be traced back directly to these "reliefs."

In the United States, inheritance taxes have always been collected by the individual states, while the federal government has imposed an estate tax. The first state inheritance tax was imposed by Pennsylvania in 1826. Since then, state inheritance taxes have grown considerably, although some moves toward reduction have been made in recent years.

Opponents of inheritance taxes claim that they hurt business incentives, reduce savings, and are an attachment against the nation's capital. Proponents argue that the tax is small and occurs only once, reduces savings much less than income taxes of equal yield, and is a useful tool for redistributing wealth. *Compare* estate tax.

inhibition, in enzymology, a phenomenon in which a compound, called an inhibitor, in most cases similar in structure to the substance (substrate) upon which an enzyme acts to form a product, interacts with the enzyme so that the resulting complex either cannot undergo the usual reaction or cannot form the usual product. The inhibitor may function by combining with the enzyme at the site at which the substrate usually combines (competitive inhibition) or at some other site (noncompetitive inhibition). In the latter, the inhibitor does not prevent binding of the substrate to the enzyme but sufficiently changes the shape of the site at which catalytic activity occurs so as to prevent it.

inhibition, in psychology, conscious or unconscious constraint or curtailment of a process or behaviour, especially of impulses or desires. Inhibition serves necessary social functions, abating or preventing certain impulses from being acted on (*e.g.,* the desire to hit someone in the heat of anger) and enabling the delay of gratification from pleasurable activities. Conscious inhibition is a common occurrence in daily life and is present whenever two conflicting desires are experienced (*e.g.,* the desire to eat a rich dessert versus the desire to lose weight).

Psychoanalytic theory views inhibition as a largely unconscious mechanism that mediates between the superego (the conscience) and the id (primitive desires). Taboos, such as those against incest or murder, are those socially imposed inhibitions which are raised to the level of unwritten laws.

An extreme lack of inhibition may be antisocial and a symptom of certain mental disorders, particularly behaviour disorders, sociopathic personality disorders, and schizophrenic disorders. Conversely, too much inhibition can be personally destructive, resulting in the neurotic inability to feel or express certain emotions, or in sexual frigidity or impotence.

The ingestion of alcohol and certain drugs, particularly sedative-tranquilizers (*e.g.*, chlordiazepoxide and diazepam), hypnotics (*e.g.*, flurazepam), and certain narcotics, may reduce inhibitions. The effects will vary from person to person.

Inhibition also plays an important role in conditioning and learning, because an organism must learn to restrain certain instinctual behaviours or previously learned patterns in order to master new patterns.

In physiological psychology, the term inhibition refers to the suppression of neural electrical activity.

Ini (Anglo-Saxon ruler): *see* Ine.

Inis (Ireland): *see* Ennis.

Inis Ceithleann (Northern Ireland): *see* Enniskillen.

Inisa, town, Oyo state, southwestern Nigeria, near a station on the railroad from Lagos, some 135 miles (215 km) to the southwest. Situated on the road from Ikirun to Offa and Ilorin, Inisa is a local market centre (yams, cassava, corn [maize], pumpkins, beans, okra) for a savanna region that is mainly inhabited by the Yoruba people. It also serves as a collecting point for cash crops (cotton and tobacco). Inisa has a government secondary school and a health office and maternity clinic. Pop. (1988 est.) 97,140.

Initial Teaching Alphabet, alphabet of 44 characters designed by Sir James Pitman to help children learn to read English more effectively. The Initial Teaching Alphabet is based on the phonemic (sound) system of English and uses the Roman alphabet, augmented by 14 additional characters, to represent each distinct sound with a separate symbol. It evolved from the "phonotypy" of Sir Isaac Pitman (grandfather of Sir James) and the "Nue Speling" of the Simplified Spelling Society of Great Britain. The Initial Teaching Alphabet adheres closely to traditional orthography but contains lowercase characters only; it retains certain conventions of English spelling, such as *c* and *k* to represent the same sound and double consonants. The Initial Teaching Alphabet was adopted on an experimental basis in some schools in England (beginning in 1960) and in the United States (beginning in 1963).



Pitman's Initial Teaching Alphabet; 44 symbols and words illustrate the sounds the symbols represent

initiative (electoral process): *see* referendum and initiative.

initiator, a source of any chemical species that reacts with a monomer (single molecule that can form chemical bonds) to form an intermediate compound capable of linking successively with a large number of other monomers into a polymeric compound.

The most widely used initiators produce free radicals (reactive atoms or groups of atoms that contain odd numbers of electrons); examples include peroxides and aliphatic azo compounds used to polymerize vinyl chloride, methyl methacrylate, and other monomers.

Acid-forming systems such as boron trifluoride with traces of water react with a monomer to produce a positively charged (cationic) intermediate. Such initiation is used in the conversion of isobutylene to butyl rubber.

Reaction of metallic sodium and biphenyl produces an anionic initiator that causes formation of polymer chains with reactive sites at both ends; these may be further treated with a different monomer to yield block copolymers.

Polypropylene and high-density polyethylene are prepared by use of Ziegler catalysts, which are initiators composed of organometallic compounds and metallic halides, such as triethylaluminum and titanium tetrachloride.

injunction, order of a court, in civil proceedings, requiring a party to do or not to do a specified act or acts. An injunction is prohibitory if it forbids the doing of an act and mandatory if it orders an act to be done. Disobedience to the order is punishable by imprisonment for contempt of court.

Injunctions may be perpetual or temporary. A temporary injunction is normally granted until the hearing of the action is held, or for some lesser period; it is intended to preserve the status quo or prevent irreparable harm before the case can be fully heard.

By the end of the 14th century the English Court of Chancery had begun to grant injunctions as a remedy for the inadequacy of decisions in the common-law courts. It often happened that an award of damages would not fully protect the plaintiff—for example, if the defendant intended to continue a trespass or a breach of covenant despite the payment of damages. When England's courts of common law and equity were merged in the 19th century into one system, the new system was empowered to grant all remedies, legal or equitable.

Injunctions may be granted to restrain a wide range of acts: a breach of contract, such as a contract against engaging in a competing business; the commission of a tort, such as a nuisance or a libel; an injury to property, such as erecting a wall standing on the plaintiff's land; wrongful expulsion, as from a club or trade union; or wrongful disclosure of confidential information.

In the United States the injunction retains its essentially equitable character and, as in England, covers a wide spectrum of types of injurious or potentially injurious conduct. The most significant U.S. developments have been in connection with labour disputes, governmental regulation, and the protection of constitutional rights. The broadest extension of the injunction remedy has been in the field of governmental regulation. Many federal and state statutes specifically authorize the use of the injunction as an alternative to seeking criminal conviction. In the enforcement of federal and state statutes, injunctions are sought with far greater frequency than are criminal penalties as a means of obtaining effective compliance. Injunctions have also been used increasingly in the protection of rights guaranteed by the U.S. Constitution, particularly to prevent violations of the rights of free assembly and speech, violations of religious freedom, and denial of equal rights and opportunity on racial grounds alone.

In civil-law countries the injunction has been relatively little used, except in Germany. There, injunctions are used to protect against interference with property and to supplement the very weak slander laws.

Consult the INDEX *first*

ink, fluid or paste of various colours, but usually black or dark blue, used for writing and printing. It is composed of a pigment or dye dissolved or dispersed in a liquid called the vehicle.

Writing inks date from about 2500 BC and were used in ancient Egypt and China. They consisted of lampblack ground with a solution of glue or gums, molded into sticks, and allowed to dry. Before use, the sticks were mixed with water. Various coloured juices, extracts, and suspensions of substances from plants, animals, and minerals also have been used as inks, including alizarin, indigo, pokeberries, cochineal, and sepia. For many centuries, a mixture of a soluble iron salt with an extract of tannin was used as a writing ink and is the basis of modern blue-black inks. The modern inks usually contain ferrous sulfate as the iron salt with a small amount of mineral organic acid. The resulting solution is light bluish black and, if used alone on paper, appears only faintly. After standing it becomes darker and insoluble in water, which gives it a permanent quality. To make the writing darker and more legible at the outset, dyes are added. Modern coloured inks and washable inks contain soluble synthetic dyes as the sole colouring matter. The writing fades in strong light and rinses out of washable fabrics but lasts for many years if not subjected to such effects.

India ink is a dispersion of carbon black in water; the suspension is stabilized with various substances, including shellac in borax solution, soap, gelatin, glue, gum arabic, and dextrin. It is used mainly for drawing.

Modern printing inks are usually less fluid than writing inks. The composition, viscosity, density, volatility, and diffusibility of ink are variable.

The Chinese experimented with printing at least as early as AD 500, with inks from plant substances mixed with coloured earths and soot or lampblack. When Johannes Gutenberg invented printing with movable type in Germany in about 1440, inks were made by mixing varnish or boiled linseed oil with lampblack. For more than 300 years such inks continued to be used with little modification in their composition.

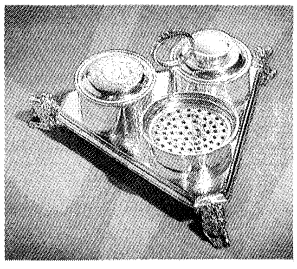
In 1772 the first patent was issued in England for making coloured inks, and in the 19th century chemical drying agents appeared, making possible the use of a wide variety of pigments for coloured inks. Later, varnishes of varying stiffness were developed to make inks for different papers and presses. Varnish was replaced by mineral oil in inks when high-speed newspaper presses were introduced. The oil base penetrated rapidly into newsprint and dried quickly. It was not until the beginning of the 20th century that ink-making became a complicated chemical-industrial process.

The manufacture of modern inks takes into

account the surface to be imprinted, the printing process, and special requirements for the job, such as colour, opacity, transparency, brilliance, lightfastness, surface hardness, pliability, wettability, purity, and odourlessness. Inks for low-speed letterpress printing—the process usually used in book production—are compounded of carbon black, a heavy varnish, and a drier to reduce the drying time. Many other vehicles, pigments, and modifiers may be used. Intaglio inks are composed of petroleum naphthas, resins, and coal-tar solvents. The intaglio printing process is used chiefly in printing rotogravure newspaper supplements and cartons, labels, and wrappers. Plastic materials are usually printed with aniline inks, which contain methyl alcohol, synthetic resins, and shellac.

inkblot test, any of a number of psychological tests in which a person is asked to interpret irregular patterns made by inkblots; the best known of these is the Rorschach Test (*q.v.*).

inkstand, receptacle for a pen, ink, and other writing accessories, generally called a standish from the 15th to the 18th century. Inkstands were made of silver, pewter, lead, earthenware, or porcelain. Silver was the most fashionable material throughout the 18th century; some Regency examples, however, have a carcass of



Silver inkstand with wafer-box (left), pounce box (centre), and inkwell (right) by John Coney, Boston, early 18th century; in the Metropolitan Museum of Art, New York City

The Metropolitan Museum of Art, New York City, bequest of Charles Allen Munn, 1924 (24.109.36), copyright © 1964 by The Metropolitan Museum of Art

wood and might be mounted on metal feet and fitted with glass inkpots with metal tops. Later examples contain a wider variety of accessories, such as a taper stick (a candlestick to hold small tapers), pounce box (for sprinkling pounce, a powdered gum that fixed ink to paper), wafer-box (to hold wafers used to seal letters), a penknife, and quills.

inky cap, common name for the 100 cosmopolitan mushroom species of the genus *Coprinus* (order Agaricales, division Mycota). They are so called because, after spore discharge, the cap disintegrates into an inklike liquid that has been used for writing. They



Inky cap (*Coprinus atramentarius*)

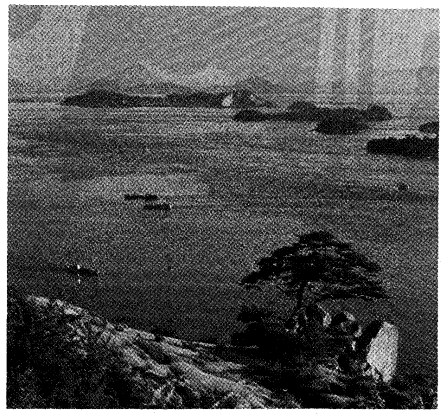
Sven G. Andersson—Tiofoto

grow on wood and dung. The caps of *C. atramentarius* and *C. comatus* (shaggy mane, or shaggy cap) are edible when young, before the gills turn black.

Inland Ice: *see* Greenland Ice Sheet.

Inland Passage: *see* Inside Passage.

Inland Sea, Japanese SETO-NAIKAI, the body of water lying between the Japanese islands of Honshu, Shikoku, and Kyushu. It is composed of five distinct basins linked together by channels. Its east–west length is about 270 mi (440 km), and its waters are easily navigable. The sea has an irregular coastline and



The Inland Sea of Japan from the coast of Okayama Prefecture, Japan

Centphoto—FPG/EB Inc.

is dotted with hundreds of small islands, the largest of which is Awaji-shima in the east. Entrance to the Inland Sea from the Philippine Sea and the Pacific Ocean is afforded by the Bungo-suidō (Bungo Strait) and the Kii-suidō. The narrow Shimonoseki-kaikyō (Shimonoseki Strait) at the western end leads to the East China Sea. The sea is a major transportation route between the Asian continent and Kyushu's Kansai area. Industries flourish together with trading and fishing ports, surrounded by the coal fields of Kyushu and the commercial centre of Ōsaka–Kōbe. The shores of the Inland Sea were Japan's leading salt-producing region until industrialization was given priority after World War II. The salt fields are no longer used, and a petrochemical industry is flourishing. Popular among vacationers for its scenery, the entire Inland Sea region is included in the Inland Sea National Park.

inlay, in the visual arts, any decorative technique used to create an ornamental design, pattern, or scene by inserting or setting into a shallow or depressed ground or surface a material of a different colour or type. Inlay techniques are used in enamelwork, furniture decoration, lacquerwork, and metalwork. Although not strictly inlay, marquetry and boulle work are often included techniques. Veneering is also closely allied.

Inman, Henry (b. Oct. 28, 1801, Utica, N.Y., U.S.—d. Jan. 17, 1846, New York City), the leading American portraitist of his time. Inman studied with John W. Jarvis, a highly successful portrait painter, before establishing his own studio. He was one of the founders of the National Academy of Design in New York City. Inman worked in New York City, Philadelphia, and, in 1844, in England, where his subjects included the lord chancellor (Earl of Cottenham), William Wordsworth, Thomas Chalmers, and Lord Macaulay. Among his American subjects were Pres. Martin Van Buren and Chief Justice John Marshall. Inman's remarkable technical facility enabled him to work quickly and confidently, imparting to his portraits an easy, gracious quality.

inn, building that affords public lodging, and sometimes meals and entertainment, to travelers. The inn has been largely superseded by hotels and motels, though the term is often still used to suggest traditional hospitality.

Inns developed in the ancient world wherever there was traveling for trading purposes. Ancient Persia's extensive highway system featured inns. Along caravan routes, caravansaries appeared. These were placed approximately eight miles apart and were often constructed as forts with watchtowers. A smaller scale structure, the khan, developed in towns.

Roman inns apparently were laid out in the same manner as ancient villas. Stables and accommodations for sleeping and eating were placed around one or more centralized courtyards. The Roman legionnaires took the commercial inn to Britain, where it was divided into two sections, one for entertaining and one for sleeping. During the early Middle Ages, accommodations for travelers were usually to be found only in monasteries; but under the combined influence of the revival of commerce in the late medieval period, the Crusades, and an increase in the popularity of pilgrimages, lodging houses were built by monasteries, guilds, and private entrepreneurs.

In Great Britain the dissolution of the monasteries and a surge in coach travel further spurred the development of inns, which numbered about 6,000 by the late 16th century. European inns of that period were planned around the sides of a courtyard, were several stories high, and featured arcaded or balustraded galleries above the ground level. The George Inn at Southwark, London, is a representative surviving example of the 17th-century coaching inn.

Inn River, Latin AENUS, a major right-bank tributary of the Danube, 317 mi [510 km] long, rising in the small Lake Lughino in Graubünden canton, Switzerland, and flowing across Austria and southern Germany. The river's Swiss section is called the Engadin (*q.v.*). In Austria the river first enters the narrow Oberinntal (upper Inn Valley) lying above Zirl and then the Unterinntal (lower Inn Valley), which includes Innsbruck. In the Unterinntal the river is wide, except at Kufstein, where it cuts between the Bavarian Alps on the west and the Kaisergebirge on the east. Entering Bavaria in Germany, the Inn flows north and then east before receiving its major tributary, the Salzach River. A short distance downstream it forms part of the Austro-German border to its confluence with the Danube at Passau, Ger. Agricultural areas lie along the middle and lower sections of the river, which is harnessed at points for hydroelectric power. The upper section is suited to white-water canoeing.

Innamincka, cattle station and small "frontier town," northeastern South Australia, at the junction of the intermittent Cooper and Strzelecki creeks, 500 mi (800 km) northeast of Adelaide. First visited about 1845 by the explorer Charles Sturt, it originated as an interstate customs post and was the site of an unsuccessful attempt to establish an Aboriginal mission station in the mid-19th century. The original cattle station was founded in 1872 and the town in 1890. Its Aboriginal name means "you go into the hole there," referring to a native legend in which a totem-hero ordered a snake into a water hole. An airstrip has aided the development of the natural gas fields, discovered in 1963, to the southwest at Gidgealpa.

innate idea, in philosophy, an idea allegedly inborn in the human mind, as contrasted with those received or compiled from experience. The doctrine that at least certain ideas (*e.g.*, those of God, infinity, substance) must be innate, because no satisfactory empirical origin of them could be conceived, flourished in the 17th century and found in René Descartes its most prominent exponent. The theory took many forms: some held that a newborn child has an explicit awareness of such ideas; others,

more commonly, maintained that innate ideas have some implicit form, either as a tendency or as a dormant capacity for their formulation, which in either case would require favourable experiential conditions for their development.

John Locke's vigorous criticism later in the century was directed against innate principles (supposed axioms, both theoretical and practical, implanted in the mind by nature) and the innate ideas claimed as the terms of the principles. But Locke's Empiricism had difficulty with certain key concepts, such as substance, "which we neither have nor can have by sensation or reflection," and cause, about which he largely anticipated David Hume's difficulties in the 18th century. Locke seems to have shared some of the assumptions of his opponents (*e.g.,* that if an idea is innate it cannot be wrong) and to have sensed that the issue is one of logic (of the status of a priori propositions) and not of genetic psychology. Completing this distinction, the 18th-century philosopher Immanuel Kant replaced the doctrine of innate ideas with questions about a priori concepts, which he characterized in terms not of their origin but of their necessity as conditions of man's experience of an objective world. In the 20th century, Noam Chomsky argued the necessity for postulating innate ideas to explain the possibility of language.

inner ear, also called LABYRINTH OF THE EAR, part of the ear that contains organs of the senses of hearing and equilibrium. The bony labyrinth, a cavity in the temporal bone, is divided into three sections: the vestibule, the semicircular canals, and the cochlea. Within the bony labyrinth is a membranous labyrinth, which is also divided into three parts: the semicircular ducts; two sac-like structures, the saccule and utricle, located in the vestibule; and the cochlear duct, which is the only part of the inner ear involved in hearing. The cochlear duct forms a shelf across the cochlea dividing it into two sections, the scala vestibuli and the scala tympani. The entire inner ear is bathed in a cushioning fluid, called the endolymph when it lies within the membranous labyrinth and the perilymph when it separates the bony and membranous labyrinths.

Hearing. In the cochlea, both the bony labyrinth and the cochlear duct are coiled in a shape resembling that of a snail shell. Resting along the basilar membrane, which forms the base of the cochlear duct, is an arrangement of sensory cells and supporting cells known as the organ of Corti. This cluster of cells varies in thickness, so that different regions within the cochlea are sensitive to different wavelengths of sound. When sound waves are conducted across the bones of the middle ear, they cause the oval window (a membranous opening between the middle and inner ears) to move in and out along with the stapes of the middle ear, to which it is attached. The motion of the oval window sets up a wave in the perilymph filling the scala vestibuli of the cochlea. This wave is transmitted across Reissner's membrane (the roof of the cochlear duct) into the endolymph of the cochlear duct. It then passes through the tectorial membrane—which forms a roof to protect the organ of Corti—into the organ of Corti. The organ of Corti contains sensory cells with hairlike projections, called hair cells, that are deformed by the progress of the wave. The hair cells trigger nerve impulses that travel along the cochlear nerve, a branch of the auditory nerve, to the brain, where they are interpreted as sound. The sound wave then passes into the perilymph of the scala tympani, where it causes a second membrane-covered opening into the middle ear, the round window, to bulge outward and dampen the wave in the perilymph.

Equilibrium. The other divisions of the inner ear—the vestibule and the semicircular canals—are involved in the sense of equilibrium. Each has an organ containing hair cells similar to those of the organ of Corti. The utricle and saccule each contain a macula, an organ consisting of a patch of hair cells covered by a gelatinous membrane containing particles of calcium carbonate, called otoliths. Motions of the head cause the otoliths to pull on the hair cells, stimulating another auditory nerve branch, the vestibular nerve, which signals the position of the head with respect to the rest of the body.

The three semicircular canals are arranged at right angles to each other, so that they measure motions in all three planes. Within each semicircular canal is a semicircular duct. Each duct ends in a swelling called an ampulla, which houses a ridge called the ampullary crest (or crista), containing still more hair cells. These cells respond to motion of the endolymph fluid caused by motion of the head in any direction; they transmit signals indicating changes of position through the vestibular nerve.

Inner Hebrides, islands off the western coast of Scotland, divided between Skye and Lochalsh and Lochaber districts of Highland region and Argyll and Bute district of Strathclyde region. As their name suggests, the Inner Hebrides lie close to the west coast of Scotland, stretching 150 miles (240 km) from Skye in the north to Islay in the south, and separated from the Outer Hebrides (Western Isles) by the Little Minch and the Sea of the Hebrides. The largest islands of the Inner Hebrides are Skye, Mull, Jura, and Islay.

The small island of Rum (Rhum), Lochaber district, Highland region, became a Nature Conservancy Research Centre in 1957, with special interests in botanical and geological research and the study of the local red deer, wild goats, and local Highland cattle and ponies. The other islands that, with Rum, comprise the Small Islands Parish—Canna, Eigg, and Muck—have small working communities.

Tiree, 50 miles west of Oban, the most westerly of the Inner Hebrides, Argyll and Bute district, Strathclyde region, has an economy based on crofting (tenant farming), bulb growing, cattle raising, fishing, tourism, and the quarrying of marble.

Islay, the most southerly island of the Inner Hebrides, Argyll and Bute district, Strathclyde region, was the ancient seat of the Macdonalds, lords of the Isles, until they were displaced by the Campbells in 1616. The island's economy is based on farming, stock raising, cheesemaking, the distilling of malt whiskey, and tourism. Bowmore is the chief town and administrative centre.

Other islands of the Inner Hebrides include Coll, Colonsay, Gigha, Iona, Kerrara, Lismore, Luing, Lunga, Oronsay, Seil, Scarba, and the 71-acre island of Staffa, which is the site of Fingal's Cave.

Inner Himalayas (mountains, Asia): *see* Lesser Himalayas.

Inner Light, also called INWARD LIGHT, the distinctive theme of the Society of Friends (Quakers), the direct awareness of God that allows a person to know God's will for him. It was expressed in the 17th century in the teachings of George Fox, founder of the Friends, who had failed to find spiritual truth in the English churches and who finally experienced a voice saying, "There is one, even Christ Jesus, that can speak to thy condition." A phrase used by Fox, "that of God in every man," has often been used to describe the Inner Light. Robert Barclay, Scottish author of the influential systematic statement of the doctrines of the Friends, *An Apology for the True Christian Divinity* (1678), stated that "the Inner Light is never separated from God nor Christ; but wherever it is, God and Christ are as wrapped up therein."

Most Friends believe, however, that the Inner Light should not simply be a mystical experience but should result in a person's working for the good of others.

Inner Mongolia, in full INNER MONGOLIA AUTONOMOUS REGION, Wade–Giles romanization NEI-MENG-KU TZU-CHIH-CH'Ü, Pinyin NEI MONGOL ZIZHIQU, one of the five *tzu-chih-ch'ü* (autonomous regions) of the People's Republic of China, a territory 800 miles (1,300 km) long in northern and northeastern China. It is bordered to the north by the Mongolian People's Republic; by the Chinese provinces of Heilungkiang, Kirin, and Liaoning to the east; by the provinces of Hopeh, Shansi, and Shensi and the autonomous region of Ningsia to the south; and by the province of Kansu to the west.

A brief treatment of Inner Mongolia follows. For full treatment, *see* MACROPAEDIA: China.

Inner Mongolia and Outer Mongolia (the latter now the Mongolian People's Republic) have been separate entities since the 17th century. The Inner Mongolia Autonomous Region was founded by the Chinese Communist Regime in 1947, more than two years prior to the establishment of its national government at Peking in 1949. In a series of annexations, Inner Mongolia was greatly expanded. In 1969 the Peking government sharply cut down the area of the autonomous region, and only the international frontier and the Mongolian People's Republic remained unchanged. This reorganization was abrogated in 1979 and its former territory restored to Inner Mongolia. Since 1954 the region's capital has been Huho-hao-t'e (Huhehaote).

Inner Mongolia is essentially an inland plateau with a flat surface lying at an elevation of about 3,000 feet (900 m) and fringed by mountains and valleys. Its southern boundary is formed by a series of high ridges. To the northwest, the land falls away toward the centre of the Gobi Desert. The Huang Ho (Yellow River) provides major irrigation in the southwestern part of the region. In the centre and the north, rainfall and snow are absorbed by the desert. The seasons are marked by sharp fluctuations in the climate. The two hottest months are July and August. Winter is bitterly cold, with strong icy winds blowing out of Siberia. Rainfall is meagre.

Mongols and Chinese compose the bulk of the population, which is unevenly distributed, with most of it concentrated in the agricultural southern belt near the Huang Ho.

The three major urban population centres are Pao-t'ou, a large steel and iron complex and the terminal of two major railways connecting Kansu province and Peking; Hu-ho-hao-t'e, a newly developed cultural and political centre; and Chi-ning, a commercial centre and the terminal of the Chi-ning–Erh-lien railway.

Inner Mongolia's harsh climate severely restricts intensive agriculture. In some areas, particularly around the great bend of the Huang Ho, oats, spring wheat, *liangkao* (sorghum), millet, and other grains are cultivated. In irrigated areas sugar beets and oilseeds are grown.

There has been a good deal of industrial development in the region, especially around Pao-t'ou. Several dozen modern plants and two electrical power plants were built, establishing the city as one of the most significant industrial bases north of the Huang Ho.

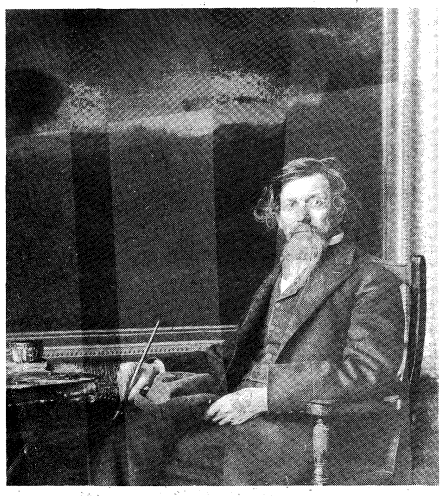
There are extensive rail and highway networks. Inland-waterway navigation is limited, and there is some local air service. Area 3,064,000 square miles (1,183,000 square km). Pop. (1985 est.) 19,850,000.

Innes, Michael (Scottish writer): *see* Stewart, J(ohn) I(nnes) M(ackintosh).

Innes, Ralph Hammond: *see* Hammond Innes, Ralph.

Inness, George (b. May 1, 1825, Newburgh, N.Y., U.S.—d. Aug. 3, 1894, Bridge of Allen, Stirling, Scot.), U.S. painter especially known for the luminous, atmospheric quality of his late landscapes.

Inness was largely self-taught. Such early



George Inness
Peter A. Juley & Son

works as "The Lackawanna Valley" (1855; National Gallery of Art, Washington, D.C.) show the influence of Asher B. Durand and Thomas Cole, painters of the Hudson River school. But the sweeping, loosely painted panoramas of the Dutch landscapists Jacob van Ruisdael and Meindert Hobbema turned him away from the Hudson River school's preoccupation with carefully rendered detail; and a third trip to Europe (1854) ended his initial period of experiment in subject and struggle against technical tightness. This stay abroad confirmed the already discernible influence of the French Barbizon school, led by Théodore Rousseau. It was through the two decades of his middle period (1855–74), including a stay in Rome and Paris (1870–74), that Inness ascended to the height of his powers with such works as the "Delaware Water Gap" (1861) and the "Delaware Valley" (1865; both in the Metropolitan Museum of Art, New York City). The impressive "Peace and Plenty" (1865; Metropolitan Museum of Art) remains exceptional in his work for physical dimensions; his more characteristic smaller canvases depict both far-reaching expanses and lesser areas intimately rendered, exhibiting the influence of J.-B.-C. Corot. Inness' increasing control over space relations and scale, drawing, and colour was directed toward achieving the idyllic and the tranquil. His own temperament, by contrast, was stormy and passionate. He was interested in social questions, and argued heatedly for the single tax and for the abolition of slavery, but the deepest effect on him and his art came from his conversion to Swedenborgianism.

The early works of his late period (1875–94), such as "Autumn Oaks" (*c.* 1875; Metropolitan Museum of Art), were marked by great concentration of feeling presaging the later ascendancy of colour over form. As his nature mysticism intensified, his pictures dissolved into shimmering colour, magnificent in itself and no longer supported by formal construction.

His painter son, George Inness, Jr. (1854–1926), remained faithful to the practices of Barbizon and resisted Impressionism in obedience to his father's strongly expressed convictions.

Innisfail, town, northeastern Queensland, Australia, at the confluence of the North and South Johnstone rivers, between the coast and Mt. Bartle Frere. It is located in a region of heavy rainfall (144 in. [3,658 mm] annually), mainly supporting sugarcane, dairy products, and tropical fruits. The port of Mourilyan, with bulk-handling installations, is immediately south, and Palmerston National Park is nearby. The Johnstone River area was explored in 1873 by George E. Dalrymple, the former Queensland colonial secretary, and was settled in 1880 by Thomas Fitzgerald, who planted sugarcane and pioneered the state's sugar industry. The community became a shire in 1910 and was called Geraldton but in 1911 adopted Innisfail, a poetic name for Ireland. Pop. (1981) 7,933.

Inniskilling (Northern Ireland): *see* Enniskillen.

Innitzer, Theodor (b. Dec. 25, 1875, Weipert, Bohemia—d. Oct. 9, 1955, Vienna), cardinal and primate of Austria who withdrew his original support of the Nazi regime and became devoted to the reconstruction of the Austrian Church.

The son of a lace maker, Innitzer was ordained priest in 1902. He taught at a Viennese seminary and later (1910) lectured on New Testament exegesis at the University of Vienna, where, in 1918, he became head of the theological faculty; he was appointed rector of the university in 1928. Under Johann Schober, chancellor of Austria, Innitzer was federal minister of social welfare. On Sept. 20, 1932, he was consecrated archbishop of Vienna, becoming cardinal in March 1933.

Innitzer upheld the authoritarian policies of Engelbert Dollfuss, prime minister of Austria (1932–34), a representative of the Christian Socialists. When Germany occupied Austria in 1938, Innitzer first supported the Nazi regime but was rapidly disillusioned by various secularizing measures of the new government and by attacks on his archiepiscopal palace by Nazi mobs (Oct. 8, 1938). After a rebuke by Pope Pius XI, Innitzer ceased to approve Nazism. His home subsequently became a refuge for Jews, while he strove to alleviate public distress and to restore the Austrian Church, disassociating himself from politics. In 1945 he founded the Vienna Catholic Academy for the training of the laity. Johann Kosnetter's *Theodor Kardinal Innitzer zum Gedächtnis* appeared in 1957.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Innocent, Latin INNOCENTIUS, name of Roman Catholic popes, grouped below chronologically and indicated by the symbol •.

• **Innocent I,** SAINT (b. Albano, Campania—d. March 12, 417, Rome; feast day July 28), pope from 401 to 417, who condemned Pelagianism, a heresy concerning the role of grace and free will.

Probably a Roman deacon, Innocent was possibly the son of St. Anastasius I, whom he succeeded in the papacy on Dec. 22, 401. In 404 Innocent ordered a synod to reinstate Patriarch St. John Chrysostom of Constantinople, who had been illegally deposed (403) by Patriarch Theophilus of Alexandria. The synod never convened because Innocent's envoys were imprisoned at Constantinople, but John was posthumously restored (407).

Innocent's papacy was endangered by the Visigothic chief Alaric, who besieged Rome (408–410) because the West Roman emperor Flavius Honorius refused to appease him. Honorius withdrew to Ravenna, where Innocent went to negotiate peace (410). Innocent returned to Rome in 412. His acknowledgment of Alexander as bishop of Antioch (414) restored communications between the sees and ended the Meletian schism, a complex 4th-century controversy about the nature of the Trinity. In January 417 Innocent condemned Pelagianism and excommunicated its proponent, Pelagius. In settling church disputes, Innocent invariably invoked Roman primacy.

• **Innocent II,** original name GREGORIO PAPARESCHI (b. Rome—d. Sept. 24, 1143, Rome), pope from 1130 to 1143.

A cardinal by 1116, Innocent was appointed in 1122 by Pope Calixtus II as one of the ambassadors who drafted the Concordat of Worms, an agreement ending disputes between the pope and the Holy Roman emperor Henry V over the right of investiture; *i.e.,* whether the papacy or temporal rulers had the right to install bishops and other clergy. In 1123 Gre-



Innocent II, detail from a mosaic, 12th century; in the apse of the basilica of Sta. Maria in Trastevere, Rome
Alinari—Art Resource/EB Inc.

gorio became papal emissary in France. On the night of Pope Honorius II's death (Feb. 13, 1130), a minority elected Gregorio (who took the name of Innocent II), while a majority soon after elected Cardinal Pietro Pierleoni as Anacletus II. Innocent was hastily consecrated, but by June 1130 Anacletus forced him to flee to France. The vindication of Innocent's title owes its success to Archbishop St. Norbert of Magdeburg, Saxony, and to Abbot St. Bernard of Clairvaux, Champagne. Bernard swayed the French Church and also King Henry I of England to Innocent's side. Norbert won over the German Church (October 1130) and the German king Lothair II/III.

In March 1131 Innocent met Lothair at Liège and induced him to fight Anacletus. The German army invaded Italy in August 1132 and by the following June occupied all of Rome except the area held by Anacletus' faction. Innocent then crowned Lothair emperor and refused to revise the Concordat of Worms to give civil authorities the right to install clergy. But when Lothair left Italy, Innocent had to flee to Pisa, where he called a council to condemn Anacletus. Lothair reinvaded southern Italy (1136–37) and expelled Anacletus' chief supporter, King Roger II of Sicily. After a quarrel with Innocent over the rulership of the region of Apulia, Lothair died (Dec. 3/4, 1137).

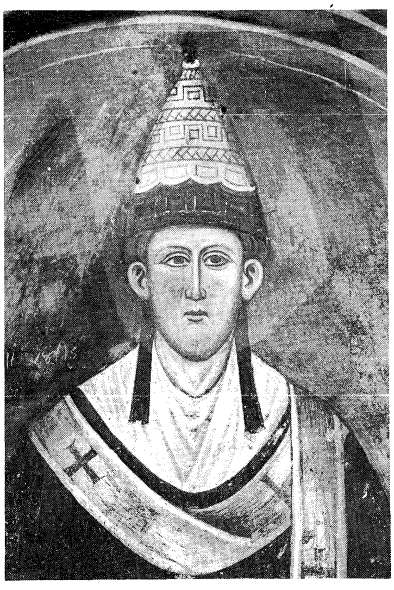
The death of Anacletus in January 1138 endangered Roger's position, and, although a successor, Antipope Victor IV, was swiftly elected, Bernard persuaded Victor to resign on May 29, 1138. Innocent convoked the second Lateran Council in April 1139 to end the schism, excommunicate Roger, and sustain his own endorsement (made on Easter 1136) of King Stephen over Empress Matilda as rightful ruler of England. On July 22, 1139, Roger captured Innocent and on July 25 forced the

Pope to recognize him as king of Sicily. The two then acknowledged each other's titles in the same year.

Innocent confirmed the rule and customs of the Templars, one of the three orders of knighthood founded during the Crusades. At the Council of Sens (1140), Innocent supported Bernard's prosecution of the theologian-philosopher Abbot Peter Abélard and his supporter, Arnold of Brescia, by condemning them as heretics. The remainder of his pontificate dealt chiefly with two struggles. He fought for church independence when the Romans established a commune with a senate free from papal authority. Innocent also placed France under the interdict—a denial of the sacraments—when King Louis VII of France refused to accept the papal choice for archbishop of Bourges.

• **Innocent (III),** original name LANDO DI SEZZE (b. Sezze, Papal States—d. La Cava, Apulia), last of four antipopes (1179–80) during the pontificate of Alexander III. A member of a family of German origin, he was a cardinal when elected on Sept. 29, 1179, by a faction opposing Alexander, who, in January 1180, relegated Innocent to the southern Italian monastery of La Cava.

• **Innocent III,** original name LOTHAIR OF SEGNI, Italian LOTARIO DI SEGNI (b. 1160/61, Gavignano Castle, Campagna di Roma, Papal States—d. July 16, 1216, Perugia), pope from 1198 to 1216, under whom the medieval papacy reached the height of its prestige and power. He presided over the Fourth Crusade and the Albigensian Crusade (against French heretics). By approving the proposed work of St. Dominic and St. Francis of Assisi and their followers, he gave legitimate standing to itinerant preaching and apostolic poverty, hitherto regarded as signs of heresy, and convoked the important fourth Lateran Council of 1215.



Innocent III, detail of a fresco, 13th century; in the lower church of Sacro Speco, Subiaco, Italy

By courtesy of the Vatican Museums

Early career. Through his mother, Claricia Scotti, Lothair of Segni was related to many noble Roman families. As a young man, he studied theology in Paris and canon law in Bologna under the great canonist Huguccio of Pisa, whose moderate doctrines on the relationship between the spiritual and temporal authorities provided a long lasting influence on the future pope. In 1190 Pope Clement III, possibly a relative of Lothair, raised the young subdeacon to the status of cardinal deacon of St. Sergius and St. Bacchus. Lothair played no prominent part in the government of the church during the pontificate of Celestine III and had time to write several theological works; two of them "On the Miserable Condition of Man" and "On the Mysteries of the Mass," are significant expressions of the ascetic-liturgical inspiration by which this pope, who was so active politically, was animated.

Election as pope. On the very day of Celestine III's death, Jan. 8, 1198, Lothair was unanimously elected pope after only two ballots; he was ordained priest on February 21 and on the next day was consecrated as bishop of Rome. He reigned as pope until 1216.

Innocent III's very exalted conception of the role of the papacy in the Christian world and his success in making his conception a reality would have been unthinkable without the preparations of the age of Gregory VII, which resulted in an increase of the role of the church and the prestige of the papacy. Innocent's sermons on the day and on the anniversaries of his coronation, as well as the vast corpus of his official letters, blended the legal and philosophical-theological thought of the scholastic age with new expressions of mystical fervour. Thus, he created a language and ideology of unprecedented splendour and majesty for the glorification of the papal office.

At the same time, the political constellations within Christendom during his pontificate allowed the Pope to exercise his spiritual authority not only in the inner precincts of the church but also in all vital political questions of the day. Yet he explicitly disclaimed the right and the intention to intervene in temporal affairs as such, with the exception of the Papal States and of those kingdoms that had voluntarily recognized the feudal suzerainty of the papacy. As far as Germany was concerned, Innocent felt that he had very special rights, since the king of Germany was also the emperor of the Holy Roman Empire and, as such, was meant to be the protector of the Roman and universal church. Because the special position of the German king–emperor ipso facto affected the pope's spiritual realm, Innocent believed he had the right to approve or reject dubious elections to the German throne and acted accordingly in the contest over the succession to Henry VI. Otherwise, he was careful to limit his intervention in temporal matters (again, outside the Papal States and the vassal kingdoms) to cases in which political actions had either infringed upon spiritual rights or raised serious moral questions.

Nevertheless, the combined authority claimed by the Pope on these various grounds was very great indeed; and he himself often spoke of the pope's sovereign power, though he considered this always as rooted in a spiritual power, the power given to Peter by Christ of binding and loosing souls. Papal plenitude of power was for him essentially spiritual sovereignty, however much it could branch out into the temporal sphere for spiritual reasons. It is this claim, not a claim to temporal world rulership, that stands behind some of Innocent's most striking assertions of papal supremacy. They are properly understood, in the whole context of his reign, only as assertions of the ultimate competency of the supreme spiritual authority in any matter whatsoever by which the spiritual concerns of the church (that is to say, faith and morals) are affected.

Problems faced by Innocent. At the beginning of his reign, Innocent III was confronted with three problems: the insecurity of papal sovereignty in the Papal States; the election of two German kings; and the French-English or, to be more exact, the Capetian-Angevin war. At the time of his accession, Rome was practically independent of papal government, but Innocent soon succeeded in reasserting papal rights there. Within a few years, though not without a struggle, he had pacified the rival aristocratic factions and won over most of the people. Moreover, he had been very successful in his policy of recuperation of the Papal States with regard not only to the reestablishment of effective papal government but also with regard to the acquisition of the Duchy of Spoleto and the March of Ancona, which together stretched from Rome to the Adriatic Sea and which he claimed on the strength of the heretofore never fulfilled promises of Pepin and Charlemagne. For Innocent, as for the popes of the 12th century, the existence of strong Papal States in the centre of Italy was a vital prerequisite for the independence of the papacy from secular power, and doubly so after the experiences of the last decade, when the union of the Holy Roman Empire with the Sicilian kingdom under Henry VI had nearly paralyzed the papacy's freedom of action.

The German crisis. The problem of Italy also governed Innocent's policy in the German crisis, when the princes of the Holy Roman Empire, ignoring the claims of Henry VI's son Frederick II, had split over the election of a new German king. One party elected the brother of the deceased emperor, Philip of Hohenstaufen, duke of Swabia; the other elected the duke of Brunswick (son of the great Guelph Henry the Lion and nephew of the English kings Richard the Lion Heart and John), who was to be known as Otto IV. Innocent, fearing the Hohenstaufen tradition, favoured Otto, and the initial actions of Philip and his followers were not calculated to allay his fears; Frederick he hoped to restrict to his Sicilian inheritance and thus to avoid a reunion of the empire with Sicily. Philip, however, was so successful against Otto that Innocent after a few years found it necessary to resume negotiations with him, which might have led to his recognition and to the resignation of Otto or even to the Pope's rejection of the latter, since he already had misgivings about him. Yet Philip unexpectedly disappeared from the scene: he was murdered in 1208 by Otto of Wittelsbach, who had a private grievance against him. Otto IV was then crowned emperor by Innocent III.

In a surprisingly short time, Otto managed to alienate the Pope by his blatant pursuit of plans and actions hostile to papal sovereignty in the Papal States and aiming at the reunion of the empire and Sicily. Innocent excommunicated him after he had embarked, in a flagrant breach of his promises, on the conquest of the Sicilian kingdom and turned to the only other possible candidate for the German and imperial crowns, the young Frederick of Sicily. The Pope had in fact no other choice; he also could hope that he would be able to prevail upon Frederick to keep Germany and Sicily permanently separate. A promise to that effect was no doubt a condition of his support in the German election of 1212 and in 1216 Frederick II, as king of Germany, solemnly promised to transfer full rule over Sicily to his infant son Henry.

French-English conflicts. Meanwhile, Frederick, with the help of King Philip II Augustus of France, had triumphed over Otto IV and over Otto's uncle and ally, King John of England, at the Battle of Bouvines (1214). Innocent, who previously had tried to end the war between France and England and had temporarily succeeded in doing so, had at this crucial moment been unable to prevent the fusion of the German throne contest with the French-English (Capetian-Angevin) dynastic conflict.

His relationship to both western kings was also complex in other respects. Philip Augustus, who had at all times opposed Otto IV, the relative of his Angevin enemies, had only after a resistance of 12 years obeyed the Pope's demand for reinstatement of his rightful queen, whom he had repudiated. John of England had

been excommunicated by Innocent because of his refusal to recognize as archbishop of Canterbury Cardinal Stephen Langton, who had been elected by the monks of the cathedral in accordance with the Pope's wishes. Not until the last moment had John submitted to the Pope and, in order to forestall French invasion of England, declared England a fief of the Holy See (1213).

While Innocent did in fact protect John from this latest French design, he could neither deprive his own protégé, Frederick II, of Philip Augustus' military help nor could he expect John to abandon his ally and nephew, Otto. However, when John was forced to sign the Magna Carta and then complained to the Pope as to his feudal overlord, Innocent annulled the charter as having been extorted without his consent. Innocent did not and could not see in the Magna Carta what later ages were to see in it, an assertion of law against tyranny; he considered it, not altogether without justification, as an attempt at feudal insurrection against royal authority, which he could not ignore.

Fourth and Albigensian Crusades. Of the two Crusades that took place during the pontificate of Innocent III, one—the Fourth Crusade of 1202–04—was diverted to Constantinople, chiefly to suit Venetian interests and against the will of the Pope. Innocent nevertheless accepted the fait accompli because he mistakenly believed that the establishment of the Latin Empire and patriarchate of Constantinople would bring about a lasting reunion between the Eastern and Western churches. The other crusade was launched, with Innocent's approval, against the Albigensian heretics, who denied the sacraments and the authority of the ecclesiastical hierarchy. The Pope's decision opened an unhappy chapter in the history of the church by placing under supreme ecclesiastical leadership the repression of heresy by force. It is true that the Albigensian Crusade achieved what two generations of missionaries had been unable to do: it led to the extirpation of heresy in southern France. But the price was much bloodshed, devastation, and injustice, which the Pope, who never demanded the death sentence against heretics, did his best to reduce to smaller proportions, though without much success.

Accomplishments within the church. Innocent recognized that the successes of the Albigensian heretics had been due in part to the fact that not a few of them tried to live in evangelic and apostolic poverty. Innocent, who in his personal life was frugal, encouraged this spirit wherever he found it among the Catholic clergy and laity. In granting lay and clerical communities—such as those of the northern Italian Humiliati (an order devoted to a life of mortification and care of the poor), the Catholic Poor of Durandus of Huesca, the Dominicans, and, above all, the first community of St. Francis of Assisi—permission to preach and teach, Innocent went far beyond what the popes of the 12th century had thought possible and inaugurated the Mendicant orders.

The fourth Lateran Council (1215) constituted the culmination not only of his pontificate but also of the whole medieval papacy with regard to brilliant attendance and representation of the whole church and, above all, as regards the importance of its decrees. The council promulgated, for instance, the dogma of transubstantiation (the belief that the substance of the bread and wine of the Lord's Supper is changed into the body and blood of Christ), bound every Catholic to confession at least once a year and communion at Easter time, forbade clerical participation in ordeals such as trial by combat and other "judgments of God," and enacted important reforms of clergy and laity without which the medieval church would hardly have withstood internal and external dangers for another 300 years.

In awareness of the importance of Innocent's legislation in all fields of the church's life, the canonists began to collect and publish his decretals during his pontificate; one of these collections, the so-called *Compilatio Tertia* by Petrus Collivaccinus, received the Pope's official approval. A great number of Innocent III's decretals were later to enter the second part of the *Corpus Juris Canonici* (Body of Canon Law); *i.e.,* Gregory IX's *Liber Decretalium,* or *Liber Extra.* The far-reaching centralization of church government is reflected by Innocent's legislation in general and also by his unlimited claim to fill all vacancies of ecclesiastical offices. The great majority of these provisions, however, were used by Innocent III to support the numerous poor clerics who had been ordained by the bishops but who were either not adequately or not at all supported by them, the rather unhappy stratum of *clerici vagantes* (wandering clerics) well known from the history of literature. Innocent was not successful in his attempt to induce the prelates assembled at the fourth Lateran Council to secure once and for all the support of the Roman Curia by the reservation of a part of their revenues; the plan, if successful, might have prevented the fiscal policies of his successors that were to do so much harm to the papacy's reputation.

In the midst of vast preparations for a new Crusade that he hoped would liberate the Holy Land, Innocent III died suddenly, in 1216, from one of his frequent attacks of fever, almost certainly malaria. It is hardly possible to refrain from surmising that, had he lived longer, the Fifth Crusade would have had a less unfortunate end or that the all-out struggle between Frederick II and the papacy might have been prevented. No other pope of the 13th century possessed the exceptional blend of strength and profound humaneness that the contemporary sources show Innocent III to have had. (G.B.L.)

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• **Innocent IV,** original name SINIBALDO FIESCHI (b. end of 12th century, Genoa—d. Dec. 7, 1254, Naples), one of the great pontiffs of the Middle Ages (reigned 1243–54), whose clash with Holy Roman emperor Frederick II formed an important chapter in the conflict between papacy and empire. His belief in universal responsibility of the papacy led him to attempt the evangelization of the East and the unification of the Christian churches.

Early life and early career. Sinibaldo Fieschi's father, Hugo, called Fliscus, was the count of Lavagna and member of a rising family in both the economic and ecclesiastical realms. Sinibaldo, the 6th of 10 children, studied at Parma under the direction of one of three uncles who were bishops and then at Bologna in the school of the most illustrious canonists of the age, where he himself became a master of canon law. He was a canon of the cathedral of Genoa and later of Parma. He was consecrated bishop of Albenga, Italy, in 1225; in 1227 he was made vice chancellor of the Roman Church and cardinal priest of St. Lawrence in Lucina by Pope Gregory IX. He continued the work and, in great part, the spirit of Gregory IX, first as rector to the March of Ancona (1235–40), where he took up the side of the Guelphs at Camerino and at Ravenna, and later during his own reign as pope.

His study and experience in the field of law (testimony of his expertise exists in his celebrated commentary on canon law, *Apparatus in quinque libros Decretalium*) prepared him to enter as one of the key figures into the conflict between the church and the empire. The emperor Frederick II sought to restructure the imperial authority, with a strong state in Italy as the basis; he was convinced that he had the right to exercise autocratically his imperial power, the *imperialis potestas.* He thus came into head-on collision with the church's claim to universal power, the *universalis potestas,* theoretically elaborated by the canonists of that time, including Sinibaldo Fieschi. According to their theory, the pope possessed universal dominion, which in the abstract juridical order extended to all kingdoms, although in the practical order he had to leave the temporal rule to the emperor and to the kings. On the basis of these two antithetical conceptions, the interests of different parties came into conflict time after time. The last phase of his conflict, which began under Gregory IX, reached its zenith under Innocent IV.

Pontificate. Frederick II was encouraged by the election of Cardinal Fieschi on June 25, 1243, after the see of Rome had been vacant for 18 months following the brief reign of Celestine IV. He immediately entered into negotiations with the new pope, who took the name Innocent IV, to have the excommunication imposed on him by Gregory IX lifted. The Pope, however, did not trust Frederick, despite an agreement reached on March 31, 1244. He felt unsafe in Rome and secretly fled the city, interrupting the negotiations with the Emperor. Genoese galleys prepared by his relatives were waiting for him at the port of Civitavecchia to take him to Genoa and then to Lyon. Although Lyon was nominally subject to the empire, Innocent IV was under the protection of Louis IX of France.

Late in 1244 the Pope called a general council to meet in Lyon the following summer. Gregory IX had earlier announced such a council, but Frederick II had impeded it by holding as prisoners more than 100 bishops who had fallen into the hands of the Pisans in the naval battle of Meloria. Three themes were to be treated in the council: the question of the Emperor, the liberation of the Holy Sepulchre, and the defense of Christianity against the advance of the Mongols. Thaddeus of Suessa tried in vain to defend the Emperor before the council. Frederick II was solemnly condemned, his subjects were freed from their bond of loyalty to him, and he was deposed on the basis of the triple charge of perjury, sacrilege, and suspicion of heresy. The Pope himself admonished the German princes to elect a new emperor. They named Henry Raspe, landgrave of Thuringia, and, at his death in 1247, William of Holland. The condemnation of Frederick II did not obtain the desired political effects in Germany, but it did show the effectiveness of the network of ties

that the papal family had succeeded in tightening in northern Italy, which contributed to the Emperor's defeat at Parma (1247).

Frederick II died on Dec. 13, 1250. The Pope left Lyon and triumphantly returned to Rome in 1253. Meanwhile, he had to continue the struggle against Frederick II's son Conrad IV and also to find a king to whom he could entrust the Kingdom of Sicily as a fief. The Pope offered Sicily first to Richard of Cornwall, then to Charles of Anjou, both of whom refused, and later to Henry III of England, who accepted for his son Edmund. After the death of Conrad IV in May 1254, the papal army was defeated by Manfred, Frederick II's illegitimate son, who had become regent for Conradin, the infant son of Conrad IV. The Pope died soon after at Naples in December 1254.

Assessment. The struggle against Frederick II brings to light a striking characteristic of Innocent's pontificate and of the period as a whole. A close relationship existed between the political activity and the personal and family fortunes of the Pope and the cardinals. Only relatives and those who received benefices could be counted upon to maintain their political loyalty beyond ideological motivations. That explains the constant presence of Innocent's family in his ecclesiastical, political, and military affairs and his frequent recourse to the distribution of ecclesiastical benefices in their behalf. He took steps to return the expenses incurred by his nephews in their combat with Frederick II, distributed the bishoprics of England and the East to cousins, and supported the creation of a strong family estate at the foot of the Ligurian Apennines, provoking opposition from bishops and lay lords in that area.

In this policy of giving church offices to his relatives, Innocent went far beyond what his predecessors had done and established a pattern of nepotism that came to be recognized as a normal papal prerogative as time went on. In addition, it was his habit to systematically intervene in the affairs of local churches, disposing of ecclesiastical posts in order to settle disputes, to help university students, to reward devout persons, or to help needy clergy. This long-distance intervention often made situations worse, because the Pope ended up promising people more benefices than were available. Innocent's successor, Alexander IV, condemned the practice.

Innocent IV's attention to all parts of Christendom and his interventions carried him beyond his conflict with the Emperor to a vivid awareness of other problems that agitated Europe even to its borders. Echoing the appeals of the Christians in Palestine, he induced Louis IX to undertake a crusade, which ended dramatically with the King's imprisonment (1250); he sent a mission (1245–47) to the Grand Khan of the Mongols, led by Giovanni Carpini, in the hope of arresting the advance of the Mongols on eastern Europe; he established contacts with the Eastern Church to prepare for ecumenical union with Russia and the Ukraine. None of these missions attained its desired success, yet he deserves credit for ferreting out the problems in the church and establishing the bases for resolving future conflicts.

The judgment of historians about Innocent IV has been conditioned by their opinion about his struggle against Frederick II. Those who see in Frederick the forerunner of the modern lay state (Jacob Burckhardt and Hermann Kantorowicz) condemn the universalistic claims of the Pope. In general, it is still difficult for German historiographers to form a dispassionate judgment. On the part of ecclesiastics, the tendency is to emphasize Innocent IV's missionary projects and his indisputable qualities as a canonist—his acuteness, openness, and solicitude for human dignity.

(F.Gu.)

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• **Innocent V,** BLESSED, original name PIERRE DE TARENTAISE (b. *c.* 1224, Tarentaise, Savoy—d. June 22, 1276, Rome; beatified March 13, 1898; feast day June 22), pope during 1276, the first Dominican pontiff. He collaborated with SS. Albertus Magnus and Thomas Aquinas in drafting a rule of studies for the Dominican order.

Innocent V became a Dominican (*c.* 1240) and studied at the University of Paris (1255–59), where he taught from 1259 to 1264 and from 1267 to 1269. After administering the French province of the Dominicans (*c.* 1264–67 and 1269–72), he was appointed archbishop of Lyon in 1272 by Pope Gregory X, who made him cardinal bishop of Ostia Antica, Papal States (*c.* 1273), and whom he succeeded as pope on Jan. 21, 1276.

During his short pontificate, Innocent V continued Gregory's efforts to initiate a crusade, reunite the Greek and Roman churches, and pacify Italy's warring states. Among his most important writings is his commentary on the *Sentences* by the 12th-century theologian Peter Lombard.

• **Innocent VI,** original name ÉTIENNE AUBERT (b. Monts, Fr.—d. Sept. 12, 1362, Avignon, Provence), pope from 1352 to 1362.

A professor of civil law at Toulouse, Fr., Innocent VI took holy orders and was appointed to the French bishoprics of Noyon (1338) and Clermont (1340). A cardinal priest in 1342, he was made cardinal bishop of Ostia, Papal States, in 1352 by Pope Clement VI, whom he succeeded on Dec. 18, 1352. As pope, Innocent prohibited the granting of innumerable benefices to one recipient, urged prelates to reside in their sees, and reformed the papal Curia at Avignon, where the papacy resided from 1309 to 1377. In August 1352 he released the Roman tribune Cola di Rienzo, who had been excommunicated by Clement for heresy because of his rebellion against the Holy Roman Empire and imprisoned by Archbishop Ernest of Prague. Innocent used Rienzo in 1353 to assist Cardinal Albornoz, vicar general of the Papal States, in restoring papal power at Rome, thus making possible a return of the papacy from Avignon to Rome. Rienzo, however, was killed on Oct. 8, 1354, in a Roman riot.

Innocent maintained Clement's alliance with King Charles IV of Bohemia, whom he caused to be crowned emperor at Rome in 1355. The following year Charles published the Golden Bull, excluding papal intervention in the election of the German ruler, but Innocent raised no objection. In 1360 he arranged the Treaty of Brétigny between England and France, which ended the first phase of the Hundred Years' War. The last years of his pontificate were occupied with preparations for a crusade and with negotiations for the reunion of the Roman and Eastern churches.

• **Innocent VII,** original name COSIMO DE' MIGLIORATI (b. 1336, Sulmona, Kingdom of Sicily—d. Nov. 6, 1406, Rome), pope from 1404 to 1406.

Appointed archbishop of Ravenna (1387) by Pope Urban VI and, in 1389, bishop of Bologna, he was made cardinal by Pope Boniface IX, whom he succeeded on Oct. 17, 1404. Innocent's election was opposed at Rome, where it caused considerable strife, and at Avignon, Fr., where the Western Schism (1378–1417) was perpetuated by the rival election of Antipope Benedict XIII. King Ladislas of Naples went to Rome and suppressed the revolutionaries who were opposing the Pope's temporal authority. In appreciation, Innocent nominated Ladislas as "defender" of the church and promised the King not to negotiate with Benedict unless the Antipope recognized Ladislas' claims to Naples.

In late 1404 Innocent summoned a general council at Rome to heal the Schism, but the council never assembled because the Romans again rebelled when Innocent's nephew, Cardinal Ludovico de' Migliorati, murdered some of the leaders of the insurrection that Ladislas had quashed. Innocent was forced to flee to Viterbo, Papal States, on Aug. 6, 1405. Later realizing that the Pope was not guilty, the Romans submitted. In March 1406 Innocent returned to Rome, where he died in the midst of plans to restore the Roman University.

• **Innocent VIII,** original name GIOVANNI BATTISTA CIBO (b. 1432, Genoa—d. July 25/26, 1492, Rome), pope from 1484 to 1492.

Named bishop of Savona, Italy, in 1467 by Pope Paul II, he was made cardinal in 1473 by Pope Sixtus IV, whom he succeeded. His election was manipulated by Cardinal Giuliano della Rovere (later Pope Julius II), whose tool Innocent remained. The executions of persons thought to be practicing witchcraft were increasing throughout western Europe. In a bull of 1484 Innocent acknowledged belief in witchcraft, condemned it, and then dispatched inquisitors to Germany to try witches. In 1486 he persecuted one of the chief exponents of Renaissance Platonism, Pico della Mirandola, by condemning his theses and prohibiting his defense.



Innocent VIII, commemorative medallion by Niccolò Fiorentino

By courtesy of the National Gallery of Art, Washington, D.C., the Samuel H. Kress Collection

When his call for a crusade against the Turks failed, Innocent made an agreement in 1489 with Sultan Bayezid II to keep Prince Jem, Bayezid's fugitive brother and pretender to the Turkish throne, confined to the Vatican in return for an annual payment and the gift of the Holy Lance, the spear thrust into Christ's body at the crucifixion. Innocent's manoeuvres in Italian politics were equally unscrupulous: he deposed King Ferdinand of Naples in 1489 for failure to pay debts of tribute; and his wars with several Italian states, especially Naples, depleted the papal treasury, which he replenished by creating and selling new posts. Generally regarded as unworthy and of low private morals, Innocent left the Papal States in anarchy.

• **Innocent IX,** original name GIOVANNI ANTONIO FACCHINETTI (b. July 20, 1519, Bologna, Papal States—d. Dec. 30, 1591,

Rome), pope from Oct. 29 to Dec. 30, 1591.

As bishop of Nicastro, Kingdom of Naples, he participated in the Council of Trent in



Innocent IX, commemorative medallion, 1591

By courtesy of the St. Charles Seminary Library, Philadelphia; photograph, Robert S. Halvey

1562. In 1566 he was a papal ambassador at Venice. He was later employed in the Roman Inquisition (to combat Protestantism) by Pope Gregory XIII, who appointed him patriarch of Jerusalem (1576) and later made him a cardinal (1583). He assumed practically all administration under the ailing pope Gregory XIV, whom he was chosen to succeed as pope. He died two months later.

• **Innocent X,** original name GIOVANNI BATTISTA PAMPHILI, or GIAMBATTISTA PAMFILI (b. May 7, 1574, Rome—d. Jan. 7, 1655, Rome), pope from 1644 to 1655.

Pamphili was a church judge under Pope Clement VIII and a papal representative at Naples for Pope Gregory XV. He was made ambassador to Spain and cardinal (1626) by Pope Urban VIII, whom he succeeded on Sept. 15, 1644. Having been supported by cardinals who had opposed his predecessor, Innocent reversed Urban's policies, as demonstrated by his condemnation of the Peace of Westphalia—the collective name for the settlements of 1648, which brought to an end the Eighty Years' War between Spain and the Dutch and the German phase of the Thirty Years' War and alienated Catholic lands. But he reigned at a time when popes were no longer consulted by nations in settling war or making peace, and his protest went unnoticed by both sides.

Innocent's relationship with his relatives was questionable, for he was guilty of nepotism, and much of his pontificate was dominated by his avaricious sister-in-law, Olimpia Maidalchini. Innocent supported the Spanish Habsburgs—a branch of one of the great sovereign dynasties of Europe—by refusing to recognize the independence of Portugal, then at war with Spain. In Rome, Innocent attacked Urban's relatives, the Barberini, for extortion and confiscated their property. He clashed with France when the Barberini took refuge in Paris with Cardinal Mazarin, whose threat to invade Italy forced Innocent to yield. In theological matters he intervened in the quarrel between the Jesuits and the Jansenists and in a bull of 1653 condemned five propositions concerning the nature of grace as interpreted by Bishop Cornelius Jansen, the founder of Jansenism. A century of controversy with the Jansenists ensued, which was particularly damaging to the French Church. By the time of Innocent's death, papal prestige had seriously declined.

• **Innocent XI,** BLESSED, original name BENEDETTO ODESCALCHI (b. May 19, 1611, Como, Duchy of Milan—d. Aug. 12, 1689, Rome; beatified Oct. 7, 1956; feast day August 13), pope from 1676 to 1689.

Odescalchi studied law at the University of Naples and entered the Curia under Pope Urban VIII. Pope Innocent X made him cardinal (1645), emissary to Ferrara, Italy, and bishop of Novara, Italy (1650).

He was elected pope on Sept. 21, 1676, against the opposition of King Louis XIV of France, who proved to be an enemy of ecclesiastical privileges during Innocent's pontificate. He inherited an insolvent papal treasury but averted bankruptcy through wise taxation, rigid economizing, and financial support from Catholic powers. Innocent aided the war against the Turks by subsidizing King John III of Poland and the Holy Roman emperor Leopold I in a campaign that led to the relief of Vienna (1683) from the Turkish siege.

Innocent quarrelled with Louis when two French bishops resisted the edict of 1673 that extended the king's right to administer vacant sees. Louis then convoked a French synod, which issued the famous Gallican Articles, four statements in support of Gallicanism, a French ecclesiastical doctrine that advocated restriction of papal power. In response, Innocent refused to confirm the promotion of clergymen involved in the synod, and the deadlock worsened.

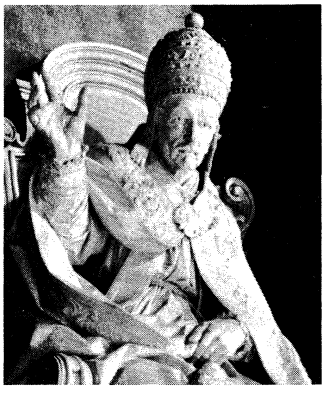
Realizing that Protestantism had to be tolerated to maintain peace, Innocent opposed Louis's persecution of the Huguenots. In May 1685 he furthered the threat of a break between France and the Holy See by acting against the French embassy in Rome for extending political asylum in such an abusive way that the neighbourhood adjacent to the embassy became a haven for criminals. The situation deteriorated further when Innocent opposed Louis's candidate for the archbishopric of Cologne (1688).

In doctrinal matters, Innocent sympathized somewhat with the Jansenists, followers of a nonorthodox ecclesiastical movement created by Bishop Cornelius Jansen of Ypres, which opposed Louis's religious policies. Although a friend of Miguel de Molinos, the Spanish mystic and proponent of the doctrine of Christian perfection known as Quietism, Innocent allowed Molinos to be arrested by the papal police and tried for personal immorality and heresy. He was sentenced to life imprisonment, and Innocent condemned his propositions in 1687.

Innocent is considered the outstanding pope of the 17th century, largely because of his high moral character. In a time of frequent papal corruption he was free from nepotism and his integrity was unquestioned. Louis O'Brien's *Innocent XI and the Revocation of the Edict of Nantes* was published in 1930.

• **Innocent XII,** original name ANTONIO PIGNATELLI (b. March 13, 1615, Spinazzola, Kingdom of the Two Sicilies—d. Sept. 27, 1700, Rome), pope from 1691 to 1700.

After studying at the Jesuit College, Rome, Pignatelli joined the Curia under Pope Urban VIII, becoming successively governor of Viterbo and papal ambassador to Tuscany and



Innocent XII, detail from a monument by Filippo Valle, 1746; in St. Peter's, Rome

Alinari—Art Resource/EB Inc.

to Poland and Austria. He was made cardinal in 1681 by Pope Innocent XI, whose pontificate Pignatelli emulated after being elected pope on July 12, 1691, as Innocent XII. In 1693 he broke the politico-religious deadlock between King Louis XIV of France and the Holy See by influencing Louis to disavow the four Gallican Articles of 1682 issued against Innocent XI. In exchange, Innocent agreed to extend the king's right to administer vacant sees. Upon Louis's insistence in 1699, Innocent condemned *Maximes des saints* ("Maxims of the Saints") compiled by the eminent French mystic archbishop Fénelon of Cambrai, whose work was one of the key issues in the controversy over a heretical doctrine of Christian perfection known as Quietism. Fénelon submitted immediately.

• **Innocent XIII,** original name MICHELANGIOLO, or MICHELANGELO, DEI CONTI (b. May 13, 1655, Poli, near Palestrina, Papal States—d. March 7, 1724, Rome), pope from 1721 to 1724.

Of noble birth, Dei Conti was papal ambassador to Switzerland and to Portugal before Pope Clement XI made him cardinal (1706) and bishop of Osimo, Papal States (1709). He



Innocent XIII, commemorative medallion, 1721

By courtesy of the St. Charles Seminary Library, Philadelphia; photograph, Robert S. Halvey

was elected pope on May 8, 1721. In the following year he invested the Holy Roman emperor Charles VI with sovereignty over the Kingdom of Naples. Innocent recognized James (the Old Pretender) as the king of England and promised him subsidies conditional upon the reestablishment of Roman Catholicism in England. Distrusting the Jesuits and their missionaries in China, who modified Christian usage (in the "Chinese rites") to attract converts, Innocent commanded the Society of Jesus to obey Clement's bull of 1713, which prohibited these rites and practices.

Innocent VENIAMINOV, SAINT, Russian INNOKENTY VENIAMINOV, original name IVAN YEVSEYEVICH VENIAMINOV (b. Sept. 6 [Aug. 26, old style], 1797, Anginskoye, Irkutsk Province, Russian Empire—d. April 12 [March 31, O.S.] 1879, Moscow; canonized Oct. 6, 1977), the most famous Russian Orthodox missionary priest of the 19th century, who later became Metropolitan Innocent of Moscow. He was canonized in the Russian Church.

Veniaminov began his career, from 1824 until 1839, as a parish priest, first in Irkutsk, the capital of Eastern Siberia, and then in Alaska, which was part of the Russian Empire until 1867. While in Alaska, Veniaminov learned the Aleut language, for which he invented an alphabet and charted a grammar. His book *The Way to the Kingdom of Heaven*, written in Aleut in 1841, gained wide appeal. After spending 10 years in the Aleutians, he moved on to Novo Arkhangelsk (now Sitka) on Baronov Island and, in 1836, began to baptize the Kolosh Indians.

In 1840, while Veniaminov was in St. Petersburg to recruit support for the Alaska Mission, his wife died; he subsequently entered the novitiate, took the name Innocent, and was ordained bishop of the new Diocese of Kamchatka, which extended from the Kamchatka Peninsula to the Alaska Peninsula, including the Kuril and the Aleutian islands and the region of Yakutsk. For 28 years he travelled this region, learning the local languages, converting the inhabitants to Orthodoxy, and ultimately establishing four separate dioceses. He was rewarded with election to the position of metropolitan of Moscow in 1868, and in this role he established the Orthodox Missionary Society, which continued his work of conversion until the Russian Revolution.

Innocents' Day: *see* Holy Innocents, Feast of the.

Innoko River, river, west central Alaska, U.S., the westernmost major tributary of the Yukon River. It rises in the Kuskokwim Mountains west of the town of McGraw and flows north, then southwest for about 500 mi (800 km) before joining the Yukon near Holy Cross. The name Innoko, first used by the Russian explorer Lavrenty Zagoskin during his 1842–44 expedition, is probably an Ingalik Indian word, but its meaning is unknown. During the 1907 gold rush, prospectors rushed into the valley and set up several mining camps, which included Ophir, Poorman, and Cripple. The streams, however, never produced much alluvial gold, and the Innoko Valley remains largely wilderness.

Innoshima, city, Hiroshima Prefecture (*ken*), western Honshu, Japan. Innoshima is a small offshore island in the Inland Sea, originally settled by pirates. After the decline of piracy in the 17th century, the island was left to fishermen. After the Russo-Japanese War, Hitachi Shipbuilding established a modern dockyard. In 1964 the 100,800-ton supertanker Ōimaru, then the largest ship ever built on a building slip, was launched. Innoshima was designated a city in 1953. Pop. (1980) 38,579.

Inns of Court, Lincoln's Inn, Gray's Inn, Inner Temple, and Middle Temple, a group of institutions of considerable antiquity, located in London, that have historically been responsible for legal education. Their respective governing bodies, the benches, exercise the exclusive right of admitting persons to practice by a formal call to the bar.

The Inns of Court are voluntary societies, unchartered, unincorporated, and unendowed. Hence, their early history is obscure. Since their inception in the Middle Ages, however, they have been devoted to the technical study of English law, rather than Roman law, which was taught in the universities (*see* Doctors' Commons). Previously, law was learned in the course of service, the first rudiments possibly in private clerkship to some official. By the mid-13th century, when the common law had become extensive and intricate, there arose a class of men, literate but lay, who created and dominated the legal profession and set up the Inns of Court as an answer to the problem of legal education. Manuals and books were produced in French rather than Latin. The students listened to arguments in court and discussed law among themselves.

In addition to those who practiced in the courts, there was also a large demand for stewards and legal advisers to landowners to conduct general business and keep manorial courts. These men needed the rudiments but not the refinements of common law. Such, too, was the case with the large class of attorneys and a growing class of bookkeepers and correspondence clerks. They gained most of their knowledge through an Inn of Chancery, an institution for training in the framing of writs and other legal documents used in the courts of chancery.

In the 14th century many of the household clerks (clergy with at least minor orders) of the chancellor's office combined in Inns and appear to have taken students for training. By the end of the century these Inns were in danger of being submerged by a flood of attorneys-to-be and students who used an Inn of Chancery as a preparation for entering an Inn of Court. Eventually, each Inn of Court secured control of one or more Inns of Chancery and supervised its affairs, appointed readers to teach in it, and later often bought its premises, becoming its landlord.

By the 15th century the Inns of Court were governed by their benchers, who had previously given at least two courses of lectures (readings) and who presided over mock arguments (moots) in which students argued difficult points of law before them.

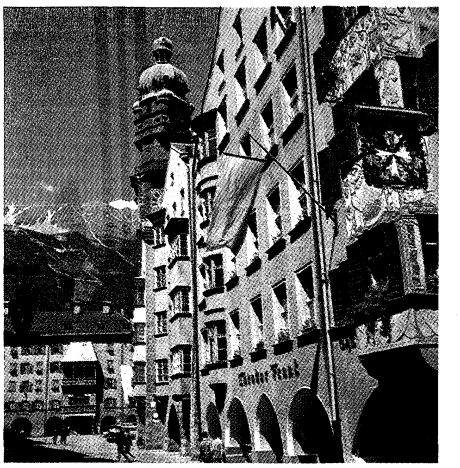
Because the law was highly technical, proficiency could be acquired only by following the demanding studies of the Inns. In practice, the Inns thus had a monopoly over legal education. In the 15th and 16th centuries, however, many students joined the Inns for the purpose of getting a general education, rather than legal training. By the end of the 16th century the Inns of Court had begun to exclude attorneys and solicitors and refused to call them to the bar, with the result that attorneys especially fell back on the Inns of Chancery and finally came to form a profession distinct from that of the barristers (*see* solicitor).

By the beginning of the 16th century, the Inns had acquired the actual ownership of their sites and began building splendid halls, a process that continued through the century.

Various causes brought on the decline of this system of education. For one thing, the great activity of the printing press led students to rely more upon printed material, and as a result they neglected attendance at readings and moots. The system broke down completely during the English Civil War; readings ceased in 1677, and only the fees survived. Having paid them, the student was deemed to have fulfilled his duties. With no readers to recommend students for call to the bar, the four Inns in the 18th century finally agreed to call students who had been in residence a stated number of terms. Later, it was settled that eating three dinners was equivalent to attending for the whole term. Meanwhile, the Inns of Chancery were no longer adequate for so large a group as the attorneys and solicitors, and these latter, therefore, created their own society.

In the 19th century the common law commissioners investigated the Inns of Court, which as a result took steps to resume their educational functions. Readerships were reestablished, and lawyers were engaged in teaching with a view to examinations conducted by the Council of Legal Education, representing all four Inns.

Innsbruck, city, capital of *Bundesland* (federal province) Tirol, western Austria, on the Inn at the mouth of the Sill River in the Eastern Alps. First mentioned in 1180 as a small market town belonging to the Bavarian counts of Andech, it developed rapidly because of its strategic position at the junction of the great trade routes from Italy to Germany via the Brenner Pass and from Switzerland and western Europe. The bridge (*Brücke*) over the Inn originally carried this traffic and gave the city its name and its insignia. Innsbruck was chartered in 1239, passed to the Habsburgs in 1363, and in 1420 became the capital of Tirol and the ducal residence under Frederick, the duke "of the empty pockets." Napoleon gave the city to the kingdom of Bavaria in 1806,

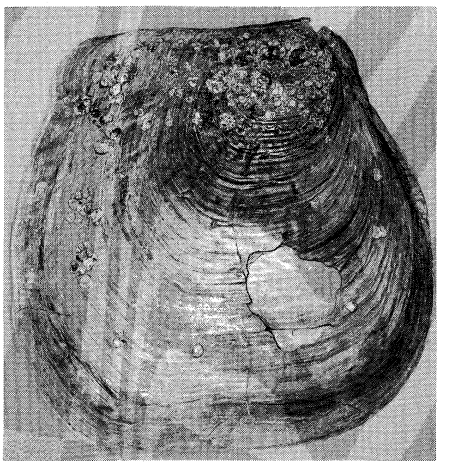


Fürstenburg building with gilded copper roof (left background), Innsbruck, Austria
Louis Goldman—Rapho/Photo Researchers

and during the War of Liberation (1809) four battles were fought around Berg Isel, a hill (2,461 ft [750 m]) immediately to the south, by Tirolian patriots led by Andreas Hofer against the Bavarians and the French.

The old town has narrow streets lined with medieval houses and arcades. One of the most famous buildings is the Fürstenburg, with a balcony with a gilded copper roof, supposedly built by Duke Frederick and refashioned by the emperor Maximilian *c.* 1500. Other notable landmarks include the Hofburg (1754–70, on the site of a 15th-century ducal residence) and the Franciscan, or Court, church (1553–63), containing the mausoleum dedicated to Maximilian I and the tombs of Hofer and other Tirolian heroes. The university was founded by Emperor Leopold I in 1677, and its great library was a gift of the empress Maria Theresa in 1745. There are four major museums: the Ferdinandeum, with prehistoric, industrial-art, and natural-history collections and a picture gallery; the Tirolean Folk Art Museum; the Museum of the Imperial Rifles; and parts of the collections of the archduke Ferdinand II, in the Castle Ambras. Innsbruck is one of the most popular tourist and health resorts and winter-sports centres in central Europe. The Olympic Winter Games were held there in 1964 and 1976. It is a rail and market centre and manufactures textiles (especially loden garments), shoes, beer, and musical instruments, and there is wood- and metalworking as well as food processing. Pop. (1981) 116,100.

Inoceramus, genus of extinct pelecypods (clams) found as fossils in Jurassic to Creta-



Inoceramus, 35 in. × 34 in., found in the Kansas Niobrara Chalk, of Cretaceous age
By courtesy of the Sternberg Memorial Museum, Hays, Kansas

ceous rocks (laid down from 190,000,000 to 65,000,000 years ago). Especially important and widespread in Cretaceous rocks, *Inoceramus* had a distinctive shell; it is large, thick, and wrinkled in a concentric fashion, making identification relatively simple. The many pits at the dorsal region were the anchoring points for the ligaments that closed the shell.

inoculation, process of producing immunity and method of vaccination that consists of introduction of the infectious agent onto an abraded or absorptive skin surface instead of inserting the substance in the tissues by means of a hollow needle, as in injection. Of the common vaccines, only smallpox vaccine is routinely inoculated. The term inoculation is also commonly used more broadly to mean any introduction of antigenic substances into the tissues. *See also* immunization; vaccine.

İnönü, İsmet (b. Sept. 24, 1884, Smyrna, Ottoman Empire—d. Dec. 25, 1973, Ankara), Turkish army officer, statesman, and collaborator with and successor to Mustafa Kemal Atatürk as president of the Turkish Republic. Identified with one-party rule between 1939 and 1946, he later emerged as a champion of democracy.

İsmet served on the general staff of the 3rd Army at Edirne and as chief of staff of the army in Yemen. During World War I, he commanded the 4th Army in Syria (1916), and, at the time of the Ottoman surrender (Oct. 30, 1918), he was the undersecretary of war in Constantinople. Later he joined Mustafa Kemal's movement to resist the Allied occupation of Anatolia. In 1920 he was elected to the last Ottoman Parliament as deputy for Edirne. After the Greek occupation of western Anatolia, he was appointed chief of the general staff of the nationalist army and repelled the invaders in the two battles of İnönü (near Ankara) in January and April 1921. From those engagements he later took his surname.

Appointed foreign minister in the government of the Grand National Assembly in Ankara in 1922, İsmet succeeded, with the support of Mustafa Kemal, in gaining most of the Turkish demands in the Treaty of Lausanne (Switz.; July 24, 1923). When the republic was proclaimed on Oct. 29, 1923, İsmet became the prime minister. He remained in power until 1937.

On Atatürk's death on Nov. 10, 1938, İnönü was elected president and became the permanent chairman of the Republican People's Party (RPP). During World War II, Turkey, under his adroit leadership, remained neutral. In the postwar period, however, in response to internal strains and to the Western pressures for a democratic regime, he encouraged the formation of the Democrat Party (DP) in 1946, which defeated the RPP in the elections of 1950. İnönü was replaced as president by Celâl Bayar and led the opposition (1950–60), assuming the role of defender of democracy.

Following the 1960 military coup d'etat, which overthrew the DP government, İnönü formed three coalition governments between 1961 and 1965, but in the general elections of 1965 and 1969 his party suffered overwhelming defeats. During this period İnönü was criticized by the Kemalist and Socialist factions within RPP for the compromises he made with the coalition partners and with the conservatives. Under these pressures he declared his ideological stance as "left of centre," alienating the centrists in his party, who formed the Reliance Party (Güven Partisi) in 1967. İnönü himself, however, was replaced in 1972 as RPP leader by Bülent Ecevit, the head of the leftist faction.

inorganic compound, any substance in which two or more chemical elements other than carbon are combined, nearly always in definite proportions. Compounds of carbon are classified as organic except for carbides, carbonates, cyanides, and a few others. *See* chemical compound.

inosilicate, formerly called METASILICATE, any of a class of inorganic compounds that have structures characterized by silicate tetrahedrons (a central silicon atom surrounded by four oxygen atoms at the corners of a tetrahedron) arranged in chains. Two of the oxygen atoms of each tetrahedron are shared with other tetrahedrons, forming a chain that is potentially infinite in length. Single chains (with a multiple of SiO_3 in the chemical formula), double chains (with Si_4O_{11} in the formula), and more complex chains are possible. Mineral examples include the pyroxenes (single chain) and the amphiboles (double chain).

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inosinic acid, a compound important in metabolism. It is the ribonucleotide of hypoxanthine and is the first compound formed during the synthesis of purine in organisms. From inosinic acid are derived such important compounds as the purine nucleotides found in nucleic acids and the energy-rich purine nucleotide adenosine triphosphate, in which chemical energy is stored in cells.

inositol, also called CYCLOHEXANEHEXOL, any of several stereoisomeric alcohols similar in molecular structure to the simple carbohydrates. The best known of the inositols is myoinositol, named for its presence in muscle tissue, from which it was first obtained in 1850. Myoinositol is essential for the growth of yeasts and other fungi; it is widely distributed in plants and animals, and large amounts of it are present in the human body, principally as a constituent of a phospholipid that is abundant in the brain. Myoinositol is commonly obtained from grains, in which it is present as the hexaphosphate, phytic acid.

Inoue Enryō (b. March 18, 1858, Echigo Province, Japan—d. June 6, 1919, Dairen, Manchuria), Japanese philosopher and educator who attempted to reinterpret Buddhist concepts so they would be relevant to Western philosophical doctrines. An ardent nationalist, Inoue helped make Buddhism an intellectually acceptable alternative to Western religious doctrines.

After attending the school for priests at the Higashihongan-ji, the main temple of the Jōdo-Shinshū (True Pure Land sect) in Japan, Inoue enrolled in Tokyo Imperial University, where he graduated from the department of philosophy in 1885. Critical of what he considered the excessive Westernization of Japan, especially the conversion of many governmental leaders to Christianity, he founded (1887) the Tetsugaku kan (Philosophical Institute) to promote the study of Buddhism. Inoue's belief that Buddhism epitomized Oriental philosophy gained many adherents, and with their aid he began to publish the highly nationalistic magazine *Nihonjin* ("The Japanese") and embarked on a series of lecture tours throughout Japan and Europe.

In his later life, Inoue conducted an educational campaign to overcome superstitions inspired by folklore interpretations of Japanese mythology. For this purpose he established the Ghost Lore Institute in Tokyo and gained the sobriquet "Doctor Obake," or "Doctor Ghost." He died while on a speaking tour in Manchuria.

Inoue Kaoru, KŌSHAKU (Marquess) (b. Jan. 16, 1836, Chōshū, Nagato Province, Japan—d. Sept. 1, 1915, Tokyo), member of the oligarchy that ruled Japan during the Meiji period (1868–1912).

Inoue was born to a samurai family and was a close boyhood friend of Itō Hirobumi, who later became Japan's first prime minister. Desiring to rid Japan of foreigners, the pair joined an attack on the British legation in Edo (now Tokyo). When this failed they became aware of their powerlessness and decided to study the foreigners firsthand. They left Japan in 1863 and worked their way to England as ordinary sailors. The following year, when news reached them of the crisis in Japan over the bombardment of foreign ships by their own clan, they hurried home to urge their clansmen and others to seek peace. They failed in this effort, and Inoue was attacked and injured by reactionary samurai.



Inoue Kaoru
BBC Hulton Picture Library

With the overthrow of the Tokugawa clan, which had ruled Japan from 1603 to 1867, and the restoration of power to the Meiji emperor, Inoue became a leading member of the government and held important positions in the ministries of finance, industry, and foreign affairs. After Itō became prime minister in 1885, Inoue served successively as foreign minister, minister of the interior, and minister of finance. During the Russo-Japanese War (1904–05) he was named special adviser to the minister of finance and at the request of the Emperor attended all important state councils.

He was closely associated with the financial world and had connections with the giant Mitsui *zaibatsu*. The *zaibatsu* were extremely large, family-owned financial empires. He retired from active politics in 1898 but continued to have an important influence on the state, remaining until his death one of the elder statesmen, or *genrō*, whose advice the Emperor sought on difficult political questions. He became a marquess in 1907.

Inoue Tetsujirō (b. 1855, Buzen Province, Japan—d. 1944), Japanese philosopher who opposed Christianity as incompatible with Japanese culture and who worked to preserve traditional Japanese values. At the same time, using Western philosophical methods, he helped to create a systematic history of the theories of Oriental philosophy and sought to develop a synthesis of Western philosophies (notably German) and Oriental philosophies.

Inoue was the son of a physician in the administration for Kyushu (Chikuzen, now Fukuoka Prefecture). Graduated from Tokyo Imperial University (1880), he served in the Ministry of Education before returning to the university in 1882, lecturing on the history of Oriental philosophy.

His essay on new forms of poetry, *Shintaishishō* (1882), contributed to the introduction of Western poetry styles. After further studies at the universities of Heidelberg and Leipzig in Germany (1884–90), he became professor of philosophy at Tokyo Imperial University. He later served as dean of the university's faculty of literature (1897–1904).

Inoue's essay on the relations between the

Imperial family and religion, *Teishitsu to shūkyō no kankei,* in 1890—the year in which the Imperial rescript on education was promulgated, demanding unquestioned acceptance of Imperial will and authority—considerably influenced public opinion. It attacked Christianity and urged the maintenance of Japan's unique traditions. His most important anti-Christian polemic, however, was his article "Kokka to Yaso-kyō to no shòtotsu" ("Conflict Between the Nation and Christianity"), published the following year.

In 1900 Inoue published *Nihon yōmei gakuha no tetsugaku,* a study of the Japanese philosophy derived from the teachings of Wang Yang-ming. His biography of the Santama Buddha, *Shakamuni-den,* and a study of the philosophy in the Japanese classics, *Nihon kogakuha no tetsugaku,* both appeared in 1902. He dealt with the philosophy of the Japanese Chu-hsi school in *Nihon shushi gakuha no tetsugaku* (1905).

His prestige as a member of the Tokyo Academy (from 1895) and president of the Association of Philosophers (Tetsugaku-kai) considerably influenced the course of Japanese philosophy and thought. He edited a number of magazines, including *Eastern Art and Sciences* and *Light in the Far East.*

After resigning from Tokyo Imperial University (1923), he lectured at the Gakushūin (peers school) and Tōyō University. He entered the House of Peers as an Imperial nominee in 1925 but resigned in the following year.

Inowrocław, town, Bydgoszcz *województwo* (province), north central Poland, in the Kujawy region. First mentioned in 1185 as a trading settlement, the town lay on an ancient trade route between southern Europe and the Baltic Sea. It became capital of the autonomous principality of Kujawy, having allegiance to the Polish crown in the 15th century. An industrial town with good road and rail connections, Inowrocław has salt deposits that provide one-sixth of Poland's needs and that have established the town as a health spa. They also are the basis of a chemical industry there.

The 12th-century Church of the Blessed Virgin contains some of Poland's oldest sculpture. Pop. (1982 est.) 66,500.

input–output analysis, economic analysis developed by the 20th-century Russian-born U.S. economist Wassily W. Leontief, in which the interdependence of an economy's various productive sectors is observed by viewing the product of each industry both as a commodity demanded for final consumption and as a factor in the production of itself and other goods. Certain simplifying assumptions are made, such as that productive resources will always be combined in the same proportions to produce any amount of a final product. Then it is possible to determine the total quantities of various goods that must be produced to obtain a given amount for final consumption.

The analysis usually involves constructing a table in which each horizontal row describes how one industry's total product is divided among various production processes and final consumption. Each vertical column denotes the combination of productive resources used within one industry. If, for example, the first row of a table for a very simple economy describes the distribution of the total production of trucks, it would show that a certain quantity of trucks is used in the production of more trucks, a certain quantity in the production of agricultural commodities, a certain quantity in the production of houses, a certain quantity by private households, and so on. If the numbers are added across the row, the total quantity of trucks produced is obtained. A table of this type illustrates the dependence of each industry on the products of other industries: for example, an increase in food output is also seen to require an increase in the production of trucks.

Input–output tables can be constructed for whole economies or for segments within economies. They are useful in planning the production levels in various industries necessary to meet given consumption goals and in analyzing the effects throughout the economy of changes in certain components. They have been most widely used in planned economies and in developing countries.

input/output device, any of various devices used to enter information and instructions into a computer for storage or processing and to deliver the processed data to a human operator or, in some cases, a machine controlled by the computer. Such devices comprise the peripheral equipment of modern digital computer systems. Apparatus of this kind with direct connection to a system's central processing unit (*q.v.*) is said to be on-line; peripheral equipment working independently of it is termed off-line.

An input device converts incoming data and instructions into a pattern of electronic signals in binary code (*i.e.*, combinations of 0s and 1s) comprehensible to a digital computer, whereas an output device reverses the process, translating the digitalized signals into a form intelligible to the user. Punched-card and paper-tape readers were once extensively used for inputting but have now been supplanted in large measure by more efficient devices. These include video display terminals consisting of a cathode-ray tube, typewriter-like keyboard, and interactive graphic devices such as a light pen, trackball, or joystick. Other direct entry mechanisms are optical laser scanners (*e.g.*, those used with point-of-sale terminals in retail stores) that can read bar-coded data or optical character fonts; and voice-recognition devices capable of understanding simple verbal commands. Output equipment, some of which can also be used for inputting, includes video display terminals, high-speed printers, console typewriters, and audio response units that convert text and other processed data into spoken words. Certain kinds of auxiliary storage devices, as for example magnetic tape and magnetic disk units, double as input/output devices (*see* computer memory).

inquest, judicial inquiry by a group of persons appointed by a court. The most common type is the inquest set up to investigate a death apparently occasioned by unnatural means. Witnesses are examined, and a special jury returns a verdict on the cause of death. In England inquests are also required when there is loss or injury in a fire. The inquest is confined to common-law jurisdictions that have a coroner system.

Although the European civil-law system has a long tradition of the use of medical evidence and professional witnesses in court, it has no procedure similar to the inquest. *See also* coroner's jury.

Inquisition, in Roman Catholicism, a papal judicial institution that combatted heresy and such things as alchemy, witchcraft, and sorcery and wielded considerable power in medieval and early modern times. The name is derived from the Latin verb *inquiro* ("inquire into"), which emphasizes the fact that the inquisitors did not wait for complaints but sought out heretics and other offenders.

After the Roman Church had consolidated its power in the early Middle Ages, heretics came to be looked upon as enemies of society. With the appearance of large-scale heresies in the 11th and 12th centuries—notably among the Cathari and Waldenses—Pope Gregory IX in 1231 instituted the papal Inquisition for the apprehension and trial of heretics.

The inquisitorial procedure was quite detailed; but, in general terms, it gave a person suspected of heresy time to confess and absolve himself, and, failing this, the accused was haled before the inquisitor and interrogated and tried, with the testimony of witnesses. The use of torture to obtain confessions and the names of other heretics was at first rejected but was authorized in 1252 by Innocent IV. On admission or conviction of guilt, a person could be sentenced publicly to any of a wide variety of penalties, ranging from simple prayer and fasting to confiscation of property and imprisonment, even life imprisonment. Condemned heretics who refused to recant, as well as those who relapsed after condemnation and repentance, were turned over to the secular arm, which alone could impose the death penalty.

The medieval Inquisition functioned only in a limited way in northern Europe; it was most employed in northern Italy and southern France. During the Reconquista in Spain, the Catholic powers used it only occasionally; but, after the Muslims had been driven out, the Catholic monarchs of Aragon and Castile determined to enforce religious and political unity and requested a special institution to combat apostate former Jews and Muslims as well as such heretics as the Alumbrados. Thus in 1478 Pope Sixtus IV authorized the Spanish Inquisition.

The first Spanish inquisitors, operating in Seville, proved so severe that Sixtus IV had to interfere. But the Spanish crown now had in its possession a weapon too precious to give up, and the efforts of the Pope to limit the powers of the Inquisition were without avail. In 1483 he was induced to authorize the naming by the Spanish government of a grand inquisitor for Castile, and during the same year Aragon, Valencia, and Catalonia were placed under the power of the Inquisition. The first grand inquisitor was the Dominican Tomás de Torquemada, who has become the symbol of the inquisitor who uses torture and confiscation to terrorize his victims. The number of burnings at the stake during his tenure has been exaggerated, but it was probably about 2,000.

In general, the procedure of the Spanish Inquisition was much like the medieval Inquisition. The auto-da-fé, the public ceremony at which sentences were pronounced, became an elaborate celebration. Under the inquisitor general and his supreme council were 14 local tribunals in Spain and several in the colonies, including those in Mexico and Peru. The Spanish Inquisition was introduced into Sicily in 1517, but efforts to set it up in Naples and Milan failed. The emperor Charles V in 1522 introduced it into the Netherlands, where its efforts to wipe out Protestantism were unsuccessful. The Inquisition in Spain was suppressed by Joseph Bonaparte in 1808, restored by Ferdinand VII in 1814, suppressed in 1820, restored in 1823, and finally suppressed in 1834.

A third variety of the Inquisition was the Roman Inquisition, established in 1542 by Pope Paul III to combat Protestantism. It was governed by a commission of six cardinals, the Congregation of the Inquisition, which was thoroughly independent and much freer from episcopal control than the medieval Inquisition had been. Its establishment has been seen by some as an attempt to counterbalance the severe Spanish Inquisition at a time when a great part of Italy was under Spanish rule.

Under Paul III (1534–49) and Julius III (1550–55), the action of the Roman Inquisition was not rigorous, and Julius ruled that, although the tribunal had general authority, its action should be limited especially to Italy. The moderation of these popes was imitated by their successors with the exceptions of Paul IV (1555–59) and Pius V (1566–72).

Under Paul IV the Inquisition functioned in such a way that it alienated nearly all parties. Although Pius V (a Dominican and himself formerly grand inquisitor) avoided the worst excesses of Paul IV, he nevertheless declared at the beginning of his reign that questions of faith took precedence over all other business and made it clear that his first care would be to see that heresy, false doctrine, and error were suppressed. He took part in many of the activities of the Inquisition.

After Protestantism had been eliminated as a serious danger to Italian religious unity, the Roman Inquisition became more and more an ordinary organ of papal government concerned with maintaining good order and good customs as well as purity of faith among Catholics. In his reorganization of the Roman Curia in 1908, Pius X dropped the word Inquisition, and the congregation charged with maintaining purity of faith came to be known officially as the Holy Office. In 1965 Pope Paul VI reorganized the congregation along more democratic lines and renamed it the Congregation for the Doctrine of the Faith.

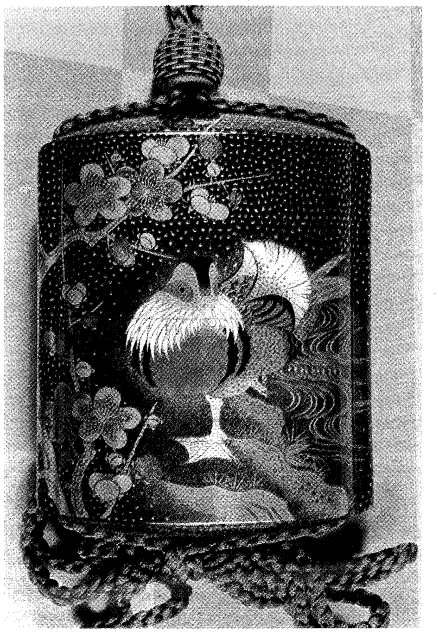
inquisitorial procedure, in law, one of the two methods of exposing evidence in court (the other being the adversary procedure; *q.v.*). The inquisitorial system is typical of civil- or Roman-law countries.

Under the inquisitorial procedure, the pretrial hearing for bringing a possible indictment is usually under the control of a judge whose responsibilities include the investigation of all aspects of the case, whether favourable or unfavourable to either the prosecution or defense. Witnesses are heard, and the accused, who is represented by counsel, may also be heard, though he is not required to speak and, if he does, he is not put under oath. In Germany the prosecution participates in the investigation; in France the prosecution presents its recommendations only at the end of the hearing; in the Soviet Union a representative of the state procurator, not a magistrate, is in charge of the investigation. In both France and Germany the investigating magistrate will recommend a trial only if he is sure that there is sufficient evidence of guilt. The entire dossier of the pretrial proceedings is made available to the defense.

At the trial the judge, once more, assumes a direct role, conducting the examination of witnesses, often basing his questions on the material in the dossier. Neither the prosecution nor the defense has the right to cross-examine, but they can present effective summations. The jury does not consult the dossier, relying on the facts brought out in the trial.

inrō, in Japanese dress, small portable case worn on the girdle. As indicated by the meaning of the word *inrō* ("vessel to hold seals"), these objects, probably originally imported from China, were used as containers for seals. In about the 16th century they were adapted by the Japanese for holding medicine, tobacco, confections, and other small items and became a part of the traditional Japanese male costume. *Inrō* are generally oval or cylindrical in section and usually measure 2 inches (5 centimetres) in width and from 2.5 inches (6.4 centimetres) to 4 inches (10 centimetres) in length. They have from two to five compartments, which are fitted into each other and held together by silken cords running along each side, secured by a bead (*ojime*), and kept from slipping through the kimono sash by a netsuke (*q.v.*), a small carved object at the end of the cords.

Early *inrō* were usually covered with plain black lacquer, but after the middle of the 17th century the more elaborate techniques of carved, painted, and gold lacquerwork were commonly used, making these objects some of the finest examples of Japanese craftsmanship in the Tokugawa (Edo) period (1603–1867).



Inrō depicting a mandarin duck, signed Toyo, Tokugawa (Edo) period

From Melvin and Betty Jahss, *Inro and Other Miniature Forms of Japanese Lacquer Art;* Charles E. Tuttle Co., Inc.

The collecting of *inrō* became especially popular in the late 19th and 20th centuries.

insanity, in criminal law, condition of mental disorder or mental defect that relieves a person of criminal responsibility for his conduct. Tests of insanity used in law are not intended to be scientific definitions of mental disorder; rather, they are expected to identify persons whose incapacity is of such character and extent that criminal responsibility should be denied on grounds of social expediency and justice.

Various legal tests of insanity have been put forward, none of which has escaped criticism. Anglo-American systems, including that of India, base the law of criminal responsibility primarily on the famous case of M'Naghten. In that case (1843) the English judges held that "to establish a defense of insanity, it must be clearly proved that, at the time of committing the act, the party accused was labouring under such a defect of reason, from disease of mind, as not to know the nature and quality of the act he was doing; or if he did know it, that he did not know he was doing what was wrong." Some U.S. courts went further and also relieved from responsibility one moved by an "irresistible impulse."

These rules have been the object of sharp controversy. Critics charge that they express an overintellectualized concept of mental disorder, reflecting outmoded notions of human behaviour. The rules have been criticized as not being based on modern concepts of medical science, thus complicating the work of the psychiatrist in giving expert testimony.

The 1954 decision of *Durham* v. *United States* promulgated a new rule: "simply that an accused is not criminally responsible if his unlawful act was the product of mental disease or mental defect." In simplicity, this test resembles the Japanese: "An act of an insane person is not punishable." Such a rule has been supported by some lawyers and judges and by many psychiatrists, but few U.S. courts have adopted it.

Many U.S. states and several courts have adopted the test proposed by the American Law Institute's Model Penal Code. This test provides a defense to a criminal charge if, at the time of the act, the accused, by reason of mental disorder or defect, lacked "substantial capacity either to appreciate the criminality of his conduct or to conform his conduct to the requirements of the law." In focussing on the volitional as well as the cognitive aspects of incapacity, this test has much in common with the European codes. The Italian penal code, for example, relieves a person of responsibility when he "is deprived of the capacity of understanding or volition." By the early 1980s two U.S. states had abolished the insanity plea; a few other states had passed laws that allowed juries to find defendants "guilty but mentally ill." In such a case, the defendant undergoes treatment at a mental institution before the sentence is carried out.

The major differences between the civil law of insanity and the common-law variant are procedural. The continental codes ordinarily do not make use of lay juries in establishing responsibility, whereas the English-speaking jurisdictions do. Some countries, including Japan and England, identify a form of mental disorder short of insanity that may be taken into account in mitigating punishment.

Insanity is justified as an exemption from responsibility on the grounds that responsibility assumes capacity to make elementary moral distinctions and power to adjust behaviour to the commands of the law. The insane should not be condemned since they cannot be deterred by the threat of penal sanctions. Critics say that the issue of responsibility is less important than the problem of how to identify and treat the disturbed individual. *See also* diminished responsibility.

insect, member of the class Insecta, the largest class of the phylum Arthropoda, which is itself the largest of the animal phyla. Of all the animal species so far described by science, insects account for about five-sixths; in addition to the nearly 1,000,000 insect species known, entomologists estimate there are 1,000,000 to 4,000,000 yet to be described.

A brief treatment of insects follows. For full treatment, *see* MACROPAEDIA: Insects.

Many of the features of insects are those of Arthropoda generally—notably jointed legs and a segmented body covered by a hard exoskeleton, composed, in part, of the protein chitin. The exoskeleton provides protection, much like a suit of armour, and it also serves as the point of attachment for the muscles. The exoskeleton must be molted (shed) periodically during growth.

Insects are unique among the arthropods in that they have only three pairs of legs (all other arthropods have four or more pairs) and in that most insects bear wings (all other arthropods are wingless). Also, unlike most other arthropods, the insects show specific division of the body into three regions: the head, the thorax, and the abdomen.

Insects exhibit a bewildering variety of forms; except in the most primitive insects, even individuals have slightly to strikingly different forms as larvae and as adults. Insects range in size from the barely visible to several inches in length or wingspread; their lifespans range from hours to many years; they may be solitary or social. Insects feed on plants, animals, and organic debris; their interactions with their food source range from mutualism to parasitism to predation.

Despite their diversity, all adult insects share some basic external and internal anatomical features. In all species, for example, the head contains sensory structures and mouthparts. In most insects the mouthparts consist of several structures, including an upper lip (labrum), a pair of jaws (mandibles), a pair of sensory structures (maxillae), and a lower lip (labium). These basic mouthparts have been highly modified for different feeding methods, including chewing, bloodsucking, sucking plant juices, and feeding on nectar. The

sensory structures of the head include a pair of antennae, which typically bear numerous tactile and olfactory bristles, and eyes. Most higher insects have two kinds of eyes: simple eyes, which perceive only light, darkness, and movement; and compound eyes, which are made up of dozens to thousands of separate lenses and presumably form mosaic images. Insects can perceive colour; they can also discern various ultraviolet wavelengths of electromagnetic radiation that are invisible to humans.

The thorax consists of three segments, which may be fused. Each segment bears a pair of legs; these may be modified for walking, jumping, grasping, burrowing, or swimming. In most insects, the rear two thoracic segments each carry a pair of wings. Some species, however, have only one pair of wings, and others lack wings entirely.

The abdomen is segmented, having 11 segments (or fewer, if fusion has occurred). It is without appendages except at the hind end, where some species have external reproductive structures, sensory feelers, or both.

Internally, insects possess well-developed digestive, circulatory, respiratory, nervous, and reproductive systems. The digestive tract consists of the foregut in the head and thorax, and the midgut and hindgut in the abdomen. Digestive enzymes are secreted by salivary glands and by cells of the midgut; digested food is absorbed chiefly in the midgut. Undigested food residues are expelled from the hindgut through the anus.

Insects have an open circulatory system. This means that the blood (hemolymph) is not confined exclusively to a network of vessels; at some point it is pumped into the interior body cavity where it directly bathes the internal tissues. In fact, insects have only one blood vessel, which runs dorsally the length of the body. The abdominal portion of the vessel is the heart, or pumping organ; the portion that extends through the thorax and head is called the aorta. Blood is discharged from the aorta into the head; it circulates through the head, thorax, and abdomen and is forced into the wings and legs by accessory pumps. As it circulates through the body spaces, the blood distributes nutrients, which it absorbs from the midgut or from the fat body, an important storage tissue in insects. The blood picks up wastes which are then removed from it by a system of malphigian tubules that open into the rear end of the midgut. Eventually the blood re-enters the heart through small openings called ostia.

Unlike most higher invertebrates (and all vertebrates), insects do not rely on the circulating blood to deliver oxygen to the body cells and to carry away the waste gas carbon dioxide. The respiratory system of insects consists of air tubes, or tracheae, which open at the surface of the abdomen and thorax through pairs of spiracles. The tracheae branch repeatedly, ending in minute, thin-walled tracheoles that reach every part of the body. Oxygen diffuses through the tracheole walls to enter the body cells. At the same time, carbon dioxide diffuses into the tracheoles from the cells.

Insects have a central nervous system composed of double ventral nerve cords joined by paired ganglia (collections of nerve cell bodies and fibres). Each ganglion supplies nerves to one or more segments of the body. These nerves contain sensory nerve cells, which relay information from the senses to the central nervous system, and motor nerve cells, which carry directives from the central nervous system to the muscles and glands. The three main ganglia in the head are fused to form the brain, which sends nerves to the eyes, antennae, and other organs of the head. Besides having sensory organs on the head, most insects are covered with tactile hairs that may be sensitive enough to detect air vibrations. Some species also have well-developed hearing organs, such as the tympanic membrane found on the abdomen in grasshoppers.

Reproduction in insects is sexual. The male reproductive system includes two testes, where sperm are produced; ducts that carry sperm from the testes; and a copulatory organ that deposits sperm in the female. The female system has two egg-producing ovaries and a pair of oviducts that unite to form a vagina. The vagina typically serves both for receiving sperm and for depositing eggs; females of some species have an ovipositor, an abdominal appendage used to deposit eggs.

The class Insecta is divided into two subclasses: the Apterygota, which are primitive and wingless and include the silverfish and bristletails (order Thysanura); and the Pterygota, more advanced winged or secondarily wingless (having lost the wings found in earlier forms) creatures that exhibit some degree of metamorphosis in individuals. The Pterygota are divided into 27 living orders, including the beetles and weevils (Coleoptera), flies, midges, gnats, and mosquitoes (Diptera), mayflies (Ephemeroptera), the bugs (Heteroptera), aphids, leafhoppers, and cicadas (Homoptera), bees, wasps, and ants (Hymenoptera), termites (Isoptera), butterflies and moths (Lepidoptera), lacewings (Neuroptera), dragonflies and damselflies (Odonata), grasshoppers, locusts, crickets, and katydids (Orthoptera), fleas (Siphonaptera), thrips (Thysanoptera), and caddis flies (Trichoptera).

Fossils indicate that primitive insects had developed by the Middle Devonian Period (about 350,000,000 years ago). They probably evolved from a wingless terrestrial arthropod. It is believed that winged insects appeared very early in the Carboniferous Period (about 300,000,000 years ago). Periods of explosive evolution, during which large numbers of new forms developed in relatively short spans of time, are thought to have occurred in the Carboniferous and Permian periods, giving rise to the orders known today as well as those known only as fossils. The diversity of body forms, behaviours, and life cycles thus produced represent adaptations to many different environmental conditions.

The life cycle begins with the fertilized egg, from which hatches the larva. Because the rigid exoskeleton does not allow for growth, it must be shed periodically and replaced by a new and larger one produced by a layer of epidermal cells. In the Apterygota the succession of larval stages (called instars) between molts differs little from one to another or from the adult form. In the Pterygota metamorphosis generally occurs; it may be incomplete, meaning that the larva substantially changes form only in the last molt, emerging as an adult with fully formed wings and genitalia, or it may be complete, as in the butterflies, whose larvae molt into a pupal phase and then again into the adult form. The adult insect exists largely to reproduce. Indeed, in some adult insects this singleness of purpose supersedes even eating. Mating behaviour varies widely among insects but frequently involves the production by male or female of powerful chemical attractants known as pheromones.

Insects are found in almost every terrestrial and freshwater habitat. By sheer numbers as well as by diversity of habit they fulfill many important ecological functions. They promote the decay of organic material and the formation of soil; they are instrumental in the pollination of many plants (the insects and the flowering plants, in fact, evolved together); and they are a major part of many food chains. Their interaction with humans is also various. Frequently they are competitors for food, either in the field or in storage; some insects are carriers of crop, livestock, or human disease; some are nuisances; some can infest and destroy buildings, garments, or carpets. On the other hand, insects produce such valuable commodities as honey, silk, wax, and dyes; some are used for human food; some are valuable in controlling populations of other, potentially harmful, species; and some have proved useful in scientific and medical research.

insect bite and sting, break in the skin or puncture caused by an insect and complicated by introduction into the skin of the insect's saliva, venom, or excretory products. Specific components of these substances are believed to give rise to an allergic reaction, which in turn produces skin lesions that may vary from a small itching wheal, or slightly elevated area of the skin, to large areas of inflamed skin covered by vesicles and crusted lesions. This article encompasses similar wounds inflicted by other small invertebrates, particularly arachnids (spiders, scorpions, ticks, mites, and their allies).

Flying insects, such as flies, gnats, and mosquitoes, attack exposed body parts, each bite resulting in a single itchy wheal that generally subsides within hours. Crawling insects may reach any part of the body, including the covered areas, and are more likely to remain there, generating skin diseases characteristic of each insect. Scabies, or sarcoptic itch, designates the skin inflammation brought about by the itch mite, *Sarcoptes scabiei.* The female mite burrows beneath the superficial layer of the skin to lay its eggs in a tunnel that can be seen as a dark wavy line. This initial lesion becomes intensely itchy after a few days to about a month, and the scratching leads to secondary skin lesions consisting of papules (solid elevations), pustules, and crusted skin areas. The itchiness is believed to be caused by the accumulation of fecal deposits by the mite in the burrow region. Scabies is most commonly noted on the webs between the fingers, other frequent locations being the natural folds of the skin and pressure areas.

Pediculosis is the skin disorder caused by various species of bloodsucking lice that infect the scalp, groin, and body. The lice live on or close to the skin, attaching their eggs to the hair or clothing of the host and periodically feeding on him. Their bite results in a small red spot that is extremely itchy and may become infected after repeated scratching. Chiggers, the larvae of certain mites, also live on man and feed on the blood. Their bite produces a wheal on the skin that is intensely itchy, the itchiness being caused by the digestive juices of the chiggers. Other bloodsucking insects that feed on man are fleas, bedbugs, and ticks, which do not live on man as a primary host but in the ground, bedding, walls, and furniture; the more commonly seen lesions are those of the bedbug, which produces a burning wheal with a central punctured dot, and those of the flea, which produces a cluster of wheals and papules, resulting from the flea's habit of sampling several adjacent spots while feeding on the skin.

Stinging insects produce a painful swelling of the skin, the severity of the lesion varying according to the location of the sting and the identity of the insect. Many species of bees and wasps have two poison glands, one gland secreting a toxin in which formic acid is one recognized constituent, and the other secreting an alkaline neurotoxin; acting independently, each toxin is rather mild, but when they are injected together through the stinger, the combination has strong irritating properties. In a small number of cases the second occasion of a bee or wasp sting causes a severe allergic reaction known as anaphylaxis (*q.v.*).

Hornets, some ants, centipedes, scorpions, and spiders also sting. Some insects leave their stinger in the wound. Multiple stings may give rise to severe systemic symptoms and in rare instances may even lead to death; the bites of

some spiders are known to be lethal, particularly to young children.

insect wax: *see* Chinese wax.

insecticide, any toxic substance used to kill insects. Insecticides take effect upon ingestion (stomach poisons), inhalation (fumigants), or penetration of the body covering (contact poisons). Most insecticides are sprayed or dusted onto plants and other surfaces traversed by insects.

Chewing insects, such as caterpillars, ingest stomach poisons, which retain their effectiveness over long periods of time but are dangerous to man and other animals. The earliest stomach poisons were arsenic compounds—*e.g.,* Paris green (copper acetoarsenite)—that caused breakdown of digestive tract tissues and affected the nervous system. Compounds of fluorine, zinc, and mercury are infrequently used inorganic stomach poisons. Systemic insecticides applied to plants become distributed throughout the plant, conferring variable protection against specific insect infestations. Formulations of disease-causing viruses and bacteria as biological controls for specific insect pests are available commercially.

Early contact poisons still in use are plant-derived insecticides known as botanicals. These include nicotine, from tobacco; rotenone, from the roots of plants of the genus *Derris;* pyrethrum, from the flowers of one species of *Chrysanthemum;* and petroleum oils.

Most insecticides now in use are synthetic contact insecticides that impair the nervous system. They include a number of types of compounds, most of which are of varying toxicity to animals other than insects. Many chlorinated hydrocarbons are powerful insecticides.

Other insecticides include organic phosphates, carbamates, and thiocyanates; naphthalene; and chlorinated phenols. *See also* chemosterilant; fumigant; miticide.

insectivore, a member of the mammalian order Insectivora, which includes the shrews, moles, hedgehogs, and other groups. Insectivores are small, active, and generally secretive. Many are ecologically important as consumers of invertebrates or as scavengers. They are found in most parts of the world except Antarctica, Australia (where certain marsupials fill similar ecological niches), and South America.

A brief treatment of insectivores follows. For full treatment, *see* MACROPAEDIA: Mammals.

There are nine families of living insectivores: hedgehogs and gymnures (Erinaceidae), moles (Talpidae), shrews (Soricidae), solenodons and almiquis (Solenodontidae), tenrecs (Tenrecidae), otter shrews (Potamogalidae), golden moles (Chrysochloridae), elephant shrews (Macroscelididae), and tree shrews (Tupaiidae; classed by some authorities in the Primates). Fourteen families of extinct insectivores are known from the fossil record. Insectivores exhibit some of the characteristics of primitive placental mammals and are in general not very specialized. For those reasons it is difficult to discern when they first appeared, but tree shrews are found in the fossil record in Early Paleocene times (approximately 65,000,000 years ago).

Although insectivores are a diverse group, certain features of natural history and behaviour are common to many or most species. They are short-lived; the average life span of some shrews has been estimated at six weeks, although one year is probably a more typical figure for the order as a whole. They tend to be solitary except during the breeding season and in the temporary association of mother and immature young, and they are frequently territorial. Most insectivores are nocturnal, but tree shrews and elephant shrews are diurnal, and some other groups, such as moles, are apparently active by day and night. Tree shrews and some tenrecs are partly arboreal, and otter shrews and some other species are partly aquatic, but in general insectivores live on the ground. All insectivores exhibit self-grooming behaviour, with the specific forms varying from species to species.

The most numerous insectivores in terms of species are the shrews, which account for nearly 300 of the 400-odd species. Some shrews are very small, the tiniest of them being the Savi's pygmy shrew (*Suncus etruscus*) of the Mediterranean, whose body measures 35 mm (1.5 inches) in length. Shrews are extremely active, alternating periods of intense feeding with short periods of rest. They detect their prey by smell or by means of vibrissae, bunches of sensitive hairs on the snout. The amount of food that is eaten daily may exceed double or triple their own body weight. Typically they forage in and on the leaf mold of woodlands, where they construct shallow runways. Shrews tend to be solitary but communicate with each other by various high-pitched squeaks and clicking sounds. Some shrews have poisonous saliva used to subdue prey; that of the North American short-tailed shrew (*Blarina brevicauda*) contains a particularly potent toxin.

Hedgehogs are stout, spiny animals active at dusk or at night. They take a wide range of food, including such invertebrates as millipedes, insects, and slugs, the young of ground-nesting birds, and fruits and berries. Hedgehogs will also attack poisonous snakes and when doing so present their erected frontal spines as a defense. Hedgehogs are able to cope with shortages of food by becoming dormant, a state in which chemical and physiological changes help conserve energy. As a natural defense against predators a hedgehog will roll itself into a ball by contraction of a well-developed skin muscle that acts like the drawstring of a purse. Eleven species of hedgehog are known throughout the Old World.

The related moonrats are much larger, about the size of an opossum, and lack spines. The three species live in lowland forests and mangrove swamps in Malaysia. In addition to invertebrates, they eat fish and crabs. They are recorded as being aggressive, and, when alarmed, they produce a foul smell from secretions of their anal glands.

True moles form a specialized group of burrowing insectivores. The bones of the forelimbs are short and wide and are used in a backward sweeping motion when burrowing. Moles build extensive burrow systems consisting of an underground nest chamber surrounded by concentric rings of tunnels interconnected by radiating tunnels. Mounds of earth often mark their excavations. Moles feed mainly on earthworms. Moles of the genus *Scapanus* of Pacific North America eat large amounts of vegetable matter and can be pests to gardeners. They detect food mainly by smell and touch.

Golden moles have thick top fur and dense underfur with an unusual iridescent bronze sheen. The eyes are vestigial. These moles dig with two large pointed claws on each forefoot together with the snout, which is protected by thick leathery skin. They tend to burrow near the surface. Eleven species of golden mole are known in southern Africa.

The tenrecs live only on Madagascar and the neighbouring Comoro Islands. In their isolation the 20 tenrec species exhibit a variety of forms that resemble other families of insectivores—hedgehogs, shrews, water shrews, moles, etc. The common tenrec (*Tenrec ecaudatus*) is one of the largest insectivores, some 41 cm (16 inches) long. Its coat is a mixture of stiff hairs and spines. When alarmed, a patch of spines on the nape of the neck forms an erectile crest. Spines on the middle of the back can be vibrated to produce a stridulating sound. Most tenrecs are nocturnal and remain during the day in underground burrows. During the dry season, they burrow into the earth and become dormant.

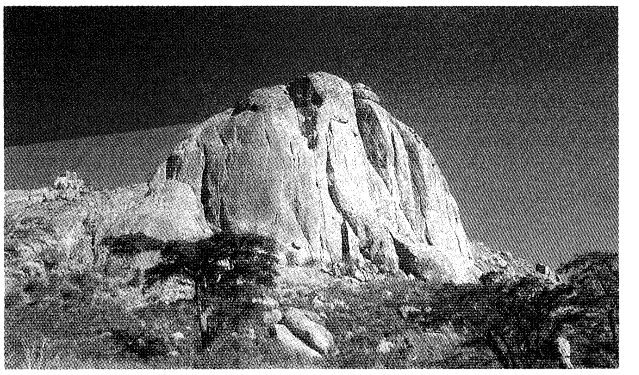
Only two species of solenodon are known from the islands of Cuba and Hispaniola. They bear a superficial resemblance to giant shrews; they are about the size of guinea pigs, with extremely long pointed snouts, small eyes, and large naked ears and tail. The name solenodon means "sword teeth" and refers to the very large anterior upper and second lower incisor teeth. As do some other insectivores, they secrete a poisonous saliva used to subdue prey as large as mice. The population of solenodons has declined since the introduction of cats, dogs, rats, and mongooses to their native islands.

The three species of otter shrews are large amphibious insectivores. Two digits of the hind feet are fused and are thought to be used in grooming. Otter shrews live in tunnels in the banks of streams. Crabs appear to be a favourite item of food; the prey is detected by numerous sensory vibrissae concentrated into a pad on the snout.

The 28 species of elephant shrews resemble long-nosed rodents. Confined to the African continent, many species live among rocky hills and scrubland, but the giant elephant shrews *Petrodomus* and *Rhynchocycon* inhabit tropical forests. Elephant shrews are active during the day and around dusk. They feed mainly on ants.

insectivorous plant: *see* carnivorous plant.

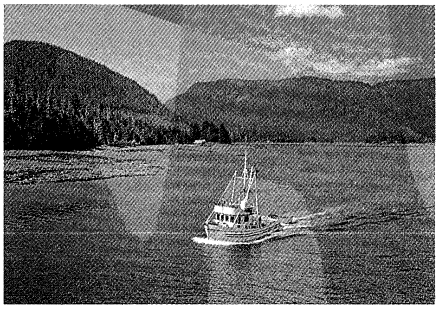
inselberg (from German *insel,* "island," and *berg,* "mountain"), isolated hill that stands above well-developed plains and appears not unlike an island rising from the sea. Although the term is usually applied generally, it is sometimes restricted to hills that are formed under tropical and subtropical conditions, composed of plutonic rocks such as granite and gneiss and characterized by steep, curved sides of smooth, bare rock. Inselbergs



Granite kopje near Inyanga, Zimbabwe
D.C.H. Plowes

occur as ridges, ranges, or isolated individuals. Their formation is a result of the resistance to erosion by structural irregularities. Bare rock domes, which may stand 450 m (1,500 feet) above the plains, are more specifically called bornhardts and display an onionlike peeling (exfoliation) of concentric rock shells (in thickness from a few centimetres to 6 metres [from about an inch to about 19 feet]) from the surface. A pediment, or low-angle slope slightly concave upward, is usually present at the base of the inselberg; the hill–plain junction is usually quite sharp. In its later stages an inselberg may develop into a kopje (koppie), *i.e.,* a residual hill composed of a pile of large boulders, in form similar to a tor. Isolated hills similar to inselbergs but formed under nontropical conditions are known as monadnocks.

Inside Passage, also called INLAND PASSAGE, or MARINE HIGHWAY, natural sheltered sea route extending for more than 1,000 miles (1,600 km) from Seattle (Wash., U.S.) to Skagway (Alaska, U.S.). It comprises channels and straits between the mainland and islands (including Vancouver Island, British Columbia, Can., and the Alexander Archipelago, Alaska) that protect it from Pacific storms. In most places there is ample depth for all vessels; anchorages are numerous, and extensive surveys have identified practically all hazards to navigation. It is the route generally used by coastal shipping to Alaska and is favoured for its scenic beauty and dependable smoothness. Towns along the passage include Victoria, Vancouver, and Prince Rupert (B.C.) and Ketchikan, Wrangell, Petersburg, and Juneau (Alaska).



A channel of the Inside Passage, Alaska
Josef Muench

insight, immediate and clear learning or understanding that takes place without overt trial-and-error testing behaviour.

Much of the scientific knowledge of insight phenomena derives from work on animal behaviour by the 20th-century German Gestalt psychologist Wolfgang Köhler. In one experiment Köhler placed a banana outside the cage of a hungry chimpanzee, Sultan, and gave the animal two sticks, each too short for pulling in the food but joinable to make a single stick of sufficient length. Sultan alternately tried each stick unsuccessfully, and he even used one stick to push the other along to touch the banana. Later, after apparently having given up, Sultan accidentally joined the sticks, observed the result, and immediately ran with the longer tool to retrieve the banana. The solution reappeared immediately when the problem was repeated. This result, however, is ambiguous. Many already conditioned responses appear to have been brought to the problem, so that the necessary motor skills were already available once Sultan accidentally rearranged the sticks.

Insight is experienced in human learning, of course, but, as with Sultan, only in situations in which already acquired responses are seen to be applicable when the stimulus properties of the situation are rearranged. Insight is also considered essential to certain methods of psychotherapy, particularly psychoanalysis, in which achieving new understanding of the unconscious motives and bases of pathological behaviour is thought an important step toward recovery.

insolvency, financial condition in which the total liabilities of an individual or enterprise exceed the total assets so that the claims of creditors cannot be paid. There are essentially two approaches in determining insolvency: insolvency in the equity sense and under the balance-sheet approach. Insolvency in the equity sense denotes the inability of the debtor to pay his debts as they become due in the ordinary course of business. Insolvency under the balance-sheet approach means that the total liabilities of the debtor exceed his total assets.

Insolvency is distinguished from bankruptcy in that bankruptcy denotes a particular legal status to be determined and declared by judicial decree. For an individual or a corporation to be declared bankrupt, certain additional requirements, such as committing an act of bankruptcy, for example, are necessary. Thus, insolvency, although an essential factor, is not the sole ingredient necessary in determining bankruptcy.

insomnia, the inability to sleep adequately. Insomnia varies greatly in pattern and degree; the responsible causes may include poor sleeping conditions, circulatory or brain disorders, a breathing disorder known as apnea, psychosomatic disorders such as tension, or other physical or mental distress. Insomnia is not harmful if it is only occasional; the body is readily restored by a few hours of extra sleep. If, however, it is regular or frequent, it may have injurious effects on the other systems and functions of the body.

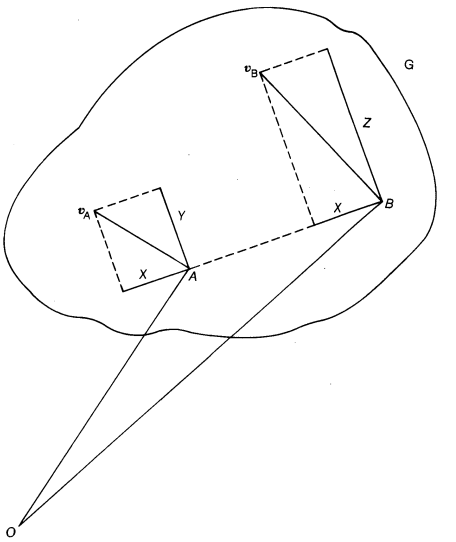
Treatment of mild insomnia may involve simple improvement of sleeping conditions or such traditional remedies as warm baths, milk, or systematic relaxation. Severe or chronic insomnia may necessitate the temporary use of barbiturates or tranquilizing drugs, hypnosis, or, because many chronic cases are psychogenic, psychotherapy; apnea and its associated insomnia may be treated surgically. The prolonged use of drugs as a relief from frequent or recurring insomnia can have harmful effects. The body tends to build up a tolerance to the soporific qualities of the drug, necessitating more potent dosage; habitual use can lead to addiction.

inspiration, in the arts, the state of creative fervour that directly precedes the composition or recitation of a work of art.

The source of poetic inspiration has long been a subject of inquiry. Plato in the *Apology* states that poets do not create from wisdom "but by reason of some natural endowment and under the power of nonrational inspiration." He further developed this thesis in the *Phaedrus* and *Ion,* in which poets and their lower counterparts, the rhapsodes, are described as madmen at the mercy of the Muses, the goddesses of all inspiration. In a passage from *Ion,* Plato declares the poet a "winged and holy thing" who possesses no "invention . . . until he is out of his senses, and the mind no longer in him." Without inspiration from the divine source, the poet is "powerless and unable to utter his oracles." This doctrine seriously influenced many poets, among them Percy Bysshe Shelley, who translated *Ion* and suggested the ideas of the above passage in his own "Defence of Poetry" (1840).

Twentieth-century psychology places creativity in the unconscious. *See also* creativity.

instantaneous centre of velocity, point at which a body in plane motion has zero velocity. In the Figure, at A the body G moves parallel to the plane of the paper and the different velocities of points A and B are indicated by the vectors v_A and v_B, which are not parallel. These vectors are related by the requirement that all points on any line in a rigid body must have velocity components along the line that are equal to one another. In the Figure, both v_A and v_B have components along AB equal to X; the components Y and Z perpendicular to AB are different because of the rotation of the body.



Instantaneous centre of velocity

Lines drawn from A and B perpendicular to v_A and v_B will intersect at point O. From the requirement previously stated, at O the component of v_O along OA must be zero because v_A has no component along OA. Similarly, the component of v_O along OB must be zero. To satisfy both conditions, v_O must be zero, and point O is the instantaneous centre of velocity for the body. In the position shown, the velocities of all points in the body are proportional to their distances from O, as they would be if the body extended to and rotated about a fixed axis at O.

In subsequent positions of the body, the point O will be in a different place; it is unique for any position if the body rotates, whereas, if the body translates, there are an infinite number of points at an infinite distance.

The instantaneous centre of velocity is useful in the velocity analysis of machine mechanisms. Because the motions are constrained (all points in the bodies move on determinate paths), the centres can be located without knowing the velocities, a simplification that results from the fact that v_A and v_B in the Figure at A are tangent to their paths, and their magnitudes are not necessary when locating O.

instinct, an involuntary response by an animal to an external stimulus, resulting in a predictable and relatively fixed behaviour pattern.

A brief treatment of instinct follows. For full treatment, *see* MACROPAEDIA: Behaviour, Animal.

Instinctive behaviour is an inherited, adaptive mechanism that serves to promote the survival of an animal or species. It is most apparent in fighting and sexual activity. Certain animal behaviour, such as exploring and play, can be modified, but, in general, inherited behaviour is a sequence of acts that is internally motivated; it may be triggered by external conditions but is only secondarily influenced by them.

The simplest form of instinctive behaviour is the reflex action, or the response of a single organ to a stimulus. Some lower animals are governed by chain reflexes; in millipedes, for example, the motion of one leg stimulates the

motion of another. Most animals, however, are capable of fixed action patterns in which several body systems participate. A number of these fixed patterns lead to one goal, but others may have several functions, such as the distinctive display actions of courtship. Patterns of motor behaviour, such as gesturing and dancing, are also used by insects, birds, and fish to communicate and enable a species to distinguish its signals from those of any other.

Among the fixed action patterns that may be modified by learning processes in some species is nest-building behaviour. Jackdaws, for example, learn how to select appropriate materials through trial and error, but canaries, even ones that have been reared in man-made cloth nests, have an innate ability to choose the right materials and to line the nest with feathers.

All animals have instinct. In general, the higher the animal form, the more flexible the behaviour. Among mammals, learned behaviour often prevails eventually over fixed action patterns, as when a young rat learns through experience to adjust its instinctive heaping and smoothing motions to the appropriate stage of nest building. In humans, behaviour is heavily influenced by the socialization process, and the issue of heredity versus environment continues to be a controversial subject.

Institut Canadien, literary and scientific society that came into conflict with the Roman Catholic church in 19th-century French Canada. Founded in Montreal on Dec. 17, 1844, it soon became a forum for discussing the problems of the day, maintaining the largest free library in Montreal. The membership of the parent organization in Montreal reached 700, and branches were established all over French-speaking Canada.

In general, the Institut Canadien became the centre of a movement critical in tone and liberal in spirit, with neither approval of nor respect for the conservatively orthodox institutionalism of church and state in Quebec. The institute publicly displayed books that were listed by the church as undesirable.

Because of these tendencies, the institute came under attack by ecclesiastical leaders, foremost among whom was Ignace Bourget, bishop of Montreal from 1840 to 1876. By 1858 all the branches of the institute outside Montreal ceased to function, but the parent body refused to change its course and in 1865 appealed to Rome. Meanwhile, in 1868, the other Canadian bishops declared their support of Bourget's position. In 1869 the church formally condemned the movement, and most of its active membership withdrew. The Montreal institute survived until after the end of the century but was no longer particularly influential.

Institut Géographique National (IGN), one of the foremost centres of mapmaking and geographic research in France, specializing in aerial and ground surveys and maps; it is located in Paris. Its origins can be traced to a mapmaking group organized in 1719, the Engineers and Geographers for Armies and Camps, which produced several geodetic and triangulation maps of France. During the reign of Louis XV, the group made the first map of the whole of France, engraved on leather and preserved in the institute's library. The group was reorganized in 1794 as the Polytechnical School and in 1887 was divided into the Geographic Service of the Armies and the Historical Service of the Armies. In 1940 the former was converted into the Institut Géographique National, which in 1967 became a public establishment of the state. The institute administers the National School of Geographic Sciences and has an extensive specialized library. It also has a small fleet of airplanes for aerial surveys.

Institute for ——— : *see under* substantive word (*e.g.,* Sex Research, Institute for).

Institutes of the Christian Religion, Latin CHRISTIANAE RELIGIONIS INSTITUTIO, French INSTITUTION DE LA RELIGION CHRÉTIENNE, John Calvin's masterpiece, a summary of biblical theology that became the normative statement of the Reformed faith. It was first published in 1536 and was revised and enlarged by Calvin in several editions before the definitive edition was published in 1559.

The first edition, written in Latin and published in Basel, where Calvin was in exile, included a dedication to the French king Francis I. Calvin intended his work to be a statement of French Protestant beliefs that would refute the king, who was persecuting French Protestants and incorrectly calling them Anabaptists (radical Reformers who wished to separate the church from the state). It consisted of six chapters that discussed the Ten Commandments, the Apostles' Creed, the Lord's Prayer, the sacraments of Baptism and the Lord's Supper, disputed sacraments, and Christian liberty. Most of the themes of Calvin's mature thought were contained in the first edition.

The first French edition, prepared by Calvin and published in Basel in 1541, was the first great work in argumentative French prose. It influenced French thought and literary style.

The final edition, in Latin and published in Geneva in 1559, was more than four times longer than the first edition. It was organized into four books concerning Creator, Redeemer, Spirit, and church. The dominating themes dealt with God's sovereignty, his grace, and his redemption of undeserving sinners. This edition was published in French (1560), in English (1561), and eventually in many other languages.

institutional economics, school of economics that flourished in the United States during the 1920s and '30s; it viewed the evolution of economic institutions as part of the broader process of cultural development.

The American economist Thorstein Veblen laid the foundation for institutionalism with his criticism of traditional static economic theory. He tried to replace the concept of people as the makers of economic decisions with a more realistic image of people as influenced by continually changing customs and institutions. Veblen saw the American economic system as one in which the primary motivation was pecuniary rather than technological: business enterprise was carried on for the amassing of money rather than the production of goods. Another economist usually placed in the institutional school was John R. Commons, best-known as an American labour economist. He emphasized the collective action of various groups in the economy and viewed their operation within a system of continually evolving institutions and laws. Others often classed as institutionalists include Rexford Tugwell, John M. Clark, and Wesley C. Mitchell in the United States and Beatrice and Sidney Webb and Richard H. Tawney in Great Britain.

Although institutionalism never became a major school of economic thought, its influence has continued, particularly in the works of economists seeking to explain economic problems at least partially in terms of broader social and cultural phenomena. This approach is useful in analyzing the problems of developing countries, where the modernization of social institutions is often a requirement for industrial progress.

Institutional Revolutionary Party, Spanish PARTIDO REVOLUCIONARIO INSTITUCIONAL (PRI), byname PRIISTAS, unique political party that has dominated Mexico's political life since its founding in 1929. Virtually all important figures in Mexican national and local politics since then have belonged to the party, because the nomination of a PRI candidate to a public office has been all but tantamount to election. Originally called the National Revolutionary Party (Partido Revolucionario Nacional), the party was renamed the Mexican Revolutionary Party (Partido de la Revolución Mexicana) in 1938 and took its current name in 1946.

The party was founded by former president Plutarco Elías Calles and his followers in a period of conflict with the Roman Catholic church, rebellion in the military, and disputes with the United States. In effect, the party represented the institutionalization of the new power structure that had emerged as a result of the Mexican Revolution (1910–20), a coalition of regional and local political-military bosses and labour and peasant leaders. This governing coalition sought a more conservative evolution (though often under "revolutionary" guises) and more stability in government. In the new party-state system that emerged, party control came to be located in a Central Executive Committee, whose chief was selected by the president of Mexico and entrusted with the task of approving party nominees for all important elective positions in the nation except for the presidency. The incumbent president selected his own successor. The Central Executive Committee became responsible for enforcing a common understanding among state and national officials and among the various groups within the party.

The establishment of the party resulted in a shift of power from political-military chieftains to state party units and to those sectors of the party representing peasants, urban labourers, and the military. President Lázaro Cárdenas (1934–40) enhanced the authority of the peasant sector and balanced the existing party sectors with a so-called popular sector representing such disparate groups as civil servants, the professions, small businessmen, small farmers, artisans, youth, and women.

In the early 1940s the military sector was disbanded, and its members were encouraged to join the popular sector, which became the largest in the party. Each of the three sectors—popular, labour, and agriculture—has its own national organization, which provides financial support for the party and selects its representatives for the party organization. The party organization acts as a channel of communication and an agency of mediation between policymakers and the general public.

The late 1970s saw the PRI's political monopoly seriously challenged when opposition parties gained a few seats in the Chamber of Deputies. The PRI remained in the majority but continued to lose congressional seats in later elections. In 1988 opposition candidates won 4 of the 64 Senate seats, the first time in 59 years that the PRI conceded losing any Senate election, and in 1989 the party lost its first state gubernatorial race.

Instruction of Catherine the Great: *see* Catherine the Great, Instruction of.

instrument landing system (ILS), electronic guidance system designed to help airline pilots align their planes with the centre of a landing strip during final approach under conditions of poor visibility. The ground equipment of the ILS consists of two directional transmitters that send out radio beams, sometimes of microwave frequencies (*i.e.,* frequencies of more than 1,000 MHz), from either side of the runway's centreline. The radio pulses are picked up by instruments on the plane and then processed and converted into precise directional and altitude information. These data are shown on an instrument display in the form of horizontal and vertical lines, which enable the pilot to determine his exact position in relation to the runway and maneuver his craft into proper alignment with it. The

ILS can be tied into a plane's automatic pilot, whereby ground-based instruments guide the plane into position while those on the aircraft control airspeed by means of an automatic throttle. The instrument landing system was introduced in 1929 and was approved and adopted by the International Civil Aviation Organization (*q.v.*) in 1949.

Instrument of Government (English constitution, 1653): *see* Government, Instrument of.

instrumentalism, also called EXPERIMENTALISM, a philosophy advanced by John Dewey holding that what is most important in a thing or idea is its value as an instrument of action and that the truth of an idea lies in its usefulness. Dewey favoured these terms over the term Pragmatism to label the philosophy on which his views of education rest. His school claimed that cognition has evolved not for speculative or metaphysical purposes but for the practical purpose of successful adjustment. Ideas are conceived as instruments for transforming the uneasiness arising from facing a problem into the satisfaction of solving it.

instrumentation, in technology, the development and use of precise measuring equipment. While the sensory organs of the human body can be extremely sensitive and responsive, modern science and technology rely on the development of much more precise measuring and analytical tools for studying, monitoring, or controlling all kinds of phenomena.

A brief treatment of instrumentation follows. For full treatment, *see* MACROPAEDIA: Measurement and Observation, Principles, Methods, and Instruments of.

Some of the earliest instruments of measurement were used in astronomy and navigation. The armillary sphere, the oldest known astronomical instrument, consists essentially of a skeletal celestial globe whose rings represent the great circles of the heavens. The armillary sphere was known in ancient China; the ancient Greeks were also familiar with it and modified it to produce the astrolabe, which could tell the time or length of day or night as well as measure solar and lunar altitudes. The compass, the earliest instrument for direction finding that did not make reference to the stars, was a striking advance in instrumentation made about the 11th century. The telescope, the primary astronomical instrument, was invented about 1608 by the Dutch optician Hans Lippershey and first used extensively by Galileo.

Instrumentation involves both measurement and control functions. An early instrumental control system was the thermostatic furnace of Cornelius Drebbel (1572–1634), in which a thermometer controlled the temperature of a furnace by a system of rods and levers. Devices to measure and regulate steam pressure inside a boiler appeared at about the same time. In 1788 James Watt invented a centrifugal governor to maintain the speed of a steam engine at a predetermined rate.

Instrumentation developed at a rapid pace in the Industrial Revolution of the 18th and 19th centuries, particularly in the areas of dimensional measurement, electrical measurement, and physical analysis. Manufacturing processes of the time required instruments capable of achieving new standards of linear precision, met in part by the screw micrometer, special models of which could attain a precision of 0.000001 inch (0.000025 millimetre). The industrial application of electricity required instruments to measure current, voltage, and resistance. Analytical methods, using such instruments as the microscope and the spectroscope, became increasingly important; the latter instrument, which analyzes by wave length the light radiation given off by incandescent substances, began to be used to identify the composition of chemical substances and stars.

In the 20th century the growth of modern industry, the introduction of computerization, and the advent of space exploration have spurred still greater development of instrumentation, particularly of electronic devices. Often a transducer, an instrument that changes energy from one form into another (such as the photocell, thermocouple, or microphone) is used to transform a sample of the energy to be measured into electrical impulses that are more easily processed and stored. The introduction of the electronic computer in the 1950s, with its great capacity for information processing and storage, virtually revolutionized methods of instrumentation, for it allowed the simultaneous comparison and analysis of large amounts of information. At much the same time feedback systems were perfected in which data from instruments monitoring stages of a process are instantaneously evaluated and used to adjust parameters affecting the process. Feedback systems are crucial to the operation of automated processes.

Most manufacturing processes rely on instrumentation for monitoring chemical, physical, and environmental properties, as well as the performance of production lines. Instruments to monitor chemical properties include the refractometer, infrared analyzers, chromatographs, and pH sensors. A refractometer measures the bending of a beam of light as it passes from one material to another; such instruments are used, for instance, to determine the composition of sugar solutions or the concentration of tomato paste in ketchup. Infrared analyzers can identify substances by the wavelength and amount of infrared radiation they emit or reflect. Chromatography, a sensitive and swift method of chemical analysis used on extremely tiny samples of a substance, relies on the different rates at which a material will adsorb different types of molecules. The acidity or alkalinity of a solution can be measured by pH sensors.

Instruments are also used to measure physical properties of a substance, such as its turbidity, or amount of particulate matter in a solution. Water purification and petroleum refining processes are monitored by a turbidimeter, which measures how much light of one particular wavelength is absorbed by a solution. The density of a liquid substance is determined by a hydrometer, which measures the buoyancy of an object of known volume immersed in the fluid to be measured. The flow rate of a substance is measured by a turbine flowmeter, in which the revolutions of a freely-spinning turbine immersed in a fluid are measured, while the viscosity of a fluid is measured by a number of techniques, including how much it dampens the oscillations of a steel blade.

Instruments used in medicine and biomedical research are just as varied as those in industry. Relatively simple medical instruments measure temperature, blood pressure (sphygmomanometer), or lung capacity (spirometer). More complex instruments include the familiar X-ray machines and electroencephalographs and electrocardiographs, which detect electrical signals generated by the brain and heart, respectively. Two of the most complex medical instruments now in use are the CAT (computerized axial tomography) and NMR (nuclear magnetic resonance) scanners, which can visualize body parts in three dimensions. The analysis of tissue samples using highly sophisticated methods of chemical analysis is also important in biomedical research.

instrumentation, also called ORCHESTRATION, in music, arrangement or composition of music for instruments. The word orchestration usually indicates music written for an orchestra, and in that sense, it is a narrower term than instrumentation, which can be applied to non-Western musical ensembles as well as to instrumentation for musical groups that are not strictly orchestral.

A brief treatment of instrumentation follows. For full treatment, *see* MACROPAEDIA: Music, The Art of.

In most cases instrumentation is part of the business of composition, but there are occasions when the two activities are carried out by different performing traditions, as with Wolfgang Amadeus Mozart's arrangement of George Frideric Handel's *Messiah,* or the orchestral versions of works by Johann Sebastian Bach created in the early part of the 20th century by Sir Edward Elgar, Arnold Schoenberg, and many others. Conductors may also decide to alter the instrumentation of works that they perform, though this practice finds less favour now than it did in earlier times. In the field of light music, however, there is frequently a degree of specialization, with the composer providing the tune, and the arranger the harmony and orchestral colour.

The history of instrumentation is inevitably bound up with the history of the orchestra, which had its beginnings in the early part of the 17th century. In his opera *Orfeo,* Claudio Monteverdi gave suggestions for the use of a large ensemble of bowed string, plucked string, wind, and keyboard instruments, but this was unusual, and he did not indicate the use of the instruments in any detail. His chamber drama *Il combattimento di Tancredi e Clorinda* is one of the earliest works in which the instrumentation is specified by means of a score, though here for only four lines of strings.

Ever since Monteverdi's time the strings have been regarded as the foundation of the orchestra, to which composers in the 18th century often added oboes, bassoons, and horns. Other instruments were reserved generally for particular occasions: trombones to suggest solemnity, for instance, or trumpets and drums to add a martial tone. Toward the end of the 18th century, however, these instruments began to be used more frequently without such associations. The orchestra also grew with the introduction of clarinets. These were specially favoured by Mozart, for instance, whose scoring for wind instruments has not been surpassed.

Improvements in instrument design during this same period also increased the flexibility of the wind instruments, and by Ludwig van Beethoven's time the orchestra had achieved the standard composition it still adheres to, with strings in five parts (two of violins, one each of violas, cellos, and double basses) joined by a woodwind family of flutes, oboes, clarinets, and bassoons, a brass group of horns, trumpets, and trombones, and timpani. It is this ensemble that provides the mass effects of Beethoven's *Fifth Symphony* and the delicacy of his *Pastoral Symphony* and Franz Schubert's *Great Symphony.*

Further developments were at hand. Carl Maria von Weber began to exploit the possibilities of the orchestra for pictorial imagery and its ability to suggest darkness, woodland scenes, and extremes of weather, especially in his opera *Der Freischütz.* Hector Berlioz emboldened the illustrative manner of Weber and added new instruments to the orchestra for special effects—for example, the harps, English horn, bells, and other percussion instruments in his *Symphonie fantastique.* He also wrote one of the first treatises on orchestration.

This new awareness of the orchestra's potential was shared by most composers later in the century: particularly Franz Liszt, Richard Wagner, Peter Ilich Tchaikovsky, and Richard Strauss. Others, notably Robert Schumann and Johannes Brahms, have been seen as less successful orchestrators, but only because their music does not, in the main, make a

special feature of variety of colour. In truth, the sober gradations of Brahms are as skillful as the vivid tone pictures of Strauss's scoring.

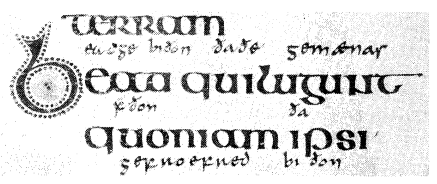
It became common practice in the 19th century for composers to write out works in some kind of draft, perhaps for piano, and then orchestrate them later. Many composers in the 20th century, however, have used the orchestra so subtly and variedly that they have needed to compose directly in orchestral score, without any intermediate stage. In this case, instrumentation becomes inextricably part of the act of composition: it would seem to be so, for example, in the music of Claude Debussy. There are others, such as Maurice Ravel and Olivier Messiaen, who have seen instrumentation as quite separate and have even orchestrated works of their own that were originally created for keyboard. If, however, instrumentation is the art of finding new sounds within a fixed body of instruments, arguably the greatest master of it in the 20th century is Igor Stravinsky.

Insubres, the most powerful Celtic people of Gallia Cisalpina (Cisalpine Gaul), in northern Italy. Despite their defeat at Clastidium (modern Casteggio) by Roman forces in 222 BC, they continued to be troublesome and aided the Carthaginian general Hannibal in the Second Punic War (218–201 BC). The Insubres were finally subdued in 196 BC and gradually lost their identity in the rise of municipal communities. They were granted Latin rights in 89 BC and full Roman citizenship 40 years later.

insula (Latin: "island"), in architecture, block of grouped but separate buildings or a single structure in ancient Rome and Ostia. The *insulae* were largely tenements providing economically practical housing where land values were high and population dense. Distinct from the *domus,* the upper-class private residence, they were inhabited primarily by the labouring class.

Insulae were constructed of brick covered with concrete and were often five or more stories high despite laws limiting them to 68 feet (21 metres), under Augustus, and then 58 ft, under Trajan. The street level characteristically housed artisans' workshops and commercial establishments. The residences above were reached by an interior common staircase, receiving light and air from the street and an inner court. Many *insulae* were encircled with open or enclosed balconies of wood or concrete. Pumping devices could raise water only to lower apartments; tenants of higher apartments had to use public water and sanitary facilities. Cheap construction and a limited water supply caused frequent collapses and serious fires.

Insular script, in calligraphy, any of several hands that developed in the British Isles after the Roman occupation of England and before the Norman Conquest. The foremost achievement of the combined Irish and English book artists, apart from their famous illumination, was the Insular half-uncial, based upon the



Insular script from the Lindisfarne Gospels, Hiberno-Saxon, *c.* 700 (British Library, Cotton Nero D. IV)

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standard uncial writing but admitting such cursive features as ascenders (*b, d, f, h, l*), descenders (*f, g, p, q*), and connections between letters. The Lindisfarne Gospels and the Book of Kells are its most famous landmarks. A second distinctive Insular script was the pointed minuscule that, by the 8th century, was beginning to attain the status of a book hand, as witness the Venerable Bede in his *Historia ecclesiastica gentis Anglorum* ("Ecclesiastical History of the English People"), written in about 731. Both Insular scripts were carried to the Continent by missionaries and used throughout Europe.

insulator, any of various substances that block or retard the flow of electrical or thermal currents.

A brief treatment of insulators follows. For full treatment, *see* MACROPAEDIA: Matter: Its Properties, States, Varieties, and Behaviour.

Although an electrical insulator is ordinarily thought of as a nonconducting material, it is in fact better described as a poor conductor or a substance of high resistance to the flow of electric current. Different insulating and conducting materials are compared with each other in this regard by means of a material constant known as resistivity. *See also* semiconductor.

Electrical insulators are used to hold conductors in position, separating them from one another and from surrounding structures. They form a barrier between energized parts of an electric circuit and confine the flow of current to wires or other conducting paths as desired. The insulation of electrical circuits is a necessary requirement for the successful operation of all electrical and electronic apparatus. Various types of materials are used as electrical insulators, the selection being made primarily on the basis of the specific requirements of each application. The copper conductors utilized in the electrical wiring of homes and industrial plants are insulated from each other and from the building by rubber or plastics. Overhead power lines are supported on porcelain insulators that are unaffected by outdoor exposure. Large electric generators and motors that operate at high voltages and high temperatures are frequently insulated with mica. In some applications, solid insulation is employed in conjunction with liquid or gaseous insulation. In high-voltage transformers, for example, solid insulation provides mechanical rigidity, while oil or other liquid substances contribute to increased insulation strength and serve to remove heat from the equipment. In the microscopic structures of integrated circuits, insulating materials such as silicon nitride may be employed in thicknesses as small as a micron.

Thermal insulating materials include fibreglass, cork, and rock wool, a mineral wool that is produced by blowing a jet of steam through molten siliceous rock or limestone or through slag. These and other substances of low thermal conductivity retard the rate of heat flow. They break up the heat-flow path by their opacity to radiant heat and by interposing numerous air spaces. Thermal conductivity is usually not constant for any given material but varies with temperature. Conductivity decreases with increasing temperature in most metals and other crystalline solids, but it increases in amorphous substances such as glass.

insulin, hormone that regulates the level of sugar (glucose) in the blood and is produced by the beta cells of the islets of Langerhans in the pancreas. Insulin is secreted when the level of blood glucose rises—as after a meal. When the level of blood glucose falls, secretion of insulin stops, and the liver releases glucose into the blood.

Insulin is a simple protein in which two polypeptide chains of amino acids are joined by disulfide linkages. Insulin helps transfer glucose into cells so that they can oxidize the glucose to produce energy for the body. In adipose (fat) tissue, insulin facilitates the storage of glucose and its conversion to fatty acids. Insulin also slows the breakdown of fatty acids. In muscle it promotes the uptake of amino acids for making proteins. In the liver it helps convert glucose into glycogen (the storage carbohydrate of animals) and it decreases gluconeogenesis (the formation of glucose from noncarbohydrate sources). The action of insulin is opposed by glucagon, another pancreatic hormone, and by epinephrine.

Inadequate production of insulin is responsible for the condition called diabetes mellitus. Severe diabetics require periodic injections of insulin, which is extracted from the pancreas of pigs, sheep, and oxen. Insulin was first isolated as a pancreatic extract in 1921 by the Canadian scientists Sir Frederick G. Banting and Charles H. Best. By the early 1980s certain strains of bacteria had been genetically modified to produce human insulin.

Insull, Samuel (b. Nov. 11, 1859, London—d. July 19, 1938, Paris), British-born American public utilities magnate whose vast Midwest holding company empire collapsed in the 1930s.

After working with one of Thomas A. Edison's London representatives, Insull went to the United States in 1881 to become Edison's private secretary. When the Edison General Electric Company was formed in Schenectady, N.Y., in 1889, Insull became a vice president. Three years later he became president of the Chicago Edison Company.

By 1907 all of Chicago's electricity was provided by Insull's firm, now the Commonwealth Edison Company. Use of central power stations brought extension of his electrical power system to most of Illinois and parts of neighbouring states by 1917. His systems grew rapidly during the 1920s, not only because of central stations but also as a result of his formation of holding companies, the first of which was Middle West Utilities (1912). After Insull's vigorous promotion of such companies' stocks, various circumstances related to the Depression brought about the collapse of his top companies, which went into receivership in 1932. Insull fled to Europe and fought to escape extradition. He was returned to Chicago in 1934 and tried three times for fraud, violation of federal bankruptcy laws, and embezzlement, but he was acquitted each time. He spent most of the rest of his life in Europe.

insurance, a contract for reducing losses from accident incurred by an individual party through a distribution of the risk of such losses among a number of parties. In return for a specified consideration, the insurer undertakes to pay the insured or his beneficiary some specified amount in the event that the insured suffers loss through the occurrence of a contingent event covered by the insurance contract or policy. By pooling both the financial contributions and the "insurable risks" of a large number of policyholders, the insurer is typically able to absorb losses incurred over any given period much more easily than would the uninsured individual. While the destruction of an automobile in a traffic accident imposes a heavy financial loss on an individual, for example, one such loss is of relatively small consequence to an insurer who is collecting sufficient premiums on a large number of automobiles.

A brief treatment of insurance follows. For full treatment, *see* MACROPAEDIA: Insurance.

"Insurable risks" constitute a subclass of all risks to persons and property and have the following characteristics: first, the risks must be such that pooling is both feasible and advantageous to the two parties. This means that the accidents insured against must be of sufficient frequency and similarity to allow for reasonably precise statistical estimation of the liabilities the insurer can expect to suffer

across the entire group of those insured; that the losses resulting must be potentially so severe as to produce an incentive for the insured to insure against them; and that the accidents covered must not be so probable as to minimize (through exorbitant premiums) the advantage gained by the individual in pooling his risks with those of others. Second, the class of insured objects must be such that the likelihood of their simultaneous destruction is minimized. (Historically, many fire insurance companies failed through the overconcentration of their policyholders in one particular city or even neighbourhood, in an era of frequent citywide conflagrations.) Third, the possible losses must be truly accidental in nature and not such that the insured could cause them to occur. Fourth, the risks covered by the insurance contract must be such as to allow for determination of whether and to what degree losses have in fact been incurred as a result of accidents insured against. Moreover, the insurance agreement must meet the more general requirements of the law of contracts, such as the legal competence of the two parties, legality of purpose, and so on.

There are many different kinds of insurance in use at the present time. Their diversity may most easily be seen by considering them under the three overlapping categories of objects insured, contingencies insured against, and manner of payment for both premiums and benefits. Objects insured may be further divided between property and person (including "corporate persons" such as incorporated businesses). Property insured includes almost every form of tangible property imaginable: personal effects, homes and other real estate, bank deposits, automobiles, plate glass windows, airplanes and ships, all manner of goods in transit, and so on. Aspects of the person insured include life and limb, health, employment and ability to work, retirement income, and, for businesses, assets subject to employee fraud and embezzlement, to name only a few. Contingencies insured against include a large variety of natural accidents including fire, explosion, flood, wind, lightning, earthquake, disease, and so on, as well as a very large class of contingencies arising from legal liability for negligent behaviour, among which are professional malpractice, debtor insolvency, personal accidents, and even, in recent years, personal liability of corporate directors for mismanagement of a corporation. The manner of payment of premiums and benefits varies somewhat from policy to policy in any area of insurance, but the most significant variations are to be found in the numerous forms of life insurance. Term insurance, under which a person is covered for a fixed contribution over a fixed period of years, has much the same form as any type of casualty insurance, in that no associated benefits are accrued. Whole life insurance typically requires premiums for a fixed period of years and stays in effect throughout the life of the insured or until maturation, accumulating a cash value along the way. Endowment policies, a kind of combination of insurance and annuity, run for a fixed term and also accumulate a cash value. Annuities are also normally considered a form of life insurance, although in their pure form they are closer to a secured investment. Here the individual pays in a certain amount over a period of years and receives somewhat larger annual payments at a later time.

The oldest persisting historical forms of insurance were the so-called bottomry contracts on shipping, which have been discovered in Babylonian records as early as the fourth millennium BCE. This type of insurance normally took the form of a loan to the shipowner, the repayment of which was made contingent on the safe completion of the voyage. The development of the bottomry contract into full-fledged marine insurance and likewise its extension to land journeys began in the late Middle Ages as a consequence of and spur to the expansion of long-distance trading. In this, it paralleled the spread of other commercial innovations such as bills of exchange and other credit mechanisms.

The next form of insurance to emerge was fire insurance, encouraged by London merchants in response to the Great Fire of 1666. By this time the joint stock company was an established legal form, and many of the new fire insurance companies adopted this structure. Others (the mutual insurance societies) retained the outward form of mutual self-help traditional to the medieval urban guilds. The 17th century saw a proliferation of fire and (as the sciences of demography and statistics emerged) life insurance organizations on a corporate basis, in contrast to the more or less ad hoc syndicates of underwriters providing marine insurance in earlier periods. (Lloyd's of London, perhaps the world's most renowned insurance establishment, is unique in its retention of the latter form.)

Casualty insurance further expanded in the 19th century to cover the implements and products of new industrial technologies: steam engines and boilers, railroads, plate glass windows, and so on. Toward the end of the 19th century and increasingly in the first half of the 20th, the growing political power of workers and labour unions introduced the various forms of social insurance, such as social security, workers' compensation, unemployment and disability insurance, and health insurance. Another feature of the development of insurance in the 20th century has been the greatly expanded role of liability insurance contracts of many sorts, notably those for automobiles.

intaglio, in visual arts, one of the four major classes of printmaking techniques, distinguished from the other three methods (relief printing, stenciling, and lithography) by the fact that the ink forming the design is printed only from recessed areas of the plate. Among intaglio techniques are engraving, etching, drypoint, aquatint, and mezzotint (*qq.v.*).

Intaglio printing is the opposite of relief printing, in that the printing is done from ink that is below the surface of the plate. The design is cut, scratched, or etched into the printing surface or plate, which can be copper, zinc, aluminum, magnesium, plastics, or even coated paper. The printing ink is rubbed into the incisions or grooves, and the surface is wiped clean. Unlike surface printing, intaglio printing—which is actually a process of embossing the paper into the incised lines—requires considerable pressure. Intaglio processes are probably the most versatile of the printmaking methods, as various techniques can produce a wide range of effects.

Virtually all intaglio plates are printed by similar means, using a roller press. This is essentially composed of two bearing rollers with a movable flatbed sandwiched horizontally between them. A viscous ink is forced into the incisions of the intaglio plate with a roller, and the excess ink is wiped away. The inked plate is laid face up on the bed, a sheet of wet printing paper is laid over it, and a blanket (to ensure even pressure) is draped over them both. Then the upper roller of the press is turned and the bed is drawn through; a pressure of several tons transmitted through the blanket presses the wet paper into the ink-filled crevices of the plate, thus producing the printed image.

There are two ways of making intaglio prints in varied colours. In the method known as *à la poupée* (French: "with the doll"), a doll-shaped bundle of fabric is used to apply different colours to different areas of a single plate, which is then printed in the usual way. In the other method separate plates, each carrying a different colour, are successively overprinted on a single sheet of paper. When this multiple-plate method is used, the printer must be careful to ensure that each successive colour falls in its precise location. The most precise method of ensuring colour registration involves the use of pinholes to check alignment.

intaglio, in sculpture, work in which the design is incised into the block, all lines appearing below the surface; it is thus the opposite of relief sculpture and is sometimes called "hollow relief." When the technique is used in casting, the design is cut in reverse into a plaster shell, which is then filled with the casting substance; the hollow impressions of the mold appear in relief on the cast. The most common use of intaglio is for engraved seals and precious stones, which are formed to produce a positive imprint when pressed into a plastic material such as heated wax. This form of intaglio has been used since antiquity, an example being Mesopotamian cylinder seals.

Intef II, also called WAHANKH INTEF (fl. 21st century BC), third king of the 11th dynasty (2081–1939 BC) in Egypt, who, during his long reign, successfully warred against the allies of the Heracleopolitans—rulers of Middle and Lower (northern) Egypt composing the 9th and 10th dynasties.

In 2065 BC Intef II succeeded his father, who had declared his independence of the Heracleopolitans and gathered the five southernmost nomes (administrative districts) of Upper Egypt under his leadership. Intef II started his reign with a vigorous thrust northward; his own tomb inscription suggests that he expanded his kingdom by conquest, thus acquiring two very important areas—Abydos, the chief religious centre (sacred to Osiris) of the Middle Kingdom, and the Thinite nome, home of the earliest kings of a united Egypt. Perhaps following this successful war, Intef concluded peace with the Heracleopolitans.

After a prosperous reign of 50 years, Intef was buried in a tomb in western Thebes. His stela near it is one of a pair describing Intef's reign.

integral, in mathematics, either a numerical value equal to the area under the graph of a function for some interval (definite integral) or a new function the derivative of which is the original function (indefinite integral). These two meanings are related by the fact that a definite integral of any function that can be integrated can be found using the indefinite integral and a corollary to the fundamental theorem of calculus. The definite integral (also called Riemann integral) of a function $f(x)$ is denoted as

$$\int_a^b f(x)\,dx$$

(*see* integration [for symbol]) and is equal to the area of the region bounded by the curve (if the function is positive between $x = a$ and $x = b$) $y = f(x)$, the x-axis, and the lines $x = a$ and $x = b$. An indefinite integral, sometimes called an antiderivative, of a function $f(x)$, denoted by

$$\int f(x)\,dx,$$

is a function the derivative of which is $f(x)$. Because the derivative of a constant is zero, the indefinite integral is not unique. The process of finding an indefinite integral is called integration.

integral equation, in mathematics, equation in which the unknown function to be found lies within an integral sign. An example of an integral equation is

$$f(x) = \int_{-\infty}^{\infty} \cos(xt)\,\varphi(t)\,dt,$$

in which $f(x)$ is known; if $f(x) = f(-x)$ for all x, one solution is

$$\varphi(x) = \frac{2}{\pi} \int_0^\infty \cos(ux) f(u)\, du.$$

integral transform, mathematical function $f(y)$ resulting when a given function $F(x)$ is multiplied by a so-called kernel function $K(x, y)$ and the product is integrated between suitable limits. The process, called transformation, is symbolized by the equation $f(y) = \int K(x, y)F(x)dx$. Several transformations are commonly named for the mathematicians who introduced them: in the Laplace transformation, the kernel is $\exp(-xy)$ and the limits of integration are zero and plus infinity; in the Fourier transformation, the kernel is $(2\pi)^{-1/2}\exp(-ixy)$ and the limits are minus and plus infinity. (*See also* Fourier transform; Laplace transform.)

The value of integral transforms lies in the simplification that they bring about, most often in dealing with differential equations subject to particular boundary conditions. Proper choice of the class of transformation usually makes it possible to convert not only the derivatives in an intractable differential equation, but the boundary values as well, into terms of an algebraic equation that can be easily solved. The solution obtained is, of course, the transform of the solution of the original differential equation, and it is necessary to invert this transform to complete the operation. For the common transformations, tables are available that list many functions and their transforms.

integraph, mathematical instrument for plotting the integral of a graphically defined function. Two such instruments were invented independently about 1880 by the British physicist Sir Charles Vernon Boys and the Lithuanian mathematician Bruno Abdank Abakanowicz and were later modified and improved by others. The integraph automatically draws the required integral curve as it traces the outline of the given curve.

integrated circuit (IC), an assembly of electronic components fabricated as a single unit, in which active semiconductor devices (transistors and diodes) and passive devices (capacitors and resistors) and their interconnections are built up on a chip of material called a substrate (most commonly made of silicon). The circuit thus consists of a unitary structure with no connecting wires. Since the individual circuit elements are microscopic, integrated circuits are sometimes also called microcircuits.

A brief treatment of integrated circuits follows. For full treatment, *see* MACROPAEDIA: Electronics.

During World War II the need to reduce the size of electronic equipment spurred engineers to study methods of miniaturizing circuit construction. Printing was used for the first time in circuit construction; electronic parts mounted on a ceramic block were connected by printed patterns etched in a metal foil bonded to the block. The invention of the transistor in 1947 revolutionized electronic circuits in a number of ways. It was not only the first solid-state device capable of amplification, but it also demonstrated some of the vast potential of semiconductors. It could also be made extremely small. Transistors were quickly adopted for use in printed circuitry. The first circuit in which at least one element was contained within the substrate itself, called a monolithic integrated circuit, was demonstrated in 1958. By the end of the decade the basic techniques and equipment for circuit integration were available.

Early ICs consisted of about 10 individual components on a silicon chip 3 mm (0.12 inch) square. The development of large-scale integration (LSI) during the early 1970s made it possible to pack thousands of transistors and other components on a chip of roughly the same size. This technology gave rise to the microprocessor, an IC that contains all the arithmetic, logic, and control circuitry needed to carry out the functions of a digital computer's central processing unit. Very large-scale integration (VLSI), developed during the 1980s, has vastly increased the circuit density of microprocessors (as well as of memory and support chips). This technology has yielded microprocessors containing more than 3,000,000 transistors on a chip less than 4 cm (1.6 inch) square.

There are several types of integrated circuits. Monolithic integrated circuits, also called semiconductor or silicon integrated circuits, are formed by the superposition of layers of materials in various patterns to form a single, three-dimensional block of circuitry. The circuit elements are formed by the particular patterns and topology of conducting, semiconducting, and insulating layers that have been used in building up the structure.

The range of electronic functions that can be performed by integrated circuits is vast and includes digital circuits, such as the logic circuits used in computers, and analog circuits, such as those used in amplifiers. In many areas of application the performance of integrated circuitry is far superior to that of conventional circuits. Because of their small size, low power requirements and heat generation, modest cost, reliability, and speed of operation, they make possible electronic systems that would otherwise be impractical. For example, computer technology would be severely restricted without the capabilities of integrated circuits. Aircraft, space vehicle, and ballistic missile instrumentation has been revolutionized by integrated circuitry. Integrated circuits are also simple to maintain because they are self-contained complete units that can be easily replaced.

Integrated circuitry continues to grow in sophistication and complexity even as it shrinks in size. Cost effectiveness and mass production have made the technology available to all levels of the electronics industry. The revolution in consumer electronics, manifested in the enormous popularity of such devices as self-focusing cameras, programmable microwave ovens, and personal computers, would have been unthinkable without integrated circuitry.

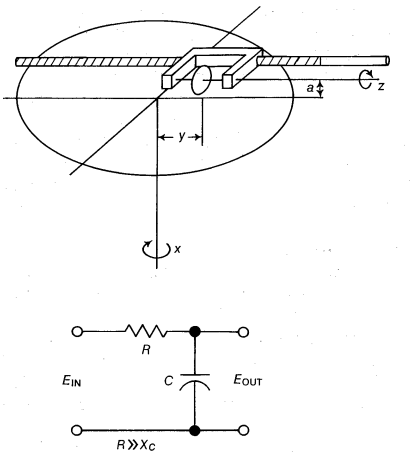
integration, in mathematics, technique of finding a function $g(x)$ the derivative (*q.v.*) of which, $Dg(x)$, is equal to a given function $f(x)$. This is indicated by the integral sign "$\int$," as $\int f(x)$, usually called the indefinite integral of the function. (The symbol dx is usually added, which merely identifies x as the variable.) The definite integral, written

$$\int_a^b f(x)\, dx$$

with a and b called the limits of integration, is equal to $g(b) - g(a)$, where $Dg(x) = f(x)$.

Some antiderivatives can be calculated by merely recalling which function has a given derivative, but the techniques of integration mostly involve classifying the functions according to which types of manipulations will change the function into a form the antiderivative of which can be more easily recognized. For example, if one is familiar with derivatives, the function $1/(x + 1)$ can be easily recognized as the derivative of $\log_e(x + 1)$. The antiderivative of $(x^2 + x + 1)/(x + 1)$ cannot be so easily recognized, but if written as $x(x + 1)/(x + 1) + 1/(x + 1) = x + 1/(x + 1)$, it then can be recognized as the derivative of $x^2/2 + \log_e(x + 1)$. One useful aid for integration is the theorem known as integration by parts. In symbols, the rule is $\int fDg = fg - \int gDf$. That is, if a function is the product of two other functions, f and one that can be recognized as the derivative of some function g, then the original problem can be solved by integrating the product gDf. For example, if $f = x$, and $Dg = \cos x$, then $\int x \cdot \cos x = x \cdot \sin x - \int \sin x = x \cdot \sin x - \cos x$. Antiderivatives are used to evaluate such quantities as area, volume, work, and, in general, any quantity that can be interpreted in some way as the area under a curve.

integrator, instrument for performing the mathematical operation of integration, important for the solution of differential and integral equations and the generation of many mathematical functions.



Mechanical integrator (top) and electrical schematic diagram (bottom) of integrating circuit

From (top) W. Soroka, *Analog Methods in Computation and Simulation*, copyright 1954; used with permission of McGraw-Hill Book Company, (bottom) M.H. Weik, *Standard Dictionary of Computers and Information Processing*

The earliest integrator was a mechanical instrument called the planimeter (*q.v.*). The illustration (top) shows a simple mechanical integrator of the disk-and-wheel variety, which has essential parts mounted on mutually perpendicular shafts, with a means of positioning the wheel in frictional contact with the disk, or turntable. In use, an angular displacement of the disk causes the wheel to turn correspondingly. The radius of the integrating wheel introduces a scale factor, and its positioning on the disk represents the integrand. Thus the rotations of the disk and the wheel are related through multiplicative factors and the number of turns made by the integrating wheel (for any number of turns of the disk) will be expressed as an indefinite integral of the function represented by the variable position of the wheel on the disk.

Electronic integrators or electrical integrating circuits have largely displaced mechanical integrators. The illustration (bottom) shows an electrical circuit that acts as an integrator. For time-varying input, if the resistance R shown in the schematic diagram is very large compared with the capacitive reactance X_C of the capacitor C, the current will be almost in phase with the input voltage E_{IN}, but the output voltage E_{OUT} will lag the phase of the input voltage E_{IN} by almost 90°. Thus the output voltage E_{OUT} is the time integral of the input voltage E_{IN}, as well as the product of the current and the capacitive reactance, X_C.

Viewed as analogues, many common devices can be considered as integrators—examples being the odometer and the watt-hour meter. *See also* analogue computer; differential analyzer.

integument, in biology, network of features that forms the covering of an organism. The

main purpose of an integument is to protect the organism from the outside world and against drying out of internal parts.

A brief treatment of integuments follows. For full treatment, *see* MACROPAEDIA: Integumentary Systems.

Invertebrates generally have an epithelial layer that constitutes the entire integument of certain lower animals, such as sponges. The noncellular coatings of invertebrates vary widely. Annelid worms, for example, have a cuticle made up of protein fibres; underneath the cuticle is a layer of water that gives rigidity to the worm's body. Other invertebrates contain hard, skeletal materials, either on the outside of the body or within the cells. The most developed external skeletons, or exoskeletons, belong to the arthropods (insects and crustaceans), which secrete chitin to form a tough cuticle. As the arthropod grows, it periodically molts, or sheds its exoskeleton.

The integument of vertebrates is made up of two main layers: a thin, protective outer layer, the epidermis; and a thicker, tougher inner layer, the dermis. Epidermal cells are produced at the innermost level, or stratus germinativum, and rise toward the surface, or horny layer, where they die and are shed. The cells of the horny layer are largely made up of keratin, a tough, insoluble protein. The dermis is composed of connective tissue in which are nerve endings, muscle cells, and blood and lymph vessels. It provides nourishment for the epidermis and is most highly developed in mammals.

Vertebrates have a variety of skin types. The smooth, flexible skin of fishes facilitates swimming. The thickness of an amphibian's horny layer depends on the amount of time that it spends out of water. A thick horny layer also protects reptiles from drying out; their skin, which tends to be dry, contains few glands. Birds have a thin epidermis covered with feathers, except at the legs and feet, where the skin is scaly. Contour feathers define the bird's shape and help it to fly. Mammals may have scales, nails, claws, hooves, horns, and other appendages. They are the only animals with hair, which insulates against cold and may also serve as a supplementary sensory organ, as do a cat's whiskers and a human's eyelashes.

intelligence, in government operations, evaluated information concerning such things as the strength, activities, and probable courses of action of other nations who are usually, but not necessarily, opponents.

A brief treatment of intelligence follows. For full treatment, *see* MACROPAEDIA: Intelligence and Counterintelligence.

The goal of every intelligence service is to produce reports consisting of evaluated information that can be given to leaders to help them in their decision making. There are three main steps to producing such reports. It first must be decided what it is that must be known, then information must be gathered, and finally it must be evaluated and analyzed. The first step—deciding what information to gather—presents many possibilities. Political intelligence—the most desired information—is perhaps the least tangible, as correct analysis of the political situation in a country can be very difficult. Political intelligence includes everything from information on party organization and ideological rivalries to detailed biographies of all key and even subordinate figures. The next most sought after intelligence concerns military and technological information. This is known as "hard" intelligence, for it is readily quantifiable and verifiable (*e.g.,* the number of active troops in Libya), unlike "soft" political intelligence (*e.g.,* who will form the next government in Bolivia). Also of importance is information regarding economics, social and religious movements, agriculture, climate, and anything else that may bear on the actions of the country.

The gathering of intelligence may entail many methods. Contrary to the impression created by spy films, most intelligence comes from open public sources, such as foreign newspapers, radio and television broadcasts, and government reports. Foreign diplomats also provide information. The remaining intelligence is gathered by covert means such as satellites, the deciphering of secret transmissions, and agents in foreign countries.

The concept of intelligence is not new. The military treatise *Ping-fa* (*The Art of War*), written *c.* 400 BC by the Chinese military philosopher Sun-tzu, mentions the use of secret agents and the importance of good intelligence. Knowledge of an enemy's intentions has always been important, and consequently intelligence systems have been in use from ancient times. It was not until the late 18th century, though, that a distinction was made between internal security and the external foreign intelligence functions of a country. It has been suggested that World War I itself was the partial result of poor intelligence, as none of the nations involved had intended to go to war. Such an experience served as a strong lesson, and with rapid developments in technology (especially in electronics and aeronautics), intelligence services grew in the 1920s and 1930s and then expanded rapidly during World War II. In the years following came the Cold War, in which global opponents fought each other with intelligence agencies rather than armies.

Several of the more prominent intelligence services are the Central Intelligence Agency (CIA) of the United States, the KGB (Komitet Gosudarstvennoy Bezopasnosti) of the Soviet Union, Great Britain's MI-5 and MI-6, the DGSE (Direction Générale de la Sécurité Extérieure) of France, China's Social Affairs Department, and the Mossad of Israel.

The major intelligence services of the world can be divided into three basic types: American (used by, for example, Japan and South Korea), Soviet (long followed by members of the Communist bloc), and British (the model used by many Western European countries). During World War II, the chief intelligence service of the United States was the Office of Strategic Services (OSS), and it was from the OSS that the CIA was born shortly after the war's end. Although the CIA was designed to facilitate the centralization of American intelligence operations, it is in fact only one member of what is known as the U.S. intelligence "community," which includes agencies from the military, along with the State Department, the Department of Energy, the National Security Agency (NSA), and the Federal Bureau of Investigation (FBI). Most members of the community are represented on the National Foreign Intelligence Board. While all agencies are theoretically equal, it is the CIA that is the most prominent.

The major activities of the CIA since it was founded have been intelligence gathering, counterintelligence, and occasionally, and most controversially, direct intervention in the internal affairs of other countries by covert military operations and other means. The CIA's chief executive is appointed by the president and is the president's primary intelligence adviser. The CIA is divided into four major divisions: operations, science and technology, administration, and intelligence. The operations division has been the area responsible for clandestine activities; the science and technology division keeps abreast of worldwide developments in intelligence and scientific technology; administration is responsible for recruitment, training, and information storage; and the intelligence division gathers information and produces finished reports. The definitive reports produced by this agency are the National Intelligence Estimates (NIEs). Reviewed by the Intelligence Board, and then presented to the president, the NIEs represent the culmination of the CIA's work.

Formed in 1954, the Soviet Union's KGB is the direct descendant of the Bolshevik secret police, the Cheka, created in 1917. The KGB is in many ways a centralized version of the entire U.S. intelligence community, as it performs the three main functions of intelligence, counterintelligence, and internal security. Long before the rise of former KGB chief Yuri Andropov to leader of the Soviet Union in 1982, the position of KGB chief was seen by observers to be immensely powerful. The KGB is divided into several major directorates, three of which are the First Chief Directorate (which carries out counterintelligence), Second Chief Directorate (responsible for foreign intelligence gathering), and Third Chief Directorate (responsible for internal security, believed to include Smersh—from Russian, *smert shpionam*, meaning "death to spies").

The British intelligence service is characterized by its high level of secrecy. It is divided into the Secret Intelligence Service and the Security Service, both of which are known by their old wartime designations of MI-6 and MI-5, respectively. Little is known about the inner workings of these services, and this model of secrecy has been emulated by France and other western European nations in their intelligence agencies.

intelligence, in psychology, an abstract faculty that comprises the capacities to learn and to adapt but is distinct from motivational or instinctual reactions. The notion of a unified "mental" faculty has existed since classical times but was not given systematic attention until after 1850, when the works of Herbert Spencer, Charles Darwin, and Sir Francis Galton began to appear.

A brief treatment of intelligence follows. For full treatment, *see* MACROPAEDIA: Intelligence, Human.

Although definitions of intelligence vary, theorists generally agree that it is a capacity or potentiality rather than a fully developed attainment and that it has a biological basis. It is thought of as a combination of the innate characteristics of an individual's central nervous system—which are genetically endowed—and of developed intelligence—which is molded by experience, learning, and environmental factors.

Intelligence can be measured, though imperfectly, by intelligence tests, among them the Stanford–Binet Intelligence Scale and the Wechsler scales. These tests are intended to determine an individual's intelligence quotient (IQ); this was originally calculated according to the relation of mental age to chronological age, but the use of the concept of mental age in assessing IQ scores has been largely discontinued. IQ is now more often assessed on the basis of the statistical distribution of scores. (*See* intelligence test.)

Although high intelligence might seem to guarantee an individual person a high degree of achievement in society, many other factors make long-term predictions unreliable. The mechanisms for turning intellectual ability into social achievement are not fully understood. School achievement tests taken early in life provide a good correlation with IQ tests taken at the same time, but the results cannot predict achievement beyond school age.

There is no known method for evaluating innate intelligence. Although the relationship between heredity and environment in the development of intelligence is not fully understood, this relationship has been studied in various ways, including that of examining the individual achievement levels of sets of identical or fraternal twins who are reared apart.

It is useful to distinguish between intellectual level—the single, mass-related test score—and intellectual pattern—the variations each person experiences in specific levels of ability. A person's intelligence level may be 120, but the level of verbal ability, for example, may be far superior to that of the skill used in solving mathematical equations. In addition, individual abilities develop at different rates throughout childhood and up to about age 25, when there is an overall slowing down of intellectual development. It is extremely difficult, therefore, to coordinate intellectual level with intellectual pattern, since IQ tests are designed to reflect general intelligence at the time that the test is taken and do not always take into account the influence of the cultural and economic milieu, or any number of specific intellectual abilities that may not be fully developed.

Around 1900, psychologists began to develop tests that led to the empirical study of the structure of human intelligence. Later, statistical techniques were applied to the test results, and comparisons made between sample findings helped to evaluate the relative importance of individual abilities to create a comprehensive picture of intelligence. Until about 1950 psychological opinion was divided between those who advocated the concept of a unified intellect and those who favoured the breakdown of intelligence into a range of specific abilities. After the 1950s the work of J.P. Guilford became a major influence in intellectual theory. Guilford broke down the concept of general intelligence into 120 specific abilities classified under three general headings: logical processes, the kinds of information processed, and the products of such processing. Guilford's work led to increased research on the relationship between creative and analytical thought. Various studies have found great overlap between the two, especially at low and average levels, and almost complete divergence, particularly among gifted individuals.

Increasingly, intellectual level has been correlated with environmental influences, particularly the effect of socioeconomic structure upon genetic endowment. Studies show that similar groups of people provide divergent test results if they come from different cultural backgrounds. Such factors as nutrition, educational resources, family life and child-rearing practices, and social expectations play a significant role in determining how individuals utilize their genetic potential.

The work of Jean Piaget (*q.v.*) greatly enhanced the overall understanding of intellectual development up to adolescence. Piaget studied individual children in an effort to synthesize biology with epistomology (the study of the nature of knowledge). He concluded that intellectual development follows a hierarchical pattern that usually corresponds with chronological age. Piaget's developmental theories continue to be a strong influence, despite the fact that a number of alternative theories have evolved.

Computers are increasingly being used to provide mathematical models of human intelligence, based on the cybernetic theory that the artificial intelligence of the computer's "brain" parallels the mechanisms of the human intellect. As a result, there is a growing trend to apply computer terminology to describe human brain activity.

intelligence, artificial (computer science): *see* artificial intelligence.

intelligence test, series of tasks designed to measure the capacity to make abstractions, to learn, and to deal with novel situations.

The most widely used intelligence tests include the Stanford–Binet Intelligence Scale and the Wechsler scales (including tests for adults, children, and young children). The Stanford–Binet Scale is the American adaptation of the original French Binet–Simon intelligence test; it was first introduced in 1916 by Lewis Terman, a psychologist at Stanford University. The individually administered test, revised in 1937, 1960, and 1972, evaluates persons two years of age and older and is designed for use primarily with children. It consists of an age-graded series of problems whose solution involves arithmetical, memory, and vocabulary skills.

The test is scored in terms of intelligence quotient, or IQ, a concept first suggested by German psychologist William Stern and adopted by Lewis Terman in the Stanford-Binet Scale. The IQ was originally computed as the ratio of a person's mental age to his chronological (physical) age, multiplied by 100. Thus, if a child of 10 had a mental age of 12 (that is, performed on the test at the level of an average 12-year-old), then the child was assigned an IQ of (12/10) X 100, or 120. A score of 100, for which the mental age equaled the chronological age, was average; scores above 100 were above average, scores below 100 were below average. The concept of mental age has fallen into disrepute, however, and few tests now involve the computation of mental ages. Yet many tests still yield an IQ; this figure is now computed on the basis of the statistical percentage of people who are expected to have a certain IQ. Intelligence test scores follow an approximately "normal" distribution, with most people scoring near the middle of the distribution curve and scores dropping off fairly rapidly in frequency away from the curve's centre. For example, on the IQ scale about two out of three scores fall between 85 and 115 and about 19 out of 20 fall between 70 and 130. A score of about 130 or above is considered gifted, while a score below about 70 is considered mentally deficient or retarded.

Intelligence tests have provoked a great deal of controversy about what kinds of mental abilities constitute intelligence and whether the IQ adequately represents these abilities, with debate centring on cultural bias in test construction and standardization procedures. Critics have charged that intelligence tests favour groups from more affluent backgrounds and discriminate against less privileged racial, ethnic, or social groups. Consequently, psychologists have attempted to develop culture-free tests which would more accurately reflect an individual's native ability. One such test, the Johns Hopkins Perceptual Test, developed by Leon Rosenberg in the early 1960s to measure the intelligence of preschool children, has a child try to match random forms (ordinary geometric forms, such as circles, squares, and triangles, are avoided because some children may be more familiar with the forms than are others). Another attempted solution to the problem was to use test material pertinent to a child's living environment; for example, for inner-city children, urban and not pastoral scenes are appropriate.

Ottawa psychologists have attempted to measure a subject's underlying neurological efficiency rather than his IQ directly; their technique consisted in measuring with an electroencephalograph the electrical activity of the subject's brain in response to flashes of light and then recording and accumulating the information by computer.

Intelsat, abbreviation of INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION, also called (1964–73) INTERNATIONAL TELECOMMUNICATIONS SATELLITE CONSORTIUM, organization founded in 1964 by the telecommunication agencies of 18 nations, including the United States, which proposed the organization. Intelsat owns communications satellites and the ground stations from which they are controlled, but the transmitting and receiving apparatus in each country is owned by the Intelsat member from that country. Within several years the membership of Intelsat had grown to include agencies from most of the nations of the world.

The consortium contracted with the U.S. National Aeronautics and Space Administration (NASA) to launch its satellites. The first of these was Early Bird, later renamed Intelsat 1, which was placed in a stationary orbit over the Atlantic Ocean at the Equator in 1965. Within a few years, other members of the Intelsat series were orbited over the Pacific and Indian oceans, establishing a commercial telecommunication system accessible from any place on the surface of the Earth. By the mid-1980s there were some 400 Earth stations for more than 20 fully operational satellites in orbit around the Earth.

intendant, administrative official under the ancien régime in France who served as an agent of the king in each of the provinces, or *généralités.* From about 1640 until 1789, the intendancies were the chief instrument used to achieve administrative unification and centralization under the crown.

The origin of the office of intendant remains obscure, and no document has been found that specifically created it. The office had its beginnings in the crown's need to oversee and supervise the venal royal bureaucracy, many of whose members had purchased their offices. The crown placed over such officials agents with well-defined powers under *lettres de commission* for a certain length of time. A number of such agents, or *commissaires,* would tour the provinces for a set length of time and with a specific purpose, but in 1555 Henry II assigned to each of them a particular territory called a *généralité.* Special *commissaires* were still dispatched to particularly troubled areas and reported to a provincial governor or an army in the field with the titles "intendant of justice" or "intendant to the army," and they eventually came to be called intendants.

During the early 17th century the intendants' posts in particular provinces were made permanent, and after 1635 an intendant had been appointed to virtually every province. By the 1630s the *commissaires,* or intendants, had begun to function as a kind of parallel administration in the provinces, thus enabling the crown to substitute its authority for that of the *gouverneurs* (provincial military commanders) and other local officials. By the mid-1640s the *commissaires* had become rivals of or had even substantively displaced the local authorities, particularly the treasurers functioning in each province. The consequent resentment of the local officials was one of the factors in the series of uprisings known as the Fronde (1648–53), which in 1648 temporarily compelled Louis XIV to revoke the powers of all intendants except those in certain frontier provinces. This decision had no lasting effect, and intendants of justice, police, and finance were reestablished in 1653.

From the beginning of his personal government (1661), Louis maintained the intendants, who thenceforth became the regular representatives of royal power. There were 33 intendants for the 34 *généralités* of France in 1789. The intendants' authority extended into every sphere of provincial administration: they were responsible for carrying out the central power's orders in their *généralités,* supervising the local officials, representing the crown at the local autonomous bodies (provincial assemblies in particular), and informing the central power about the economic situation and public opinion in their *généralités.* Their mission remained always one of providing information rather than of making decisions, and in order to act they had to obtain an order from the king's council, which, however, would usually be drafted on the lines

they suggested. As intendants of justice they could preside over local courts, suspend unsatisfactory magistrates, and set up extraordinary tribunals to suppress brigandage and sedition. As intendants of finance, they determined the incidence of taxes in the district and discussed with the assemblies the amount of the annual taxes to be voted in the district assemblies; by the end of the 17th century, it was their responsibility to collect new taxes. Responsible for public order, they coordinated the activities of the *prévôts des maréchaux* (the police force under the marshals of France) and sometimes intervened in the affairs of private persons, prompting the dispatch of *lettres de cachet* (*q.v.*). They also controlled municipal administration. Their great power made them unpopular, and it was partly to remedy their excess of power that the so-called *assemblées provinciales,* with consultative and administrative powers, were set up throughout France in 1787; the powers of the intendants were suppressed in 1789.

intendente, royal official appointed by the 18th-century kings of the Bourbon dynasty in Spain. Modelled after the French *intendants,* the *intendentes* were to serve as instruments of royal centralization and administrative reform but were frequently resisted as conflicting with local privileges. In the Spanish colonies the system was imposed in Cuba (1765) after the brief British occupation of Havana. With the creation of the new viceroyalty of La Plata, the system was applied throughout that area, which was divided into 12 intendencies (*intendencias*) from Buenos Aires to Potosí (1776).

intension and extension, in logic, correlative words that indicate the reference of a term or concept: "intension" indicates the internal content of a term or concept that constitutes its formal definition; and "extension" indicates its range of applicability by naming the particular objects that it denotes. For instance, the intension of "ship" as a substantive is "vehicle for conveyance on water," whereas its extension embraces such things as cargo ships, passenger ships, battleships, and sailing ships. The distinction between intension and extension is not the same as that between connotation and denotation.

intensive agriculture, in agricultural economics, system of cultivation using large amounts of labour and capital relative to land area. Large amounts of labour and capital are necessary to the application of fertilizer, insecticides, fungicides, and herbicides to growing crops, and capital is particularly important to the acquisition and maintenance of high-efficiency planting, cultivating, and harvesting machinery, and irrigation equipment where that is required.

Optimal use of these materials and machines produces significantly greater crop yields per unit of land than extensive agriculture, which uses little capital or labour. As a result, a farm using intensive agriculture will require less land than an extensive agriculture farm to produce a similar profit. In practice, however, the increased economies and efficiencies of intensive agriculture often encourage farm operators to work very large tracts in order to keep their capital investments in machinery productively engaged, *i.e.*, busy.

On the level of theory, the increased productivity of intensive agriculture enables the farmer to use a relatively smaller land area that is located close to market, where land values are high relative to labour and capital, and this is true in many parts of the world. If costs of labour and capital outlays for machinery and chemicals, and costs of storage (where desired or needed) and transportation to market are too high then farmers may find it more profitable to turn to extensive agriculture.

However, in practice many relatively small-scale farmers employ some combination of intensive and extensive agriculture, and many of these operate relatively close to markets. Many large-scale farm operators, especially in such relatively vast and agriculturally advanced nations as Canada and the United States, practice intensive agriculture in areas where land values are relatively low, and at great distances from markets, and farm enormous tracts of land with high yields. However, in such societies overproduction (beyond market demands) often results in diminished profit as a result of depressed prices.

intention (Latin *intentio*), in Scholastic logic and psychology, a concept used to describe a mode of being or relation. In knowing, the mind is said to "intend" or "tend toward" its object, and a thing as known, or in the knowing mind, has "intentional being." Intention may mean either the mind knowing or the knowledge itself, analogous to the use of perception for the act of perceiving or for the thing perceived. First intention is knowledge of a thing as it is in itself; second intention, knowledge of the thing as known. Thus, the term man is in first intention in the statement "man is mortal," but in second intention in "man is a species." Logic was held by the Scholastics to consist of the study of second intentions.

intentionality, in Phenomenology, the characteristic of consciousness whereby it is conscious *of* something; *i.e.*, its directedness toward an object.

The concept of intentionality enables the Phenomenologist to deal with the immanent–transcendent problem—the relation between what is within consciousness and what extends beyond it—in a manner different from that employed by many philosophers who have claimed that an experienced, represented, and remembered object (*e.g.*, a tree) is inside consciousness (immanent), whereas the real object itself is outside the mind (transcendent). These philosophers have made this distinction the ground of a doubt about the existence of things and of skepticism about the possibility of knowledge of things.

Phenomenologists have noted that this distinction is a question of meaning and thus pertains to the reflective, or ontological, level; it is a distinction made, however, on the level of the everyday world, that of the natural attitude. Thus, in order to reach the level of meaning, Phenomenologists—contrary to these other philosophers—"bracket" existence (*i.e.*, exclude from consideration the question of existence or non-existence as things) by the phenomenological reduction and deal exclusively with the indubitable—with consciousness and the immediately given evidence of consciousness. On this level, the immanent is what is given adequately (*e.g.*, one sees the front side of the tree) and the transcendent is what is aimed at, or intended (the tree). Thus, the problem of how to move from the immanent to the transcendent is solved by an analysis of how an object comes to have meaning for consciousness and of how consciousness relates to the object. This procedure is called intentional analysis, or the analysis of the constitution of meaning.

Every particular profile of an object refers to, though it does not present, the object as a whole (*i.e.*, as it could be perceived in all of its profiles). Thus, the object as a whole (the intended, or meant, object) is what unifies all of the profiles as given in the many acts of perception. Each perception anticipates the other perceptions, and perception is thus a process of fulfillment. The whole of the factors not effectively or immediately given—*i.e.*, the object in its other profiles—is called the internal horizon, and the background against which the object appears is called the external horizon. Thus, the constitution of the object is the unity of the acts of consciousness, the unity of all of the profiles with the internal horizon, and the external horizon.

Inter-American Development Bank, an international organization founded in 1959 by 20 American governments to finance economic and social development in the Western Hemisphere. The largest charter subscribers were Argentina, Brazil, Mexico, Venezuela, and the United States. Subscribers now include 6 more American countries, 2 Asian, and 14 European countries. Many of the loans granted are to improve the conditions of low-income people.

Inter-Governmental Maritime Consultative Organization (IMCO): *see* International Maritime Organization.

interaction, fundamental: *see* fundamental interaction.

interactionism, in Cartesian philosophy and the philosophy of mind, those dualistic theories that hold that mind and body, though separate and distinct substances, causally interact. Interactionists assert that a mental event, as when John Doe wills to kick a brick wall, can be the cause of a physical action, his leg and foot moving into the wall. Conversely, the physical event of his foot hitting the wall can be the cause of the mental event of his feeling a sharp pain.

In the 17th century, René Descartes gave interactionism its classical formulation. He could give no satisfactory account of how the interaction takes place, however, aside from the speculation that it occurs in the pineal gland deep within the brain. This problem led directly to the occasionalism of Nicolas Malebranche, a 17th–18th-century French Cartesian who held that God moves the foot on the occasion of the willing, and to various other accounts of the mind–body relation. These include the theory of Gottfried Wilhelm Leibniz, a 17th–18th-century German philosopher-mathematician, of a harmony between the mind and body preestablished by God at creation, and the rejection of dualism by the 17th-century Dutch Jewish Rationalist Benedict de Spinoza in favour of a monistic theory of mind and body as attributes of one underlying substance—a view known as parallelism (*q.v.; see also* psychophysical parallelism).

Two difficulties confront the interactionist: (1) As different substances, mind and body are so radically different in quality that it is difficult to imagine how two such alien things could influence one another. (2) Physical science, when interpreted mechanistically, would seem to present a structure totally impervious to intrusions from a nonphysical realm, an appearance that would seem to be as true of the brain as of any other material aggregate.

intercalation, insertion of days into a calendar to bring it into line with the solar year (year of the seasons). One example is the periodic inclusion of leap-year day (February 29) in the Gregorian calendar now in general use. To keep the months of a lunar calendar (*e.g.*, the Hindu calendar) in their proper seasons, an entire month must be intercalated or extracalated (dropped) periodically, because there are a fractional number (between 12 and 13) of cycles of lunar phases (months) in a solar year. In astronomically primitive cultures, intercalation and extracalation were done empirically, whenever seasons and their properly associated months became noticeably out of step.

interceptor, in military aviation, a fighter aircraft (*q.v.*) designed to intercept enemy planes.

Intercession Cathedral: *see* Saint Basil the Blessed.

intercolumniation, in architecture, space between columns that supports an arch or an entablature (an assemblage of horizontal moldings and bands), the lowest horizontal beam of a roof. In Classical architecture and its derivatives, Renaissance and Baroque architecture, intercolumniation was determined from a system codified by the 1st-century BC Roman architect Marcus Vitruvius Pollio.

The measurement between columns is calculated and expressed in terms of the diameters of the columns in the building—*i.e.,* two columns were expressed as being 3 diameters (3D) rather than 9 feet (2.7 m) apart. This system conveniently and universally expressed the measurement of a particular unit of space, the size of which varied from building to building, according to the Classical order used (*see* order).

Vitruvius established five standard measurements for intercolumniation: 1½ diameter interval (D), called pycnostyle intercolumniation; 2D, called systyle; 2¼ D (the most common ratio), called eustyle; 3D, called diastyle; and 4 or more D, called araeostyle.

Although the five standard ratios prevailed, variations in actual building practice occurred frequently. In Doric temples the intercolumniation at the corners was sometimes one-half as wide as the intercolumniation along the front and lateral sides of the building.

In Japanese architecture intercolumniation is based on a standard unit, the *ken,* which is divided into 20 sections, each termed a minute of space; each minute is subdivided into 22 units, or seconds.

intercourse, sexual: *see* sexual intercourse.

interdict, in Roman and civil law, a remedy granted by a magistrate on the sole basis of his authority, against a breach of civil law for which there is no stipulated remedy. Interdicts can be provisionary (opening the way for further action) or final.

An exhibitory interdict, which usually involves rights over things, is an order requiring that a person or thing be produced. A restorative interdict is an order requiring someone to restore something taken away, undo something that has been done, or end a specific type of interference with a right.

In medieval canon law, an interdict involves the withholding of certain sacraments and clerical offices from certain persons and even territories, usually to enforce some type of obedience. The power to impose interdict on states or dioceses belongs to the pope and general councils of the church, but individual parishes, groups, or persons may be placed under interdict by local bishops. Interdicts were frequently used, either actually or as a threat, against recalcitrant monarchs throughout the European Middle Ages.

Interessengemeinschaft Farbenindustrie AG (German cartel): *see* IG Farben.

interest, the price paid for the use of credit or money. It may be expressed either in money terms or as a rate of payment.

A brief treatment of interest follows. For full treatment, *see* MACROPAEDIA: Economic Theory.

Interest may also be viewed as the income derived from the possession of contractual promises from others to pay sums in the future. The question may be asked, "What is the value today of a promise to pay $100 a year from now?" If the answer is $100, then no interest income is generated. Most people, however, would require an inducement to give up $100 today and for the next year. If $5 were sufficient inducement—that is, if they would buy such a promise for $95—then interest income of $5 has been generated at a rate of just over 5 percent.

Various theories have been developed to account for and justify interest. Among the better known are the time-preference theory of the Austrian, or Marginalist, school of economists, according to which interest is the inducement to engage in time-consuming but more productive activities, and the liquidity-preference theory developed by J.M. Keynes, according to which interest is the inducement to sacrifice a desired degree of liquidity for a nonliquid contractual obligation. It may be mentioned that in Marxist theory interest, like capital itself, is a portion of labour expropriated by the capitalist class by virtue of its political power.

interest group, also called SPECIAL-INTEREST GROUP, any aggregate of individuals that, on the basis of one or more shared concerns, makes claims upon groups or society in general in order to promote its objectives.

A brief treatment of interest groups follows. For full treatment, *see* MACROPAEDIA: Political Parties and Interest Groups.

In developing societies, the prominent type of interest group is the primordial one—based on kinship, lineage, neighbourhood, or religion. In industrialized societies, the prominent type is the associational one—created to serve a goal. Associational groups may take different forms.

When any interest group tries to influence government, it becomes a "pressure group." Any interest group that is not a part of the government and does not itself seek to govern the country in its own name but does seek to influence that government for its own purposes is a pressure group.

A political party differs from a pressure group in that a party has a structure and presents candidates for public office, whereas a pressure group seeks to influence both government and parties. But what begins as a pressure group may become a political party. The British Labour Party began in 1900 as a collection of trade unionists trying to secure the election of working-class MPs to Parliament; later it broadened its program and membership.

Although all pressure groups seek out the influential agencies of government, they can only resort to influential organs that are accessible. In any system the influence of government organs varies. Strategy for an interest group thus consists in determining the influential organ that is accessible.

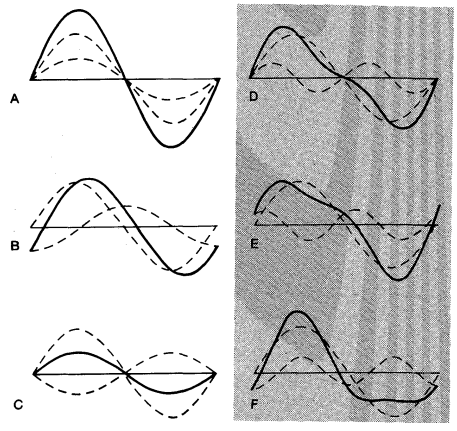
Where the population is not divided ideologically or culturally, interest groups are "secondary"—independent of government, politically neutral, possessed of specialized objectives, and distinct from parties. In Britain there are formal channels by which to influence the executive; groups influence parties by securing their members' nomination, by financial assistance, or by participating in party caucuses and promoting amendments at committee stage. In the United States, lobbying and appearing at hearings is important, but contact with the presidency and the media can be decisive.

In developing countries, ideologies and "natural" affiliations fragment political culture. And nascent modernizing forces tend to range against rural groupings. Also, after independence, informal interests persist in their activities, intertwining with new parties. Associations tend to have low densities, though latent interest is high.

Most communist countries contain associational but few promotional groups. The Communist Party may allow other parties to exist, but it assures its power by controlling the nomination of the leadership of minor parties and interests.

interface, surface separating two phases of matter, each of which may be solid, liquid, or gaseous. An interface is not a geometric surface but a thin layer that has properties differing from those of the bulk material on either side of the interface. A common interface is that between a body of water and the air, which exhibits such properties as surface tension, by which the interface acts somewhat like a stretched elastic membrane. Interfacial effects, or processes that occur at interfaces, include the evaporation of liquids, the action of detergents and chemical catalysts, and the adsorption of gases on metals.

interference, in physics, the net effect of the combination of two or more wave trains moving on intersecting or coincident paths. The effect is that of the addition of the amplitudes of the individual waves at each point affected by more than one wave.



Component waves and their resultants

If two of the components are of the same frequency and phase (*i.e.,* they vibrate at the same rate and are maximum at the same time), the wave amplitudes are reinforced, producing constructive interference; but, if the two waves are out of phase by ½ period (*i.e.,* one is minimum when the other is maximum), the result is destructive interference, producing complete annulment if they are of equal amplitude. The solid line in Figures A, B, and C represents the resultant of two waves (dotted lines) of slightly different amplitude but of the same wavelength. The two component waves are in phase in Figure A but out of phase by ¼ period and ½ period in B and C.

When two stones are dropped into a pool of water, waves spread out from each source, and interference occurs where they overlap. Constructive interference results where the crest of one coincides with the crest of the other. Two wave trains of light from a double slit produce interference, an effect that is visible on a screen as a pattern of alternating dark and light bands caused by intensification and extinction at points at which the waves are in phase and out of phase, respectively.

Interference also occurs between two wave trains moving in the same direction but having different wavelengths or frequencies. The resultant effect is a complex wave. A pulsating frequency, called a beat, results when the wavelengths are slightly different. Figures D, E, and F show complex waves (solid lines) composed of two component interfering waves (dotted lines), the ratio of their wavelengths being 1:2 and of their amplitudes 1:3.

Interference between waves traveling in opposite directions produces standing waves (*q.v.*).

interferon, any of several related proteins that are produced by the body's cells as a defensive response to viruses. Interferons interfere with the multiplication of viruses within cells; they are the body's most rapidly produced and most important defense against such organisms. It is primarily due to the action of interferons that most viral infections are not life threatening to humans.

Interferons are produced by all vertebrate animals and possibly by some invertebrates as

well. Interferon is produced only when cells are stimulated to do so by a virus or other foreign substance, but interferon does not directly inhibit the virus's multiplication. Viral invasion of a cell activates a gene in that cell's DNA that holds the stored information for the production of interferon, and within an hour or so the cell begins to produce and secrete interferon in tiny amounts. This interferon stimulates other nearby body cells to produce proteins that modify the cells' protein-synthesizing processes in such a way that the virus can no longer replicate within them. The end result is that the further production of virus within the cells is inhibited. A strong causal link has been established between interferon and an animal's ability to naturally recover from most viral infections.

The type of cell that produces the interferon and the type of virus stimulating its production determine which of the three distinct types of interferon is produced. Alpha (α) and gamma (γ) interferons are mainly produced by lymphocytes, a type of white blood cell, while beta (β) interferons may be produced by many kinds of body cells.

Interferons were discovered in 1957 by Alick Isaacs and Jean Lindenmann. Research conducted in the 1960s using interferon produced by cell cultures revealed that these substances could prevent the formation or suppress the growth of cancers in laboratory animals. In the 1970s human leukocyte interferon was found to be effective in the treatment of human viral infections. Research efforts such as these, however, were seriously hampered by the fact that only minute quantities of interferon could be produced by laboratory cell cultures even after the most strenuous and lengthy effort; but the use of recombinant-DNA technology greatly increased the amounts of interferon produced in laboratories in the early 1980s. The genes that code for interferon were introduced into the genetic makeup of bacteria, and these easily cultured organisms then produced interferon in commercially significant amounts.

Alpha interferon has been tested against a variety of viral diseases and cancers. Clinical studies suggest its effectiveness in preventing the spread of the common cold (when caused by a rhinovirus) and perhaps in treating influenza, shingles, and chronic hepatitis-B infection. Certain viral eye infections, as well as benign, warty skin tumours called papillomas, also seem to respond to treatment with interferon. Alpha interferon seems effective in treating several uncommon cancers, notably hairy-cell leukemia (a rare form of blood cancer) and Kaposi's sarcoma, which is commonly found in AIDS patients.

interior design, the planning and design of man-made spaces, a part of environmental design and closely related to architecture.

A brief treatment of interior design follows. For full treatment, *see* MACROPAEDIA: Decorative Arts and Furnishings.

The design of interior spaces is undertaken to create a harmonious and appropriate environment for the human activities to be pursued in those spaces. Interior decoration is an important part of interior design, and the terms are sometimes used interchangeably, though strictly the designer is concerned with larger concepts and the overall organization of space; the decorator works to select the best fabrics, furniture, colours, and accessory furnishings to enhance the entire interior space.

The interior designer must consider the form and character of the exterior architecture; the site, size, character, and lighting of the interior spaces; the function of those interiors; the life-style and socioeconomic needs of the people who will use those spaces; and the appropriateness of any design features to be incorporated. The designer's goal is to create a coordinated and harmonious whole where the architecture, site, function, and visual aspects of the interior are unified and pleasing to mind and body. Scale is a vital factor in interior design. Furniture and accompanying accessories must be in proportion to the space they occupy and also to the human needs. Character is equally vital—whether the "feel" of the space is to be formal or informal, for example.

The design and decoration of residential spaces involve a personal statement about the status, taste, and life-style of its residents. Such interiors can be infinitely varied, though the overall good design criteria such as harmony of colour, texture, lighting, scale, and pleasing proportion remain paramount. The design of nonresidential spaces such as offices, hospitals, stores, and educational buildings invites a more standardized approach on the part of the designer, who will often strive for clear organization of systems and functions ahead of purely aesthetic considerations.

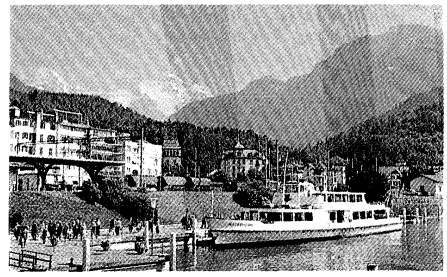
Interior Lowlands, the broad, generally flat areas of the central part of the North American continent. The name is used in regional geologic and physiographic descriptions of North America and the conterminous United States. From the tectonic view, the continental Interior Lowlands are areas largely undisturbed by mountain building in past geologic time. They extend from the delta of the Mackenzie River, in northern Canada, south to the rim of the Coastal Plain and are bounded by the Western Cordillera (Rocky Mountains) on the west, the Canadian Shield on the north and east, and the Appalachian Mountains on the east.

In the regional physiography of the conterminous United States, the Interior Lowlands are composed chiefly of the great Central Lowland of the Middle Western states and the Great Plains landform region to the west. Their related uplands include the Superior Upland, Appalachian Plateau (but not the Appalachian Mountains), the Interior Low Plateaus, and the Ozark Plateau.

interior monologue, in dramatic and nondramatic fiction, narrative technique that exhibits the thoughts passing through the minds of the protagonists. These ideas may be either loosely related impressions approaching free association or more rationally structured sequences of thought and emotion. Interior monologues encompass several forms, including dramatized inner conflicts, self-analysis, imagined dialogue (as in T.S. Eliot's "The Love Song of J. Alfred Prufrock"), and rationalization. It may be a direct first-person expression apparently devoid of the author's selection and control, as in Molly Bloom's monologue concluding James Joyce's *Ulysses* (1922), or a third-person treatment that begins with a phrase such as "he thought" or "his thoughts turned to."

The term interior monologue is often used interchangeably with "stream of consciousness." But while an interior monologue may mirror all the half thoughts, impressions, and associations that impinge upon the character's consciousness, it may also be restricted to an organized presentation of his rational thoughts. Closely related to the soliloquy and dramatic monologue, the interior monologue was first used extensively by Édouard Dujardin in *Les Lauriers sont coupés* (1887; *We'll to the Woods No More*) and later became a characteristic device of 20th-century psychological novels. *See also* consciousness, stream of.

Interlaken, town, Bern *canton,* central Switzerland. It lies along the Aare River, in the Bernese Highland. Its name is derived from its position on the flat plain (Bödeli), 1,864 feet (568 m) above sea level between Lakes



Interlaken, Switz., on the Aare River
Sven Samelius

(*inter lacus*) Brienz to the east and Thun to the west. The town grew up around a convent of Augustinian canons (1130–1528). It is one of Switzerland's oldest and most frequented summer tourist resorts, and its main avenue (Höheweg) is lined with hotels. Interlaken commands a magnificent view of the Jungfrau (13,642 feet [4,158 m]) to the south and is a starting point for many Alpine excursions. Textiles and watches are manufactured there. Pop. (1980) 4,852.

interleukin (IL), any of a group of naturally occurring proteins that are important in the activation of lymphocytes. Discovered in the 1970s, several known types of interleukin are recognized as crucial constituents of the body's immune system.

The best-known interleukins are IL-1 and IL-2. IL-1 is produced by macrophages that have come in contact with foreign particles (antigens) and microbes. In the presence of the antigen, the activated macrophage secretes IL-1, which induces helper T cells to produce IL-2. The IL-2 produced by helper T cells stimulates the division and proliferation of more helper T cells and also of cytotoxic T cells, which are lymphocytes that kill infected body cells. In this manner, IL-1 and IL-2 ensure a plentiful supply of T cells to fight specific infectious agents.

In the 1980s researchers began the experimental use of IL-2 as an anticancer agent. Lymphocytes drawn from cancer patients were inoculated in the laboratory with genetically reproduced IL-2. The stimulated lymphocytes, now called lymphokine-activated killer (LAK) cells, were injected back into the patients along with additional doses of IL-2. The drug produced toxic reactions and appeared to be only modestly effective in killing some types of cancer cells.

Interlingua, also called LATINO SINE FLEXIONE, simplified form of Latin intended for use as an international second language. Interlingua was originally developed in 1903 by the Italian mathematician Giuseppe Peano, but lack of clarity as to what parts of Latin were to be retained and what were to be discarded led to numerous "dialects" of Interlingua, confusion, and its dying out among enthusiasts. In the late 1940s and early 1950s, the linguist Alexander Gode, with the sponsorship of the International Auxiliary Language Association, reformulated and revived Interlingua and promoted its use in the international scientific community. As reformulated, Interlingua's grammar is not much more complex than that of Esperanto; it has only one form for nouns (taken from the Latin ablative case), no gender, no case, plurals in *-s,* one form for adjectives with no noun–adjective agreement, one definite article, and verbs with no inflection for person or number. Abstracts and summaries are published in Interlingua by several international scientific journals, but in general the language has not been widely adopted.

Interlochen, unincorporated resort village, Grand Traverse county, northwestern Michigan, U.S., located in a fruit-growing region about 10 miles (16 km) south of Traverse City.

The village was named for its location between Lake Wahbekaness ("Water Lingers," formerly Duck Lake) and Lake Wahbekanetta ("Water Lingers Again," formerly Green Lake).

Interlochen is best known as the home of the Interlochen National Music Camp. The music camp began as Camp Interlochen (a state-sponsored summer camp), established in 1922. In 1927 it became the National High School Orchestra Camp and in 1931 the National Music Camp. The camp was not officially affiliated with the University of Michigan until 1942, though its first director was a music professor at Michigan. It allows high-school student musicians to work closely with outstanding professional musicians. During the months of June, July, and August, concerts are offered almost daily. The Interlochen Arts Academy, founded in 1960, offers a full high-school program—including music, dramatics, and related arts—throughout the school year. The music camp is situated in a stately stand of virgin white pines, one of the last of the original forests in the region. Adjacent to the music camp is the 187-acre (76-hectare) Interlochen State Park. Pop. (latest est.) 130.

interlocutory decree, generally, a judicial decision that is not final or that deals with a point other than the principal subject matter of the controversy at hand. An interlocutory decree of divorce in the United States or a decree nisi in England, for example, is a judicial decree pronouncing the divorce of the parties provisionally but not terminating the marriage until the expiration of a certain period. The purpose of requiring such a period of time is to discourage quick and easy divorce, to encourage reconciliation, and to enable the court to supervise the arrangements to be made for the children of the marriage. In England the time is also used to give the court an opportunity to discover collusive practices by which the parties may have deceived the court.

In England the interlocutory period is six weeks, whereas in the United States, in those states requiring that a decree of divorce be preceded by an interlocutory decree, the period of delay varies from three months to one year. *See also* judgment.

interlude, in theatre, early form of English dramatic entertainment, sometimes considered as the transition between medieval morality plays and the Tudor dramas. Interludes were performed at court or at great houses by professional minstrels or amateurs at intervals between some other entertainment, such as a banquet. Although most interludes were sketches of a nonreligious nature, some plays were called interludes that are today classed as morality plays. John Heywood, one of the most famous interlude writers, brought the genre to perfection in his *The play of the wether* (*c.* 1533) and *The Playe Called the foure P.P.* (*c.* 1544). The Earl of Essex is known to have had a company of interlude players in 1468; the first royal company was apparently established in 1493.

intermediate goods: *see* producer goods.

Intermediate-Range Nuclear Forces Treaty, abbreviation INF TREATY, nuclear-arms-control accord reached by the United States and the Soviet Union in 1987 in which those two nations agreed to eliminate their stocks of intermediate-range and shorter-range (or "medium-range") land-based missiles (which could carry nuclear warheads). It was the first arms-control treaty to abolish an entire category of weapon systems. In addition, two protocols to the treaty established unprecedented procedures for observers from both nations to verify firsthand the other nation's destruction of its missiles.

The INF Treaty defined intermediate-range ballistic missiles (IRBMs) and ground-launched cruise missiles (GLCMs) as those having ranges of 1,000 to 5,500 km (620 to 3,400 miles) and shorter-range ballistic missiles (SRBMs) as those having ranges from 500 to 1,000 km (310 to 620 miles).

The deployment of IRBMs in Europe first became an arms-control issue in the late 1970s, when the Soviet Union began replacing its older single-warhead SS-4 and SS-5 IRBMs with newer and more accurate SS-20s, which could deliver three nuclear warheads apiece from a distance of 5,000 km (3,000 miles). Mounted on mobile launchers based in the European part of the Soviet Union, the SS-20s could strike targets anywhere in western Europe in less than 10 minutes.

Under pressure from its western European allies in the North Atlantic Treaty Organization (NATO), the United States in 1979 committed itself to deploying two intermediate-range weapons systems of its own in western Europe: the Pershing II and the Tomahawk cruise missile. Mounted on mobile launchers, the Pershing II was an IRBM that could carry a single nuclear warhead a distance of about 2,000 km (1,240 miles) and strike within the vicinity of Moscow in less than 10 minutes.

The SS-20 and the Pershing II could deliver warheads to their targets with unprecedented accuracy. They thus had the capability to destroy reinforced command bunkers and missile silos deep within enemy territory. Such missiles, it was argued, were not defensive in nature but were actually destabilizing "first-strike" weapons that directly threatened both the military command structure of NATO and prime targets within the Soviet heartland. This created the political incentive for both sides to curtail such weapons through arms-control negotiations.

INF negotiations began in October 1980, three years after the first SS-20s were deployed in the Soviet Union and three years before the first Pershings and Tomahawks were deployed in western Europe under NATO auspices. The treaty as finally approved was based upon the "zero option" proposed by the United States in November 1981. Under this proposal, NATO would forego deploying its intermediate-range missiles if the Soviets dismantled their SS-20s and the older IRBMs it was replacing. After five years of interrupted and often acrimonious negotiation, the Soviet Union accepted the concept of elimination (rather than mere reduction) of all land-based IRBMs and, in July 1987, expanded it to include a "double-zero" option. This proposal called for the elimination not only of all of the superpowers' intermediate-range missiles but also of their shorter-range missiles as well. These SRBMs consisted of the U.S. Pershing 1A and the Soviet SS-12 and SS-23. The United States agreed to this proposal. The Soviet Union also agreed to on-site verification of the missiles' destruction.

The treaty incorporating these commitments was signed in Washington, D.C., on Dec. 8, 1987, by U.S. President Ronald Reagan and Soviet General Secretary Mikhail Gorbachev. It was ratified by the U.S. Senate and the Supreme Soviet the following year.

The INF Treaty called for the progressive dismantling, over three years, of 2,619 missiles, about half of which were deployed at the time of signing. About two-thirds of the missiles affected were Soviet, and the rest were American. Each country was allowed to keep intact the warheads and guidance systems of the destroyed missiles. Also to be destroyed were missile launchers and various kinds of support equipment and structures. Teams of observers from both countries were to be given access to certain operating bases, support facilities, and elimination facilities in order to verify the withdrawal and destruction of the missile systems. In order to ensure the permanent elimination of intermediate-range missiles, each country was given the right for 13 years to conduct periodic inspections of operating bases and support facilities and to monitor one production plant at which weapons of the INF category might be produced.

intermediate vector boson, type of boson (*q.v.*) associated with the electromagnetic and weak forces in unified form.

intermetallic compound, any of a class of substances composed of definite proportions of two or more elemental metals, rather than continuously variable proportions (as in solid solutions). The crystal structures and the properties of intermetallic compounds often differ markedly from those of their constituents. In addition to the normal valences of their components, the relative sizes of the atoms and the ratio of the total number of valence electrons to the total number of atoms have important effects on the composition of intermetallic compounds. *See also* alloy.

intermezzo (Italian: "interlude"), plural INTERMEZZI, or INTERMEZZOS, in music and theatre, an entertainment performed between the acts of a play; also a light instrumental composition. In the late 15th and 16th centuries, classical and contemporary plays were performed with intermezzi written by the finest composers of the time and consisting of solo songs, madrigals and other part-songs, dance, and, occasionally, spoken dialogue. In subject matter, they were often allegorical or pastoral.

By 1600 the intermezzi were frequently elaborate spectacles that attracted more attention than the play. In Italy, opera evolved within the framework of the intermezzo. Comic intermezzi were performed between the acts of 17th- and 18th-century serious operas. Usually for soprano and bass, and sung throughout, they gave rise to opera buffa, the characteristic Italian form of comic opera. Giovanni Battista Pergolesi's famous and influential opera buffa, *La serva padrona* (1733; *The Maid as Mistress*), was originally a series of intermezzi performed between the acts of his serious opera *Il prigionier superbo* (*The Haughty Prisoner*).

In the 19th century "intermezzo" was often used as a title for light instrumental pieces, such as the piano intermezzi composed by Franz Schubert and Johannes Brahms. The orchestral intermezzo in Pietro Mascagni's one-act opera *Cavalleria rusticana* (1889; *Rustic Chivalry*) forms an interlude between the opera's two sections.

internal-combustion engine, any engine in which a fuel–air mixture is burned in the engine proper so that the hot gaseous products of combustion act directly on the surface of its moving parts, such as that of a piston or turbine rotor blade. Internal-combustion engines are the most widely used of all present-day power-generating systems. They include gasoline engines, diesel engines, gas-turbine engines, pure jet engines, and rocket engines and motors.

A brief treatment of internal-combustion engines follows. For full treatment, *see* MACROPAEDIA: Energy Conversion.

Internal-combustion engines constitute one class of what are known as heat engines, devices that derive their power either directly or indirectly from an exothermic reaction (*e.g.*, combustion). The other principal class of heat engines consists of external-combustion engines, of which the steam engine and the Stirling engine are notable examples. Unlike internal-combustion systems, these engines employ a secondary working fluid that is interposed between the combustion chamber and the power-producing elements. In the steam engine, for instance, fuel is burned in a furnace external to the engine, and a portion of the energy liberated is transferred through boiler or heat-exchanger walls to the secondary

working fluid consisting of water. The water is converted into steam, which is then conveyed through pipes to the engine in which the pressure of the steam acts on pistons or turbine runners. In effect, the steam engine and other external-combustion systems operate with a high-pressure working medium produced by utilizing the expansion that accompanies the vaporization of a liquid. Internal-combustion engines, on the other hand, make use of the large volume of hot combustion products that become a high-pressure gaseous medium when confined.

Internal-combustion engines are commonly divided into two major subclasses: continuous-combustion engines and intermittent-combustion engines. The first type, exemplified by the jet engine, is characterized by a steady flow of fuel and air into the engine where a stable flame is maintained for continuous combustion. In the second variety, typified by the gasoline-reciprocating piston engine, discrete quantities of fuel and air are processed in a cyclical manner, with a periodic ignition of the fuel–air mixture.

internal energy, in thermodynamics, the property or state function that defines the energy of a substance in the absence of effects due to capillarity and external electric, magnetic, and other fields. Like any other state function, the value of the energy depends upon the state of the substance and not upon the nature of the processes by which it attained that state. In accordance with the first law of thermodynamics, when a system undergoes a change of state as a result of a process in which only work is involved, the work is equal to the change in internal energy. The law also implies that if both heat and work are involved in the change of state of a system, then the change in internal energy is equal to the heat supplied to the system minus the work done by the system.

Sometimes it is convenient to represent the internal energy as a sum of terms that can be interpreted as kinetic energy, potential energy, and chemical energy.

Internal energy is an extensive property—that is, its magnitude depends on the amount of substance in a given state. Its value usually is calculated with reference to some standard state rather than being expressed in absolute terms.

Internal Macedonian Revolutionary Organization (IMRO), Macedonian VATRESHNA MAKEDONSKA-REVOLUTSIONNA ORGANIZATSIYA, Bulgarian VŬTRESHNATA MAKEDONO-ODRINSKA REVOLUTSIONNA ORGANIZATSIYA, secret revolutionary society that operated in the late 19th and early 20th centuries to make Macedonia an autonomous state but that later became an agent serving Bulgarian interests in Balkan politics.

Founded in November 1893 at Resna under the leadership of Damyan Gruev, Gotse Delchev, and Yane Sandanski, IMRO adopted the slogan "Macedonia for the Macedonians" and a program aimed at winning autonomy for Macedonia from its Ottoman Turkish rulers and at creating a Balkan federation, in which Macedonia would be an equal partner with all other Balkan states.

Having swiftly gained widespread support among the Christian Slav populations of Macedonia, IMRO began violent anti-Turkish activities in 1897 and in 1903 staged a major but unsuccessful rebellion that was also supported by a parallel, pro-Bulgarian organization, Vzhovists. Subsequently, its organization deteriorated, and, after Macedonia was seized from the Turks and divided between Serbia and Greece (Balkan Wars, 1912–13), IMRO's terrorist bands operated in conjunction with Bulgaria's foreign policy, which was designed to force a redistribution of Macedonia. By the end of World War I, however, IMRO's indiscriminate and unprincipled use of terror had alienated both its Macedonian and Bulgarian supporters.

Under Todor Aleksandrov, however, IMRO reestablished itself as an influential factor in Balkan politics, particularly by participating in the overthrow and assassination of Bulgaria's prime minister Aleksandŭr Stamboliyski (June 1923), who had tried to ease relations with other Balkan states. IMRO then obtained control of the Petrich (*i.e.,* the Macedonian) district of Bulgaria and pursued its terrorist activities in Bulgaria and Yugoslavia with the unofficial approval and protection of the Bulgarian war ministry and with clandestine support from the Italian government. After Aleksandrov was assassinated (1924), however, the organization split into two rival factions, which engaged in frequent gunfights in Sofia in an effort to annihilate one another.

In May 1934 Colonel Kimon Georgiev seized power in Bulgaria, arrested IMRO's leaders, and disarmed its members.

internal medicine, medical specialty that deals with the diagnosis and medical, as opposed to surgical, treatment of diseases of adults. It is broadly identical with the practice of the physician, as opposed to that of the surgeon. Internal medicine, which deals with the entire patient rather than a particular organ system, is in effect the parent of other medical specialties such as cardiology, dermatology, and gastroenterology. An advanced practitioner of internal medicine is called an internist in the United States and many other countries.

In 1936 the American Board of Internal Medicine was established in the United States, with the object of formally certifying specialists in internal medicine. Professional qualifications for certification include graduation from an approved medical school, followed by an internship of not less than one year and, further, a prolonged program of intensified training and experience. The core of this program consists of two to three years of full-time residency training in a hospital.

Additional study in the program may be devoted to work in any clinical, investigative, or basic science field related to internal medicine. The training program for internists emphasizes advanced knowledge of anatomy, microbiology, biochemistry, pathology, pharmacology, and physiology. Completion of training is followed by written and oral examinations given by the board and then by certification.

The development of internal medicine as a scientific discipline begins with Thomas Sydenham's concept of disease, articulated in the 17th century. Sydenham closely observed clinical phenomena at the patient's bedside and conceived for the first time the possibility of a variety of distinct "diseases," as opposed to general illness caused by the imbalance of "humours," which was then the prevailing theory of disease causation. Sydenham's work created a framework for the classification of diseases, which was built upon by François Boissier de Sauvages, who in 1763 published the first methodical nosology, or description of disease symptoms. Sauvages emphasized symptomatology as the basis for disease classification, since there was no information then available about the causes of diseases.

From the time of Sauvages until the 20th century, internists could do little to treat diseases. Unlike surgeons, who could remove the offending organ, internists had no specific therapies; most of the "treatments" that physicians could offer made the patient worse, not better. The measure of an internist's skill was the accuracy of his diagnosis and the reliability of his advice about the probable outcome of the disease. Only with the development of disease-specific therapies at the beginning of the 20th century did internal medicine become effective in the cure, rather than just the supportive care, of patients. As more and more specific medications and courses of therapy became available and the volume of medical knowledge increased, more and more subspecialties devoted to particular organ systems split off, leaving internal medicine as the specialty of physicians dealing with all problems of the adult patient.

internal pair production, electromagnetic process classified as a form of gamma decay. *See* gamma decay; pair production.

International, FIRST, formally INTERNATIONAL WORKING MEN'S ASSOCIATION, federation of workers' groups that, despite ideological divisions within its ranks, had a considerable influence as a unifying force for labour in Europe during the latter part of the 19th century.

The First International was founded under the name of International Working Men's Association at a mass meeting in London on Sept. 28, 1864. Its founders were among the most powerful British and French trade-union leaders of the time. Though Karl Marx had no part in organizing the meeting, he was elected one of the 32 members of the provisional General Council and at once assumed its leadership. The International came to assume the character of a highly centralized party, based primarily on individual members, organized in local groups, which were integrated in national federations, though some trade unions and associations were affiliated to it collectively. Its supreme body was the Congress, which met in a different city each year and formulated principles and policies. A General Council elected by the Congress had its seat in London and served as the executive committee, appointing corresponding secretaries for each of the national federations; organizing collections for the support of strikes in various countries; and, in general, advancing the International's goals.

From its beginnings, the First International was riven by conflicting schools of socialist thought—Marxism, Proudhonism (after Pierre-Joseph Proudhon, who advocated only the reform of capitalism), Blanquism (after Auguste Blanqui, who advocated radical methods and a sweeping revolution), and Mikhail Bakunin's version of anarchism, which dominated the International's Italian, Spanish, and French-Swiss federations. The First International split at its Hague Congress in 1872 over the clash between Marx's centralized socialism and Bakunin's anarchism. In order to prevent the Bakuninists from gaining control of the association, the General Council, prompted by Marx, moved its headquarters to New York City, where it lingered until it was formally disbanded at the Philadelphia Conference in July 1876. The Bakuninists, assuming leadership of the International, held annual congresses from 1873 to 1877. At the Ghent Socialist World Congress in 1877, the Social Democrats broke away because their motion to restore the unity of the First International was rejected by the anarchist majority. The anarchists failed, however, to keep the International alive. After the London anarchist Congress of 1881, it ceased to represent an organized movement. The International was early proscribed in such countries as Germany, Austria, France, and Spain. French and German proposals that it be outlawed by concerted European action failed, however, because of British reluctance to suppress the General Council in London. It should be noted that the International's renown at the time as a formidable power with millions of members and almost unlimited resources was out of proportion with the association's actual strength; the hard core of its individual members probably seldom exceeded 20,000. Although so accused, it did not organize the wave of strikes that swept France, Belgium,

and Switzerland in 1868, but its support and rumoured support of such strikes was very influential.

International, SECOND, also called SOCIALIST INTERNATIONAL, federation of Socialist parties and trade unions that greatly influenced the ideology, policy, and methods of the European labour movement from the last decade of the 19th century to the beginning of World War I.

The Second International was founded at a congress in Paris in 1889. Unlike the First International (*see* International, First), it was based on membership of national parties and trade unions only. It was not a centralized organization, like the first, but rather a loose federation that did not set up an executive body, the International Socialist Bureau, until 11 years after its foundation. Its headquarters was in Brussels, where the second congress of the International met in 1891. The congresses met in a number of cities at various intervals, not on a yearly basis. By 1912 the Second International represented the Socialist parties of all European countries, the U.S., Canada, and Japan, with a voting strength of nearly 9,000,000. Although it had no mandatory power, it was recognized by its member parties as their highest moral authority.

The Second International stood for parliamentary democracy and finally, at its London Congress in 1896, expelled from its ranks the Anarchists, who opposed it. Yet, after much debate, it rejected the theory of the gradual achievement of Socialism through cooperation with non-Socialist parties in office and reaffirmed the Marxist doctrine of the class struggle and the inevitability of revolution. Its main concern, however, was the prevention of war. After extended debate it rejected the use of a general strike to ward off the imminent danger of war. It demanded the introduction of compulsory courts of arbitration for the settlement of disputes between nations; the reduction of armaments with total disarmament as the ultimate aim; the abolition of secret diplomacy; and the establishment of parliamentary responsibility in matters of foreign policy. In a resolution drafted by Lenin, Rosa Luxemburg, and L. Martov and adopted by its Stuttgart Congress in 1907, however, the International pledged its member parties in belligerent countries to use the social and economic crisis brought about by war to promote social revolution.

The power groupings in World War I confronted the Socialist parties in the belligerent countries with a dilemma. With the exception of the Serbian and Russian Socialists, all supported the war efforts of their respective countries. This situation split the International: a growing minority within these parties rebuked the majority for its desertion of the anti-war principles of the Second International. At a conference held in Zimmerwald, Switz., in 1915, these "Internationalists" called for an immediate cessation of the war and peace negotiations based on the principle of "no annexations, no indemnities." The minority Socialists opposed to the war were themselves divided, however; a "left" group led by Lenin urged an effort to transform the imperialist war into a class war and opposed a revival of the Second International, which had by then ceased to function.

In an attempt to reconstruct the Second International, a commission of Socialist leaders in the Allied countries convened a congress of the International at Geneva in 1920. When this congress met, however, only a small fraction of the prewar membership of the Second International attended. The rift in Socialist ranks over war policy and over the Bolshevik Revolution, which had also aroused great controversy, had finally destroyed the common ground for the reinstitution of the Second International.

International, THIRD, also called COMMUNIST INTERNATIONAL, byname COMINTERN, association of national Communist parties founded in 1919. Though its stated purpose was the promotion of world revolution, the Comintern functioned chiefly as an organ of Soviet control over the Communist movement.

The Comintern emerged from the three-way split in the Socialist Second International (*see* International, Second) over the issue of World War I. A majority of Socialist parties, comprising the International's "right" wing, chose to support the war efforts of their respective national governments against enemies that they saw as far more hostile to Socialist aims. The "centre" faction of the International decried the nationalism of the right and sought the reunification of the Second International under the banner of world peace. The "left" group, led by the Russian Lenin, rejected both nationalism and pacifism, urging instead a Socialist drive to transform the war of nations into a transnational class war. In 1915 Lenin proposed the creation of a new International to promote "civil war, not civil peace" through propaganda directed at soldiers and workers. Two years later Lenin led the Bolshevik seizure of power in Russia, and in 1919 he called the first congress of the Comintern, in Moscow, specifically to undermine ongoing centrist efforts to revive the Second International. Only 19 delegations and a few non-Russian Communists who happened to be in Moscow attended this first congress; the second, meeting in Moscow in 1920, was attended by delegates from 37 countries. There Lenin established the Twenty-one Points, the conditions of admission to the Communist International. These prerequisites for Comintern membership required all parties to model their structure on disciplined lines in conformity with the Soviet pattern and to expel moderate Socialists and pacifists.

The administrative structure of the Comintern resembled that of the Soviet Communist Party: an executive committee acted when congresses were not in session, and a smaller presidium served as chief executive body. Gradually, power came to be concentrated in these top organs, the decisions of which were binding on all member parties of the International. Moreover, Soviet domination of the Comintern was established early. The International had been founded by Soviet initiative, its headquarters was in Moscow, the Soviet party enjoyed disproportionate representation in the administrative bodies, and most foreign Communists felt loyal to the world's first Socialist state.

The realization that world revolution was not imminent led in 1921 to a new Comintern policy: anticentrism was de-emphasized in order to gain broad working-class support. "United fronts" of workers were to be formed for making "transitional demands" on the existing regimes. This policy was abandoned in 1923, when the Comintern's left wing gained temporary control. Stalin's assault on the left group of his party, however, brought the expulsion of the Comintern's first president, Grigory Y. Zinovyev, in 1926 and a further rapprochement with moderate Socialism. Then Stalin's move against the right wing of his party led to another turn in Comintern policy. In 1928 the 6th congress adopted a policy of "extreme leftism" set forth by Stalin: once again, moderate Socialists were branded as the chief enemies of the working class. The dangers of the rising Fascist movement were ignored. In Germany the Communists focussed their attacks on the Social Democrats and even cooperated with the Nazis, whom they claimed to fear less, in destroying the Weimar Republic. World revolution was once more to be considered imminent, despite Stalin's own concentration on "building Socialism in one country." At the Comintern's 7th and last congress in 1935, Soviet national interests dictated a new policy shift: in order to gain the favour of potential allies against Germany, revolutionary ardor was dampened, and the defeat of Fascism was declared the primary goal of the International. Now Communists were to join with moderate Socialist and liberal groups in "popular fronts" against Fascism. By now the Comintern was being used as a tool of Soviet foreign policy. The program of popular fronts (*q.v.*) ended with the signing of Stalin's pact with Adolf Hitler in 1939. Soon, however, Germany and the Soviet Union were at war, and in 1943 Stalin officially dissolved the Comintern in order to allay fears of Communist subversion among his allies. From the Soviet point of view, Moscow was confident of its ability to control the foreign parties; and, in any case, much of the Comintern organization was preserved intact within the Central Committee of the Communist Party of the Soviet Union. *See also* Cominform.

International, FOURTH, a multinational body composed of Trotskyist organizations that was first formed in opposition to the policies of the Stalin-dominated Third International, or Comintern (*see* International, Third).

The idea of a Fourth International was first presented in the late 1920s by various opponents of Joseph Stalin, particularly the followers of Leon Trotsky. Trotsky at first opposed the idea because he felt that the parties of the Comintern, despite their flaws, still represented the "vanguard" of the working classes, but by July 1933, with the victory of Nazism in Germany, Trotsky called for a Fourth International, because he felt the need for a reorientation of the vanguard of the working class and opposed the Comintern's condoning of Fascism.

The preparatory work for the formation of the new International, however, was difficult. It entailed trying to draw those working-class parties sympathetic to Communism away from the Comintern, in which they saw the repository of the ideals of the Russian Revolution of October 1917. Also, Stalin's secret police killed many potential Trotskyists in the period 1934–38, so that the ranks of the Trotskyist movement were thin.

The founding conference was held in Périgny, Fr., on Sept. 3, 1938; it proclaimed the Fourth International and adopted Trotsky's Transitional Program as its primary strategical document. This program called for goals falling between those of minimum reform (*e.g.,* higher wages, better working conditions) and those of the maximum program (*i.e.,* the overthrow of capitalism and the transition to Socialism). The Fourth International's task, according to Trotsky, was to undermine the base of the ruling classes and to prepare for the mobilization of the masses for the revolution. It should press such tactical demands as those for sliding wage scales, expropriation of private banks, workers' groups for self-defense, and separate programs for farmers.

Just before and after Trotsky's death, in 1940, the only active section of the Fourth International was the small Socialist Workers' Party (SWP) of the United States. Then, after World War II, the Fourth International's leadership fell to Michel Pablo and Ernest Germain, two Belgian Trotskyists. When in 1949 Pablo predicted "degenerated workers' states for centuries" and, consequently, called for the dissolution of the International, a factional fight erupted, culminating in 1953 in the split into two factions—the International Committee, (composed of such groups as the American Workers' League and the British Socialist Labour League) and the Interna-

tional Secretariat, which supported Pablo. The chief importance of the Fourth International lies in disseminating information to the many extreme left-wing groups affiliated to one or another of its fragments.

International, Labour and Socialist: *see* Labour and Socialist International.

International, Socialist: *see* International, Second; Socialist International.

International, The (anthem): *see* Internationale, L'.

international agreement, instrument by which states and other subjects of international law, such as certain international organizations, regulate matters of concern to them. The agreements assume a variety of form and style, but they are all governed by the law of treaties, which is part of customary international law.

A treaty, the typical instrument of international relations, is defined by the 1969 Vienna Convention on the Law of Treaties as an "agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation. Contractual treaties are treaties by which the parties agree to exchange pieces of territory or settle a dispute or claims—that is, by which they deal with a particular kind of business. Lawmaking treaties, which have grown tremendously in number and significance since World War II, are instruments in which the parties formulate principles or detailed rules for their future conduct."

Some multilateral agreements set up an international organization for a specific purpose or a variety of purposes. They may therefore be referred to as constituent agreements. The United Nations Charter (1945) is both a multilateral treaty and the constituent instrument of the United Nations. An example of a regional agreement that operates as a constituent agreement is the charter of the Organization of American States (Charter of Bogotá), which established the organization in 1948. The constitution of an international organization may be part of a wider multilateral treaty. The Treaty of Versailles (1919), for example, contained in Part I the Covenant of the League of Nations and in Part XIII the constitution of the International Labour Organisation.

The term supranational is of recent origin and is used to describe the type of treaty structure developed originally by six western European states: France, Germany, Italy, The Netherlands, Belgium, and Luxembourg. The first treaty was that of Paris, signed in 1951, establishing the European Coal and Steel Community (ECSC); the second, the Rome treaty, signed in 1957, establishing the European Economic Community (EEC); the third, the Rome treaty of the same date establishing the European Atomic Energy Community (Euratom). A clause in the ECSC treaty provides for the complete independence of the members of the executive organ from the governments that appoint them.

Treaties, however, are not the only instruments by which international agreements are concluded. There are single instruments that lack the formality of a treaty called agreed minute, memorandum of agreement, or modus vivendi; there are formal single instruments called convention, agreement, protocol, declaration, charter, covenant, pact, statute, final act, general act, and concordat (the usual designation for accords with the Holy See); finally there are less formal agreements consisting of two or more instruments, such as "exchange of notes" or "exchange of letters."

In the absence of an international legislature, the multilateral treaty is the chosen instrument for adapting international law to changing circumstances brought about by rapid technological developments and the ever-growing interdependence of nations.

Despite the extreme diversity of international agreements, it is possible to classify them according to the functions that they serve in international society. Three such broad functions may be discerned; namely, the development and codification of international law, the establishment of new levels of cooperation and integration between states, and the resolution of actual and potential international conflict.

The Vienna Convention on the Law of Treaties contains a compromissory clause (whereby participants agree to submit disputes to arbitration or the International Court of Justice) for certain types of disputes and a procedure of conciliation for others. The resistance of states to compulsory arbitration or adjudication is indicative of their limited commitment to universal integration through the rule of law. In this respect the European Economic Community is an exception, providing as it does for the compulsory settlement of disputes arising under the three constituent treaties by the Court of Justice, which is open even to individuals. It may be noted that western Europe was the cradle of nationalism and the doctrine of the sovereignty of states. Now it may have become the cradle of supranational integration.

International Amateur Athletic Federation (IAAF), track-and-field organization of national associations of more than 160 countries; founded at Stockholm, Sweden, 1912. In 1936 the IAAF took over regulation of women's international track-and-field competition from the Fédération Sportive Féminine International, which had been founded in 1921. The major aims of the IAAF are to establish friendly cooperation between members; eliminate hindrance to participation in international meets on racial, religious, or political grounds; and compile rules and regulations governing competition. The IAAF is the ratifying body for all official world records in track-and-field events. It is recognized by the International Olympic Committee (IOC) and is financed by members' fees, publication sales, and the promotion of championships. Headquarters are in London.

International Association of Universities (IAU), nongovernmental educational organization founded in 1950 to promote cooperation at the international level among the universities of all countries as well as among other bodies concerned with higher education and research. Membership consists of individual universities and institutions of university rank in 96 countries. The General Conference, convened every five years, elects an administrative board composed of the president and 14 members. The association is supported by members' dues and grants from UNESCO and maintains information centres in 120 countries, carrying out a research program with UNESCO. English and French are official languages of the association, but German, Russian, and Spanish are also used. Publications include *International Handbook of Universities* (triennially) and *International List of Universities and Other Institutions of Higher Education* (biennially).

International Atomic Energy Agency (IAEA), autonomous intergovernmental organization dedicated to increasing the contribution of atomic energy to the world's peace and well-being and ensuring that agency assistance is not used for military purposes. The agency was established on Oct. 23, 1956, with the approval of a statute that came into force on July 29, 1957. Its activities include research on the applications of atomic energy to medicine, agriculture, water location, and industry; the operation of conferences, training programs, fellowships, and publications to promote the exchange of technical information and skills; provision of technical assistance, especially to less developed countries; and the establishment and administration of radiation safeguards.

The General Conference, consisting of all members, meets annually to approve the budget and programs; the Board of Governors, with 34 members, carries out the agency's statutory functions; the Secretariat, consisting of professional and general staff, executes the agency's programs. Headquarters are in Vienna.

International Ballet, British dance company. Founded in 1941 by Mona Inglesby to bring classical ballet to new urban and provincial audiences, it performed in cinemas and arenas, as well as at more conventional sites. The repertory included revivals of full-length ballets, especially Fokine's, with Nicholas Sergeyev as ballet master. It successfully toured Italy, Spain, and Switzerland. Dancers Moira Shearer, Nina Tarakanova, and Ernest Hewitt belonged to the company, which disbanded in 1953.

International Ballet Competitions, one of the world's most prestigious dance competitions, open to both male and female dancers of all countries, and much like the Olympic Games in purpose. The first International Ballet Competitions were held in Varna, Bulg., in July 1964. The competitions were organized by the Bulgarian Ministry of Culture to sponsor a dance event of international interest, creating opportunities for dancers, choreographers, directors, and teachers to demonstrate and exchange skills. Following the original competitions the next were held in 1965, 1966, 1968, and every two years thereafter. Other sites for the competitions have been Moscow, Tokyo, and Jackson, Miss. There are three rounds to the competitions, all of which are judged by the impartial, designated members of the International Ballet Competitions Rules Committee. Given the political schisms between many of the countries that are represented, however, the decisions of the judges are often disputed. Competitors progress to each round through a process of elimination.

The opening night ceremony is climaxed by the lighting of the competitions' torch, following which the competitors return to their provided housing and rest for the first round that begins the next day. Traditionally, round one includes performances of classical variations as well as contemporary compulsories, created after 1925. Dancers choose works to perform from among the group of choreographers designated by the Rules Committee. Round two consists of contemporary compulsories created after 1974. In round three there are performances of more classical variations and contemporary pieces. The winners are recognized with gold, silver, or bronze medals at both junior and senior levels. A multitude of great dancers have participated in the competitions, which offered many of them their first international acclaim.

International Bank for Economic Cooperation (IBEC), international bank instituted by an agreement signed by Bulgaria, Hungary, East Germany, Mongolia, Poland, Romania, Czechoslovakia, and the Soviet Union in October 1963 to facilitate economic cooperation among the member countries and to promote their development. It began operations in January 1964. Cuba and Vietnam joined afterward.

Its functions include making multilateral settlements in transferable rubles, advancing credit to members to finance temporary trade imbalances, accepting deposits of uncommit-

ted funds in transferable rubles, accepting gold and convertible currencies on deposit, and conducting arbitrage and other financial operations with them. It also performs other banking operations.

General policy decisions are made by the Council, which is composed of representatives from each of the 10 member nations. A 10-member Board acts as the executive body.

International Bank for Reconstruction and Development (IBRD), byname WORLD BANK, organization affiliated with the United Nations and designed to finance productive projects that further the economic development of member nations. Resulting from negotiations that culminated in the United Nations Monetary and Financial Conference at Bretton Woods, N.H., in July 1944, the bank officially began operations in June 1946. Although its first loans were made for post-World War II reconstruction, by 1949 the emphasis had shifted to loans for the purpose of economic development. World Bank headquarters are in Washington, D.C.

The bank obtains its funds from the paid-in capital subscriptions of member countries, bond flotations on the world's capital markets, and its net earnings. Each member's capital subscription is based on its relative economic resources. Usually only about 10 percent of the subscribed capital is paid in; the remainder is subject to call if required to meet obligations.

The bank usually makes loans directly to governments, or to private enterprises with their government's guarantee, for specific projects when private capital is not available on reasonable terms. A large part of the bank's portfolio initially consisted of loans to publicly and privately owned utilities for investment in electric power, transportation, and water-supply lines; but by the late 20th century, agriculture and rural development had become the most important lending sector. As a matter of general policy, the bank lends only for the cost of imported material, equipment, and services obtained from abroad, and disbursements are usually made directly to the supplier. The interest rate depends mainly on the cost of borrowing to the bank. In addition to financial assistance, the bank also furnishes technical assistance.

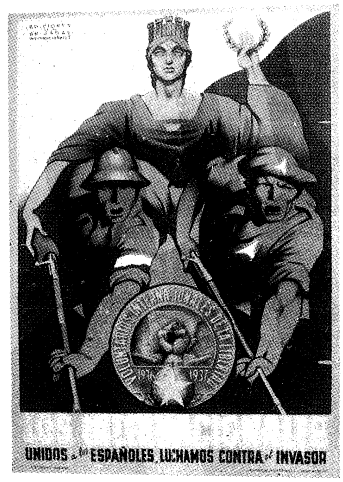
The bank is administered by a board of governors, executive directors, a president, and a staff. The board of governors, composed of representatives from all the member countries, meets once a year; policy matters are carried out by the 21 executive directors, who approve all loans.

International Boundary Waters Treaty (1909), treaty between the United States and Great Britain establishing an International Joint Commission of Americans and Canadians to oversee any issue related to waters on the boundary between the United States and Canada. The treaty was signed on Jan. 11, 1909, calling for an annual meeting of the Joint Commission. These meetings are still being held to regulate use of the waters and also safeguard water quality.

Questions of fishing rights, diversion and use of the shared waters, shipping and other transportation rights, building of dams and bridges, and concern for possible water pollution are brought before the jurisdiction of the Joint Commission. Cases involving the Great Lakes and the St. Lawrence Seaway, as well as many smaller lakes and rivers, are within the jurisdiction of the Commission, which has headquarters in both Ottawa and Washington, D.C.

The treaty of 1909 proposed the Commission "to prevent disputes regarding the use of boundary waters and to settle all questions which are now pending between the United States and the Dominion of Canada involving the rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along their common frontier."

International Brigades, groups of foreign volunteers who fought on the Republican side against the Nationalist forces during the Spanish Civil War (1936–39). So called because their members (initially, anyway) came from some 50 countries, the International Brigades were recruited, organized, and directed by the Comintern (Communist International), with headquarters in Paris. A large number of the mostly young recruits were Communists before they became involved in the conflict; more joined the party during the course of the war. The French were the largest single foreign group (some 10,000); Germany, Austria, Poland, Italy, the United States, the United Kingdom, Yugoslavia, Czechoslovakia, Canada, and Hungary were also represented by significant numbers of volunteers.



"The Internationals—United with the Spaniards We Fight the Invader," poster by Parrilla, published by the International Brigades, 1936–37

By courtesy of the Abraham Lincoln Brigade Archives, Brandeis University Library

The first group of 500 trainees arrived in Albacete, Spain, on Oct. 14, 1936. As other trainees and Soviet arms arrived, they were placed under the command of representatives of the Comintern. There were seven brigades in all, and each one was divided into battalions by nationality (*e.g.,* the French-Belgian Commune de Paris Battalion, the American Abraham Lincoln Battalion, the British Battalion). The number of volunteers probably never exceeded 20,000 at any one time, but the total number of volunteers, including a small number of women, reached about 37,000.

From 1936 to 1938 the brigades, despite some difficulties, operated effectively on the Republican side, and their organization was imitated by other units of the Republican army. From 1937 on, recruits for the brigades diminished, and men lost in action or by desertion were replaced mainly by Spanish Communists. The brigades were formally withdrawn from Spain late in 1938, when the Soviet Union began to decrease its support for the Spanish Republic. The last battle in which they participated was that of the Ebro. A farewell parade was held for the volunteers in Barcelona on Nov. 15, 1938.

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America: *see* Teamsters Union.

International Bureau of Weights and Measures, French BUREAU INTERNATIONAL DES POIDS ET MESURES (BIPM), international organization founded to bring about the unification of systems of measurement, to establish and preserve fundamental international standards and prototypes, to verify national standards, and to determine fundamental physical constants. The bureau was established by a convention signed in Paris on May 20, 1875, effective January 1876. In 1921 a modified convention was signed.

The convention provides for a General Conference that meets every four years to consider required improvements or modifications in standards, an International Committee of Weights and Measures composed of 18 scientists elected by the Conference (meets annually), and several consultative committees. The bureau headquarters at Sèvres, Fr., serves as a depository for the primary international standards and as a laboratory for certification and intercomparison of national standard copies. By 1990, 47 countries had joined.

International Business Machines Corporation (IBM), leading American computer manufacturer, with a major share of the market both in the United States and abroad. The company also produces a broad line of other office products and information-handling systems. Headquarters are in Armonk, N.Y.

The company was incorporated in 1911 as Computing-Tabulating-Recording Company in a consolidation of three smaller companies. It assumed its present name in 1924 following the arrival of Thomas Watson, a man of considerable marketing skill, who took the then-floundering company and built it into a giant of the industry, with widely varied products.

By the mid-1920s IBM had become the country's largest manufacturer of time clocks and had developed and introduced the first electric typewriter. By 1951, when IBM entered the computer field, its size allowed it to invest heavily in development. This investment capability, in addition to the company's marketing expertise and commitment to repair and service its own equipment, allowed IBM quickly to assume the predominant position in the American computer market.

IBM's other products include virtually every type of equipment needed for information handling, storage, and retrieval. In addition to being the world's largest manufacturer of data-processing machines and systems, the company produces word-processing equipment and other business machines.

International Church of the Foursquare Gospel, Pentecostal denomination established by Aimee Semple McPherson (*q.v.*), a popular revivalist preacher, in Los Angeles in 1927. During a revival campaign in Oakland, Calif., four years earlier, "Sister" Aimee claimed to have seen a vision of four living creatures reminiscent of the one recorded in the Old Testament Book of Ezekiel (1:5–10). She interpreted the faces of these four creatures—a lion, a man, an ox, and an eagle—as symbolizing perfection, and she equated a perfect, foursquare, full gospel with one that would stress four themes: salvation, Holy Spirit baptism, healing, and the Second Coming of Christ. These four themes became the hallmark of her preaching, and, in a short time, hundreds flocked to her meetings; in two years she was able to dedicate Angelus Temple in Los Angeles as the "mother church" of the Foursquare Gospel Association. From 1923 the organization grew to national and international importance.

Branch churches sprang up in the environs of Los Angeles; by 1925, 32 had been established in southern California, and 50 more were appealing to Angelus Temple for permission to affiliate. By the late 20th century the Foursquare Church had become one of the largest Pentecostal denominations.

The episcopal character of its church government bears the stamp of the founder, around whom everything centred during her lifetime. Aimee Semple McPherson was president of

the church and the ruling power and voice of the organization. She held the power of veto; she appointed all officers; she hired all personnel and set their salaries. Her son and successor, Rolf K. McPherson, carried on this tradition. Doctrinally, however, the church is similar to the Assemblies of God, on whose ministerial rolls Aimee Semple McPherson's name appeared for several years during her early evangelistic career. *See* Pentacostalism.

International Civil Aviation Organization (ICAO), French ORGANISATION DE L'AVIATION CIVILE INTERNATIONALE (OACI), intergovernmental specialized agency associated with the United Nations and dedicated to developing safe and efficient international air transport for peaceful purposes and ensuring a reasonable opportunity for every state to operate international airlines.

At the invitation of the United States, representatives of 54 nations met at Chicago in November 1944 for the purpose of reaching some agreement that would provide for the control of air transportation and, at the same time, foster its development. The result was a Convention on International Civil Aviation, which superseded conventions of Paris (1889) and Havana (a Pan-American civil aviation convention signed in 1928); and, after 26 states had ratified the Convention, the ICAO was established on April 4, 1947, becoming a specialized agency of the United Nations in October 1947. Permanent headquarters was established at Montreal.

The organization, whose membership consists of virtually all nations of the world, has these component bodies: (1) an Assembly of delegates from all member nations; (2) a Council of representatives of the member states, which is elected by and is responsible to the Assembly and which sits in continuous session at the headquarters of the organization; (3) an Air Navigation Commission appointed by the Council from among persons nominated by member states; and (4) various standing committees.

The organization's activities have included the establishment and review of international standards for the licensing of personnel, aircraft operation, condition of aircraft, telecommunications, meteorology, and rules of the air. It also acts to ensure the cooperation of nations in maintaining adequate facilities for air transport. Under the United Nations Development Program, it offers technical assistance to less developed countries. Such activities are governed not only by the original Convention of 1944 but also by several "annexes," or codicils, that are adopted and periodically revised by the Council and that prescribe standards, practices, and procedures covering the technical fields of civil aviation.

International Commission on Radiological Protection (ICRP), French COMMISSION INTERNATIONALE DE PROTECTION CONTRE LES RADIATIONS, commission established in 1928 in Stockholm as the International X-Ray and Radium Protection Commission; the present name was adopted in 1950. The commission's objectives are to set international standards of radiation protection and to study their effects. Its membership consists of individuals in nine countries.

International Confederation of Free Trade Unions (ICFTU), French CONFÉDÉRATION INTERNATIONALE DES SYNDICATS LIBRES (CISL), international labour organization formed in 1949 by trade union federations that had withdrawn from the World Federation of Trade Unions (WFTU) after bitter disagreements with the Communist unions in the WFTU. The stated purpose of the new federation was to ensure "collaboration between the free and democratic trade union movements throughout the world."

The primary strength of the ICFTU lies in the trade union federations of western Europe and the Commonwealth. American participation was greatly reduced when the American Federation of Labor–Congress of Industrial Organizations withdrew from the ICFTU in 1969. Its headquarters are in Brussels.

International Convention for the Protection of Literary and Artistic Works: *see* Berne Convention.

International Court of Justice, the principal judicial organ of the United Nations, which succeeded the Permanent Court of International Justice after World War II. Article 92 of the Charter of the United Nations states:

> The International Court of Justice shall be the principal judicial organ of the United Nations. It shall function in accordance with the annexed Statute, which is based upon the Statute of the Permanent Court of International Justice and forms an integral part of the present Charter.

Article 93 provides that all members of the United Nations are ipso facto parties to the statute and that states not members may become parties on conditions to be determined in each case by the UN General Assembly upon recommendation of the Security Council. The court consists of 15 judges, no two of whom may be nationals of the same state, elected by the General Assembly and the Security Council. They do not have life tenure but are elected for periods of nine years and are eligible for reelection.

The seat of the court is at The Hague, but it may hold sessions elsewhere whenever it considers it desirable. Its first session was held at The Hague in April and May 1946.

It is a continuing body. The statute provides that it shall remain permanently in session, except during judicial vacations. It is also an autonomous body. It elects its president and vice president, appoints its registrar, and provides for the appointment of such other officers and clerical staff as may be necessary. The president and the registrar are required to reside at The Hague.

Because the function of the court is to pass judgment upon disputes between states, only states may be parties in cases before the court. It is open to all states that are party to the statute and to such other states as comply with conditions laid down by the Security Council, which conditions must not, in any case, place the parties in a position of inequality before the court.

At the time that the statute was being drafted, there was strong sentiment on the part of certain states, particularly the smaller ones, for giving the court compulsory jurisdiction; *i.e.,* making it possible for any state to bring an action against any other state without the latter's consent. The opponents of this view felt that some states were not yet ready to accept compulsory jurisdiction and that to try to force it upon them might cause them to decline to accept the statute at all. They favoured the adoption of the optional provisions in article 36 of the Statute of the Permanent Court. This was agreed upon and that article became, for the most part, article 36 of the new statute. Under it parties to the statute may at any time file with the secretary general of the United Nations a declaration accepting compulsory jurisdiction. Some four dozen states have done so. The declaration may be made unconditionally or on condition of reciprocity on the part of other states, or for a certain time. It was further provided that declarations made under the old statute conferring jurisdiction on the Permanent Court that were still in force should be deemed, as between the parties to the new statute, to be acceptances of the compulsory jurisdiction of the new court.

The official languages of the court are French and English; either may be used by the parties. Written pleadings and oral arguments presented in one language are translated into the other. The judgments and opinions are in both French and English.

Cases are brought before the court either by the notification to it of a special agreement concluded by the parties or by the unilateral action of one of them through a written application addressed to the registrar. The proceedings are in two parts, written and oral.

The court may also hear witnesses and appoint commissions of experts to make investigations and reports when necessary. Both these procedures were followed in *Corfu Channel* (United Kingdom v. Albania) (1949). Experts and witnesses presented by the parties were also heard by the court in *Temple of Preah Vihear* (Cambodia v. Thailand) (1962) and in *South West Africa* (Ethiopia and Liberia v. South Africa) (1966). In the South West Africa case, the court decided not to accede to a request by South Africa that the court should itself make an on-site inspection.

The deliberations of the court are in private, but the judgments, which are by a majority vote, are read in open court. In case of a tie, the president may cast a deciding vote; this was done in *South West Africa,* when the judges divided 7–7. Any judge may file a separate opinion if he does not agree in whole or in part with the decision. Few decisions represent the unanimous opinion of the judges. The judgment is final and without appeal.

The question is frequently asked as to how decisions of the court are enforced. This also troubled the minds of some of the delegates at the United Nations Conference on International Organization, held at San Francisco, Calif., when the statute was under consideration. To meet their wishes there was incorporated in article 94 of the charter an undertaking on the part of each member of the United Nations "to comply with the decision of the . . . Court . . . in any case to which it is a party," and a further provision that:

> If any party to a case fails to perform the obligations incumbent upon it under a judgment rendered by the Court, the other party may have recourse to the Security Council, which may, if it deems necessary, make recommendations or decide upon measures to be taken to give effect to the judgment.

It should be remarked, however, that there has been only one known instance of the failure of a party to a case before the court, or before its predecessor, the Permanent Court of International Justice, to carry out a decision of either court. In the Corfu Channel case, Albania failed to pay £843,947 awarded to the United Kingdom by the court as compensation for damages suffered.

The court is authorized by article 65 of the statute to give advisory opinions on any legal questions at the request of whatever body may be authorized by or in accordance with the charter of the UN to make such a request. Article 96 of the charter provides that such opinions may be requested by the General Assembly or the Security Council; also that they may be requested by other organs of the United Nations and specialized agencies, when authorized by the General Assembly. Such requests must be laid before the court by means of a written request containing an exact statement of the questions, accompanied by all documents likely to throw light upon them. From this point on, the procedure before the court is somewhat analogous to that followed in contentious cases. States and organizations presenting written or oral statements are allowed, within a specified time, to comment on those submitted by others. Advisory opinions, like judgments, are delivered in open court.

International Criminal Police Organization: *see* Interpol.

international date line, also called DATE LINE, imaginary line extending between the North Pole and the South Pole and arbitrarily demarcating each calendar day from the next. It corresponds along most of its length to the 180th meridian of longitude but deviates eastward through the Bering Strait to avoid dividing Siberia and then deviates westward to include the Aleutian Islands with Alaska. South of the Equator, another eastward deviation allows certain island groups to have the same day as New Zealand.

The date line is a consequence of the worldwide use of timekeeping systems arranged so that local noon corresponds approximately to the time at which the Sun crosses the local meridian of longitude (*see* standard time). A traveler going completely around the Earth, carrying a clock that he advanced or retarded by one hour whenever he entered a new time zone and a calendar that he advanced by one day whenever his clock indicated midnight, would find on returning to his starting point that the date according to his own experience was different by one day from that kept by persons who had remained at the starting point. The date line provides a standard means of making the needed readjustment: a traveler moving eastward across the line sets his calendar back one day, and one traveling westward sets his a day ahead.

International Development Association (IDA), United Nations specialized agency affiliated with but legally and financially distinct from the International Bank for Reconstruction and Development (World Bank). It was instituted in September 1960 to make loans on more flexible terms than those of the World Bank. IDA members must be members of the bank, and the bank's officers serve as IDA's ex officio officers. Headquarters are in Washington, D.C.

Most of the IDA's resources have come from the subscriptions and supplementary contributions of member countries, chiefly the 26 wealthiest. Although the wealthier members pay their subscriptions in gold or freely convertible currencies, the less developed nations may pay 10 percent in this form and the remainder in their own currencies.

international exchange, also called FOREIGN EXCHANGE, the market in which national currencies are bought and sold by those who require them for various transactions. The sellers and buyers may include exporters, importers, multinational corporations, persons wishing to send money gifts to friends or relations, or governments.

A brief treatment of international exchange follows. For full treatment, *see* MACROPAEDIA: International Trade.

The market in currencies operates much like any other market, with principals interested in doing business and intermediates who profit by arranging the transactions and in so doing helping maintain a stable and organized set of prices. The principal difference between the international exchange market and markets for other goods is the existence of a parity price established for each currency—*i.e.,* an equality of purchasing power established by law between different currencies at a given ratio. Parity is determined by the government responsible for a given currency in terms of a gold valuation registered with the United Nations' International Monetary Fund (IMF). Actual prices quoted on the market fluctuate constantly and are almost always different from the parity price but may not deviate from it by more than a set amount without provoking government intervention to restore the price to its proper range.

The art of the middlemen is arbitrage (*q.v.*), and its effect is to smooth out the temporary price discrepancies from which the arbitrageur profits and thus reduce the necessity for official interventions in the market. When intervention becomes necessary it usually takes the form of selling currencies by central banks in such amounts as to satisfy the unusually strong demand that has driven up those currencies' price relative to the national currency. Another tool used by governments is the manipulation of short-term interest rates, by which inflows or outflows of capital may be encouraged.

Transactions in which one currency is exchanged directly for another are called spot transactions. Many transactions involve contracts to exchange currencies at a specified rate on a specified future date; these are forward exchanges. In forward exchanges, differences in the short-term interest rates in the countries involved must be taken into account in order to achieve interest parity. Again, in forward transactions the agency of the arbitrageur and occasionally the intervention of governments serve to smooth fluctuations in price. Forward transactions make it possible for debtors and creditors to protect themselves against possible large changes in exchange rates (*i.e.,* devaluations or revaluations of national currencies) by covering, or making forward commitments opposite the future payment or receipt; they also allow for hedging, whereby asset holders may by similar means protect against losses due to large exchange-rate changes. The anticipation of such changes will also incite speculation in currencies, which frequently has the effect of multiplying movements of funds in international markets.

International Exhibition of Modern Art (1913): *see* Armory Show.

International Federation for Documentation, French FÉDÉRATION INTERNATIONALE DE DOCUMENTATION (FID), international library organization that was founded in 1895 as the Institut International de Bibliographie (IIB) to promote a unified and centralized approach to bibliographic classification; it became a federation under the present name in 1938. The IIB was founded by two Belgian lawyers, Paul Otlet and Henri Lafontaine. In 1905 the IIB published the Universal Decimal Classification, a classificatory system for publications that was an expanded version of the Dewey Decimal Classification. The FID's current aims are to promote, through international cooperation, research in and development of documentation, which includes the organization, storage, retrieval, dissemination, and evaluation of information. The organization has consulting status with many international organizations. In the late 20th century it had national members in more than 50 countries and more than 300 affiliated organizations and individuals. Headquarters are in Brussels.

International Finance Corporation (IFC), United Nations specialized agency affiliated with but legally separate from the International Bank for Reconstruction and Development (World Bank). It was founded to stimulate the economic development of its members by providing capital for private enterprises when sufficient private capital is not available. The corporation officially came into existence on July 24, 1956, and its aid has been especially aimed at less developed areas. Executive directors of the World Bank also serve as directors of the IFC. Headquarters are in Washington, D.C.

In financing only predominantly private enterprises, it makes loans without government guarantee of repayment. Unlike most other organizations of its kind, the IFC cannot stipulate where the proceeds of its loans will be spent. Though the terms of loans are negotiated in each individual case, maturity dates usually range from 5 to 15 years. The IFC seeks to diversify its investments; commitments have been made in the fields of tourism development, animal feeds, publishing, iron and steel, fertilizers, and textiles.

International Fund for Agricultural Development (IFAD), a Rome-based United Nations agency that supports increased food production in poor communities. The World Food Conference adopted a resolution in November 1974 that brought IFAD into existence in June 1976. IFAD's members fall into three categories: Category I, "industrialized countries," includes most of the developed nations of western Europe as well as Japan, the United States, and others; Category II, "petroleum-exporting developing countries," includes the major petroleum producers of the Middle East, Africa, and elsewhere; Category III includes more than 100 "recipient developing countries." Countries in Categories I and II are obliged to provide revenue for the fund; countries in Category III may contribute but are not obliged to do so, though recipient countries must be members of IFAD.

IFAD is committed to bringing about worldwide recognition that, as well as being a technical problem, food production is determined by both political and social issues. In view of this attitude, IFAD assists only underdeveloped agricultural countries and their poorer communities. The fund's priorities are threefold: first, to raise food production in developing countries; second, to employ farmers who are either poor or landless; third, to reduce malnutrition.

International Geophysical Year (IGY), worldwide program of geophysical research that was conducted from July 1957 to December 1959. IGY was directed toward a systematic study of the Earth and its planetary environment. The IGY encompassed research in 11 fields of geophysics: aurora and airglow, cosmic rays, geomagnetism, glaciology, gravity, ionospheric physics, longitude and latitude determinations, meteorology, oceanography, seismology, and solar activity. Because the IGY period was chosen to coincide with the maximum sunspot cycle, when solar flares and other disturbances are prevalent, research on the Sun was especially significant.

In 1950 a group of geophysicists led by the American scientist Lloyd V. Berkner proposed a third International Polar Year, an international scientific effort that would utilize the advances made in instrumentation, rocketry, and information processing since the Second International Polar Year of 1932–33. These proposals soon broadened from the field of polar studies to a wider array of geophysical research. The parent body of international scientific organizations—the International Council of Scientific Unions—sanctioned the broader study of proposals for what became known as the International Geophysical Year. National IGY committees were then established by scientific organizations in many countries, and more than 70 nations ended up cooperating in IGY.

The IGY pioneered in the use of rocketry to conduct studies of high-altitude and upper-atmosphere phenomena. Several of the earliest artificial satellites launched by the Soviet Union and the United States in the late 1950s were used to gather data for the IGY.

In retrospect, perhaps the most important achievement of the IGY was its verification in 1958 of scientists' suggestion that there existed a continuous system of submarine mid-oceanic ridges that encircled the globe. The implications of this mountain chain, the largest on Earth, were only understood in the 1970s with the recognition of plate tectonics as a basic phenomenon of the Earth's crust.

The discovery of the Van Allen radiation

belts, which surround the Earth at altitudes of hundreds and thousands of kilometres, was another major achievement of IGY. The inner Van Allen belt was first delineated by instruments aboard the early Explorer satellites in 1958, and the space probes Pioneers III and IV discovered the second Van Allen belt soon afterward. Specific discoveries and findings represented only a part of the technical results of IGY. Most of the effort involved the collection of synoptic data—*i.e.,* data that gave a comprehensive overview of global physical phenomena.

The success of the IGY inspired the formation of several other cooperative international research programs, notably the International Years of the Quiet Sun (1964–65), the International Hydrological Decade (1965–75), and the International Decade of Ocean Exploration (1970–80).

International Harvester Company: *see* Navistar International Corporation.

International Herald Tribune, formerly PARIS HERALD TRIBUNE, daily newspaper published in Paris, long the staple source of English-language news for American expatriates and businessmen in Europe. Its roots are in the *Paris Herald,* established (1887) by James Gordon Bennett, Jr., a few years after he sent Henry M. Stanley to Africa to find David Livingstone for his *New York Herald.* After the younger Bennett died in 1918, Frank A. Munsey bought the Paris edition along with its New York City parent. After seeking vainly to buy the *New York Tribune* to combine with the *Herald,* he did a turnabout and sold the *Herald* to the *Tribune,* and the merger came about in reverse. The *Paris Herald Tribune* enjoyed great popularity—as the Paris edition of the *New York Herald-Tribune*—and was affectionately called "Le New York" by many Parisians. The paper shared its own reportage with the *New York Herald-Tribune* and had full access to the latter's stories. It was shut down for four years when the Germans occupied Paris in World War II, but it regained its old momentum and was faring well in the 1960s when rising costs, falling revenues, and a lengthy strike swept its parent into a series of mergers and eventual extinction. The Paris edition was rescued—renamed *International Herald Tribune*—by a joint venture of *The New York Times, The Washington Post,* and Whitney Communications. Its headquarters remain in Paris, but the paper is now printed simultaneously by satellite in cities around the world, including Hong Kong, Singapore, London, The Hague, and Miami, Fla.

International Ice Patrol, patrol established in 1914 by the agreement of 16 nations with shipping interests in the North Atlantic after the *S.S. Titanic* collided with an iceberg and sank (1912). The patrol is conducted annually in the North Atlantic during the iceberg season, from February to October. The U.S. Coast Guard contributes a large share of the patrol, using planes and ships equipped with radar, loran, and underwater sound devices. But, owing to the electrical properties of ice, these electronic devices cannot detect bergs in choppy seas and therefore cannot be relied on in most cases. This fact causes tracking to depend on visual observation from aircraft and, in bad weather, ships. The patrol locates icebergs, follows and predicts their drift, and issues warnings to any ship in the vicinity. Destruction of dangerous icebergs has been attempted, but with little success. The towing of icebergs by wrapping cables around them and then having ships pull the bergs in the desired direction appeared to be a promising method for diverting them from heavily traveled sealanes.

International Investment Bank, Russian MEZHDUNARODNY INVESTITSIONNY BANK, international bank founded in 1970 and operational in 1971, designed to provide long-term and medium-term credit for capital construction in member states. The founding members were Bulgaria, Cuba, Czechoslovakia, East Germany, Hungary, Mongolia, Poland, Romania, the U.S.S.R., and Vietnam. The bank was headquartered in Moscow, and its council met not less than twice yearly. The bank granted credits to the banks and economic enterprises of the member states and also, from 1974, financed programs of economic and technical assistance for developing countries.

International Labour Organisation (ILO), specialized agency of the United Nations whose aim is to facilitate the improvement of conditions of labour and living standards throughout the world.

The ILO was created after World War I in 1919 by Part XIII (Labour) of the Treaty of Versailles as an affiliated agency of the League of Nations. After the United Nations was established during World War II, the ILO became the first specialized agency to be affiliated with it, in 1946.

The functions of the ILO include the development and promotion of standards for national labour legislation to protect and improve conditions of work and standards of living. It provides technical assistance in social policy and administration and in manpower training and utilization and fosters cooperative organizations and rural industries. It compiles labour statistics and conducts research on the social problems of international competition, unemployment and underemployment, labour and industrial relations, economic development, and technological change (including automation). The ILO is also concerned with the protection of international migrants, the safeguarding of trade-union rights and other human rights, and the attempt to associate labour with economic and social decisions. It also encourages a continuing exchange of ideas among representatives of the world's governments, workers, and employers, together with the ILO's own staff. The ILO was awarded the Nobel Prize for Peace in 1969 in recognition of its far-flung and constructive activities.

In its first decade, the ILO was concerned primarily with legislative and research efforts, with the definition and promotion of proper minimum standards of labour legislation for adoption by member states, and with arranging for collaboration among workers, employers, government delegates, and office professional staff. During the 1930s the ILO sought ways to combat worldwide unemployment and economic depression. Its proposals of extensive international public works were, however, too far ahead of their time to influence national decision makers.

After World War II the breakup of European colonial empires and the claims of the developing nations brought forth new tasks for the ILO; its membership was no longer predominantly that of European, economically developed states but increasingly that of the underdeveloped states of the third world. Among intergovernmental organizations the ILO is unique in that member states are represented not only by delegates of their governments but also by delegates of those states' employers and workers, especially trade unions. In the mid-1980s more than 150 nations were members of the ILO.

National representatives to the ILO meet at the annual International Labour Conference. The executive authority of the organization is vested in the Governing Body, which is elected by the Conference. The International Labour Office in Geneva, composed of the permanent Secretariat and professional staff, handles the day-to-day operations of the ILO. It is under the supervision of an appointed director general and has international civil servants and technical-assistance experts working in countries throughout the world. Some idea of the ILO's manifold activities may be gleaned from its current *Catalogue of Publications;* most widely used are the monthly *International Labour Review* and the *Year Book of Labour Statistics.*

International Ladies' Garment Workers' Union (ILGWU), U.S. and Canadian industrial union representing workers in the women's clothing industry. When the ILGWU was formed in 1900, most of its members were Jewish immigrants employed in sweatshops—*i.e.,* small manufacturing establishments that employed workers under unfair and unsanitary conditions. Successful strikes in 1909 and 1910 in New York City by the ILGWU resulted in a "protocol of peace" between the women's clothing industry and labour. The protocol greatly improved conditions for the garment-makers; wages were increased, working hours were reduced, the union was recognized by the clothing manufacturers, and a board of arbitration was established to handle labour–management disputes. David Dubinsky, who later served as the union's president from 1932 to 1966, led a successful battle against a communist attempt to gain control of the ILGWU in the 1920s. When resolutions that would have allowed craft unions to organize the workers in mass-production industries were defeated at the convention of the American Federation of Labor (AFL) in 1935, the ILGWU and seven other AFL unions formed the Committee for Industrial Organization (CIO). All eight were expelled from the AFL in 1937. When the CIO transformed itself into the Congress of Industrial Organizations in 1938, the ILGWU withdrew and two years later returned to the AFL.

Under Dubinsky's leadership the union grew from 45,000 members in 1932 to 450,000 in the 1960s. He transformed the ILGWU from a faction-ridden, insolvent regional union into a strong and progressive international organization that succeeded in improving the pay and working conditions of its members. The union was also a founder of the Liberal Party in New York state.

international law, also called PUBLIC INTERNATIONAL LAW, OR LAW OF NATIONS, the body of legal rules that apply between sovereign states and other entities having international personality. International law means public international law as distinguished from private international law, which deals with the differences between the municipal or internal laws of different countries.

A brief treatment of international law follows. For full treatment, *see* MACROPAEDIA: International Law.

International law has developed from the necessity of nations to coexist peacefully; it is anchored in common sense, self-interest, and a variety of practical considerations. Although there is no effective international law-enforcing body, individual states have shown an increasing willingness to adhere to legal principles of mutual cooperation. In fact, many states now incorporate agreed principles of international law into their own municipal jurisdictions.

International law is generated by three discrete processes: by the process of international customary law, by treaties, and by general principles of law recognized by civilized nations. International customary law is essentially the international law of unorganized society. The basic rules of international customary law can be summarized in the following fundamental principles: sovereignty, recognition, consent, good faith, freedom of the seas, international responsibility, and self-defense.

Rules of sovereignty define the limits of jurisdiction that subjects of international law have over their own territory as well as over

persons and things outside their territory. The rules of recognition cover situations such as the co-option of new subjects of international law, the recognition of the territorial claims of another state, and the grant and withdrawal of nationality. The rules on consent enable subjects of international law, when entering into agreement, to modify and to supplement as they see fit, but without prejudice to the rights of third parties, any of the rules of international customary law or the general principles of law recognized by civilized nations. Good faith characterizes the spirit in which parties to a consensual engagement must interpret and execute that engagement; good faith is identified with the requirements of reasonableness, common sense, and equity. The rules protecting the freedom of the seas preclude the appropriation by any individual subject of international law of any portion of the high seas as distinct from the subsoil and bed of the sea. The ability to exercise permitted jurisdiction varies according to the state of peace or war between the parties concerned. The rules on international responsibility can be reduced to two propositions, namely, that the breach of any international obligation by the organ of a subject of international law constitutes an illegal act, or international tort, and that the subject has a duty to make reparation. The rules of self-defense mainly govern the measures that may be taken against illegal acts attributable to another subject of international law and against acts of individuals, ships, or aircraft that disentitle any other subject of international law from the grant of protection.

International law is also created by treaties. Treaties and other consensual engagements are legally binding undertakings by which the subjects of international law may declare, modify, or develop existing international law as they see fit or agree on transactions. Among the bodies of international rules governed by treaties and other agreements, five are of special significance: territory, diplomatic law, and immunity; the protection of nationals abroad; freedom of commerce and navigation; extradition and asylum; and succession to international rights and obligations.

Global multipurpose institutions such as the United Nations play an important role in the development of international law. They are best understood as organizational superstructures of international customary law on a consensual and confederate basis. Their impact on international law is threefold: they have been responsible for the modification, by express consent, of the rules underlying the fundamental principles of international law, for the indirect modification of these rules by acquiescence on the part of member states in the action of organs not actually authorized to exercise lawmaking functions, and for the initiation of the further codification and development of international law.

International Load Line (marine engineering): *see* Plimsoll line.

International Maritime Organization, formerly (1948–82) INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION (IMCO), United Nations specialized agency created to provide machinery for cooperation in establishing technical regulations and practices in international shipping, to encourage the adoption of the highest possible standards for maritime safety and for navigation, and to discourage discriminatory and restrictive practices in international trade and unfair practices by shipping concerns.

The establishment of the organization was provided for in a convention prepared by the United Nations Maritime Conference held in 1948. The convention came into force on March 17, 1958, and the organization held its first assembly in January 1959. Its current name was adopted on May 22, 1982.

The Assembly is the policymaking body and meets every two years. The Council, consisting of 24 member states, meets twice a year and is responsible for governing between Assembly sessions. Safety proposals are submitted to the Assembly by the 16-member Maritime Safety Committee, which meets annually. There are a number of subcommittees to deal with specific issues, such as the carriage of dangerous goods, radiocommunications, fire protection, ship design and equipment, lifesaving appliances, and cargoes and containers. A Marine Environment Protection Committee was established in 1973. A secretariat is also maintained, with headquarters in London.

International Monetary Fund (IMF), specialized agency of the United Nations, founded at the Bretton Woods Conference in 1944 to secure international monetary cooperation, stabilize exchange rates, and expand international liquidity (convertibility to cash). Membership in the IMF subsequently grew as former colonies gained independence. Headquarters of the IMF are in Washington, D.C.

Members are pledged to orderly currency exchange arrangements, a reduction in the role of gold in international monetary transactions, and expansion of the Fund's capability to carry out its original goals. The continuous liaison maintained between the monetary authorities of the member states has made the IMF a convenient instrument of consultative cooperation and an outstanding centre of research and statistical information on international monetary questions.

Operating funds are subscribed by member governments according to the volume of their international trade, their national income, and their international reserve holdings. Members with temporary difficulties in their international balances of payments may purchase from the IMF, with their own national currencies, the foreign exchange they need. The expansion of international liquidity that results from these drawings is eliminated as they are repaid.

Additional devices to assist members in temporary balance-of-payments difficulties included the Standby Arrangements, introduced in 1952, enabling members to negotiate lines of credit in anticipation of actual needs; the General Arrangements to Borrow, based on an agreement in 1961 of 10 countries to provide standby credit; and Compensatory Financing of Export Fluctuations, introduced in 1963 and liberalized in 1966, enabling developing countries to cope with a sudden fall of export receipts without imposing exchange restrictions or severe deflation.

The increasing volume of international transactions and successive financial crises created a demand for additional reserves that could be used in settlement of international balances. Special Drawing Rights, which permanently expanded the supply of international liquidity, were approved at the annual meeting of the IMF in October 1969. Special Drawing Rights in effect enlarged members' quotas without any additional subscription either in gold or in national currencies. In 1986 the IMF and the International Bank for Reconstruction and Development began a new multibillion-dollar lending pool to serve the world's poorest nations.

International Olympic Committee, organization formed in Paris in 1894 to conduct, promote, and regulate the modern Olympic Games (*q.v.*).

international organization, any institution drawing its membership from two or more sovereign states and maintaining arrangements and facilities to promote continuous activities by its members.

The creation of international organizations has been essentially a 20th-century phenomenon: only a handful of the international organizations now in existence were formed before 1850; and about 90% were organized in the period 1900–56. In the mid-1980s there were more than 2,500 international organizations, of which about 750 were formed after World War II. This number included more than 130 intergovernmental agencies, of which the most notable were the United Nations and its affiliates, and such regional organizations as the European Economic Community, the North Atlantic Treaty Organization, the Organization of American States, and the Council for Mutual Economic Assistance.

The 20th-century trend toward the creation of international organizations on a wide scale essentially stemmed from advances in the technology of communication, transportation and warfare, and from the spread of industrialization. These developments gave rise to a sense of interdependence among the peoples of the world, thereby stimulating recognition of the need for systematic international cooperation to avoid the dangers, solve the problems, and exploit the opportunities which confront the society of nations. These same developments also gave an unprecedented air of feasibility to the project of creating and operating organizations on a worldwide scale. Such institutions vary greatly in geographic scope, ranging from regional organizations to universal bodies embracing virtually the whole world. Some are concerned only with single and relatively narrow problems, while others (*e.g.,* the United Nations) deal with a great variety of substantive matters. Finally, international organizations may be designated as either intergovernmental or nongovernmental agencies.

With the rapid multiplication of international organizations in the 20th century, efforts have been made to create a pattern of orderly relationships among them. The Union of International Associations, founded in Brussels in 1907, was an early coordinating body. The League of Nations provided a focal point for intergovernmental organizations and also for the growing network of nongovernmental agencies.

After World War II, the United Nations became a "roof organization" for the major enterprises in systematic international cooperation. In accordance with its charter, the UN entered into coordinating agreements with intergovernmental agencies operating in economic, social, cultural, educational, health, and related fields. The Economic and Social Council (Ecosoc) of the UN, in particular, maintains a consultative relationship with nearly 300 nongovernmental organizations, virtually all international in scope.

International Organization for Standardization (ISO), specialized international organization founded in Geneva in 1946 and concerned with standardization in all technical and nontechnical fields except electrical and electronic engineering (the responsibility of the International Electrotechnical Commission). Its membership extends to more than 80 countries, and each member is the national body "most representative of standardization in its country"—in Western industrial countries usually a private organization, such as the American National Standards Institute (ANSI) and the British Standards Institute (BSI), but in most other countries a governmental organization.

Standardization affects units of measurement; alphabetization and transliteration; specifications for parts, materials, surfaces, processes, tools, methods of testing, and machines; and even the form in which specifications are presented. Upon request, the ISO establishes international "technical committees" to investigate and resolve specific issues of standardization and publishes the results

as "International Standards" (IS). Because of technological evolution, ISO standards are optimally reviewed (and, if necessary, revised) every five years.

International Paper Company, major American manufacturer of pulp and paper products, including stationery, printing paper, specialty paper products, and packaging materials. It also is one of the world's largest private owners of timberland. Headquarters are in Purchase, N.Y.

The original company was established as International Paper Company in 1898 in a merger of 20 paper mills in the northeastern United States. It was subsequently acquired in 1941 by International Paper and Power Corporation, which then assumed the original name. International Paper has a history of acquisitions and mergers but has tended to concentrate on paper and lumber production. In 1986 International Paper acquired the Hammermill Paper Company, a manufacturer of printing papers and a large paper marketer and distributor.

The company manufactures a wide variety of paper products for business and industry, including stationery, fine writing and printing papers, and specialty newsprint; packaging products, including paper boxes and bags and plastic containers; and wood products. Its subsidiaries are active in consumer paper products, wholesale paper distribution, rice harvesting, and finance. The company's timberlands—primarily in the southern, northeastern, and western United States and Canada—are planted with southern pine and supply paper and packaging plants throughout the United States and abroad.

international payment, a payment made between countries either in settlement of a trade debt, as a unilateral transfer of funds, for capital investment, or for some other purpose. The causes of such payments, the methods of making them, and accounting for them are matters of concern to economists and national governments.

A brief treatment of international payments follows. For full treatment, *see* MACROPAEDIA: International Trade.

For statistical data on international transfers and payments, *see* BRITANNICA WORLD DATA ANNUAL.

International debts are settled either from accumulated balances of foreign exchange, or by loans from the creditor to the debtor, or by drawings on the International Monetary Fund (*q.v.*), or by movements of gold. Whenever this process is multilateral rather than bilateral, it provides an additional advantage. For if, in terms of the total annual turnover of transactions between them, England is in debit to the United States and in surplus with the Commonwealth and the latter in surplus with the United States but in debit to England, there is no net change in the foreign-exchange position of the countries concerned if the various credits and debits exactly cancel out. In practice, however, it does not work out so smoothly; there always have been considerable fluctuations in net credit and debit positions within any given year as well as between years. The way in which a country balances its international accounts is one of the most important problems of its balance of payments.

The balance of payments is a systematic record of all economic transactions during a given period between residents (including the government) of one country and residents (including the governments) of other countries, referred to for convenience as foreigners. The transactions are presented in the form of double entry bookkeeping with credit entries balanced on the debit side, and vice versa. The balance of payments of a country thus necessarily balances. There can be no surplus or deficit in a country's balance of payments as a whole.

The balance of payments of the United States, for example, records the various ways in which dollars are made available to foreigners through U.S. imports, American tourists' expenditures abroad, donations, foreign lending activities, and so forth. These expenditures are shown on the debit (payments) side of the balance. The credit (receipts) side indicates the various uses to which foreigners put their dollars, such as paying for U.S. exports, servicing of debts to the United States, and the like. If foreign countries do not spend all the dollars made available to them during a given period to obtain goods and services from the United States, the balance of payments will show on the credit (receipts) side an increase of foreign-held dollar balances, foreign purchases of U.S. securities, gold exports from the United States, or some similar item. If, on the other hand, the dollars made available by the United States are insufficient to pay for the exports of U.S. goods and services, additional dollars can be obtained only by liquidation of foreign holdings in the United States, by gold imports into the United States, and by similar operations which would necessarily be recorded on the payments side. This must mean that for any period the receipts measured in dollars are equal to the payments measured in dollars when all the receipts and payments are included.

Countries are greatly concerned about the types of transactions giving rise to the receipts and payments of foreign exchange and how these compare in size with one another. The standard schedule for reporting a country's balance of payments to the International Monetary Fund (IMF) is divided into two major sections: the current account and the capital and monetary gold account. The current account is in turn subdivided into two sections; one records goods and services, the other, transfer payments. The capital account is also subdivided into two major sections; one records the transactions in nonmonetary sectors, the other, in monetary sectors.

Commonly heard references to a surplus or deficit in the balance of payments would appear to be contradictions. Often what is actually meant is the "trade balance" (*i.e.,* the net credit or debit of merchandise trade). While this is an important segment of the balance of payments, it may have very little significance by itself. An import surplus may be matched by net sales of services that are closely similar in their economic implications to sales goods. There would then be no deficit in goods and services as a whole, and this balance is a broader and more significant measure than is trade alone.

Often the balance of goods and services is discussed as if it were the balance on current account. The current account as a whole has always had a basic importance since it is the counterpart of the capital account. A nation with a deficit on total current account is ipso facto decreasing its capital assets abroad (including gold) or increasing its capital liabilities to foreigners. A nation with a current-account surplus is gaining foreign assets or reducing its foreign liabilities.

A deficit in the balance of goods and services is not necessarily an indication of pressure on a country's exchange rate. It may be matched by an inflow of investment capital that strengthens the immediate exchange position and builds up a country's future exporting capacity. Similarly, a surplus in the balance of goods and services may be no indication of a strong exchange position.

In public discussions a deficit in the balance of trade is often referred to as an "unfavourable trade balance" and a surplus as a "favourable trade balance." These terms, when not wholly invalid, are subject to such grave limitations that they are rejected in modern treatments of the subject and are replaced by such terms as active and passive, or positive and negative, trade balance. Other terms used for the same phenomena are export surplus and import surplus, or credit balance and debit balance. The more important item, net total on current account, is often designated by the terms surplus or deficit in a country's balance of current payments. The value of the net outflow of gold plus net increases in foreign holdings of a country's short-term balances has most frequently been used as a measure of a country's balance-of-payments deficit. It is one measure of what are termed "accommodating payments," *i.e.,* those that have taken place only because the other items in the balance of payments leave a gap of this size to be filled. This is a useful theoretical concept even though in practice it is by no means easy to distinguish between accommodating and other payments.

International Peace Garden, park that straddles the North Dakota (U.S.)–Manitoba (Can.) border in the Turtle Mountain Valley. It is situated about 30 miles (50 km) north of the geographical centre of North America and 81 miles (130 km) northeast of Minot, N.D. The park has a total area of 2,220 acres (898 hectares), of which 887 acres (359 hectares) are in the United States. Established in 1932 as a symbol of lasting friendship between the United States and Canada, the park contains a formal garden, a simple cairn of stones from both sides of the border, sunken gardens, and numerous lakes. Camping and lodging facilities are available.

International Phonetic Alphabet (IPA), an alphabet developed with the intention of enabling students and linguists to learn and record the pronunciation of languages accurately, thereby avoiding the confusion of inconsistent, conventional spellings and a multitude of individual transcription systems. One aim of the IPA was to provide a unique symbol for each distinctive sound in a language—that is, every sound, or phoneme, that serves to distinguish one word from another.

IPA primarily uses Roman characters; other letters are borrowed from different scripts (*e.g.,* Greek) and are modified to conform to Roman style. Diacritics are used for fine distinctions in sounds and to show nasalization of vowels, length, stress, and tones. The concept of IPA was first broached by Otto Jespersen in a letter to Paul Passy of the International Phonetic Association and was developed by A.J. Ellis, Henry Sweet, Daniel Jones, and Passy in the late 19th century.

The IPA can be used for broad and narrow transcription. For example, in English, there is only one *t* sound distinguished by native speakers. Therefore, only one symbol is needed in a broad transcription to indicate every *t* sound. If there is a need to transcribe narrowly in English, diacritic marks can be added to indicate that the *t*'s in "tap," "pat," and "stem" differ slightly in pronunciation.

The International Phonetic Alphabet has not had the overwhelming success that its designers intended, and it is used less commonly in America than in Europe. Despite its acknowledged failings as a universal system for phonetic transcription, it is more widely employed than any other. One of its principal disadvantages when used in printing and typing is its utilization of a large number of special symbols in addition to the letters of the Roman alphabet that constitute its core. Modifications and substitutions are often made for reasons of economy and convenience.

International Physicians for the Prevention of Nuclear War, international organization of doctors who are opposed to the nuclear arms race and who seek to educate

the public on the catastrophic medical consequences that would result from a nuclear war. The group was awarded the Nobel Prize for Peace in 1985.

International Physicians was founded (in 1980) and led by several American and Soviet physicians under the leadership of Bernard Lown and Yevgeny I. Chazov, respectively. The organization promotes research on the medical, psychological, and biospheric effects that a nuclear war would have. At the time that it was awarded the prize, the group had more than 135,000 members in 41 countries, with about 30,000 of them in the United States and about 60,000 in the Soviet Union. International Physicians has been criticized in some quarters for allegedly letting itself be drawn into the antiwar propaganda activities of the U.S.S.R.

International Refugee Organization (IRO), temporary specialized agency of the United Nations that, between its formal establishment in 1946 and its termination in January 1952, assisted refugees and displaced persons in many countries of Europe and Asia who either could not return to their countries of origin or were unwilling to return for political reasons. Beginning operations on July 1, 1947, the IRO took over the work of its principal predecessor organization, the United Nations Relief and Rehabilitation Administration. Among the services supplied by the IRO were the care and maintenance of refugees in camps, vocational training, orientation for resettlement, and an extensive tracing service to find lost relatives. It also assumed the responsibilities for the legal protection and resettlement of refugees previously carried out by the Intergovernmental Committee on Refugees. It was succeeded by the Office of the United Nations High Commissioner for Refugees.

International Settlements, Bank for (BIS), international bank established at Basel, Switz., in 1930, as the agency to handle the payment of reparations by Germany after World War I and as an institution for cooperation among the central banks of the various countries. It has come to serve as a centre for economic and monetary research and consultation and as a technical agency for the execution of certain specific agreements. The bank's capital, divided into 600,000 registered shares, is fixed at 1,500,000,000 gold francs, only 25 percent of which has been paid in. Subscription of the capital was originally guaranteed in equal parts by the central banks of Belgium, France, West Germany, Great Britain, and Italy and by two banking groups, one from Japan and one from the United States. All of the U.S. stock was sold in American markets, most of it being bought by Europeans. The Japanese interest was repurchased by other central banks.

Liquidation of the bank was recommended at the Bretton Woods (N.H.) Conference of 1944, when the International Monetary Fund and the International Bank for Reconstruction and Development were founded, but such a step was avoided. In 1947 the bank was appointed agent for the execution of the first intra-European compensation agreement initiated under the Marshall Plan, and in 1950 it became the agent for the Organization for European Economic Co-operation to serve the European Payments Union until its liquidation at the end of 1958. Since 1973 the bank has been the agent of the European Monetary Cooperation Fund, set up by the member countries of the European Economic Community.

Under its statutes the bank may carry out only operations that are in conformity with the monetary policy of the countries concerned. Its granting of credits and its purchases and sales of gold and foreign exchange have been on a short-term basis only. The bank showed a profit every year, except for 1945; dividend payments were suspended then but resumed in 1951. The bank is administered by a board of directors consisting of governors of central banks and other appointed and elected members.

International Society for Krishna Consciousness: *see* Hare Krishna.

International Society of Christian Endeavor, original name UNITED SOCIETY OF CHRISTIAN ENDEAVOR, interdenominational organization for Protestant youth in Canada, Mexico, and the United States. It was founded in 1881 by Francis Edward Clark, who served as president until 1927. Members of the society pledged to try to make some useful contribution to the life of the church. Other churches soon organized Christian Endeavor societies, and the movement grew rapidly in the United States.

The purpose of the International Society of Christian Endeavor is "to promote an earnest Christian life among its members, to increase their mutual acquaintance, to train them for work in the church, and in every way to make them useful in the service of God and their fellow men." The organization publishes a periodical, *Christian Endeavor World,* and holds conventions biennially.

The World's Christian Endeavor Union, (WCEU), organized in 1895, is a cooperative organization for Christian Endeavor groups in more than 75 countries. It holds conventions every four years. Headquarters for both organizations are in Columbus, Ohio.

International Standard Book Number (ISBN), in bibliography, 10-digit number assigned before publication to every book or edition thereof, which identifies each work's national geographical or language grouping and its publisher, title, edition, and volume number. The ISBN is part of the International Standard Bibliographic Description (ISBD), which was prescribed by a UN-sponsored International Organization for Standardization; delegates adopted the numbering system in 1969. The ISBN provides a standard for the arrangement of bibliographic information in single- and multivolume publications, and its numbers are assigned by designated national standard book numbering agencies, *e.g.,* R.R. Bowker in the United States, Standard Book Numbering Agency Ltd. in the United Kingdom, National Library in Brazil, the Staatsbibliothek Preussischer Kulturbesitz (Prussian State Library) in Germany, and the Research Library on African Affairs in Ghana. Each ISBN is identical with the Standard Book Number, originally devised in the United Kingdom, with the addition of a preceding national group identifier.

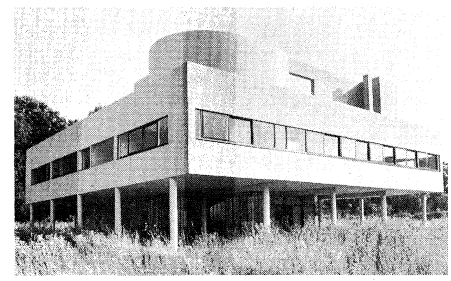
International Standard Serial Number (ISSN), in bibliography, eight-digit number that provides a concise and unambiguous identification code for serial publications. Unlike the ISBN (*q.v.*), this number's only significance is its unique identification of a particular publication; it does not record such characteristics as subject, language, or publisher. The ISSN is used by librarians, authors, publishers, and subscriptions agencies for such various purposes as administration, copyright, ordering, and inventory control.

The ISSN was developed by a technical committee of the International Organization for Standardization, a United Nations agency. It stipulated that a "key title" should be agreed upon for assignment of a standard citation control element; serial numbers, including new assignments for a changed title, are provided through guidelines established by the International Serials Data System (ISDS). ISSN registrations are made available routinely by the U.S. Library of Congress, which includes the number on serial catalog cards and, when possible, in its publication *New Serial Titles.* The ISDS in Paris also makes comprehensive ISSN information available on microfiche.

International Style, architectural style that developed in Europe and the United States in the 1920s and '30s and became the dominant tendency in Western architecture during the middle decades of the 20th century. The most common characteristics of International Style buildings are rectilinear forms; light, taut plane surfaces that have been completely stripped of applied ornamentation and decoration; open interior spaces; and a visually weightless quality engendered by the use of cantilever construction (the use of reinforced concrete projecting out from metal supports). Glass and steel, in combination with usually less visible reinforced concrete, are the characteristic materials of construction. The term International Style was first used in 1932 by Henry-Russell Hitchcock and Philip Johnson in their essay entitled *The International Style: Architecture Since 1922,* which served as a catalog for an architectural exhibition held at the Museum of Modern Art.

The International Style grew out of three phenomena that confronted architects in the late 19th century: (1) architects' increasing dissatisfaction with the continued use of stylistically eclectic buildings, *e.g.,* ones incorporating a mix of decorative elements from different architectural periods and styles that bore little or no relation to the building's functions; (2) the creation of large numbers of office buildings and other commercial and civic structures that served a rapidly industrializing society; and (3) the development of new building technologies centring on the use of iron and steel, reinforced concrete, and glass. These three phenomena dictated the search for an honest, economical, and utilitarian architecture that would both use the new materials and satisfy society's new building needs while still appealing to aesthetic taste. Technology was a crucial factor here; the new availability of cheap, mass-produced iron and steel and the discovery in the 1890s of those materials' effectiveness as primary structural members effectively rendered the old traditions of masonry (brick and stone) construction obsolete. The new use of steel-reinforced concrete as secondary support elements (floors, etc.) and of glass as sheathing for the exteriors of buildings completed the technology needed for modern building, and architects set about incorporating that technology into an architecture that openly recognized its new technical foundation. The International Style was thus formed under the dictates that modern buildings' form and appearance should naturally grow out of and express the potentialities of their materials and structural engineering. A harmony between artistic expression, function, and technology would thus be established in an austere and disciplined new architecture.

The International Style grew out of the work of a small group of brilliant and original architects in the 1920s who went on to achieve great influence in their field. These major figures included Walter Gropius and Ludwig Mies van der Rohe in Germany and the



Savoye House, Poissy, Fr., an International Style residence by Le Corbusier, 1929–30

Pierre Belzeaux—Rapho/Photo Researchers

United States, J.J.P. Oud in The Netherlands, Le Corbusier in France, and Richard Neutra and Philip Johnson in the United States.

Gropius and Mies were best known for their structures of glass-curtain walls stretched between steel girders that form the skeleton of the building. Important examples of Gropius' work are the Fagus Works (Alfeld-an-der-Leine, Ger.; 1911), the Bauhaus (Dessau, Ger.; 1925–26), and the Graduate Center at Harvard University (Cambridge, Mass.; 1949–50)—all of which show his concern for uncluttered interior spaces. Mies van der Rohe and his followers in the United States, who did much to spread the International Style, are most clearly identified with glass-and-steel skyscrapers such as the Lake Shore Drive Apartments (Chicago; 1949–51) and the Seagram Building, done jointly with Philip Johnson (New York City; 1958). Oud helped to bring more rounded and flowing geometric shapes to the movement. Le Corbusier, too, was interested in the freer treatment of reinforced concrete but added the concept of modular proportion in order to maintain a human scale in his work. Among his best-known works in the International Style is the Savoye House (Poissy, Fr.; 1929–30).

In the 1930s and '40s the International Style spread from its base in Germany and France to North and South America, Scandinavia, Britain, and Japan. The clean, efficient, geometric qualities of the style came to form the basis of the architectural vocabulary of the skyscraper in the United States in the 1950s and '60s. The International Style provided an aesthetic rationale for the stripped-down, inexpensively surfaced skyscrapers that became the status symbols of American corporate power and progressiveness at this time.

By the 1970s, however, many architects had begun to chafe at the constraints and limitations inherent in the International Style. The bare and denuded quality of the steel-and-glass "boxes" that embodied the style by then appeared stultifying and formulaic. The result was a reaction against modernist architecture and a renewed exploration of the possibilities of innovative design and decoration. Architects began creating freer and more imaginative structures that used modern building materials and decorative elements to create a variety of novel effects. This movement emerged into prominence in the late 1970s and early 1980s and became known as Post-Modernism.

International System of Units, also called SI SYSTEM, French SYSTÈME INTERNATIONAL D'UNITÉS, international decimal system of weights and measures derived from and extending the metric system of units. Adopted by the 11th General Conference on Weights and Measures in 1960, it is abbreviated SI in all languages.

Rapid advances in science and technology in the 19th and 20th centuries fostered the development of several overlapping systems of units of measurements as scientists improvised to meet the practical needs of their disciplines. The early international system devised to rectify this situation was called the metre-kilogram-second (mks) system. Providing for the definition of basic electrical units, the International Committee of Weights and Measures added three new units in 1937: a unit of force (since christened the newton), defined as that force which gives to a mass of one kilogram an acceleration of one metre per second per second; a unit of energy (the joule), defined as the work done when the point of application of a newton is displaced one metre in the direction of the force; and a unit of power (the watt), which is the work done at the rate of one joule per second. All three units are named for eminent scientists of the past.

The 1960 International System builds upon the mks system. Its seven basic units, from which all other units are derived, are defined as follows: for length, the metre, defined as the distance traveled by light in a vacuum in 1/299,792,458 second; for mass, the kilogram (about 2.2 pounds avoirdupois), which equals 1,000 grams as defined by the international prototype kilogram of platinum and iridium in the keeping of the International Bureau of Weights and Measures in Sèvres, Fr.; for time, the second, the duration of 9,192,631,770 cycles of radiation associated with a specified transition of the cesium atom; for electric current, the ampere, which is the current produced by one volt across a resistance of one ohm (also defined in terms of the electromagnetic force between two wires in free space separated by one metre); for luminous intensity, the candela, fixed at 1/600,000 of the intensity of one square metre of a radiating cavity at the temperature of freezing platinum (or approximately the intensity of one paraffin candle); for amount of substance, the mole, defined as containing as many elementary units of a substance as there are atoms in 0.012 kilogram of carbon-12; for thermodynamic temperature, the kelvin (*see* absolute zero).

International Telecommunication Union (ITU), specialized agency of the United Nations that was created to encourage international cooperation in all forms of telecommunication. Its activities, carried out through the various ITU organs, include the maintenance of order in the use of radio frequencies; studying and making recommendations on technical and operational matters; and assisting countries in developing their own telecommunication systems.

The origin of the ITU can be traced to 1865, when the International Telegraph Union was established by a convention signed in Paris. The International Telecommunication Convention of 1932, which merged the International Telegraph Convention and the International Radiotelegraph Convention, provided that the International Telecommunication Union would succeed the International Telegraph Union when the convention became effective in 1934. The ITU was made a specialized agency of the United Nations in 1947, and the convention has been revised several times.

The organization of the ITU includes: (1) the Plenipotentiary Conference, which is the supreme organ of the ITU and meets approximately every five years; (2) two World Administrative Conferences, one for telegraph and telephone and one for radio, which meet according to technical needs; (3) the Administrative Council, which meets annually and is responsible for executing decisions of the Plenipotentiary Conference; (4) the General Secretariat, responsible for administrative and financial services; (5) the International Frequency Registration Board, concerned with the assignment of radio frequencies and the elimination of harmful interference; (6) the International Telegraph and Telephone Consultative Committee, which replaced separate committees for telegraph and telephone in 1957 and conducts technical studies; (7) the International Radio Consultative Committee, which conducts technical studies in the radio field; and (8) a number of Plan Committees.

The ITU has had its headquarters in Geneva since 1948, when it was moved from Bern.

International Telecommunications Satellite Consortium: *see* Intelsat.

International Telephone and Telegraph Corporation: *see* ITT Corporation.

international trade, the sale and purchase of consumer or capital goods and services, raw materials, securities, or gold across national borders. Such transactions may be accomplished by barter or, more typically, through the exchange of national currencies.

A brief treatment of international trade follows. For full treatment, *see* MACROPAEDIA: International Trade.

For statistical data on international trade, *see* BRITANNICA WORLD DATA ANNUAL.

Trade across national borders is as old as national borders themselves, but no fully satisfactory theory has been devised to account for its various aspects. The earliest theory of trade, mercantilism, developed in the 16th century and expressed the interests of the rising merchant class. With its insistence on the accumulation of national wealth in the form of gold by encouraging exports and discouraging imports, mercantilism was an inconsistent and ultimately self-defeating theory.

The classical school of British economists suggested a more useful approach. David Ricardo, in particular, was able to show that international trade would work to the advantage of both partners and increase the real income of all concerned if it were left to develop freely. In demonstrating his "principle of comparative advantage," Ricardo disproved the common assumption that a nation whose production of goods was less efficient, hence more costly, than that of other nations could not hope to engage in trade with more productive nations because, if such trade were to occur, the more productive nation would gain nothing from it.

The classical position on trade, as elaborated further by John Stuart Mill and other economists through the 20th century, firmly supported free trade and laissez-faire. It was, however, built on several simplifying assumptions that limited its ability to explain or prescribe for certain real-world situations. As an essentially static model, for example, it could not offer guidance on the sensitive subject of trade between capital-rich industrial countries and developing nations that produce chiefly primary products while attempting to build an industrial base of their own.

Free trade has throughout history been the exception rather than the rule. For numerous reasons, governments generally choose to erect barriers to trade, ranging from simple tariffs through sundry forms of regulation to outright prohibition. The most common motives for erecting such barriers include revenue generation from tariffs, protection of domestic industry or employment, national defense, a desire for self-sufficiency, or autarky, and persistent imbalances in international exchange.

International Unit (IU), in pharmacology, quantity of a substance, such as a vitamin, hormone, or toxin, that produces a specified effect when tested according to an internationally accepted biological procedure. For certain substances, the IU has been identified with a weight of a particular purified form of the material; for example, one gram of vitamin A acetate contains 2.904×10^6 IU. For international units of physical quantities, such as mass, length, etc., *see* International System of Units.

International Working Men's Association: *see* International, First.

Internationale, L', English THE INTERNATIONAL, Russian INTERNATIONAL, former official socialist and communist song. It was the anthem of the First, Second, and Third Internationals and until 1944 the national anthem of the U.S.S.R. It is still the unofficial anthem of many socialist and communist parties, including the Communist Party of the Soviet Union.

About 1871 a Parisian transport worker, Eugène Pottier, wrote the words (as a poem), which begin, "Debout, les damnés de la terre" ("Arise, the wretched of the earth") and

acclaim, "Nous n'étions rien—donc, soyons tout!" ("We were nothing—thus let us be everything!"); somewhat later a Lille industrial worker, Pierre Degeyter, wrote the music. Translated into Russian (in two successive versions), the *Internationale* was the Soviet national anthem until replaced on March 15, 1944, by *The Hymn of the Soviet Union* (*Gimn Sovetskogo Soyuza*), formerly referred to as the "Song of Stalin."

interplanetary exploration, use of unmanned space probes to investigate the other planets and other bodies in the solar system. (*See* space exploration.)

As with lunar exploration, the Soviet Union was the first nation to attempt interplanetary studies. In October 1960 the Soviets fired two probes to Mars. These initial attempts were failures. Early in 1961, the Soviet Union scored a qualified success with its first Venus probe. The spacecraft called Venera 1 passed within 62,000 miles (99,000 km) of Venus, but no data were transmitted owing to a telemetry failure. The Soviets continued to launch planetary probes in 1962. Only one, Mars 1, flew toward its designated target, but it too was plagued by radio failure and sent no data back.

The United States made its first attempt with Pioneer 5, launched on March 11, 1960. Operating flawlessly, the 94.8-pound (43-kilogram) vehicle passed near Venus and sent back the first deep-space measurements (*e.g.,* cosmic-ray and magnetic-field intensities). The first probe to send back data about another planet was the U.S. Mariner 2. Launched Aug. 26, 1962, Mariner passed within 21,600 miles (34,600 km) of Venus. The U.S. space probe Mariner 4, launched Nov. 28, 1964, marked the first successful mission to the planet Mars: the probe sent back the first photographs of the planet, from within 6,200 miles (9,900 km) of its surface.

The Soviets made considerable headway in their efforts to explore Venus during the last half of the 1960s. In 1966 they launched Venera 3, which became the first spacecraft to crash-land on another planet. Venera 4, which parachuted a capsule of instruments to the surface of Venus in 1967, was the first probe to transmit information on the planet's atmosphere. The United States continued with its Mariner and Pioneer programs. Mariner 5 (1967) measured the magnetic field and atmosphere of Venus, and Mariner 6 and 7 (1969) analyzed and photographed the surface of Mars. Pioneers 6, 7, and 9 (1965–68) collected valuable information about deep-space conditions.

The 1970s saw impressive gains in interplanetary exploration, particularly by the United States. The U.S. Mariner 10 became the first space probe to reach Mercury. On March 29, 1974, it flew to within 460 miles (740 km) of the planet and transmitted high-quality photographs of its surface. More spectacular were those missions involving the U.S. Viking 1 and 2 probes (1975). Both of these twin spacecraft consisted of an orbiter and lander, the latter equipped with various devices that were specially designed to search for traces of bacterial life on Mars. For months the probes relayed detailed, closeup pictures of the Martian terrain and precise measurements of its meteorological conditions. The results of the biological tests, however, proved inconclusive. Other important planetary flights were those of U.S. Pioneer Venus 1 and 2, which took radar photographs of Venus' surface and analyzed the chemical composition of its atmosphere in December 1978. That same month, the Soviet probes Venera 11 and 12 transmitted data on the planet's lower atmosphere before landing.

Exploration of the larger, more distant planets was also undertaken. The United States launched a total of four planetary probes toward Jupiter between 1971 and 1977, three of which flew on to Saturn after reaching their initial destination. In December 1973 Pioneer 10 became the first spacecraft to pass by Jupiter. Pioneer-Saturn flew to within 26,000 miles (42,000 km) of Jupiter in December 1974 and photographed its polar regions. In September 1979 the probe reached the vicinity of Saturn and discovered two additional rings around the planet. Voyager 1 and Voyager 2 flew past Jupiter in March and July 1979, respectively; the first probe detected a thin ring around the planet. Voyager 1 sped by Saturn in November 1980, taking photographs of the planet from a distance of 77,000 miles (124,000 km). These pictures revealed that the structure of Saturn's rings was far more complex than the best telescopes on Earth could discriminate. Voyager 2 passed Saturn in August 1981 and recorded information about the atmospheric gases of the planet and of its largest satellite, Titan. The probe passed within 50,600 miles (81,000 km) of Uranus in January 1986. It made many significant discoveries, including the presence of a substantial magnetic field around the planet and 10 additional satellites. Voyager 2 passed within 3,000 miles (4,800 km) of Neptune in August 1989. Among its major discoveries were the presence of a magnetic field and three rings around the planet, intense atmospheric storms, and at least six additional satellites.

Much information about comets was obtained from spacecraft exploration of Halley's Comet in 1986 during its closest approach to Earth. The Giotto probe of the European Space Agency (ESA) returned closeup photographs of the comet's nucleus and coma, while the Soviet Vega spacecraft analyzed the composition of its dust tail.

interplanetary medium, thinly scattered matter that exists between the planets and other bodies of the solar system as well as the forces (*e.g.,* magnetic and electric) that pervade this region of space. The material components of the interplanetary medium consist of neutral hydrogen, plasma gas of electrically charged particles (chiefly protons and electrons produced by the ionization of hydrogen released by the Sun), cosmic rays, and dust particles.

Extremely small amounts of neutral hydrogen have been detected throughout much of interplanetary space—*e.g.,* at the orbit of the Earth the concentration of non-ionized hydrogen is about 0.01 atom per cubic centimetre. Some of the neutral hydrogen that enters the solar system from interstellar space is reduced in quantity by photo-ionization and charge exchange with the solar wind plasma. The solar wind is a flow of completely ionized gas with a density of about 1,000,000 protons and 1,000,000 electrons per cubic centimetre that continuously expands outward through the solar system from the Sun's corona. This outflow of plasma transports the magnetic fields of force present at the surface of the Sun radially away from it and is responsible for deflecting both the tail of the Earth's magnetosphere and the tails of comets away from the Sun.

Most of the cosmic rays in the solar system originate beyond its boundaries, presumably in exploding stars called supernovae. Some are emitted by the Sun during solar flares. All such primary cosmic rays consist of atomic nuclei—principally the nuclei of hydrogen atoms (protons) and substantial numbers of nuclei of such heavier elements as lithium, boron, neon, and sulfur—and some electrons. Cosmic rays are distinguished from the particles of the solar wind by their extremely high speeds (*i.e.,* they travel near the speed of light) and their kinetic energies, which measure millions of electron volts as opposed to the 800 electron volts of solar wind particles.

Relatively small amounts of dust exist in the solar system, most of which appear to be orbiting the Sun in planes near the zone of planetary orbits. Much of the dust is thought to have been produced by collisions between asteroids. The dust grains vary considerably in density, ranging from two to eight grams per cubic centimetre. Some originating from comets have a lower density. Particles that measure one micrometre or less in size are quickly blown out of the solar system by radiation pressure from the Sun. About 16,000 tons of interplanetary dust particles of larger size are estimated to enter the Earth's atmosphere each year.

The magnetic field lines of the Sun are carried outward into space by the solar wind, but the lines of force remain attached to the surface of the Sun. Because of its rotation, the lines assume a spiral structure. Closely associated with the interplanetary magnetic field are electric forces that act to attract or repel charged particles. The intensity of the electric field is directly proportional to the intensity of the magnetic field and to the sine of the angle between the direction of the solar wind and the direction of the magnetic field. Besides the Sun, Earth, Mercury, Jupiter, Saturn, Uranus, and Neptune are known to have a measurable magnetic field.

Interpol, byname of INTERNATIONAL CRIMINAL POLICE ORGANIZATION, organization that exists to facilitate the cooperation of the criminal police forces of more than 125 countries in their fight against international crime. The aims of the organization are to promote the widest possible mutual assistance between all the criminal police authorities of the affiliated nations within the limits of the laws existing in those countries and to establish and develop all institutions likely to contribute effectively to the prevention and suppression of ordinary crime. A general secretariat headed by a general secretary controls the everyday workings of Interpol.

Each affiliated country has a domestic clearinghouse (called the National Central Bureau, or NCB) through which its individual police forces may communicate either with the general secretariat or with the police of other affiliated countries. Television and motion pictures have portrayed Interpol agents as wandering from country to country, making arrests wherever they please; such representations are false, since the nations of the world have varying legal systems and their criminal laws, practices, and procedures differ substantially from one another. No sovereign state would permit any outside body to bypass its police or disregard its laws. The main weapon in the hands of Interpol is not a universal detective; it is the extradition treaty.

Interpol's principal target is the international criminal, of which there are three main categories: those who operate in more than one country, such as smugglers, dealing mainly in gold and narcotics and other illicit drugs; criminals who do not travel at all but whose crimes affect other countries—for example, a counterfeiter of foreign bank notes; and criminals who commit a crime in one country and flee to another. At its headquarters in Lyon, Fr., Interpol maintains a voluminous record of international criminals and others who may later fall into that category, containing particulars of their identities, aliases, associates, and methods of working, gathered from the police of the affiliated countries. This information is sent over Interpol's telecommunications network or by confidential circular.

There are four types of confidential circular. The first type asks that a particular criminal be detained in order that extradition proceedings can be started. The second does not ask for detention but gives full information about the

criminal and his methods. The third describes property that may have been smuggled out of the country in which a crime was committed. A fourth deals with unidentified bodies and attempts to discover their identity.

Interpol began in Europe, which is not surprising since many countries of Europe have common frontiers and a criminal can, for example, be in one of four other countries within an hour of having committed a crime in Belgium. After World War I there was a great increase in crime; one of the countries most affected was Austria, and the Viennese police president, Johann Schober, obtained his government's support in 1923 for calling together representatives of the criminal police of other countries. The representatives of 20 nations met to discuss the problems facing them, and the International Criminal Police commission was formed that year. Vienna was the home of its first headquarters, and Schober became its first president. From 1923 until 1938 the commission flourished. In 1938 the Nazis seized Austria—and Interpol with it. All of its records were taken to Berlin. The outbreak of World War II brought Interpol's activities to a standstill. After World War II, the French government offered Interpol a headquarters in Paris, together with a staff for the general secretariat consisting of officials of the French police. This offer was gratefully accepted and Interpol was thus revived, although its complete reorganization was necessary, since all its prewar records had been lost or destroyed.

Interpol flourished, and by 1955 the number of affiliated countries had increased from 19 in 1946 to 55. A modern and complete constitution for the organization was ratified in 1956, under which its name was changed to the International Criminal Police Organization. The organization continued to progress, and by the mid-1980s the number of affiliated countries had risen to more than 125, representing all the continents of the world.

interpolation, in mathematics, the determination or estimation of the value of a function $f(x)$ from certain known values of the function. If $x_0 < \ldots < x_n$ and $y_0 = f(x_0), \ldots, y_n = f(x_n)$ are known, and if $x_0 < x < x_n$, then the value $f(x)$ is said to be an interpolation. If $x < x_0$ or $x > x_n$, $f(x)$ is said to be an extrapolation.

If $x_0, \ldots, x_n$ are given, along with corresponding values $y_0, \ldots, y_n$, interpolation may be regarded as the determination of a function $y = f(x)$ whose graph passes through the $n+1$ points (x_i, y_i) $(i = 0, 1, \ldots, n)$. There are infinitely many such functions, but the simplest is a polynomial $y = p(x) = b_0 + b_1 x + \ldots + b_n x^n$. If $p(x_i) = y_i$ for $i = 0, \ldots, n$, $p(x)$ is called the polynomial interpolation through the points (x_i, y_i). There is exactly one such interpolating polynomial of degree n or less. Polynomial approximation is useful even if the actual function $f(x)$ satisfying $f(x_i) = y_i$ is not a polynomial, for it often happens that the value of the polynomial $p(x)$ is a good estimate for the value of $f(x)$.

If two points (x_0, y_0) and (x_1, y_1) are given, the polynomial interpolation is called the linear interpolation, for here $p(x) = a + bx$. The methods of analytic geometry give $b = (y_1 - y_0)/(x_1 - x_0)$ — that is, the slope of the line $y = p(x)$ — and the equation $y = p(x) = y_0 + b(x - x_0)$. To illustrate, suppose the population of a city is known to have been 304,000 in 1970 and 335,000 in 1980. The population in 1974 and in 1987 can be estimated by linear interpolation. (The latter estimate is an extrapolation.) We have $x_0 = 1970$, $x_1 = 1980$, $y_0 = 304$, and $y_1 = 335$, where the y's are measured in thousands. Thus $b = (y_1 - y_0)/(x_1 - x_0) = 31/10 = 3.1$, and the interpolating line is $y = 304 + 3.1(x - 1970)$. Setting $x = 1974$, we find $y = 316.4$ thousand as the population estimate in 1974, and setting $x = 1987$ we estimate 356.7 thousand as the population in that year. This latter extrapolation is also called the straight-line projection.

It would be foolhardy to take the above numbers as anything more than reasonable estimates. Few people would consider a straight-line projection to the year 2100 as meaningful, or in the other direction an extrapolation back to the year 1492. (The latter gives an estimated population of about minus 1,000,000.)

For $n+1$ points, the polynomial interpolation is especially easy to compute if the x_i's are equally spaced. Let $x_{i+1} - x_i = h$ and calculate the differences $\Delta y_i = y_{i+1} - y_i$ $(i = 0, \ldots, n-1)$, then the second differences $\Delta^2 y_i = \Delta y_{i+1} - \Delta y_i$ $(i = 0, \ldots, n-2)$, and so on. Then take $a_0 = y_0$, $a_1 = \Delta y_0$, $a_2 = \Delta^2 y_2$, etc. Then the polynomial interpolation through the points (x_i, y_i) is

$$f(x) = a_0 + \frac{a_1(x - x_0)}{h} + \frac{a_2(x - x_0)(x - x_1)}{2!h^2} + \cdots + \frac{a_n(x - x_0) \cdots (x - x_{n-1})}{n!h^n}.$$

This is called Newton's formula after its discoverer, Sir Isaac Newton.

To illustrate this formula, suppose that a table of values gives $f(3) = 1.3106$, $f(3.1) = 1.3200$, and $f(3.2) = 1.3310$, and estimate $f(3.15)$ by quadratic interpolation. Here, $h = 0.1$ and $x_0 = 3$. The y's are successively 1.3106, 1.3200, 1.3310. The first differences are .0094, .0110, and the second difference is .0016. Newton's formula gives

$$f(3.15) = 1.3106 + .0094\,\frac{.15}{.1} + .0016\,\frac{.15 \times .05}{.1^2 \times 2} = 1.3253.$$

(The first two terms give the linear approximation 1.3247.)

Similar formulas can be found if the x_i's are not equally spaced, but the computation is more cumbersome.

interrex, plural INTERREGES, in ancient Rome, a provisional ruler specially appointed for a period during which the normal constituted authority was in abeyance (the interregnum). The title originated during the period of the Roman kings when an *interrex* was appointed (traditionally by the Senate) to carry on the government between the death of one king and the election of his successor. It was subsequently used in republican times for an officer appointed to hold the *comitia* that would elect new consuls when for some reason the retiring consuls had not done so.

In the regal period when the Senate decided to appoint *interreges,* the Senate divided itself into 10 *decuriae,* from each of which one senator was selected. Each of these 10 senators acted as king for 5 days; and if, at the end of 50 days, no king had been elected, the rotation was renewed. It was their duty to nominate a king, whose appointment was then ratified or refused by the *curiae* and the patrician senators. Under the republic the same procedures were followed when a consul could not complete his term of office. When the first consuls were elected, Spurius Lucretius may have held the *comitia* as interrex, and from that time down to the Second Punic War (218–201 BC) such officers were from time to time appointed. Thenceforward there is no record of the office until 82 BC, when the Senate appointed an *interrex* to hold the *comitia,* which made Sulla dictator. In 55, 53, and 52 BC *interreges* are again found, the last-mentioned being on the occasion when Pompey was elected sole consul.

interrogation, in criminal law, process of questioning by which police obtain evidence. The process is largely outside the governance of law except for rules concerning the admissibility at trial of confessions obtained through interrogation and limitations on the power of police to detain suspected persons against their will. *See also* confession.

In the United States relatively elaborate safeguards have been placed on the interrogatory powers of the police. In *Escobedo* v. *Illinois* (1964) and *Miranda* v. *Arizona* (*q.v.*), (1966), the Supreme Court required that the police inform a suspected person of his right to remain silent and of his right to have legal counsel present at his interrogation. These decisions were criticized as having achieved questionable safeguards of suspected persons' rights at great detriment to law enforcement. Some commentators pointed out that similar restrictions could not be found in the legal procedures of other countries. Most agreed that in Escobedo and Miranda, the Supreme Court stretched the constitutional requirements of right to counsel and freedom from self-incrimination for the purpose of achieving social justice for indigent defendants.

In Great Britain interrogation is regulated by the "judges' rules." If an officer has sufficient evidence that an offense has been committed, he must caution the suspect. After a suspect has been formally charged, he must be cautioned again before further questioning can take place. Continental European countries give their police far greater freedom to question suspects, but the power to hold a person on suspicion is limited in much the same manner as in Anglo-American countries. *See also* arrest; search and seizure.

Interrogation of the Old Men, The, Irish Gaelic AGALLAMH NA SEANÓRACH, also called DIALOGUE OF THE ANCIENTS, or COLLOQUY OF THE ANCIENTS, in Gaelic literature, the preeminent tale of the Old Irish Fenian cycle of heroic tales. The "old men" are the Fenian poets Oisín (Ossian) and Caoilte, who, having survived the destruction of their comrades at the Battle of Gabhra, return to Ireland from the timeless Land of Youth (Tír na nÓg) to discover they have been gone 300 years. They meet St. Patrick, who interrogates them about the deeds of Finn and the heroes of the past. Oisín joins his mother in a fairy mound; Caoilte travels with St. Patrick throughout Ireland, recounting the legends, history, and myths associated with each place they visit, while St. Patrick's scribe Brogan records the tales. This framework combines the traditional Irish *Dinnsheanchas* ("Histories of Places") with heroic legend and folklore. St. Patrick's delight in the tales and his desire to record them confirm the sympathetic attitude of monastic scribes to the pagan past.

The *Interrogation* was probably compiled from older sources and oral tradition by a single author in about 1200. Preserved in the 16th-century manuscript *The Book of the Dean of Lismore,* it is written in prose with verse passages that later gave rise to the Ossianic ballads.

interstate commerce, in U.S. constitutional law, any commercial transactions or traffic that cross state boundaries or that involve more than one state. The traditional concept that the free flow of commerce between states should not be impeded has been used to effect a wide range of regulations, both federal and state. A further extension of the established notion regarding the free flow of trade was introduced when Title II of the 1964 Civil Rights Act (*q.v.*)—dealing with discriminatory practices in public accommodations—was upheld by the Supreme Court. The court decided that a business, although operating within a single state, could affect interstate commerce with its restrictive laws and was, therefore, at odds with the federal legislation that proved to be enabling of the Constitution's commerce clause (*q.v.*).

Other specific historical instances of federal government action to regulate interstate commerce can be cited.

The Interstate Commerce Commission (ICC), established in 1887, was intended originally to regulate the railroad industry. It has since expanded to deal with trucks, ships, freight forwarders, and other interstate carriers. The regulations concern rates, routes, services, mergers, bills of lading, and securities issued by carriers.

The Sherman Act (1890), followed by the Clayton Act (1914), made illegal any acts that tended to interfere in free competition between and among industries, businesses, and all interstate commercial ventures. The Sherman Act specifically involved trusts, or monopolies, while the Clayton Act also concerned itself with stock acquisition and sale and forbade interlocking directorates as an impediment to free competition and, therefore, a bar to free interstate commerce.

The Federal Trade Commission (FTC) was established by the Federal Trade Commission Act of 1914, which gave the FTC powers—judicial, legislative, and executive—to administer the Sherman and Clayton acts.

The fair-trade legislation of 1937 protects manufacturers by permitting them to maintain an image of quality by charging a higher price through their retailers. These laws, which forbade discounters from selling the goods at lower than retail prices, were considered protective of interstate commerce because they restricted cutthroat competition. In recent years, however, these laws have been challenged, and the challenges have been upheld, showing the laws to be actually restrictive of interstate commerce rather than protective.

The Civil Aeronautics Board (CAB), which operated from 1938 to 1984, was involved in setting interstate routes as well as regulating fares for the commercial airlines. With the deregulation of the airline industry, however, the role of the CAB was much-diminished, and its residual functions were assumed by the Department of Transportation.

The Federal Communications Commission (FCC) was created to protect the right of the public to its airwaves through licensing and by overseeing the practices of broadcasters in radio and television. Again, the application to interstate commerce is that radio (and television) air belongs to all Americans even if the broadcast is local, the station privately funded, and the signal not intended to be picked up beyond the state lines.

In essence, the bulk of interstate-commerce regulatory agencies are to be found in the ICC (railroads and trucking), FCC (broadcasting), and FTC (antitrust provisions).

The several states also have some authority to regulate aspects of interstate commerce. Under the provisions of the states' police powers, interstate shipments may be banned, and, in the absence of federal laws to the contrary, state laws regulating highway traffic will invariably be upheld. In both examples, the burden on interstate commerce must not be so great as to outweigh either a state's greater interest or its implied powers of regulation in the absence of congressional legislation. Under the provisions of the commerce clause, a state may, in certain instances, tax goods in interstate commerce, providing that no congressional legislation prohibits such action (*Hammerstein* v. *Superior Court* [340 U.S. 602; 1951]).

Interstate Commerce Commission, the first regulatory agency established in the United States, and a prototype for independent government regulatory bodies. *See* regulatory agency.

interstellar medium, region between the stars that contains vast, diffuse clouds of gases and minute solid particles. Such tenuous matter in the interstellar medium of the Milky Way system, in which the Earth is located, accounts for about 5 percent of the Galaxy's total mass.

A brief treatment of the interstellar medium follows. For full treatment, *see* MACROPAEDIA: Galaxies.

The interstellar medium is filled primarily with hydrogen gas. A relatively significant amount of helium has also been detected, along with smaller percentages of such substances as calcium, sodium, water, ammonia, and formaldehyde. Sizable quantities of dust particles of uncertain composition are present as well. In addition, primary cosmic rays travel through interstellar space, and magnetic fields thread their way across much of the region.

In most cases, interstellar matter occurs in cloudlike concentrations, which sometimes condense enough to form stars. These stars, in turn, continually lose mass, in some instances through small eruptions and in others in catastrophic explosions known as supernovae. The mass is thus fed back to the interstellar medium, where it mixes with matter that has not yet formed stars. This circulation of interstellar matter through stars determines to a large degree the amount of heavier elements in the cosmic clouds. Interstellar matter in the Milky Way Galaxy is found primarily in the system's outer parts (*i.e.,* the so-called spiral arms), which also contain a large number of young stars and nebulae. This matter is closely concentrated in a plane, a flat region commonly known as the galactic disk.

The interstellar medium is studied by several methods. Until the mid-20th century, virtually all information was obtained by analyzing the effects of interstellar matter on the light from distant stars with the aid of optical telescopes. Since the early 1950s, much research has been conducted with radio telescopes, which enable astronomers to study and interpret radio waves emitted by various constituents of the interstellar medium. For example, neutral (*i.e.,* non-ionized) hydrogen atoms absorb or emit very small amounts of radio energy of a particular wavelength—namely, 21 cm. By being measured at this point and compared with nearby wavelengths, absorbing or radiating hydrogen clouds can be detected.

Optical and radio emissions have provided much of the information on the interstellar medium. In recent years, the use of infrared telescopes on orbiting satellite observatories has also contributed to knowledge of its properties, particularly the relative abundances of the constituent elements.

intertropical convergence zone (ITCZ), also called EQUATORIAL CONVERGENCE ZONE, belt of converging trade winds and rising air that encircles the Earth near the equator. The rising air produces high cloudiness, frequent thunderstorms, and heavy rainfall; the doldrums, oceanic regions of calm surface air, occur within the zone. The ITCZ shifts north and south seasonally with the Sun. Over the Indian Ocean, it undergoes especially large seasonal shifts of 40°–45° of latitude.

Intertype (trademark), typesetting machine similar to Linotype that sets type in full lines called slugs, long used to set newspaper copy. The Intertype machine incorporates a keyboard, a magazine that contains continuously reused type matrices, a casting mechanism, and a distribution system for returning used matrices to the magazine. Like Linotype machines, some Intertype machines are driven semiautomatically by means of perforated tape that indicates characters and spacing. Intertype, like Linotype, has to a large extent given way to photocomposition. *Compare* Linotype; photocomposition.

interval, in music, the distance in pitch between one tone and another, whether sounded simultaneously (harmonic interval) or successively (melodic interval). Simple intervals encompass one octave or less. Compound intervals exceed the range of one octave and are heard as varieties of their simple counterparts: a tenth (octave plus a third, *e.g.,* c–c′–e′) is associated by the ear with a third (an interval encompassing three notes, *e.g.,* c–e).

There are four perfect (P) intervals: prime, or unison (P1); octave (P8); fourth (P4); and fifth (P5), corresponding to the lowest in the harmonic overtone series. The other intervals (seconds, thirds, sixths, sevenths) have major (M) and minor (m) forms that differ in size by a half step (semitone).

Both perfect and major intervals may be augmented (A), or enlarged by a half tone—for example, c–e (M3) to c–e♯ (A3), or c–g (P5) to c–g♯ (A5). Perfect and minor intervals may be diminished (d), or narrowed by a half tone—for example, e–g (m3) to e–g♭ (d3), or f–c (P5) to f♯–c (d5). Enharmonic intervals are those that, in the system of equal temperament tuning, sound identical but are notated differently—for example, c–e♯ and c–f—according to the key in which the interval is written.

Intervals are calculated in terms of ratios between the constituent frequencies—for example, 2:1 for the octave, since the frequency of the higher pitch of an octave is twice that of the lower. For purposes of measurements of intervals outside the system of equal temperament, especially with reference to non-Western music, the octave is conveniently divided into 1,200 cents, with one semitone, or minor second, corresponding to 100 cents. So measured, the interval of a minor third, to cite but one instance, contains 300 cents in equal temperament, 294 in Pythagorean tuning, and 316 in just intonation.

interval estimation, in statistics, evaluation of a parameter (mean, standard deviation, proportion) of a population by computing an interval, or range of values, within which the parameter is most likely to be. The likelihood is specified by a probability, commonly chosen as 95 or 99 percent.

The interval containing a population parameter—for example, the mean, symbolized by the Greek letter mu, μ—is established by calculating that statistic from values measured on a random sample taken from the population and by applying the knowledge (derived from the mathematical theory of probability) of the fidelity with which the properties of a sample represent those of the entire population.

The probability tells what percentage of the time the assignment of the interval will be correct, but not what the chances are that it is true for any given sample. Of the intervals computed from many samples, a certain percentage will contain the true value of the parameter being sought.

Intervals can be established only when the distribution of large samples tends to normal and the distribution of small samples tends to Student's *t*-distribution or the chi-square distribution (*see* Student's *t*-test).

The intervals are called confidence intervals; the end points of an interval are called upper and lower confidence limits. The probability is called the confidence coefficient.

interval training, method of competitive training in which rest and exercise intervals of controlled duration are alternated. Rest intervals are usually the amount of time needed to allow the athlete's pulse rate to return to near normal before beginning the next exercise period. During exercise intervals, the athlete tries to maintain a specified level of performance, slightly less than his best effort. Interval training is frequently used by track and competitive-swimming coaches.

intestate succession, in the law of inheritance, succession to property that has not been

disposed of by a valid last will or testament. Although laws governing intestate succession vary widely in different jurisdictions, they share the common principle that the estate should devolve upon persons standing in some kinship relation with the decedent. Modern laws of intestacy have tended not to emphasize the traditional concern that property be kept within the bloodline through which it came to the decedent. Modern practice also tends to favour the rights of the surviving spouse, whether or not he or she is regarded as kin, and (in most jurisdictions) to ease restrictions on inheritance by illegitimate children.

intestinal diverticulum, abnormal pocket in the wall of the intestine, found singly or in large numbers along the small intestine but more frequently along the colon (diverticulosis). Diverticulosis occurs in 5 to 10 percent of persons more than 40 years old; its cause is unknown, but weakness of the intestinal wall and increased pressure within the channel of the intestine are probably significant factors.

The diverticula usually produce no symptoms, although occasionally they may bleed, even when there is no inflammation. In about 20 percent of persons with diverticulosis, the diverticula become inflamed (diverticulitis), producing pain, chills and fever, obstruction of the bowel, and, in severe cases, bleeding and perforation of the intestinal wall. Whereas medical treatment is usually adequate for mild and uncomplicated cases, surgical removal of infected portions of the colon may become necessary.

intestinal gas, volatile material contained within the digestive tract. Intestinal gas consists principally of swallowed air and partly of by-products of digestion. In humans the digestive tract contains normally between 150 and 500 cubic centimetres of gas. During eating, air is swallowed into the stomach; this is either eructated or passed on to the intestines.

Gas in the stomach contains approximately 15 to 16 percent oxygen and 5 to 9 percent carbon dioxide; the rest is nitrogen. The air that is breathed contains about 21 percent oxygen; thus, some of the swallowed oxygen is absorbed by the blood capillaries in the stomach. Carbon dioxide is formed by reduction of the food by the stomach's gastric juices. Nitrogen is an inert element that is neither used nor absorbed as a gas, and it is usually passed on.

The small intestine absorbs some of the carbon dioxide and oxygen and rapidly passes the remaining gas to the large intestine. If obstructions occur in the small intestine, gas pockets can accumulate containing as much as 3,500 cubic centimetres of gas. These pockets distend the small intestine, causing severe pain. Normally, gas passes through the small intestine with the regular intestinal movements.

In the large intestine, or colon, the gas volume is usually 100 to 200 cubic centimetres. Most of the oxygen has been removed, and the amount of carbon dioxide has increased. New gases formed from bacterial fermentation are added in the colon. Of the new gases produced, hydrogen is the major component. Some of this is absorbed by the blood and released through the lungs during breathing. Other gas products formed are methane, hydrogen sulfide, ammonia, and various sulfur-containing mercaptans. Excess gas in the colon is eventually passed from the body by a process known as flatulence. Certain foods, such as beans, pork, onions, cabbage, and cauliflower, because of their high sulfur content, are known to increase gas production. Cows and other animals that eat mainly plant life have a larger volume of intestinal gas than do human beings and may produce several litres of gas daily.

intestinal juice, clear to pale, yellow, watery secretion composed of hormones, digestive enzymes, mucus, and neutralizing substances released from the glands and mucous-membrane lining of the small and large intestines. Some of the functions of intestinal juice are to neutralize hydrochloric acid coming from the stomach; to release gastrointestinal hormones into the bloodstream; and to provide digestive enzymes, which facilitate the digestion and absorption of food. Intestinal-juice secretions are liberated under the influence of hormones, the vagus nerve, and the mechanical stimulation produced by the presence of food.

intestinal obstruction, functional or mechanical blockage of the alimentary canal. There is functional blockage when the muscles of the intestinal wall fail to contract normally in the wavelike sequence (peristalsis) that propels the intestinal contents. Mechanical obstructions include a narrowing of the channel (stricture), adhesions, the presence of a foreign object, pressure from outside, hernia, volvulus, and intussusception. In a hernia (*q.v.*), a loop of intestine protruding from the abdomen may be compressed at the point where it passes through the abdominal wall. A volvulus (*q.v.*) is a twisting of the intestine upon itself, and an intussusception (*q.v.*) is the telescoping of a section of intestine into an adjacent portion.

In obstructions high in the intestinal canal, the loss of fluids and chemicals through vomiting is frequent. Obstructions in the lower reaches of the small intestine (ileum) and in the large intestine are inaccessible to evacuation by vomiting; the intestine above the obstruction becomes distended by accumulated material and swallowed air, the pressure in the intestinal channel may cause death of tissue in the walls of the intestine, and the walls may become abnormally permeable, allowing noxious agents to escape into the abdominal cavity and thence into the bloodstream. The signs and symptoms of intestinal obstruction, as well as the treatment, depend upon the nature of the obstruction and its location.

intestinal squeeze, pain and possible injury to the small or large intestine caused by expansion of trapped gases when a pilot or underwater diver goes from areas of greater pressure to areas of less pressure. Under normal atmospheric conditions, intestinal discomfort can be felt when air or gas collects in the intestines. Relief is obtained by expelling the gas when it begins to expand the intestinal walls. When the pilot goes from normal land environments into higher altitudes, the pressures exerted upon the body are reduced. Gases in his body expand proportionally to the reduction in pressure. Swallowed air or gases formed by the breakdown of food products, if not expelled by burping or by expelling gas through the anus, will distend the intestines. Divers, on the other hand, are increasing the amount of pressure on their bodies while descending under water. Gases are compressed in the body at depths; upon return to the surface, however, they again begin to expand. If a diver swallows air while at depth or if food products produce gases, he is confronted with the same situation as the pilot when pressure is reduced.

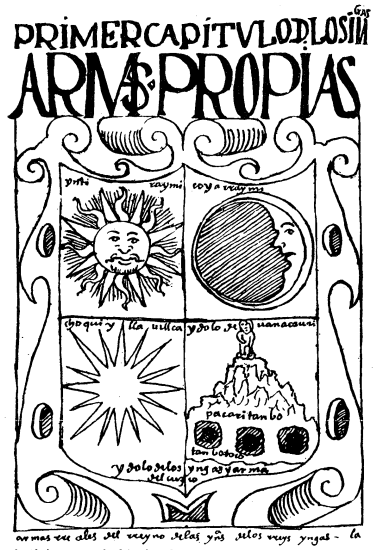
The usual symptoms are a bloated feeling and pain. If the gas cannot be relieved, the intestinal tissue may rupture or the pain may be severe enough to cause fainting. Intestinal squeeze can be avoided in many cases by selecting a diet before working that does not usually cause intestinal gas. Carbonated beverages, cabbage, beans, fruits, nuts, and spicy foods are thus to be avoided. *See also* decompression sickness.

intestine (anatomy): *see* large intestine; small intestine.

Inthanon, Doi, mountain in Chiang Mai province in the Northern region of Thailand, the country's highest peak (8,515 ft [2,595 m]). It lies southwest of Chiengmai, in a spur of the Thanon Tong Chai Range between the Chom (west) and Ping (east) rivers.

Inti, also called APU-PUNCHAU, in Inca religion, the sun god; he was believed to be the ancestor of the Incas. Inti was at the head of the state cult, and his worship was imposed throughout the Inca Empire. He was usually represented in human form, his face portrayed as a gold disk from which rays and flames extended. Inti's sister and consort was the moon, Mama-Kilya (or Mama-Quilla), who was portrayed as a silver disk with human features. Among the 20th-century Quechua people, Inti is occasionally confused with Christ or God.

Inti-raymi was one of a cycle of *raymi*, or "festivals." Held in June (after the Spanish



Inti (upper left) depicted as the sun god in the Inca royal coat of arms, illumination from the manuscript of Felipe Guamán Poma de Ayala, 1560; copy in the British Library of the original in the Royal Library, Copenhagen

Photograph by Michael Holford

conquest, in May or June to coincide with the feast of Corpus Christi), Inti-raymi honoured the sun god and was celebrated with animal sacrifices and ritual dances.

Inti Cusi Huallpa Huáscar: *see* Huascar.

Intibucá, department, southwestern Honduras, bounded on the south by El Salvador. The 1,186-sq-mi (3,072-sq-km) department consists of portions of the Cordillera de Montecillos and the Sierra de Opalaca and is drained by tributaries of the southward-flowing Lempa River and the northward-flowing Ulúa. The Honduran population is mostly Indian, but El Salvador's political problems and overcrowding have swelled the flow of refugees into the department. Less than one-third of the land is in farms and less than one-fifth of this is cultivated because of the very rugged terrain. The principal products are wheat, corn (maize), beans, cattle, sheep, hogs, lumber, and handicraft articles.

La Esperanza (*q.v.*), the departmental capital and major town, is known for its handweaving industry. Second-class highways, one of which leads northward from the Pan-American Highway, converge upon La Esperanza. Pop. (1983 est.) 111,412.

Intimism, variety of late 19th- and early 20th-century painting that made an intense exploration of the domestic interior as subject matter. It was practiced principally by Pierre Bonnard and Édouard Vuillard, the two most



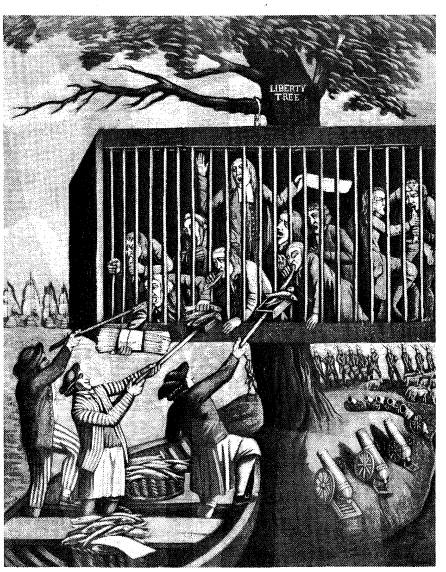
"Woman Sweeping," Intimist painting by Édouard Vuillard, oil on panel, *c.* 1892; in the Phillips Collection, Washington, D.C.

By courtesy of the Phillips Collection, Washington, D.C.

distinguished members of the Nabis, a Parisian group that believed in expressing ideas and emotions through colour and line. To convey the warmth, comfort, and quiet isolation of interior scenes, Bonnard and Vuillard used the Impressionist broken-colour technique of capturing the light and atmosphere of the fleeting moment (*see* Impressionism). But, unlike the Impressionists, who derived their colours from precise observation of the visual world, these painters exaggerated and distorted natural colour to express mood.

Both artists displayed a strong decorative sense in the arrangement of dense areas of colour. Using rich, subdued colours, Vuillard produced paintings characterized by harmonious composition and exquisite form. Bonnard, somewhat less concerned with formal structure, infused a playful tenderness into his bright, gently coloured scenes (which usually included the unobtrusive figure of his wife). Although Intimism was not a major movement, its achievements were considerable enough to give it an important place in the art of the period.

Intolerable Acts, also called COERCIVE ACTS (1774), in U.S. colonial history, collective name of four punitive measures enacted by the British Parliament in retaliation for acts of colonial defiance, together with the Quebec Act establishing a new administration for the territory ceded to Britain after the French and Indian War (1754–63).



"The Bostonians in Distress," mezzotint by Philip Dawe, 1774, following the closing of the city's harbour

By courtesy of the Library of Congress, Washington, D.C.

Angered by the Boston Tea Party (1773), the British government passed the Boston Port Bill, closing that city's harbour until restitution was made for the destroyed tea. Second, the Massachusetts Government Act abrogated the colony's charter of 1691, reducing it to the level of a crown colony, substituting a military government under Gen. Thomas Gage, and forbidding town meetings without approval.

The third, the Administration of Justice Act, was aimed at protecting British officials charged with capital offenses during law enforcement by allowing them to go to England or another colony for trial. The fourth Coercive Act included new arrangements for housing British troops in occupied American dwellings, thus reviving the indignation that surrounded the earlier Quartering Act, which had been allowed to expire in 1770.

The Quebec Act, under consideration since 1773, removed all the territory and fur trade between the Ohio and the Mississippi from possible colonial jurisdiction and awarded it to the province of Quebec. By establishing French civil law and the Roman Catholic religion in the coveted area, the act raised the spectre of popery before the mainly Protestant colonies.

The Intolerable Acts represented an attempt to reimpose strict British control, but after 10 years of vacillation, the decision to be firm had come too late. Rather than cowing Massachusetts and separating it from the other colonies, the oppressive measures became the justification for convening the First Continental Congress later in that same year of 1774.

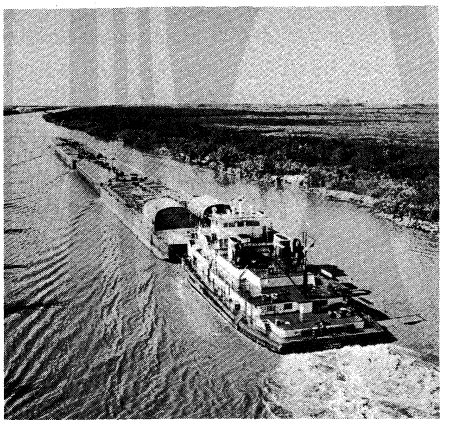
intonation, in phonetics, the melodic pattern of an utterance. Intonation is primarily a matter of variation in the pitch level of the voice (*see also* tone), but in such languages as English, stress (*q.v.*) and rhythm are also involved. Intonation conveys differences of expressive meaning (*e.g.,* surprise, anger, wariness).

In many languages, including English, intonation serves a grammatical function, distinguishing one type of phrase or sentence from another. Thus, "Your name is John," beginning with a medium pitch and ending with a lower one (falling intonation), is a simple assertion; "Your name is John?", with a rising intonation (high final pitch), indicates a question.

Intracoastal Waterway, navigable toll-free shipping route, extending for about 3,000 mi (4,800 km) along the Atlantic and Gulf of Mexico coasts in the southern and eastern U.S. It utilizes sounds, bays, lagoons, rivers, and canals and is usable in many portions by deep-draft vessels. The route is federally maintained and is connected to inland waterways in many places. It was originally planned to form a continuous channel from New York City to Brownsville, Texas, but the necessary canal link through northern Florida was never completed; hence, it is now in two separate sections—the Atlantic and the Gulf.

The Atlantic Intracoastal Waterway serves ports from Boston to Key West, Fla. The route is linked by several essential man-made canals, including the Cape Cod, Chesapeake and Delaware, and Albemarle and Chesapeake. The lowest controlling depth is 6.1 ft (1.9 m) in the Dismal Swamp Canal of Virginia and North Carolina. During World War II, the route became important as a means of avoiding the submarine menace along the coast. Commercial traffic (oceangoing vessels and barges) serves the heavily concentrated industrial areas north of Norfolk, Va; whereas, to the south, the waterway accommodates mainly pleasure craft travelling to the Florida resort areas.

The Gulf Intracoastal Waterway serves ports for more than 1,100 mi between Brownsville, Texas, and Apalachee Bay, Fla. It lies mainly behind barrier beaches and provides a 150-ft-wide, 12-ft-deep channel. At its eastern end, the waterway is not directly connected with its Atlantic counterpart, except via the open waters of the Gulf of Mexico and the 6-ft-deep Okeechobee Waterway in southern Florida. The heaviest commercial activity is centred at New Orleans and extends eastward to the Black Warrior–Tombigbee river system at Mobile Bay, Ala., and westward to the major Texas ports. The Plaquemine–Morgan City



The Intracoastal Waterway in Louisiana, U.S.

Charles May—Shostal Assoc./EB Inc.

Waterway provides direct connection west of New Orleans with the extensive Mississippi River Valley system of inland waterways, and the Harvey Lock at New Orleans furnishes a direct entrance to the Mississippi River. Part of the Gulf route at New Orleans consists of the Inner Harbor Navigation Canal, an artificial waterway that is the axis of a major industrial district. Among the principal items moved on the route are petroleum and its products, industrial chemicals, pipe and other supplies for the oil fields, and sulfur.

Intramuros, urban district and historic walled city within Metropolitan Manila, in the Philippines. The name, from the Spanish word meaning "within walls," refers to the fortified city founded at the mouth of the Pasig River shortly after 1571 by the Spanish conquistador Miguel López de Legazpi.

Intramuros, though formally subject to the viceroyalty of New Spain in Mexico City, became the capital of the New Spanish island dominion and flourished during the 17th and 18th centuries. The 146 ac (59 ha) within the original 20-ft- (6-m-) thick walls contain Manila Cathedral, Fort Santiago, San Augustin Church, the University of the City of Manila, and other monuments to the political and cultural influence Intramuros exerted during this period. Urban congestion during the late 19th and early 20th centuries gradually encircled the site (the moat was filled in 1905) and wore down and replaced the distinctive Spanish colonial architecture with government offices; in 1944 U.S. bombing completed the reduction of the city to rubble. The site was cleared after World War II, but reconstruction was very slow. By the early 1980s, however, restoration of the pentagonal walls, seven gates, and small plazas that distinguish Intramuros from the surrounding Malay and Americanized districts of Manila was well underway. Pop. (1970) 2,560.

intrigue, comedy of, also called COMEDY OF SITUATION, comic form in which type characters are involved in complex plots and subplots based on ridiculous and contrived situations with large doses of farcical humour. An example of comedy of intrigue is Shakespeare's *Comedy of Errors,* itself a version of two plays

by the Roman comedy writer Plautus (*c.* 254–184 BC), *Menaechmi* and *Amphitruo,* a humorous exploitation of the confusion resulting from twin masters and their twin servants.

In the hands of a master such as Molière, the comedy of intrigue often shades into a comedy of manners. Thus, *Le Médecin malgré lui* (1666; *The Doctor in Spite of Himself, c.* 1669), which begins as a farce based on the simple joke of mistaking the ne'er-do-well woodcutter Sganarelle for a doctor, gradually becomes a satire on learned pretension and bourgeois credulity as Sganarelle fulfills his role with as good results as a bona fide doctor.

intrinsic factor, a mucoprotein (*i.e.,* a complex compound containing both polysaccharide and protein components) secreted in the stomach that combines with vitamin B_{12} (cyanocobalamin), thereby making the vitamin absorbable in adequate amounts to prevent pernicious anemia. The intrinsic factor is so named because it was postulated to be a substance produced in the body (intrinsic) that acted upon a substance from outside the body (an extrinsic factor, later identified as vitamin B_{12}) to produce a substance causing red blood cells to develop.

introspection, the process of observing the operations of one's own mind with a view to discovering the laws that govern the mind (from Latin *introspicere,* "to look within"). In a dualistic philosophy that divides the stuff of the natural world (matter, including the human body) from the contents of consciousness, introspection is the chief method of psychology. Thus, it was the method of primary importance to many philosophers, including Thomas Hobbes, John Locke, George Berkeley, David Hume, James Mill, John Stuart Mill, Alexander Bain—as it was to the 19th-century pioneers of experimental psychology, especially Wilhelm Wundt, Oswald Külpe, and E.B. Titchener.

To all these men the contents of consciousness appeared to be immediate experience: to have an experience was to know that one has it. In this sense introspection appeared to be self-validating; it could not lie.

Wundt and Titchener, as well as Külpe in his early years (until 1893), believed that introspection finds in consciousness a dynamic mixture of essentially sensory materials—sensations proper, images, and feelings that closely resemble sensations. This view is known as classical introspection and became unpopular after Titchener.

Many other psychologists, however, found other kinds of content in consciousness. The German philosopher Franz Brentano and Külpe, in his later years, were the most influential act psychologists, who saw consciousness as constituted of both sensory contents and more impalpable acts.

Perpetual controversy about the results of introspection made it quite clear by 1920 that introspection is not infallible and, later, that its fallibility is due to the fact that it is not immediate but is an observational, inferential process that takes time and is subject to errors of observation. By 1940 both the concept of dualism and the word introspection had largely disappeared from scientific psychology in the U.S., where behaviourism, which rejected the significance of consciousness, ruled.

Actually, the repudiation of dualism by modern experimental psychology led only to the surrender of the word introspection, not to the abandonment of the method. The general method (not classical introspection) is used without the name (1) in phenomenological description as the Gestalt psychologists used it, as the Phenomenologists and Existentialists—mostly in Europe—use it, and as it is employed in the description of experience in studies of perception; (2) in psychophysics, where are determined the relations of conscious events, usually of a sensory nature, to magnitudes of the stimulus, especially in the determination of the sensory thresholds and sensory scales; and (3) in the reports of patients as they describe their conscious states to psychiatrists and psychoanalysts, sometimes in free association on the psychoanalytic couch and sometimes in projective tests, such as the Rorschach ink blots, in which the subject for diagnostic purposes reports the train of thought aroused in him by an equivocal stimulus or situation.

introvert, a person whose thoughts are continually directed inward, in contrast to an extrovert (*q.v.*). Both terms were coined by the 20th-century Swiss psychiatrist Carl Jung.

The introvert tends to have difficulty adjusting to social situations and expressing emotions. Excessive daydreaming and introspection, careful balancing of considerations before reaching decisions, and withdrawal under stress are also typical of the introverted personality. Research has shown, however, and Jung himself recognized that no one can be accurately described as a "typical" introvert or extrovert.

intuition, in philosophy, the power of obtaining knowledge that cannot be acquired either by inference or observation, by reason or experience. As such, intuition is thought of as an original, independent source of knowledge, since it is designed to account for just those kinds of knowledge that other sources do not provide. Knowledge of necessary truths and of moral principles is sometimes explained in this way.

Some necessary truths—for example, statements of logic or mathematics—can be inferred, or logically derived, from others. But not all such statements can be so derived, and there must be some statements not inferred (*i.e.,* axioms). Furthermore, the interconnected character of such a system, the derivability of statements from axioms, presupposes rules of inference. Because the truth of axioms and the validity of basic rules of inference cannot themselves be established by inference—since inference presupposes them—or by observation—which can never establish necessary truths—they may be held to be objects of intuition.

Axioms are ordinarily truisms; consequently, self-evidence may be taken as a mark of intuition. To "see" that one statement follows from another, that a particular inference is valid, enables one, it is said, to make an "intuitive induction" of the validity of all inferences of that kind. Other nonformal necessary truths (*e.g.,* "nothing can be both red and green all over") are also explained as intuitive inductions: one can see a universal and necessary connection through a particular instance of it.

Moral philosophers from Joseph Butler to G.E. Moore have held that moral assertions record knowledge of a special kind. The rightness of actions (or, in Moore's view, the goodness of states of affairs) is discovered by a special moral faculty, seen as analogous to the power of observation or the power of intuiting logical principles. This theory, like that which holds logical principles to be the outcome of intuition, bases its case on the self-evident and unarguable character of the assertions with which it is concerned.

Much the same argument can be brought against both theories. The axioms of logic and morality do not require for their interpretation a special source of knowledge, since neither records discoveries; rather, they record resolutions or conventions, attitudes that are adopted toward discourse and conduct, not facts about the nature of the world or of man.

Two further technical senses of intuition may be briefly mentioned. One, deriving from Immanuel Kant, is that in which it is understood as referring to the source of all knowledge of matters of fact not based on, or capable of being supported by, observation. The other is the sense attached to the word by Spinoza and by Henri Bergson, in which it refers to supposedly concrete knowledge of the world as an interconnected whole, as contrasted with the piecemeal, "abstract" knowledge obtained by science and by common observation.

intuitionism, school of mathematical thought introduced by the 20th-century Dutch mathematician L.E.J. Brouwer that contends the primary objects of mathematical discourse are mental constructions governed by self-evident laws. Intuitionists have challenged many of the oldest principles of mathematics and logic as being nonconstructive and hence mathematically meaningless. *Compare* formalism; logicism. *See also* mathematics, foundations of.

intussusception, telescoping of a segment of the intestine into an adjacent segment, producing a mechanical obstruction of the alimentary canal. Primary intussusception is sometimes congenital and rarely appears later than the third year; it arises in the course of intestinal development, but the mechanism producing it is unknown.

Secondary intussusception may occur at any age and appears to be triggered by the development of a growth projecting into the intestinal lumen; if the wall at that point is weakened, it may buckle when peristalsis forces the growth toward the anus and the segment of the gut immediately anterior to the growth is pulled along and becomes ensheathed by a posterior segment. The blood supply to the engulfed segment may be so impaired as to cause gangrene and severe constriction or complete blockage of the canal. Treatment is usually surgical removal of the growth and of the affected part of the intestine.

Articles are alphabetized word by word, not letter by letter

Inugsuk culture, Eskimo culture that developed from the Thule culture (*q.v.*) in northern Greenland (Kalâtdlit-Nunât) during the 12th and 13th centuries. It was distinguished by an increased dependence on hunting by means of a kayak (a one-man skin boat) and implements associated with this development. Sea mammals (especially whales) and land mammals were hunted; birds and fish also formed part of the diet. Dog-drawn sleds and umiaks (large, open skin boats) also provided transportation. Bone, wood, whalebone, and stone were used in manufacture. There were distinctive types of harpoon heads as well as elements that show a Norse influence (there were Norse settlements in southern Greenland from 985 to about 1500), such as small wooden containers produced by the coopering technique and trade goods such as church-bell metal and woven wool cloth.

The Inugsuk culture spread southward along the west coast of Greenland to its tip, and then moved northward along the east coast. In northeastern Greenland the Inugsuk mixed with earlier cultural elements, forming the hybrid Northeast Greenland mixed culture, beginning about the 16th century.

From about 1600, individual coastal settlements began to lose contact with one another, some becoming depopulated or breaking up. In the 18th and 19th centuries, descendants of the Inugsuk Eskimo again came into contact with European culture, this time with whale hunters and then Danish colonizers. The Northeast Greenland Eskimo disappeared in the 19th century, for unknown reasons. Present Greenland culture is based on the mixture of European and Eskimo cultures.

Inuit (people): *see* Eskimo.

Inukai Tsuyoshi (b. 1855, Okayama, Japan—d. May 15, 1932, Tokyo), Japanese politician and prime minister whose assassination marked the end of party participation in the Japanese government in the period preceeding World War II.

Of samurai origin, Inukai began his career as a reporter. He became minister of education in 1898 and then founded a new political party, the Rikken Kokumintō (Constitutional National Party). In 1913 he headed a popular movement against the autocratic and unpopular government of the former army general Katsura Tarō. As a result of Inukai's efforts, Katsura was forced to resign, opening the way for the gradual development of a cabinet selected by the majority party in the Diet (Japanese parliament).

In 1922 Inukai organized another new party, the Kakushin Kurabu (Reform Club), and the following year he again joined the Cabinet, this time as minister of communications. In 1924, however, he destroyed this coalition government when he left it to join the Rikken Seiyūkai (Friends of Constitutional Government), the largest party in Japan; and in 1929 he became president of the Rikken Seiyūkai.

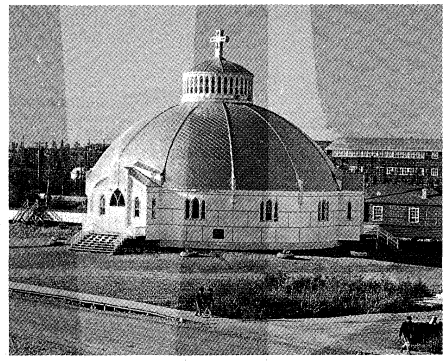
In 1931 Japanese troops occupied the Chinese provinces of Manchuria (Northeast Provinces), the first step in the process that led to the Pacific conflict of World War II. When the Cabinet resigned, Inukai, who headed the Rikken Seiyūkai, took the country off the gold standard. This move produced such a boom in exports that Japan became the first country to recover from the effects of the Great Depression.

Opposed to the continued attempts by the military to usurp the decision-making functions of the Cabinet, Inukai prepared to send a representative to negotiate with the Chinese and tried to halt any further military activities, whereupon he was assassinated during an attempted coup d'état by ultranationalist naval officers.

inulin clearance, clinical test that estimates the filtering capacity of the glomeruli (the main filtering structures of the kidney) by measuring the rate at which inulin, the test substance, is cleared from blood plasma. Inulin is the most suitable and accurate substance to test because it is a small, inert polysaccharide molecule that readily passes through the glomeruli and remains neutral to cellular activity. The normal rate at which substances are filtered out of the plasma (the glomeruli filtration rate) is about 100 to 150 millilitres per minute; it is markedly reduced in such conditions as acute glomerulonephritis, characterized by inflammation of the small blood vessels that loop through the glomeruli.

Inuvik, northwestern region of the Northwest Territories, Canada. Inuvik region was created in the early 1970s by the territorial government and was formerly part of Mackenzie and Franklin districts. It extends from Wrigley northward along the middle reaches of the Mackenzie River, which forms its heartland, to the river's delta on the Beaufort Sea of the Arctic Ocean and including Banks Island, the westernmost island in the Canadian Arctic Archipelago, to the north. The region is characterized by the Richardson and Mackenzie mountains (in the northwest and southwest, respectively), the Mackenzie River lowlands (centre), and the Franklin Mountains (east). Most of the region lies in a subarctic coniferous forest-tundra vegetation zone. Inuvik town, located on the Mackenzie delta, is the regional headquarters and the area's major commercial and transportation centre. The region's economy, once based on fur trapping and whaling, now includes the development of petroleum and natural-gas resources. The population is a mix of Athabascan-speaking North American Indians, Eskimo (Inuit), and other Canadians. Pop. (1986) 8,411.

Inuvik, town, Inuvik region, Northwest Territories, Canada, on the East Channel of the Mackenzie River delta, just east of the northernmost point of the Yukon. Planned as a model community by the Canadian government, with an Inuit (Eskimo) name meaning "place of man," it was built (1954–62) on firm, well-drained land to avoid the building, road, and sewer construction problems that had plagued Aklavik, which was established on shifting permafrost and silt.



Igloo-shaped Roman Catholic church in Inuvik, N.W. Terr.

By courtesy of the Canadian Government Travel Bureau, Ottawa; photograph, Ted Grant

Government headquarters of Inuvik region, the town is now the major commercial and transportation centre for the area and has schools, a hospital, and hotel facilities. It is a centre for trappers, sealers, and walrus hunters, is a base for oil exploration of the area, and specializes in Eskimo handicrafts and garments. Pop. (1986) 3,389.

Invar, alloy of iron that expands very little when heated; it contains 64 percent iron and 36 percent nickel. Invar was formerly used for absolute standards of length measurement and is now used for surveying tapes and in watches and various other temperature-sensitive devices. The trademark name was selected by the alloy's inventor, the Swiss physicist Charles-Édouard Guillaume, to express the invariability of its dimensions when heat is applied.

invention, in music, any of a number of markedly dissimilar compositional forms dating from the 16th century to the present. While its exact meaning has never been defined, the term has often been affixed to compositions of a novel, progressive character—*i.e.,* compositions that do not fit established categories. The earliest-known use of the term in *Premier livre des inventions musicales* (1555) by the Frenchman Clément Janequin clearly alludes to the composer's highly original programmatic chansons—secular French part-songs containing extramusical allusions (*e.g.,* imitations of battle sounds). Similarly capricious or novel effects occur in John Dowland's *Invention for Two to Play upon One Lute* (1597); Lodovico da Viadana's *Cento concerti ecclesiastici . . . Nova inventione* (1602), the first sacred collection to require a basso continuo; and Antonio Vivaldi's *Il cimento dell'armonia e dell'invenzione,* opus 8 (1720; "The Contest Between Harmony and Invention"), which contains, among others, a number of programmatic concerti.

Best known perhaps is the set of two-part inventions and 15 three-part sinfonias (often called *Three-Part Inventions*) for clavier (*c.* 1720) by J.S. Bach, each of which is characterized by the contrapuntal elaboration of a single melodic idea and for which Francesco Bonporti's *Invenzioni* for violin and bass (1712) may have served as a model.

Twentieth-century composers of pieces entitled "Invention" include the Austrian Alban Berg, the Germans Boris Blacher and Wolfgang Fortner, and the Russian-American composer Alexander Tcherepnin, who followed Bach's lead more or less directly.

inventory, in business, any item of property held in stock by a firm, including finished goods held for sale, goods in the process of production, raw materials, and goods that will be consumed in the process of producing goods to be sold. Inventories appear on a company's balance sheet as an asset. Inventory turnover, which indicates the rate at which goods are converted into cash, is a key factor in appraising a firm's financial condition. Fluctuation in the ratio of inventory to sales is known as inventory investment or disinvestment.

The money value of the inventory also appears on the income statement in determining the cost of the goods sold. The cost of goods sold is determined by adding the inventory on hand at the beginning of the period and the cost of purchasing and producing goods during the period and subtracting from this total the inventory on hand at the end of the period. For financial statements inventories are usually priced (1) at cost or (2) at cost or market value, whichever is lower. The cost of the merchandise and materials purchased usually fluctuates during the year, and it is necessary to determine which cost is to be used for inventory purposes. Three methods are in general use: average cost; first in–first out (FIFO), which assigns the cost of the last units purchased to the inventory and the cost of the first units purchased to the goods that were sold; and last in–first out (LIFO), in which the reverse pattern is followed.

Inveraray, town ("royal burgh"; 1648), Argyll and Bute district, Strathclyde region, Scotland, situated on the Atlantic coast near the mouth of the River Aray. Inveraray was the ancestral seat of the Campbells of Argyll and was rebuilt by them in the 18th century, its architectural style reflecting the elegance of the period. The buildings are now officially preserved. The castle, in French château style, was damaged by fire in 1975, and many art treasures were lost. Pop. (1981) 949.

Invercargill, city, the southernmost city of South Island, New Zealand, situated on the Waihopai River near its confluence with the New River Estuary. The surrounding area was bought from the Maoris by the New Zealand Company in 1853. Two years later the first settlers arrived at the site, then known as Kelly's Point. Its name was changed in 1857 to honour the colonizer Captain William Cargill. It was surveyed in 1859 and proclaimed a town in 1861, a borough in 1871, and a city in 1930. Most of the early settlers were Scots.

Invercargill is the centre of a sheep- and dairy-farming region and has food-processing plants, woolen mills and sawmills, joineries, foundries, storage facilities, and engineering plants. Pop. (1987 est.) 47,800.

Inverclyde, district, Strathclyde region, southwestern Scotland, created by the reorganization of 1975 from the southern part of the former county of Renfrew. The district, which covers an area of 61 square miles (158 square km), is bounded by the River Clyde and the Firth of Clyde on the north, with docks, shipbuilding, and marine engineering at Port Glasgow, Greenock, and Gourock. The immediate hinterland is industrialized, but higher land to the west, where Creuch Hill rises to 1,446 feet (441 m), is rural, with dairying and sheep farming. Greenock is the seat of the district authority. Pop. (1986 est.) 97,227.

Inverell, town, northeastern New South Wales, Australia, at the junction of the Swanbrook and Macintyre rivers in the Western Slopes district. Established in 1848 as a stock

station, it was declared a town in 1858 and a municipality in 1872, when it was given its Gaelic name, which means "meeting of the swans."

In 1979 amalgamation of the municipality with neighbouring shires created Inverell Shire. It serves an area of mixed farming (wheat, sheep, grapes, potatoes, tobacco, fruits, fodder, and dairying), and tin, silver, bauxite, diamonds, sapphires, and zircon are worked locally. Inverell has sawmills, brick and engineering works, slaughterhouses, and food-processing plants. A rail terminus, it is on the Gwydir Highway and has air links to Sydney (285 mi [459 km] southwest) and Brisbane. Pop. (1981) 9,734.

Invergordon, small North Sea port, district of Ross and Cromarty, Highland region, Scotland, on the deep sheltered waters of the Cromarty Firth. Situated on one of the deepest and safest harbours in Great Britain, Invergordon became a Royal Navy dockyard during World War I but was considered too vulnerable to air attack during World War II so the fleet was transferred to Scapa Flow.

Rapid industrialization followed the establishment of Europe's largest grain distillery in 1960 and the British Aluminium smelting plant soon afterward. Although working at only half capacity, the smelter produces about 100,000 tons of aluminum annually from alumina imported directly from the Caribbean. Further development followed the discovery and exploitation of North Sea oil. Britain's only submarine pipe-coating plant is situated there to manufacture protective coating for the pipelines that bring crude oil and gas ashore. Invergordon's industrial structure is sufficiently varied so as not to depend wholly upon the necessarily temporary offshore oil industry. Pop. (1981 prelim.) 4,050.

Inverness, also called INVERNESS-SHIRE, former county, northwestern Scotland. It was Scotland's largest county and included several of the Western Isles, such as Skye, Harris, Benbecula, the Uists, and many smaller ones. At the reorganization of 1975 its land was divided among the districts of Inverness, Lochaber, Skye and Lochalsh, and Badenoch and Strathspey.

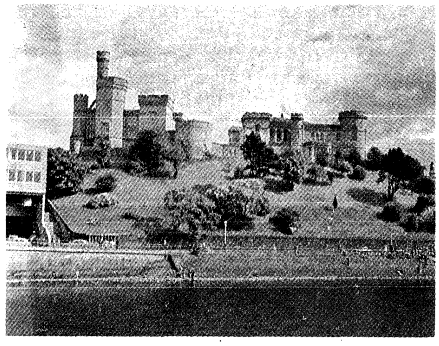
Inverness, district, Highland region, northern Scotland; created by the administrative reorganization of 1975, it covers an area of 1,081 sq mi (2,800 sq km), formerly the northern half of the county of Inverness. Glen More nan Albin, or rift valley of Glenmore, containing the glacial Loch Ness, bisects the area from northeast to southwest, separating the deeply dissected eastward-sloping plateau of the North West Highlands from the higher and more rugged Cairngorms to the east and from Ben Nevis (4,406 ft [1,343 m], the highest mountain in Great Britain) to the south. Lowland areas are limited and confined to the coastal strip and glacial drift-covered valley floors.

In the 6th century the early Pictish inhabitants were converted to Christianity by St. Columba and subsequently overrun by heathen Norsemen in the 9th century. Rural depopulation is a longstanding feature of the remoter highland areas, exacerbated in the 19th century by the Highland clearances when the crofters were forcibly evicted by the landowners and their lands converted into extensive sheep farms. Depopulation continues, reflecting the marginal nature of hill farming (the result of difficult physical conditions) and the attraction of better employment opportunities in Inverness and the oil-related industries of the west shore of the Moray Firth and Aberdeen areas. Crofting, the traditional agricultural economy based on sheep, oats, potatoes, and supplementary fishing, continues in the north and west. Extensive sheep farms predominate in the hills, with cattle- and sheep-raising in the valleys. The drier eastern lowlands produce barley, oats, and beef cattle. Large areas have been developed for forestry, game moors, and tourist amenities—climbing and winter sports.

Early development of hydroelectric power attracted an aluminum smelting plant to Foyers, now closed and superseded by Kinlochleven and Fort William (Lochaber district) and Invergordon. Traditional industries include whisky distilling, woollen manufacturing, and boat building. The North Sea oil boom has resulted in increased industrial activity in Inverness and on the west shore of the Moray Firth. Ardersier, previously a declined fishing village on the southern shore of the Firth, now has an important oil platform production yard.

Inverness, the historic regional capital and seat of both district and regional authorities, is the administrative, commercial, and educational centre for an extensive hinterland and is an important tourist centre. Pop. (1982 est.) 57,263.

Inverness, royal burgh and seat of Inverness district, Highland region, Scotland. It is the long-established centre of the Highlands (*q.v.*) and lies at the best crossing place of the River Ness, which flows from Loch Ness at the east end of Glen More. Situated astride the river



The 19th-century castle on the River Ness, Inverness, Scot.
J. Allen Cash—EB Inc.

and the Caledonian Canal, it commands the route system of northeastern Scotland.

Inverness was the capital of the Pictish kingdom of King Brude, who was visited and converted by St. Columba *c.* 565. By the 12th century Inverness had become a burgh nestling under the castle attributed to King Malcolm III Canmore, which remained a royal residence and fortress for centuries.

The present 19th-century castle overlooks the river and, on the site of a fortress destroyed in 1746 by the Jacobites, now houses law courts. The few old surviving buildings include the old Town Cross (1685), the Town Steeple (formerly a prison), the old High Church (1769–72), and St. Andrew's Cathedral (1866–71).

Inverness functions as the administrative, commercial, educational, and tourist centre of a large area and has light engineering, woollen, and food-processing industries. Both manufacturing and services are expanding as the offshore oil industry develops.

Inverness Airport (at Dalcross, 8 mi [13 km] northeast) provides services for the Western Isles and the south of Scotland. Pop. (1981) 40,011.

inversion, in chemistry, the spatial rearrangement of atoms or groups of atoms in a dissymmetric molecule, giving rise to a product with a molecular configuration that is a mirror image of that of the original molecule.

The reaction is usually one in which an atom or a group of atoms in the molecule is replaced by another atom or group. The phenomenon of inversion is sometimes known as Walden inversion, after the German chemist Paul Walden, who discovered it in 1895. The idea that inversion is the stereochemical consequence of a nucleophilic displacement reaction was introduced by the British chemists Sir Christopher Ingold and E.D. Hughes (*see* substitution reaction).

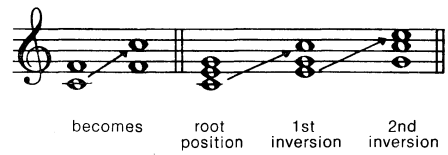
inversion, in literary style, the syntactical reversal of the normal order of the words and phrases in a sentence, as, in English, the placing of an adjective after the noun it modifies ("the form divine"); a verb before its subject ("Came the dawn"); or a noun preceding its preposition ("worlds between"). It is most commonly used in poetry in which it may both satisfy the demands of the metre and achieve emphasis:

> In Xanadu did Kubla Khan
> A stately pleasure dome decree:
> (Coleridge, "Kubla Khan")

Inversion used simply for the sake of maintaining a rhyme scheme is considered a literary defect, although it is a common convention in folk ballads:
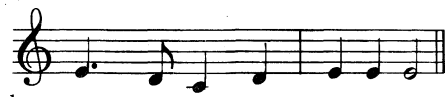
> Then up spoke the captain of our gallant ship,
> And a well-spoken man was he;
> "I have married a wife in Salem town,
> And tonight she a widow will be"
> ("The Mermaid," anonymous)
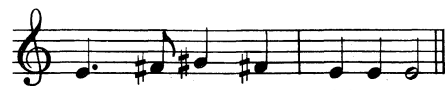
inversion, in music, rearrangement of the top-to-bottom elements in an interval, a chord, a melody, or a group of contrapuntal lines of music. The inversion of chords and intervals is utilized for various purposes, *e.g.*, to create a melodic bass line or (with certain chords) to modulate to a new key. To invert a chord or an interval is to rearrange its notes so that the original bottom note becomes an upper note; for example,



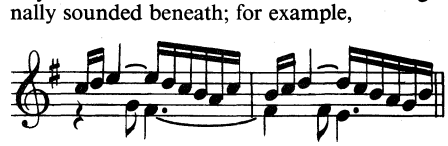
An interval (such as c′–f′) and its inversion (f′–c″) are complementary: together they form an octave. A three-note chord (triad) can be inverted twice from its original, or root, position.
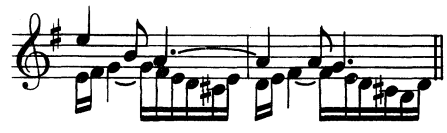
Inversions of melody and counterpoint enable a composer to elaborate on basic musical material; they are common in fugues. To invert a melody means to change its ascending intervals to descending ones and vice versa; for example:





In inverted counterpoint, the original order of the contrapuntal lines is rearranged. In this way a line sounds above the line that it originally sounded beneath; for example,





invertase (enzyme): *see* sucrase.

invertebrate, any animal that lacks a vertebral column, or backbone, in contrast to vertebrates, all of which possess some form of cartilaginous or bony internal skeleton. More than 90 percent of living animals are invertebrates. Worldwide in distribution, they range in size from minute protozoans to giant squids.

Apart from the absence of a vertebral column, invertebrates have little in common. They are generally soft-bodied animals without a rigid internal skeleton for the attachment of muscles but often with a hard outer skeleton (as in most mollusks, crustaceans, and insects) that serves, as well, for body protection.

The taxonomic term Invertebrata, formerly used in contrast to Vertebrata (still a valid subphylum name), has no validity in modern classifications.

investigative powers, legislative: *see* legislative investigative powers.

Investigator Strait, channel, about 60 mi (100 km) long and nearly 30 mi wide, between Yorke Peninsula to the north and Kangaroo Island to the south, leading eastward from the Indian Ocean into Gulf St. Vincent, South Australia. It merges (east) with the Backstairs Passage (channel), and its western entrance is marked by the three rocky Althorpe Islands, which rise to 285 ft (87 m). Now heavily used as an approach to Adelaide on the gulf coast and as an area for game fishing, it was navigated in 1802 by the English explorer Matthew Flinders and is named after his ship.

Investiture Controversy, power struggle between the papacy and the Holy Roman Empire during the late 11th and early 12th centuries; it began with a dispute about the lay investiture of bishops and abbots. Such prelates held land and often exercised secular as well as ecclesiastical functions; for this reason, lay overlords had an understandable interest in their appointment and frequently invested (formally presented) them with the symbols of their various offices.

Because Pope Gregory VII's condemnation (1075) of lay investiture immediately preceded his dispute with the German king and Holy Roman emperor Henry IV (reigned 1056–1106), historians have given to the quarrel and its aftermath the name Investiture Controversy; but the real conflict between Henry IV and Gregory, the main disputants, involved the issue of whether the pope or the emperor should dominate the church. The political results of their struggle, which generated civil war in Germany, were far-reaching. In Germany the power of the aristocracy, at the expense of the monarchy, was permanently enhanced, while in northern Italy the rise of the Lombard communes with papal support weakened imperial authority there. Gradually, the extreme papalists widened their opposition to any lay control over the episcopate. In 1106 Henry I of England renounced the practice of investing prelates with the symbols of their spiritual office, and in return the church conceded that homage to the king should precede episcopal consecration (thus ensuring that the candidate become the king's man before he became bishop). A similar compromise was effected by the Concordat of Worms (1122) between the emperor Henry V and Pope Calixtus II; and in Germany (but not in Burgundy or Italy) the emperor also acquired the right to have elections conducted in his presence.

investment, process of exchanging income during one period of time for an asset that is expected to produce earnings in future periods. Thus, consumption in the current period is foregone in order to obtain a greater return in the future.

For an economy as a whole to invest, total production must exceed total consumption. Throughout the history of capitalism, investment has been primarily the function of private business; during the 20th century, however, governments in planned economies and developing countries have become important investors.

From the standpoint of an individual, two types of investment may be distinguished: investment in the means of production and purely financial investment. Although at the individual level both types may provide a monetary return to the investor, from the standpoint of the entire economy, purely financial investments appear only as title transfers and do not constitute an addition to productive capacity.

Before the 1930s, investment was thought to be strongly affected by the going rate of interest, with the rate of investment likely to rise as the rate of interest fell. Since then, empirical investigation has shown business investment to be less responsive to interest rates and more dependent on businessmen's expectations about future demand and profit, technical changes in production methods, and the expected relative costs of labour and capital.

Because investment increases an economy's capacity to produce, it is the factor responsible for economic growth. For growth to occur smoothly, it is necessary that savers intend to save the same amount that investors wish to invest during a time period. If intended saving exceeds intended investment, unemployment may result; and if investment exceeds saving, inflation may occur. *See also* saving; marginal efficiency of investment.

investment, marginal efficiency of: *see* marginal efficiency of investment.

investment bank, firm that originates, underwrites, and distributes new security issues of corporations and government agencies. The investment banking house operates by purchasing all of the new security issue from a corporation at one price and selling the issue in smaller units to the investing public at a price sufficiently high to cover expenses of sale and leave a profit. The major responsibility for setting the public offering price rests on the investment bank because it is in close contact with the market, is familiar with current interest rates and yields, and is best able to judge the probable demand for the issue in question.

In the underwriting and distribution of most security issues a syndicate of investment banking firms is organized. If the amount of capital sought is large enough to prohibit one investment banking firm's undertaking the risk of purchasing the entire issue, the investment bank that initiates the issue with the corporation organizes a group of investment bankers to divide the liability for the purchase, with the originator acting as manager of the group.

If the market coverage that can be obtained by the members of the syndicate is deemed insufficient, selected dealers are used to bring about a wider distribution. Securities are sold to the dealers at a reduction (known as a concession), which reimburses the dealer for his expenses and provides him with a profit if the distribution is performed skillfully.

When new securities are to be issued, an investment firm having close contact with the corporation is likely to be asked to originate the issue. This process often is called private negotiation. An alternative arrangement is competitive bidding, under which the corporation itself settles upon the terms of the issue to be offered and then invites all banking firms to submit bids. The issue will be sold to the highest bidder.

investment casting, precision-casting technique for forming metal shapes. A typical process for bronze castings involves six steps:

1. A gelatin mold is formed around the solid sculptured form.
2. The mold is removed (in two or more sections) from the sculptured form, and the inside of the mold is filled with wax or coated with a layer of wax of the same thickness as that desired for the final casting.
3. The outer gelatin mold is then removed, and a second mold, of heat-resisting clay, is formed around the wax shell, the interior of which is filled with a clay core.
4. The mass is baked, hardening the clay and melting the wax, which runs off through openings in the outer mold.
5. The hardened mold is packed in sand, and molten bronze is poured through the openings to fill the space vacated by the lost wax.
6. The mold is broken, and the bronze form remains.

In modern foundries, plastics, or occasionally frozen mercury, are used in place of the wax. Coated with a refractory cement instead of clay, the mold is packed in a porous cement, dried, and heated. The plastic melts, leaving cavities to be filled with molten metal. For all except the smallest forms, the molds are usually made in sections. The process is used for manufacturing jewelry, dentures, sculpture, and many small industrial parts that require minutely precise details. *See also* cire-perdue.

investment credit, tax incentive that permits businesses to deduct a specified percentage of certain investment costs from their tax liability, in addition to the normal allowances for depreciation (*q.v.*). Investment credits are similar to investment allowances, which permit businesses to deduct a specified percentage of certain capital costs from their taxable income.

Both investment credits and investment allowances differ from accelerated depreciation by offering a percentage deduction at the time an asset is purchased, in addition to its full depreciation allowances. In effect, they are subsidies for investment. Proponents of investment credits argue that they are easier to use than depreciation allowances and that they apply equally to all businesses or individuals regardless of their tax rate. Opponents claim that the investment credit favours wealthier investors, although few deny that it does provide an incentive to investment.

Investment credits and investment allowances were adopted by the United States in 1962 in order to protect domestic business from foreign competition, but they were eliminated in the Tax Reform Act of 1969 in an attempt to counteract rising inflation. The U.K. has also experimented with investment allowances, but in the late 1960s it changed the allowance to a direct government subsidy.

investment trust, also called CLOSED-END TRUST, financial organization that pools the funds of its shareholders and invests them in a diversified portfolio of securities. It differs from the mutual fund (*q.v.*), or unit trust, which issues units representing the diversified holdings rather than shares in the company itself.

Closed-end trusts have a fixed amount of outstanding shares that are bought and sold in the market; the price of these shares therefore depends both on the market value of the underlying securities and on the demand for and supply of investment trust shares. In most modern investment trusts, management has complete discretion over the portfolio, subject to general charter provisions.

The English and Scottish investment trusts formed as early as 1860 are generally considered the prototype of the modern organizations, although the idea probably had its beginning with the investment trust authorized in Belgium by King William I of The Netherlands in 1822. The early U.S. trusts

copied the basic idea of diversification practiced by the British organizations but were less soundly managed. The collapse of the U.S. stock market in 1929 brought enormous losses and many failures to the investment trusts; after a period of confusion throughout the 1930s, strong survivors and new companies became widely accepted and grew rapidly under new federal regulation.

invisible trade, in economics, exchange of physically intangible items between countries. Invisible trade can be distinguished from visible trade, which involves the export, import, and re-export of physically tangible goods. Three basic categories of invisible trade can be identified: services (receipts and payments arising from services); receipt and payment of income from foreign investment in the form of interest, profits, and dividends; and private or government transfers of monies from one country to another.

Services account for the vast majority of invisible trade. Such services include freight and passenger transport, various types of insurance, scientific-technical exchange, and international tourism. Income gained by foreign investment is the second largest contributor to invisible trade, and private and government transfer is the smallest.

Information on invisible trade and its contribution to a country's balance of payments is documented primarily in capitalist nations. In socialist and communist countries the magnitude of such trade is less evident since all trade is usually a government transaction. Invisible trade, therefore, can be characterized as a phenomenon of capitalist countries.

Great Britain has consistently achieved an invisible trade surplus over the years, which has often contributed to a balance-of-payments surplus. Services comprise the largest contribution to Great Britain's surplus in invisible-trade transactions.

Historically, receipts from invisible exports have normally exceeded payments for invisible imports in the United States. This surplus has been derived primarily from private foreign-capital investment.

Several European countries achieve substantial contributions to their balance of payments from invisible exports. Norway, Sweden, Denmark, and The Netherlands, for example, receive income from shipping, and Spain, Italy, and Austria earn receipts from tourism. Switzerland also earns income from tourism as well as substantial contributions from banking and insurance.

In many developing countries, invisible exports are exceeded by invisible imports. This deficit is closely tied to the foreign debt and interest payments often made by developing countries to the developed nations. The growing external debt of many developing countries, such as Mexico, Brazil, and nations in Africa and Asia, and their inability to repay the loans and interest not only threatens the economies of the borrowing developing nations but also the foreign-investment sector of invisible-trade earnings for many developed countries.

For statistical data on components and balance of international invisible trade, *see* BRITANNICA WORLD DATA ANNUAL.

Inward Light (religion): *see* Inner Light.

inyoite, a colourless and transparent borate mineral ($Ca_2B_6O_{11} \cdot 13H_2O$) that occurs as massive granular or sperulitic aggregates in borate deposits. The structure of the mineral consists of two $BO_2(OH)_2$ tetrahedrons and a BO_2OH triangle linked by calcium and hydroxyl–hydrogen bonds. Inyoite alters by partial dehydration to meyerhofferite and colemanite, both of which are used as raw materials for boric acid, sodium borate, and related products. Originally found near Death Valley, Inyo county, Calif., U.S., inyoite has also been discovered lining gypsum deposits at Hillsborough, N.B., Can., and in Kazakhstan, U.S.S.R. For detailed physical properties, *see* borate mineral (table).

Io, in Greek mythology, daughter of Inachus, the river god of Argos. Under the name of Callithyia, Io was regarded as the first priestess of Hera, the wife of Zeus. Zeus fell in love with her and, to protect her from the wrath of Hera, changed her into a white heifer. Hera persuaded Zeus to give her the heifer and sent Argus Panoptes (the All-Seeing) to watch her. Zeus thereupon sent the god Hermes, who lulled Argus to sleep and killed him. Hera then sent a gadfly to bother Io, who therefore wandered all over the earth, crossed the Ionian Sea, swam the strait that was thereafter known as the Bosporus (meaning Ox-Ford), and at last reached Egypt, where she was restored to her original form and became the mother of Epaphus.

Io was thus identified with the Egyptian goddess Isis, and Epaphus with Apis, the sacred bull. Epaphus was said to have been carried off by order of Hera to Byblos in Syria, where he was found again by Io. This part of the legend connects Io with the Syrian goddess Astarte. Both the Egyptian and the Syrian parts, in fact, reflect interchange with the East and the identification of foreign with Greek gods.

Io, innermost of Jupiter's four large Galilean satellites (discovered by Galileo in 1610) and the only extraterrestrial object definitely known to have active volcanos. Io always keeps the same face to Jupiter, having a period of rotation equal to its period of revolution—1.77 Earth days. Its perfectly circular orbit has an inclination of 0.027° to the equatorial plane of Jupiter and a radius of 421,600 km (261,980 miles). The orbital position of Io to some extent controls the beaming of bursts of radio noise at decametre wavelengths from Jupiter to Earth. Io has a mass of $8.92 \pm 0.04 \times 10^{25}$ grams, a diameter of about 3,640 km (2,262 miles), and an average density of 3.55 grams per cubic centimetre, which is characteristic of rocks and not ices. It has a very thin atmosphere, composed in part of sulfur dioxide.

When the Voyager 1 spacecraft flew by Io on March 5, 1979, seven active volcanos were observed erupting and ejecting fountains of fine particles hundreds of kilometres into space. Material spewed off the satellite occupies a toroid that follows its orbit, wraps part of the way around Jupiter, and contains atoms of sodium, potassium, and sulfur. In the three months between the passages of Voyager 1 and Voyager 2 by Io, some surface features had changed markedly, one of the volcanos had stopped erupting, and another had started. Near some of the volcanic calderas, black, red, and orange downhill-flow features are observed; these are due to some liquid, generally but not universally thought to be liquid sulfur. The extraordinary multicoloured appearance of Io is the end product of a large number of such volcanic flows, which are so extensive and so frequent that the entire satellite is being resurfaced to an average depth of about 1 cm (0.4 inch) a year.

Ioannes (Greek personal name): *see under* John.

Ioánnina, also spelled YANNINA, or JANINA, city and capital, *nomós* (department) of Ioánnina, in the Epirus (Ípiros) region of northwestern Greece. It is located on a plateau on the western side of a lake beneath the gray limestone mass of Mount Mitsikéli. The lake, ancient Pambotis, is fed by streams from Mount Mitsikéli; it has subterranean drainage. As a regional agricultural and commercial centre, Ioánnina declined somewhat with the partition of Epirus between Greece and Albania in 1913. The city remains the commercial centre of Epirus and is noted for its metalwork and embroidery. It is the seat of a metropolitan bishop and a divisional headquarters of the Greek army. The University of Ioánnina opened in 1970.

Ioánnina was first mentioned in ecclesiastical registers of the 9th and 10th centuries as an important Byzantine city. At the beginning of the 13th century it was the capital of the Greek Despotate of Epirus. After 1318 it reverted to the Byzantine Empire and was made a metropolitanate by Andronicus II, but in 1349 it fell to the Serbs. Subsequently it was contested by the Italians, Albanians, and Turks, to whom it succumbed about 1430. From 1788 to 1822 it was the centre of the Albanian-born despot Ali Pasha, whose revolt against the sultan's rule, although quickly suppressed by his assassination, helped trigger the War of Greek Independence (1821–29). Ioánnina and southern Epirus were finally united with the Greek kingdom in 1913. Pop. (1981) 44,829; *nomós,* 147,304.

IOC: *see* International Olympic Committee.

iodate mineral: *see* nitrate and iodate minerals.

iodine (I), chemical element, a member of the halogen elements, or Group VIIa of the periodic table. Iodine, a nonmetallic, nearly black crystalline solid, is used in medicine, in the synthesis of some organic chemicals, in the manufacture of dyes, in analytical chemistry, and in photography. At room temperature, solid iodine sublimes to a deep-violet vapour that is irritating to the eyes, nose, and throat. Iodine dissolves in alcohol and slightly in water to give brown solutions and in carbon tetrachloride and carbon disulfide to give violet solutions.

Iodine is never found in nature uncombined. It is sparingly present in seawater as iodide ion, I^-, to the extent of approximately 50 milligrams of iodine per ton of seawater. Appreciable quantities are found in a number of natural brines. Iodine occurs in animals and plants, generally in very small amounts, but very abundantly in seaweeds. Dispersed as a trace element in rocks, iodine is not sufficiently concentrated to form independent minerals. A large source of iodine for commercial preparation is the saltpetre or nitrate deposits of Chile, in which iodine is present as solid iodates, especially calcium iodate, $Ca(IO_3)_2$. A French manufacturer of saltpetre from seaweeds, Bernard Courtois, discovered (1811) iodine in water that was used to extract the soluble material from seaweed ash. Since that time, in France and Great Britain and, more recently, in Japan, iodine has been recovered from seaweeds.

Iodine is an essential microconstituent in the human body, which contains an average of 14 milligrams (0.00049 ounce) of the element, concentrated mostly in the thyroid gland. The thyroid gland secretes iodine-bearing hormones, especially thyroxine, which are essential for maintaining normal metabolism in all the body's cells. Where insufficient iodine is present in the food supplies, as in North America's Great Lakes region, The Netherlands, and most mountainous areas of the world, the main source of iodine is table salt to which potassium iodide or other iodizing chemicals have been added. Iodine deficiency leads to endemic goitre and myxedema.

Iodine at high concentration is poisonous and may cause serious damage to skin and tissues; in dilute alcoholic solution (tincture of iodine) or aqueous solution, it has limited use as a topical antiseptic.

In chemical compounds the common oxidation states are −1 (iodides), +5 (iodates), and +7 (periodates). Iodine combines readily with most metals and some nonmetals to form

iodides. The iodide ion is a strong reducing agent; that is, it readily gives up one electron. Although the iodide ion is colourless, iodide solutions may acquire a brownish tint as a result of oxidation of iodide to free iodine by atmospheric oxygen. Molecules of elemental iodine, consisting of two atoms (I_2), combine with iodides to form polyiodides (typically $I_2 + I^- \rightarrow I_3^-$), accounting for the high solubility of iodine in solutions containing soluble iodide. The aqueous solution of hydrogen iodide (HI), known as hydriodic acid, is a strong acid that is used to prepare iodides by reaction with metals or their oxides, hydroxides, and carbonates. Iodine exhibits a +5 oxidation state in the moderately strong iodic acid (HIO_3), which can be readily dehydrated to yield the white solid iodine pentoxide (I_2O_5). Periodates may take a form represented by potassium metaperiodate (KIO_4) or silver paraperiodate (Ag_5IO_6), for example, because the large size of the central iodine atom allows a relatively large number of oxygen atoms to get close enough to form bonds.

The only naturally occurring isotope of iodine is stable iodine-127. An exceptionally useful radioactive isotope is iodine-131, which has a half-life of eight days. It is employed in medicine to monitor thyroid gland functioning, to treat goitre and thyroid cancer, and to locate tumours of the brain and of the liver. It is also used in investigations to trace the course of compounds in metabolism. Several iodine compounds are used as contrast mediums in diagnostic radiology. In aqueous solution even minute amounts of iodine in the presence of starch produce a blue-black colour.

atomic number	53
atomic weight	126.9044
melting point	113.5° C (236° F)
boiling point	184° C (363° F)
specific gravity	4.93 (20° C)
oxidation states	−1, +1, +3, +5, +7
electronic config.	2-8-18-18-7 or (Kr)$4d^{10}5s^25p^5$

iodine deficiency, condition in which an organism does not take in enough iodine, an element that directly affects thyroid gland secretions, which themselves to a great extent control heart action, nerve response to stimuli, rate of body growth, and metabolism.

Simple goitre (enlargement of the thyroid gland) is the most common form of iodine deficiency illness and is found particularly in mountainous regions and areas far from salt water. Lowest incidence of this disease occurs along seacoasts. When the supply of iodine is only moderately deficient, the thyroid gland works harder to synthesize hormones in normal quantities, but the affected individual may continue in general good health despite the possible presence of goitre. In cases of severe and prolonged deficiency, however, there may be a deficit of thyroid hormones, resulting in myxedema, a condition characterized by dry skin, loss of hair, puffy face, flabbiness and weakness of muscles, weight increase, diminished vigour, and mental sluggishness.

Prevention of iodine deficiency is most simply accomplished by eating seafood regularly or by use of iodized table salt. To overcome natural iodine deficits, government health officials in Canada and other nations have made dietary iodine additives mandatory.

Sporadic goitre remains a mystery because it occurs in areas where iodine intake is more than adequate. Foods such as cabbage and turnips contain a potentially dangerous progoitrin substance believed to inhibit normal intake of iodine by body tissues. During the heat of cooking, however, the offending enzyme usually is destroyed.

A lack of iodine during infancy may cause a condition known as cretinism, in which mental and physical development is severely impaired. This condition can be prevented if the mother maintains a diet of foods high in iodine during pregnancy.

iodine value, also called IODINE NUMBER, in analytical chemistry, measure of the degree of unsaturation of an oil, fat, or wax; the amount of iodine, in grams, that is taken up by 100 grams of the oil, fat, or wax. Saturated oils, fats, and waxes take up no iodine; therefore their iodine value is zero; but unsaturated oils, fats, and waxes take up iodine. (Unsaturated compounds contain molecules with double or triple bonds, which are very reactive toward iodine.) The more iodine is attached, the higher is the iodine value, and the more reactive, less stable, softer, and more susceptible to oxidation and rancidification is the oil, fat, or wax. In performing the test, a known excess of iodine, usually in the form of iodine monochloride, is allowed to react with a known weight of the oil, fat, or wax, and then the amount of iodine remaining unreacted is determined by titration.

Drying oils used in the paint and varnish industry have relatively high iodine values (about 190). Semidrying oils, such as soybean oil, have intermediate iodine values (about 130). Nondrying oils, such as olive oil, used for soapmaking and in food products, have relatively low iodine values (about 80).

iodized salt, table salt with small amounts of iodine added, usually as potassium iodide, to ensure against dietary deficiency of iodine. Where iodized salt is used, particularly in Switzerland and the United States, endemic goitre has disappeared.

In the United States, iodized salt contains 1 part in 10,000 iodide and, in Switzerland, 1 part in 200,000. The World Health Organization recommends 1 part in 100,000. *See also* iodine deficiency.

iodoform, also called TRIIODOMETHANE, a yellow, crystalline solid belonging to the family of organic halogen compounds, used as an antiseptic component of medications for minor skin diseases.

First prepared in 1822, iodoform is manufactured by electrolysis of aqueous solutions containing acetone, inorganic iodides, and sodium carbonate. Several reagents convert iodoform to methylene iodide (diiodomethane), a dense liquid, colourless when pure but usually discoloured by traces of iodine, used as a heavy medium in gravity separation processes.

Iodoform's antiseptic action, discovered in 1880, made it an important medicinal, but it has been largely displaced by more effective substances.

Iogaila (Lithuanian duke): *see* Władysław II Jagiełło.

Iol, modern CHERCHELL, or SHARSHAL, ancient seaport of Mauretania, located west of what is now Algiers in Algeria. Iol was originally founded as a Carthaginian trading station, but it was later renamed Caesarea and became the capital of Mauretania in 25 BC. The city was famous as a centre of Hellenistic culture, and under the Romans it became one of the most important ports on the African coast.

The modern town of Cherchell is a small fishing port, occupying a much smaller area than did the ancient settlement.

Iolaus, ancient Greek hero, the nephew, charioteer, and assistant of Heracles. He was the son of Iphicles, himself mortal half brother of Heracles by the same mother.

Iolaus aided Heracles in his second labour, the slaying of the Hydra and its ally the crab. He also went with him to the far west to capture the cattle of the giant Geryon. Hence he was associated with various places in Sicily and, later, in Sardinia. Iolaus had a hero cult at Thebes, but elsewhere he was worshipped only in conjunction with Heracles.

iolite (mineral): *see* cordierite.

ion, any atom or group of atoms that bears one or more positive or negative electrical charges. Positively charged ions are called cations; negatively charged ions, anions. Ions are formed by the addition of electrons to, or the removal of electrons from, neutral atoms or molecules or other ions; by combination of ions with other particles; or by rupture of a covalent bond between two atoms in such a way that both of the electrons of the bond are left in association with one of the formerly bonded atoms. Examples of these processes include the reaction of a sodium atom with a chlorine atom to form a sodium cation and a chloride anion; the addition of a hydrogen cation to an ammonia molecule to form an ammonium cation; and the dissociation of a water molecule to form a hydrogen cation and a hydroxide anion.

Many crystalline substances are composed of ions held in regular geometric patterns by the attraction of the oppositely charged particles for each other. Ions migrate under the influence of an electrical field and are the conductors of electric current in electrolytic cells.

ion, carbonium (chemistry): *see* carbonium ion.

ion-exchange capacity, measure of the ability of an insoluble material to undergo displacement of ions previously attached and loosely incorporated into its structure by oppositely charged ions present in the surrounding solution. Zeolite minerals used in water softening, for example, have a large capacity to exchange sodium ions (Na^+) for calcium ions (Ca^{2+}) of hard water. High cation-exchange capacities are characteristic of clay minerals and numerous other natural and synthetic substances possessing ion-exchanging properties.

ion-exchange reaction, any of a class of chemical reactions between two substances (each consists of positively and negatively charged species called ions) that involves an exchange of one or more ionic components. Such reactions are widely used for purposes of purification, concentration, and ion separation in industry and in the laboratory.

A brief treatment of ion-exchange reactions follows. For full treatment, *see* MACROPAEDIA: Chemical Reactions.

During an ion exchange process, ions attached to or incorporated within the molecular structure of insoluble substances, called ion exchangers, exchange with ions present in a surrounding solution. The process has also been called base exchange and exchange adsorption. Ion exchangers are essentially insoluble acids or bases, the salts of which are also insoluble. Ion exchangers may undergo exchange either with positively charged ions (cations) or negatively charged ions (anions). In the former case the process is referred to as cation exchange and in the latter as anion exchange.

Numerous substances, of both natural and synthetic origin, possess ion exchanging properties. These include proteins, synthetic resins, cellulose, bone, living cells, silicate minerals, and soils. For commercial and laboratory uses the inorganic ion exchangers include the natural zeolites, glauconite and greensand, and synthetic zeolites such as the sodium alumino-silicates. Inorganic ion exchangers have been prepared from insoluble salts, heteropoly acids, and hydrous oxides. These include compounds such as zirconium and titanium phosphates, zirconium and tin oxides, ammonium molybdophosphate, and many other insoluble compounds possessing ion exchanging properties. Inorganic ion exchangers are of special interest because they are more stable than organic ion exchangers under certain condi-

tions, such as high temperature and ionizing radiation. The most important organic ion exchange reactions employ synthetic resins. The synthetic resins are plastics that may be chemically modified to impart or enhance their ion exchanging properties.

Ion exchangers can take a variety of geometric shapes, forms, and internal structures. Among the most important forms are sheets, or membranes, which are widely used for electrochemical purposes. The structure of the synthetic resins can be modified to enhance or impart desired properties. These include the chelating resins, into which are incorporated chemical groupings possessing a preferential affinity for a given ion or group of ions. Another type of ion exchange material is paper impregnated with ion exchanging substances for use in paper chromatography.

Ion exchange resins. An ion exchanging resin consists of a polymeric organic network or backbone and ionized or functional groups that undergo exchange. A very effective organic network is formed by the polymerization of styrene in the presence of varying amounts of divinylbenzene, which serves to crosslink the long chains of styrene into a three-dimensional fishnet-type of structure. Functional groups are introduced subsequently into the polystyrene or, in the case of other ion exchangers, may be part of the monomer. Ion exchange resins are prepared in the form of very small spheres or beads. The commonest particle diameters used for water treatment are in the range from 0.84 to 0.297 millimetre (0.033 to 0.012 inch), but for certain difficult separations smaller sizes are used.

A typical ion-exchange reaction can be written as follows:

$$A^+ + B^+Res^- \rightleftharpoons B^+ + A^+Res^-$$

in which Res^- stands for an ion fixed in the resin or other type of exchanger and A^+ and B^+ are univalent cations (monopositive ions).

Special resins are synthesized so as to contain functional groupings that have a specific or marked affinity for certain ions. Other special resins include types that undergo oxidation-reduction reactions. Instead of exchanging ions, these electron-exchange polymers exchange electrons.

Techniques. Contact between a solution and an ion exchanger involves either a batch or a column process. In the batch process the resin is simply mixed with solution and agitated continuously or intermittently until equilibrium is reached—a period of a few minutes or several days, depending on the resin and type of ions being exchanged. After equilibration the resin is removed by filtration. Batch techniques are infrequently employed for industrial purposes, but are often used in the laboratory for fundamental studies of the mechanism of ion exchange reactions.

Column methods generally involve fixed-bed operation, which refers to the use of a packed column of resin through which is passed the feed or regenerant solution. The resin is supported on a porous support while solution flows through by gravity or under pressure. The solutions are usually passed down through the resin, though up-flow operation is not uncommonly employed, especially when it is desired to remove suspended particles from the resin bed during regeneration.

A fixed-bed cycle generally consists of the following steps: (1) saturation of the bed with solution until the desired or undesired ions break through to a predetermined level; (2) removal or elution of the retained ions by regenerant solution; and (3) rinsing the bed free of regenerant so that the cycle can be repeated. Between cycles the bed may be backwashed by up-flow through the system.

Most applications of ion exchange involve column operation because of the completeness of separation that can be obtained and the ease with which automatic instrumentation can be employed. Column techniques correspond to the use of a large number of batch operations in series, an analogy closely akin to fractional distillation processes.

ion-exchange resin, any of a wide variety of organic compounds synthetically polymerized and containing positively or negatively charged sites that can attract an ion of opposite charge from a surrounding solution. The resins commonly consist of a styrene-divinylbenzene copolymer (high molecular weight substance), although other compositions, such as methacrylic acid–divinylbenzene and phenol–formaldehyde polymers, are also employed. The electrically charged groups are commonly sulfonic or carboxylic acid salts or quaternary ammonium salts. Polymers containing acid groups are classified as acid, or cation, exchangers because they exchange positively charged ions, such as hydrogen ions and metal ions; those containing ammonium groups are considered basic, or anion, exchangers because they exchange negatively charged ions, usually hydroxide ions or halide ions.

Ion-exchange resins are light and porous solids, usually prepared in the form of granules, beads, or sheets. When immersed in solution, the resins absorb the solution and swell; the degree of swelling is dependent on the polymeric structure and the total ion concentration of the solution. Resins of suitable chemical compositions and physical properties may be synthesized at will for specific ion-exchange applications; thus, they comprise the bulk of synthetic ion-exchange materials used in the laboratory and industry. In industrial and domestic applications, ion-exchange resins are used for the removal of calcium, magnesium, iron, and manganese salts from water (water softening), for purification of sugar, and for concentration of valuable elements, such as gold, silver, and uranium from mineral ores. In chemical analysis, ion-exchange resins are used for the separation or concentration of ionic substances, and in chemical synthesis, some ion-exchange resins have been used as effective catalysts, notably in esterification and hydrolysis reactions.

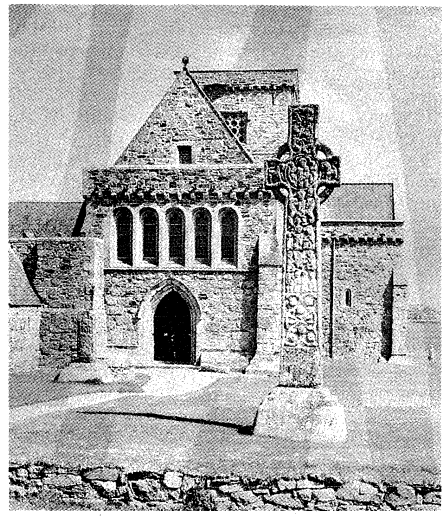
Two separate types of resins are commonly classed as ion-exchange resins, although their functions do not involve an interchange of ions. These are the chelating resins and the electron-exchange resins. Chelating resins are styrene–divinylbenzene polymers to which iminodiacetate groups are introduced. This functional group forms complexes with all the metallic elements except the alkali metals, with stabilities that vary with the different metals; in analytical chemistry, they are used for the separation of trace amounts of metals. Electron-exchange resins accept or donate electrons to the surrounding solution and are used in oxidation–reduction reactions; examples include polymers prepared from hydroquinone, phenol, and formaldehyde.

A group of minerals that have ion-exchanging properties is the zeolites (*q.v.*).

ion pair, in physics and chemistry, a duplex of charged particles (ordinarily charged atoms or molecules), one positive, the other negative. An ion pair, for the physicist, is the positively charged particle (positive ion) and the negatively charged particle (negative ion) simultaneously produced by the addition of sufficient energy to a neutral atom or molecule to cause it to dissociate into oppositely charged fragments. Thus, an energetic electron passing near or through an oxygen molecule, O_2, may force one of the electrons out of the molecule. The result is an ion pair consisting of the positive oxygen ion, O_2^+, and the negative detached electron, e^-.

An ion pair, in the context of chemistry, consists of a positive ion and a negative ion temporarily bonded together by the electrostatic force of attraction between them. Ion pairs occur in concentrated solutions of electrolytes (substances that conduct electricity when dissolved or molten). Thus, in concentrated solutions of sodium chloride, some positive sodium ions, Na^+, and some negative chloride ions, Cl^-, are paired together. Upon colliding, two oppositely charged ions stay together only for a short period of time. On the average, a certain population of these pairs exists at any given time, although the formation and dissociation of ion-pairs is continuous. *See also* heterolysis.

Iona, island of the Inner Hebrides, Strathclyde region, Scotland. It is 3 mi (5 km) long by 1½ mi wide, with its highest point just under 330 ft (100 m) above sea level, and is separated by the Sound of Iona (¾ mi wide) from the large island of Mull. Most of the island is rough grazing land, but there is some permanent pasture, and sheep and cattle



West facade of the Cathedral of St. Mary, with St. Martin's Cross, Iona, Scotland
A.F. Kersting

are raised. Tourism and crofting (small-scale farming) are the main economic activities.

Iona was readily accessible by sea from Ireland, and it was here that St. Columba landed in AD 563 to begin his Christianization of Scotland. From his monastery on Iona, Columba established the Celtic Church and sent missionaries throughout mainland and insular Scotland. He died in 597 and was buried on the island.

During the period from 795 to the late 10th century, the pagan Norsemen repeatedly invaded the island. The original monastery was burned down and the monks murdered. Iona's insecurity led to the transfer in 849 of the relics of St. Columba to the safety of Kells in Ireland. By the 11th century the monastery had been rebuilt and was included by the Norsemen, by now converted to Christianity, in their diocese of Man and the Isles. In 1154 this see was put under the archbishop of Trondheim, in Norway, and it retained this status until 1266, when the Hebrides were ceded to Scotland.

Throughout centuries of invasion and warfare, the reputation of the island as a holy place flourished, and it became the burial place of Scottish, Irish, and Norwegian kings.

The monastery was suppressed after the Reformation, and in 1693 the island passed into the overlordship of the Campbells of Argyll, until 1899, when the 8th duke presented the ruined abbey to the Church of Scotland. The abbey was gradually rebuilt and was opened again for public worship in 1912.

In 1938 George MacLeod, a Glasgow minister, founded the Iona Community. Pop. (1981) 268.

Iona Community, missionary group of clergy and laymen within the Church of Scotland. It was founded in 1938 by George MacLeod, a parish minister in Glasgow who hoped to infuse a new vitality into Christianity. He was convinced that the wide gap between actual life and theoretic religion should be closed and that, as in the ancient Celtic church of St. Columba, the Irish missionary who established a monastery on the island of Iona, the spiritual and the material should be intertwined. The pitiful condition of many of the ancient buildings on Iona offered MacLeod and his seven comrades an opportunity for showing something of the spirit that had impelled Columba and his 12 followers, more than 1,300 years earlier, to leave their native Ireland to spread the gospel. With the approval of the Church of Scotland, the General Assembly of which recognized it officially in 1951, they began their work of restoring the ruins, and in 1959, when the cloisters, the sanctuary, and the sacristy were finished, the abbey was consecrated.

Iona Community members spend most of the year working on the Scottish mainland, chiefly in industrial parishes, and abroad. The primary conditions of membership, however, entail residence for part of the summer on Iona and personal participation in the devotions of the community and in the physical work of restoration. The members adhere to a community rule of prayer and Bible study rather than to any particular ritual. Christian groups, young people, and individuals of all denominations visit Iona every summer for recreation of body, mind, and spirit.

Ionesco, Eugène, Romanian EUGEN IONESCU (b. Nov. 26, 1912, Slatina, Rom.), Romanian-born French dramatist whose one-act "anti-play" *La Cantatrice chauve* (1949; *The Bald Soprano*) inspired a major revolution in dramatic techniques and helped inaugurate the Theatre of the Absurd. He was elected to the French Academy in 1970.



Ionesco, 1959
Mark Gerson

Ionesco was taken to France as an infant but returned to Romania in 1925. After obtaining a degree in French at the University of Bucharest, he worked for a doctorate in Paris (1939), where, after 1945, he made his home. While working as a proofreader, he decided to learn English; the formal, stilted commonplaces of his textbook inspired the masterly catalog of senseless platitudes that constitutes *La Cantatrice chauve.* In its most famous scene, two strangers—who are exchanging banalities about how the weather is fairing, where they live, and how many children they have—stumble upon the astonishing discovery that they are indeed man and wife; it is a brilliant example of Ionesco's recurrent themes of self-estrangement and the difficulty of communication.

In rapid succession Ionesco wrote a number of plays, all developing the "antilogical" ideas of *La Cantatrice chauve;* these included brief and violently irrational sketches and also a series of more elaborate one-act plays in which many of his later themes—especially the fear and horror of death—begin to make their appearance. Among these, *La Leçon* (1951; *The Lesson*), *Les Chaises* (1952; *The Chairs*), and *Le Nouveau Locataire* (1955; *The New Tenant*) are notable successes. By contrast, it was only with difficulty that Ionesco mastered the techniques of the full-length play: *Amédée* (1954), *Tueur sans gages* (1959; *The Killer*), and *Le Rhinocéros* (1959; *Rhinoceros*) lack the dramatic unity that he finally achieved with *Le Roi se meurt* (1962; *Exit the King*). This success was followed by one of his best and most spectacular flights of philosophical fantasy, *Le Piéton de l'air* (1963; *A Stroll in the Air*). With *La Soif et la faim* (1966; *Thirst and Hunger*), however, he returned to a more fragmented type of construction. In the next decade he wrote *Jeux de massacre* (1970; *Killing Game*); *Macbett* (1972), a retelling of Shakespeare's Macbeth; and *Ce formidable bordel* (1973; *A Hell of a Mess*). During his long career he also published essays, textbooks for children, and a novel (*Le Solitaire,* 1973).

Ionesco's achievement lies in having popularized a wide variety of nonrepresentational and surrealistic techniques and in having made them acceptable to audiences conditioned to a naturalistic convention in the theatre. His success in this was facilitated by his pointed and vituperative brilliance as a critic (*Notes et contre-notes,* 1962; *Notes and Counter Notes*). Ionesco's later works show less concern with intellectual paradox and more with dreams, visions, and exploration of the subconscious. His pessimism relaxed slightly after *Le Roi se meurt.* At the same time, however, his political attitudes hardened, and, whereas earlier he described himself as a "right-wing anarchist," his *Journal en miettes* (1967; *Fragments of a Journal*) reveals him as an opponent of every kind of left-wing ideology.

Ionia, ancient region comprising the central sector of the western coast of Anatolia (now Turkey). It was bounded by the regions of Aeolis on the north and Caria on the south and included the adjacent islands. Ionia consisted of a coastal strip about 25 miles (40 km) wide that extended from Phocaea at the mouth of the Hermus River in the north to the territory of Miletus south of the Maeander River, thus extending for a north-south distance of about 100 miles (160 km). Its habitable area consisted principally of three flat river valleys, the Hermus (modern Gediz), Cayster (Küçük Menderes), and Maeander (Büyük Menderes), that led down between mountain ranges of 5,000–6,000 feet (1,500–1,800 m) to empty into deeply recessed gulfs of the Aegean coast.

The region bordered on the Hittite empire before 1200 BC. This particular stretch of coast was known as Asia by the early Greeks and possibly corresponds to the Assuwa of Hittite records. The name Ionia, however, does not appear in any records of this time, and Homer does not recognize any Ionic settlement of the Asiatic coast in Achaean times. The name Ionia must therefore have been first applied to this coast subsequent to the collapse of the Achaean kingdoms in Greece in the face of the Dorian invasion, when Ionic Greek refugees migrated eastward across the Aegean, which would conform to archaeological data placing the Greek emigration to Anatolia at about 1000–900 BC.

The original Greek settlements in the region were numerous and small, but by the 8th century BC they had confirmed their possession of the whole coastline and had consolidated themselves into 12 major cities—Phocaea, Erythrae, Clazomenae, Teos, Lebedus, Colophon, Ephesus, Priene, Myus, and Miletus on the mainland, with the islands Chios and Samos. These Greek Ionian cities formed an exclusive religious league, the Panionion.

The cities of Ionia were pioneers of Greek civic (and probably constitutional) development in the 8th and 7th centuries. They seem to have played little part in Greek maritime enterprise of the 8th century in the Mediterranean, but after 700 BC Ionic seamen of Miletus and Phocaea became active in the Black Sea area and along the Mediterranean coasts of France and Spain, planting numerous colonies. Miletus alone is said to have been the mother of 90 cities. By the end of the 7th century the Ionian cities had achieved great prosperity through their trading enterprises, their colonization efforts, and their manufacture of ceramics, textiles, and metalware.

In this period and down to about 500 BC, Ionic rational thought dominated the intellectual life of Greece. Hecataeus of Miletus pioneered the Greeks' study of geography. His city, Miletus, was the birthplace of natural philosophy in the persons of Thales and Anaximander, and Ionians at home and overseas (Heraclitus, Pythagoras, and Parmenides) would lay the foundations of Greek philosophy. The Ionic dialect of Greek became the language of literature and learning, and Ionic architecture, sculpture, and bronze casting were also influential.

The overseas expansion of Ionia in the 7th century was in part due to the need of a new population outlet after deep Ionic penetrations inland had provoked opposition and conflict with the rising power of Lydia under the Mermnads. After repeated conflicts, most of Ionia finally came under Lydian rule in the reign of Croesus (*c.* 560–546). After Croesus' fall at the hands of Achaemenian Persia, the cities of Ionia were unable to effectively oppose the latter. The Ionians mounted an unsuccessful revolt against Persian rule in about 499 BC, but their fleet was crushed in a naval battle off Lade five years later. This revolt against the Persians marked the opening phase of the Greco-Persian Wars.

After the Greeks' victory over Persia at the Battle of Salamis in 480 BC, the Ionian cities regained their independence and helped to form the Delian League with Athens. They had come under Athenian control by the late 5th century, however. Sparta gained influence in Ionia in the last stages of the Peloponnesian War (413–404) but abandoned the Ionian mainland to Persia in 387 BC.

Ionia was nominally independent again from 334 to 301 under the rule first of Alexander the Great and then of Antigonus I Monophthalmus. The region then became part of the Seleucid and later of the Attalid kingdom. In 133 BC Ionia passed under Roman rule and became part of the Roman province of Asia. Under the Roman Empire the principal cities of Ionia experienced a revival of prosperity, and many of the impressive ruins on their sites date from that time. Ephesus, Miletus, Smyrna, and Chios were among the most splendid cities of the Roman world and continued to flourish in Byzantine times.

To make the best use of the Britannica, consult the INDEX *first*

Ionian, any member of an important eastern division of the ancient Greek people, who gave their name to a district on the western coast of Anatolia (now Turkey). The Ionian dialect of Greek was closely related to Attic and was spoken in Ionia and on many of the Aegean islands.

The Ionians are said to have migrated to western Anatolia from Attica and other central Greek territories following the Dorian immigration (*c.* 1000 BC) that upset the Achaean kingdoms on the mainland. This is confirmed by the fact that the same four "tribes" (*phylai*) found among the Athenians reappear in the

inhabitants of Miletus and other Ionian cities. Homer in his epics gives the Ionians but a passing mention, but in the Homeric *Hymn to Apollo,* roughly corresponding in time to the first certain written reference to the Ionians by the Assyrian king Sennacherib (reigned 704–681 BC), they are noted as the great and wealthy people who frequent the festival of Apollo at Delos.

By the time of Herodotus (*c.* 450 BC), Greek thinkers had worked out a detailed ethnological theory, identifying the Ionians with the aboriginal element in Greece (Pelasgoi) and the Dorians with the immigrant northern Hellenes proper. This hypothesis introduced an element of racialism into Greek interstate polemics. The Ionians of Asia, because of their exposed position, had been subjected by Persia and came to be despised as "soft" in comparison to the military, disciplined cadres of the Peloponnesian Dorians.

From about 700 BC, expansion and accompanying colonization brought the Ionians of Euboea to eastern Sicily and Cumae near Naples, and Samians to Nagidus and Celenderis in Pamphylia. Among the Ionian cities, Miletus, said to have founded 90 colonies, was instrumental in opening up the Black Sea, while Phocaea was active in the Mediterranean, establishing a colony at Massilia (Marseille). "Ionians" (Homeric Iawones, Persian Yauna, Hebrew Yewanim, Turkish and Arabic Yunani) became and remained the Oriental term for all Greeks.

The contribution of Ionians to Greek culture was of major importance, including the Homeric epics and the earliest elegiac and iambic poetry. In the 6th century, Ionic rational thought dominated intellectual life, fostering the study of geography and nature and research into matter and the universe. Ionians at home and overseas also laid the foundation of Greek philosophy and historiography. In the age after Alexander the Great, Attic Ionic, the literary language, became the basis of Koine, or "common speech," the language of practically all later Greek writing, including the New Testament, down to the present day. Ionians were also substantial artists in the areas of architecture, sculpture, and cast-bronze statuary. *See also* Ionia.

Ionian Islands, Modern Greek IÓNIOI NÍSOI, island group off the west coast of Greece, stretching south from the Albanian coast to the southern tip of the Peloponnese, and often called Heptanesos (Seven Islands). The islands are Corfu (Kérkira), Cephalonia (Kefallinía), Zacynthus (Zákinthos, Zante), Leucas (Levkás), Ithaca (Itháki), Cythera (Kíthira), and Paxos (Paxoí), with their minor dependencies. Their combined land area is 891 square miles (2,307 square km).

With good rainfall and much arable soil, the islands produce timber, fruit, and flax and raise pigs, sheep, and goats. Exports include currants, wine, cotton, salt, olives, and fish. The islands are largely self-sufficient in grains. Their harbours are superior to those of the west coast of Greece and more conveniently located for international shipping. The islands are subject to severe earthquakes, which in 1953 caused considerable damage to towns and facilities in Cephalonia, Zante, and Ithaca. (For physical description and classical history, *see* the articles on individual islands.)

Because of their strategic maritime location between the Greek and Italian mainlands, intervention from outside has affected the islands and their people since classical times. Leo IV the Wise (*c.* AD 890) formed most or all of the islands into a province of the Byzantine Empire as the *theme* of Cephalonia. The Norman adventurer Robert Guiscard captured Corfu (1081) and Cephalonia, but his death (1085) prevented the establishment of a dynasty. When the Latin empire (1204–61) was established at Constantinople, the Venetians received Corfu; but in 1214 the Greek despotate of Epirus annexed the first Venetian colony, and a long period of Epirote, Sicilian, and Neapolitan-Angevin rule followed until 1386, when Corfu submitted voluntarily to the Venetian republic. In 1479 the Turks captured the islands of Cephalonia, Zacynthus, Leucas, and Ithaca, annexing them to their empire. The Venetians soon counterattacked and retook them during the 15th and 16th centuries.

The Venetians won the adherence of the principal local families on the islands by the bestowal of titles and appointments. The Roman Catholic church was established there, and the Italians and Greeks intermarried. Greek ceased to be spoken except by the peasantry, who remained faithful to the Greek Orthodox communion. On the fall of the Venetian republic in 1797, the islands were awarded to France, whose rule was quickly ended by a Russo-Turkish force (1798–99). Reclaimed by France in 1807 and made an integral part of the French empire under Napoleon, the islands were placed by the Treaty of Paris (1815) under the exclusive protection of Great Britain.

An Ionian senate and legislative assembly began to function in 1818, but real authority was vested in a British high commissioner. Schools of higher learning and a judiciary were set up, but the inhabitants resented the restrictions imposed by the firm British rule. After 1848 periodic insurrections by the peasantry, notably in Cephalonia, had to be put down with force, and the Ionian parliament voted for immediate union with the new Greek kingdom. In 1864 Britain ceded the islands to Greece as a gesture marking the accession of a new Greek king, George I (the former Prince William George of Glücksburg), son of Christian IX of Denmark. Following their annexation, the prosperity of the islands decreased, partly because of the loss of the special tax and trading privileges granted under the protectorate. The islands were occupied by Italy and, later, Germany during World War II. They were liberated with the rest of Greece in 1944. Pop. (1981) 182,651.

Ionian school, school of Greek philosophers of the 6th to 5th century BC, including Thales, Anaximander, Anaximenes, Heracleitus, Anaxagoras, Diogenes of Apollonia, Archelaus, and Hippon. Although Ionia was the original centre of their activity, they differed so greatly from one another in their conclusions that they cannot be said to have represented a specific school of philosophy. Their common concern to explain phenomena in terms of matter or physical forces, however, distinguished them from later thinkers.

Ionian Sea, Latin MARE IONIUM, Italian MARE IONIO, part of the Mediterranean Sea, lying between Greece (east), Sicily (southwest), and Italy (west and northwest). Though considered by ancient authors to be part of the Adriatic Sea, the Ionian Sea is now seen as a separate body of water. In the Ionian Sea, south of Greece, the Mediterranean reaches its greatest depth (16,000 feet [4,900 m]).

The Ionian is connected with the Tyrrhenian Sea by the Strait of Messina and with the Adriatic Sea by the Strait of Otranto. The Ionian Sea includes the gulfs of Squillace and Taranto (Italy) and Arta, Patras, and Corinth (Greece). Main Ionian ports are Syracuse and Catania (Sicily), Taranto (Italy), Kérkira (Ionian Islands), and Pátrai (Greece). The Ionian Islands lie off the western coast of Greece.

Ionic alphabet, most important variety of the eastern form of the ancient Greek alphabet, developed late in the 5th century BC. In 403 the Ionic alphabet used in the Anatolian city of Miletus was adopted for use in Athens, and by the middle of the 4th century the Ionic had become the common, 24-letter, classical Greek alphabet.

ionic bond, also called ELECTROVALENT BOND, type of linkage between oppositely charged atoms in a chemical compound. Such a bond forms when the valence (outermost) electrons of one atom are transferred permanently to another atom. The atom that loses the electrons becomes a positively charged ion (cation), while the one that gains them becomes a negatively charged ion (anion). The idea of electron transfer between atoms was suggested by the British physicist J.J. Thomson in the late 19th century and was developed into a theory of the ionic bond in 1916 by the German scientist Walter Kossel.

Ionic bonding results in compounds known as ionic, or electrovalent, compounds, which are perhaps best exemplified by the hydrides of the alkali and alkaline-earth metals. In ionic crystalline solids of this kind, the electrostatic forces of attraction between opposite charges and repulsion between similar charges orient the ions in such a manner that every positive ion becomes surrounded by negative ions and vice versa. In short, the ions are so arranged that the positive and negative charges alternate and balance one another, the overall charge of the entire substance being zero. The magnitude of the electrostatic forces in ionic crystals is considerable. Accordingly, these substances tend to be hard and nonvolatile. Their ionic bonds, however, are greatly weakened in media of high dielectric constant.

Various ionic compounds are thought to contain covalent bonds, which are linkages between two—or occasionally three—atoms that form when each of the atoms shares one of its valence electrons with the other. Unlike ionic bonding, covalent bonding involves no permanent electron transfer. *Compare* covalent bond.

Ionic order, one of the orders of classical architecture. Its distinguishing feature is the twin volutes, or spiral scrolls, of its capital. *See* order.

ionium-thorium dating, method of establishing the time of origin of marine sediments according to the amount of ionium and thorium they contain. Because uranium compounds are soluble in seawater, while thorium compounds are quite insoluble, the thorium isotopes produced by the decay of uranium in seawater are readily precipitated and incorporated in sediments. One of these thorium isotopes, thorium-230 (also known as ionium), has a half-life of about 80,000 years, which makes it suitable for dating sediments as old as 400,000 years. Thus, the amount of ionium in sediments can be used as a rough measure of the age of sediment. Accurate dating by measurement of ionium alone requires that the rate of sedimentation of ionium be constant with time, an assumption that does not hold for many sediments; any thorium-232 present in seawater will also precipitate, and the decay of the ratio of ionium to thorium-232 can be used as a measure of time. This method does not require a constant rate of sedimentation of ionium but simply that the two isotopes are precipitated in a constant proportion.

The validity of the ionium-thorium age method is based upon the following assumptions: (1) the ratio of thorium-230 (ionium) to thorium-232 in ocean water remains constant during the age span of the sample to be dated; (2) during precipitation there is no chemical fractionation of ionium and thorium, so that they are precipitated in a constant ratio; (3) the sediments do not contain any detrital material that has a significant amount of either nuclide; and (4) after deposition the thorium isotopes do not migrate within the sediments. When these assumptions are valid, an accurate

date may be obtained for the age of marine sediments.

ionization, in chemistry and physics, any process by which electrically neutral atoms or molecules are converted to electrically charged atoms or molecules (ions). Ionization is one of the principal ways that radiation, such as charged particles and X rays, transfers its energy to matter.

In chemistry, ionization often occurs in a liquid solution. For example, neutral molecules of hydrogen chloride gas, HCl, react with similarly polar water molecules, H_2O, to produce positive hydronium ions, H_3O^+, and negative chloride ions, Cl^-; at the surface of a piece of metallic zinc in contact with an acidic solution, zinc atoms, Zn, lose electrons to hydrogen ions and become colourless zinc ions, Zn^{2+}.

Ionization by collision occurs in gases at low pressures when an electric current is passed through them. If the electrons constituting the current have sufficient energy (the ionization energy is different for each substance), they force other electrons out of the neutral gas molecules, producing ion pairs that individually consist of the resultant positive ion and detached negative electron. Negative ions are also formed as some of the electrons attach themselves to neutral gas molecules. Gases may also be ionized by intermolecular collisions at high temperatures.

Ionization, in general, occurs whenever sufficiently energetic charged particles or radiant energy travel through gases, liquids, or solids. Charged particles, such as alpha particles and electrons from radioactive materials, cause extensive ionization along their paths. Energetic neutral particles, such as neutrons and neutrinos, are more penetrating and cause almost no ionization. Pulses of radiant energy, such as X-ray and gamma-ray photons, can eject electrons from atoms by the photoelectric effect to cause ionization. The energetic electrons resulting from the absorption of radiant energy and the passage of charged particles in turn may cause further ionization, called secondary ionization. A certain minimal level of ionization is present in the Earth's atmosphere because of continuous absorption of cosmic rays from space and ultraviolet radiation from the Sun.

ionization chamber, radiation detector used for determining the intensity of a beam of radiation or for counting individual charged particles. The device may consist of a gas-filled, cylindrical container in which an electric field is maintained by impressing a voltage that keeps the wall negative relative to a wire extending along the axis. When a photon or a charged particle enters the chamber, it converts some of the gas molecules to positive ions and electrons; under the influence of the electric field, these particles migrate to the wall and the wire, respectively, and cause an observable pulse of current to flow through the circuit joining these elements.

A proportional counter is a modified ionization chamber, one in which a higher voltage is impressed, making the electric field near the axial wire intense enough to accelerate the approaching electrons to energies so high that their collisions with the gas molecules cause further ionization. This effect, called gas multiplication, makes the output electric pulse proportional to the ionization produced by the radiation entering the counter and thus permits differentiation among particles of various kinds and energies.

A Geiger-Müller counter results from the application of a still-higher voltage across the electrodes of a proportional counter. Individual particles of various kinds and energies entering a Geiger-Müller counter produce essentially the same large output pulse, making the instrument an excellent counter of individual particles. The mixture of gases within a Geiger counter quenches the avalanche of ions produced by a single particle of radiation so that the device can recover to detect another particle. An additional significant increase in voltage causes a continuous current to flow through the gas between the electrodes, rendering the device useless for detecting radiation.

Articles are alphabetized word by word, not letter by letter

ionization potential, also called IONIZATION ENERGY, in chemistry, the amount of energy required to remove an electron from an isolated atom or molecule. There is an ionization potential for each successive electron removed; the ionization potential associated with removal of the first (most loosely held) electron, however, is most commonly used.

The ionization potential of a chemical element, expressed in electron volts, is usually measured in an electric discharge tube in which a fast-moving electron generated by an electric current collides with a gaseous atom of the element, causing it to eject one of its electrons. For a hydrogen atom, composed of an orbiting electron bound to a nucleus of one proton, an ionization energy of 13.6 electron volts is required to force the electron from its lowest energy level entirely out of the atom. The magnitude of the ionization potential of an element is dependent on the combined effects of the electric charge of the nucleus, the size of the atom, and its electronic configuration. Among the chemical elements, removal of an electron is hardest for the noble gases and easiest for the alkali metals. The ionization energy required for removal of electrons increases progressively as the atom loses electrons, because the positive charge on the nucleus of the atom does not change, and therefore, with each removal of an electron, the remainder are held more firmly.

The ionization potential is a measure of the capability of an element to enter into chemical reactions requiring ion formation or donation of electrons. It is also generally related to the nature of the chemical bonding in the compounds formed by the elements. *See also* binding energy; electron affinity.

ionosphere, region of the Earth's atmosphere in which the number of ions, or electrically charged particles—resulting from the action of extraterrestrial (primarily solar) radiation on the neutral atoms and molecules of the air—is large enough to affect the propagation of radio waves. The ionosphere begins at a height of about 50 km (30 miles) above the surface but is most distinct at altitudes above about 80 km (50 miles).

A brief treatment of the ionosphere follows. For full treatment, *see* MACROPAEDIA: Atmosphere.

Discovery of the ionosphere extended over nearly a century. As early as 1839, the German mathematician Carl Friedrich Gauss speculated that an electrically conducting region of the atmosphere could account for observed variations of the Earth's magnetic field. The notion of a conducting region was reinvoked by others, notably in 1902 by the American engineer Arthur E. Kennelly and the British physicist Oliver Heaviside to explain the transmission of radio signals around the curve of the Earth's surface, before definitive evidence was obtained in 1925. For some years the ion-rich region was referred to as the Kennelly-Heaviside layer.

The ionosphere consists of three layers: the D region, the lowest, is strongly ionized during the day and is responsible for the attenuation of shortwave and broadcast-band radio signals, an effect that largely disappears at night; the E layer, extending from 90 to 140 km (56 to 90 miles), is a region of ionized molecules and strong electric currents; and the F region, from 140 km up, is characterized by ionized atoms and contains the stratum (designated as F2) in which ion concentration reaches a maximum. The E and F regions are responsible for the long-distance propagation, by reflection, of radio signals in the short-wave and broadcast bands. Extending upward from the F layer is a region called the magnetosphere, wherein the Earth's magnetic field largely controls the movement of ions. The magnetosphere contains the highly energetic charged particles of the Van Allen radiation belts, though its ion content is little affected by them. At distances of 8 to 14 Earth radii (roughly 51,000 to 89,000 km, or 31,700 to 55,500 miles) on the sunward side and farther out elsewhere, the magnetosphere and the ionosphere end at a boundary known as the magnetopause, beyond which is the domain of the solar wind (continual flow of electrons and atomic nuclei from the Sun).

Ionization in the ionospheric region is chiefly effected by solar radiation at X-ray and ultraviolet wavelengths. The particles ionized are mainly molecular nitrogen and molecular and atomic oxygen, but at a height of about 1,000 km (620 miles) there is a region, sometimes called the protonosphere, in which protons (hydrogen nuclei) constitute the dominant ionic species.

iora, smallest of the fairy bluebird species. *See* fairy bluebird.

Iorga, Nicolae (b. June 18, 1871, Botoşani, Rom.—d. Nov. 28, 1940, Strejnicu), scholar and statesman, Romania's greatest national historian, who also served briefly as its prime minister (1931–32).

Appointed professor of universal history at Bucharest (1895), Iorga early established his historical reputation with his *Geschichte des rumänischen Volkes* (1905; "History of the Romanian People"), his five-volume *Geschichte des osmanischen Reiches* (1908–12; "History of the Ottoman Empire"), and studies of the Crusades.

From the time of his first election to the Romanian Parliament (1907), he played an important role in national politics. He founded his own party, the National Democrats, and in 1931–32 he served as prime minister and also minister of education. A man of enormous energy, he had already by 1933 written an estimated 800 books and 10,000 articles and founded a people's university at Vălenii de Munte (1908), the Southeast European Institute (1913), and numerous periodicals. He subsequently published a monumental 10-volume national history (*Istoria Românilor;* 1936–39). His strongly nationalist writings and lectures influenced all of Romanian intellectual life.

Iorga supported the regime of his former pupil, King Carol II, who had returned from exile in 1930 to claim the national throne. In November 1940 Iorga was assassinated by terrorists of the national Fascist Iron Guard.

Ioshkar-Ola (Russian S.F.S.R.): *see* Yoshkar-Ola.

Iowa, North American Indian people of Siouan linguistic stock who in their prehistoric period migrated westward from north of the Great Lakes to the general area of the present state of Iowa. In 1836 they ceded their lands to the United States and moved to a reservation on what is now the Kansas-Nebraska border. Some were later moved to a reservation in Indian Territory (present Oklahoma). Their estimated population in the mid-18th century was 1,100. In the late 20th century there were more than 100 Iowa descendants living on the reservation in Kansas-Nebraska and more than 100 living in Oklahoma.

Unlike many Plains people, the Iowa were not solely hunters. Their semisedentary, agricultural way of life bore more resemblance to that of the Eastern Woodlands tribes. They raised corn (maize) and traded fur pelts and clay pipes with the French. They lived in oven-shaped, earth-covered houses, using tepees when hunting or on the warpath. Like the



Mew-hew-she-kaw (The White Cloud), chief of the Iowa, painting by George Catlin, 1834

By courtesy of the American Museum of Natural History, New York

Osage and Kansa, Iowa warriors wore a scalp lock decorated with deer hair. They recognized three grades of battle exploits: victorious captaincy, killing an enemy, and decapitating and scalping an enemy.

Iowa, constituent state of the United States of America, lying in the Midwestern region in the north-central United States, bounded on the north by Minnesota, on the east by Wisconsin and Illinois, on the south by Missouri, and on the west by Nebraska and South Dakota. The landscape is typified by gently rolling prairie. The capital is Des Moines.

A brief treatment of Iowa follows. For full treatment, *see* MACROPAEDIA: United States of America: *Iowa.*

The French explorers Jacques Marquette and Louis Jolliet were probably the first Europeans to reach Iowa, but permanent settlement did not take place until the 1830s. Iowa became a part of the United States with the rest of the Louisiana Purchase in 1803. Following the purchase of eastern Iowa from the Sauk and Fox Indians in the 1830s, settlers from the Eastern states rapidly moved in. Iowa became a territory in 1838 and the 29th state in 1846. The population grew rapidly but stabilized about 1900.

Iowa's terrain and rich soils are products of the glaciation that covered much of North America during the Pleistocene epoch, between 1,600,000 and 10,000 years ago. Most of the state is overlain by glacial drift. Lakes or swamps that were left by the ice have long since been drained by natural erosion, leaving a rolling landscape of great uniformity. Broad, flat uplands cover 12,300 square miles (32,000 square km) of the state's central and north-central portions. The most varied relief in the state is in the northeast, where tributaries of the Mississippi River have cut deeply into the underlying bedrock.

Iowa winters are cold and summers warm and humid. In the northwest, January's average temperature is 14° F (−10° C), in the southeast, 22° F (−6° C). Winter snowfall is generally light. The average July temperature is 74° F (23° C). Precipitation ranges from less than 28 inches (700 mm) in the northwest to 35 inches (889 mm) in the southeast. Summer thunderstorms increase precipitation significantly.

Iowa was settled largely by immigrants from states lying directly to the east and from northwestern Europe. The people were and continue to be mostly Protestant. In the 20th century the only notable immigration into Iowa has been that of blacks to the larger urban areas. Blacks, however, compose only a small percentage of the total population. Iowa is about three-fifths urban—less urban than any bordering state except South Dakota. The state's population grew only slightly between 1970 and 1980 and then began slowly to decrease.

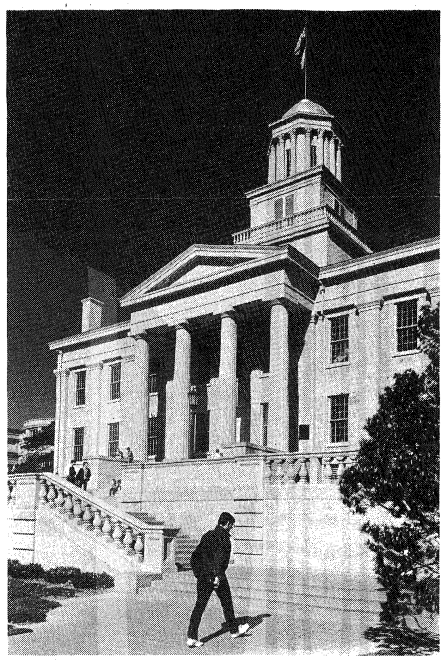
Iowa is one of the nation's leading states in production of livestock (especially hogs), corn (maize) for feed, soybeans, and oats and hay. Iowa's manufacturing output is closely related to its agricultural predominance; in the 20th century it became a major breadbasket of the United States. The main industries are devoted to food processing and the manufacture of agricultural machinery. One famous exception is the manufacture of refrigeration equipment in Amana. Except for the mining of portland cement and gypsum, mineral resources play a minor role in the economy.

In the 1920s Iowa developed an extensive rural-road system designed to serve the relatively low population density. Inland-waterway traffic is carried along the Mississippi and Missouri rivers.

The major cultural centres in Iowa are the large state and smaller private universities and colleges. The fine arts are notably supported at the University of Iowa, where the regional painter Grant Wood did much of his work. There is a natural-history museum and planetarium at Cherokee and a Norwegian-American historical museum at Decorah. Folk traditions are maintained in the Amana Colonies (Oktoberfest) and in the Dutch community of Pella, with its annual tulip festival. Area 56,275 square miles (145,753 square km). Pop. (1990 est.) 2,758,000.

Iowa City, city, seat (1839) of Johnson county, east-central Iowa, U.S., on the Iowa River, 27 miles (43 km) south of Cedar Rapids. Founded as territorial capital of Iowa in 1839, it lost the state capital to Des Moines in 1857 but retained the University of Iowa (1847).

The Old Capitol (1840) stands on the university campus. With the arrival of the railroad (1855), the city became an important dispersal point for westward immigrants. Its economy, centred on the university and its medical centre, is supplemented by light manufactures (including adhesive paper, toothbrushes, and toiletries) and farming (hogs, cattle, and grain). The Herbert Hoover birthplace (a national historic site) is in West Branch, 10 miles (16 km) east, and the Amana Colonies, seven Old-World villages, are 20 miles (32 km) west-northwest. Coralville, immediately to the west, was the starting point for the Mormon handcart expedition to Utah of 1856. Inc. 1853. Pop. (1987 est.) 50,192.

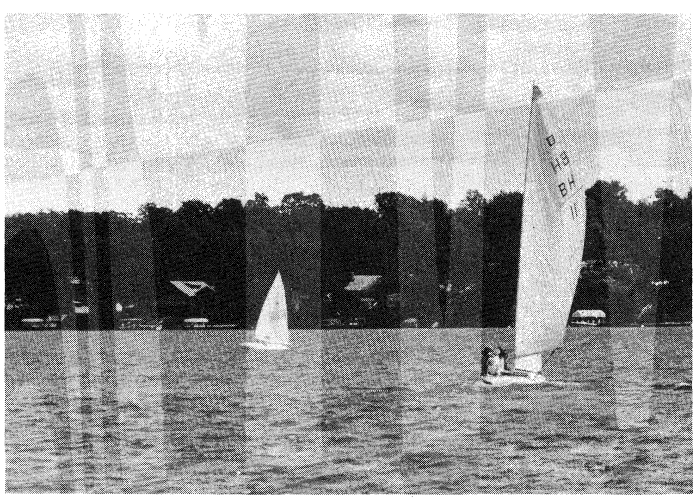


The Old Capitol at the University of Iowa, Iowa City, Iowa

By courtesy of the University of Iowa, Iowa City, Iowa; photograph, Tom Jorgensen

Iowa Great Lakes, leading resort area in northern Iowa, U.S., embracing Spirit, West Okoboji, East Okoboji, and Silver lakes, in Dickinson county, just south of the Minnesota state line. All four lakes are of glacial origin. Spirit Lake, the largest (4 miles long by 3 miles wide [6.4 km long by 4.8 km wide]), lies just north of Spirit Lake town, which is the chief community of the region. West Okoboji Lake is noted for its crystalline clarity.

A number of state parks, including Mini-Wakan, provide public access to the lakes, which have swimming, boating, and fishing facilities. Rich in Indian lore, the region was the scene of the so-called Spirit Lake Massacre (March 1857) of more than 30 white settlers by a band of Sioux led by the renegade Inkpaduta. The incident, commemorated by several historical cabin sites including the Gardner Log Cabin-Museum in Arnolds Park, provided the background for MacKinley



Sailing on Okoboji Lake, Iowa Great Lakes

By courtesy of the Iowa Tourism Bureau

Kantor's novel *Spirit Lake* (1961). The Spirit Lake Fish Hatchery is in Orleans just north of the town of Spirit Lake, and Ocheyedan Mound (1,675 ft [511 m]), 25 mi west, the highest point in the state, is where the Indians mourned their dead (its name means "spot where they weep").

Iowa River, river formed by the confluence of East and West branches, near Belmond in Wright County, north central Iowa, U.S. It flows generally southeast past Iowa Falls, Marshalltown, and Iowa City.

At Columbus Junction, about 25 mi (40 km) below Iowa City, the Iowa River is joined by the Cedar River, and the combined streams enter the Mississippi River nearly 20 mi south of Muscatine. Above Iowa City the river is dammed for flood control and recreation to form Coralville Reservoir and Lake Macbride. Its course with its headstreams is about 330 mi.

IPA: *see* International Phonetic Alphabet.

Ipameri, city, southeastern Goiás state, south central Brazil. Lying in rolling uplands between the Veríssimo and Corumbá rivers, tributaries of the Paranaíba, it is primarily a cattle-shipping centre that also houses meat-processing and rice-hulling plants. Additional income is derived from the gathering and selling of rock crystals and rutile for use as gemstones. The city is on the railroad linking Goiânia, the state capital, and Anápolis with São Paulo and Belo Horizonte. It is also accessible by highway from Goiânia, which lies to the northwest. Pop. (1980 prelim.) 14,163.

Ipatieff, Vladimir Nikolayevich, Ipatieff also spelled IPATYEV (b. Nov. 21 [Nov. 9, old style], 1867, Moscow—d. Nov. 29, 1952, Chicago), Russian-born U.S. chemist who was one of the first to investigate high-pressure catalytic reactions of hydrocarbons and who developed a process for manufacturing high-octane gasoline.

In 1887 Ipatieff became an officer in the Imperial Russian Army and later attended the Mikhail Artillery Academy (1889–92), St. Petersburg (now Leningrad), where he served as professor of chemistry (1898–1906). In 1897 he went to Munich to study and, while there, discovered the structure of isoprene, the basic molecular unit of rubber. Continuing his studies of hydrocarbons after his return to Russia, he soon learned to control and direct high-pressure catalytic reactions.

At the outbreak of World War I, Ipatieff was appointed chairman of the chemical committee of the Russian government, and throughout the war he served in administrative positions in the chemical industry. In spite of his anti-Communist feelings, he continued to work for the government after the Russian Revolution, but in 1930 he left the U.S.S.R. and accepted a position with the Universal Oil Products Company, Chicago. There he developed his catalytic processes for industrial use. Among the most important applications of these processes was the manufacture of high-octane gasoline from low-octane fuels.

Ipek (Yugoslavia): *see* Peć.

Iphicrates (b. *c.* 418 BC—d. *c.* 353), Athenian general known chiefly for his use of lightly armed troops (peltasts); he increased the length of their weapons and improved their mobility by reducing defensive armour.

Iphicrates used his peltasts skillfully in the Corinthian War (395–387), nearly annihilating a battalion of Spartan hoplites near Corinth in 390. After the war he served the Persians as a mercenary commander, then returned to Athens. His expedition (373) to relieve Corcyra of a Spartan siege was successful, but he failed in attempts to recover Amphipolis (367–364).

Retiring to Thrace, Iphicrates fought for the Thracian king Cotys against Athens. The Athenians soon pardoned him and made him a commander in their struggle against their rebelling allies (Social War, 357–355). Iphicrates and two of his colleagues were prosecuted by Chares, the fourth commander, after they had refused to give battle during a violent storm. Iphicrates was probably acquitted but he died soon afterward.

Iphigeneia, in Greek mythology, eldest daughter of Agamemnon, king of Mycenae, and his wife Clytemnestra. Her father had to sacrifice her to the goddess Artemis in order that the Achaean fleet, of which he was leader, might be delivered from the calm (or contrary winds) by which Artemis was detaining it at Aulis and proceed on its way to the siege of Troy.

Iphigeneia served as a key figure in certain Greek tragedies: in the *Agamemnon* of Aeschylus, in the *Electra* of Sophocles, in Euripides' unfinished *Iphigeneia in Aulis*, and in his earlier play *Iphigeneia in Tauris*, in which she was saved by Artemis, who substituted a hind. Variants of her story are found in later authors. In some localities she was identified with Artemis, and some ancient writers claimed that Iphigeneia was originally the goddess Hecate.

Iphigeneia's story was also popular with later European dramatists, providing the plot of the *Iphigénie* by Racine and of the *Iphigenie auf Tauris* of Goethe. Racine's play was the basis for Gluck's opera *Iphigénie en Aulide.*

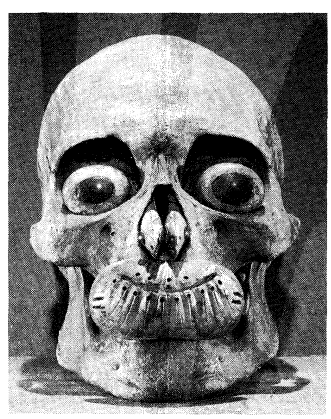
Ipiales, city, Nariño department, southwestern Colombia, in the Andes Mountains on the banks of the Río Guáitara, at 9,505 ft (2,897 m) above sea level. It is known as the "city of the three volcanoes."

The Spanish settlement was founded in 1585 by missionaries working among the indigenous Pasto Indians. It contains well-known Indian markets and the sanctuary of the Virgin of Las Lajas. Ipiales is an important regional manufacturing centre, producing woollen and cotton textiles, articles of sisal, and beer. It is also a border post, being on the Pan-American Highway, 2.5 mi (4 km) from the Ecuadorean boundary. Pop. (1973) 34,536.

Ípiros (Greece): *see* Epirus.

Ipiutak culture, Eskimo culture of northwestern Alaska, probably dating from the 2nd to the 6th century AD. A Siberian origin has been suggested, based on similarities in burial practices and ceremonialism, animal carvings and designs, and some use of iron; but evidence is not conclusive. There seem to be links with the Kachemak culture (*q.v.*) as well as with some areas of southwestern and western Alaska.

The Ipiutak people may have inhabited the coastal region only in the spring and summer months, moving inland for the rest of the year. Coastal dwellings were semi-subterranean huts. Seals and walrus were a major source of food and were hunted with harpoons from the edge of the ice. Bows and arrows were preferred for hunting caribou. Fish and birds were a minor part of the diet.



Burial skull of the Ipiutak culture, Alaska, with artificial eyes of jade and ivory; in the American Museum of Natural History, New York City

By courtesy of the American Museum of Natural History, New York City

A distinctive feature of Ipiutak tools was the use of flint rather than rubbed slate. The abundant flint of Point Hope was used for weapon points, knives, and scrapers. Ipiutak artifacts show more decoration than those of any other Eskimo culture; both geometric and realistic designs were used. Their sculpture, carvings in ivory and antler of real or imaginary animals, was finely crafted.

Elaborate burial customs, a ghost and a bear cult, and shamanism are suggested.

Ipiutak culture lacked a number of elements of typical Eskimo culture, such as stone or clay lamps and cooking pots, harpoon floats, bow drills, and slate implements.

Ipoh, capital of Perak state, West Malaysia (Malaya), on the Sungai (River) Kinta. Surrounded by steep hills, except to the south, it lies on a flat alluvial plain in the Kinta Valley (*q.v.*). The name comes from a local tree, whose poisonous resin was once used by Aboriginals for hunting. The modern town dates from the 1890s, when British tin-mining companies transferred operations from around Taiping to the rich Kinta ores. Immigrant Chinese were brought in to work the tin deposits, and their descendants now operate the open-pit mines and dominate the town.

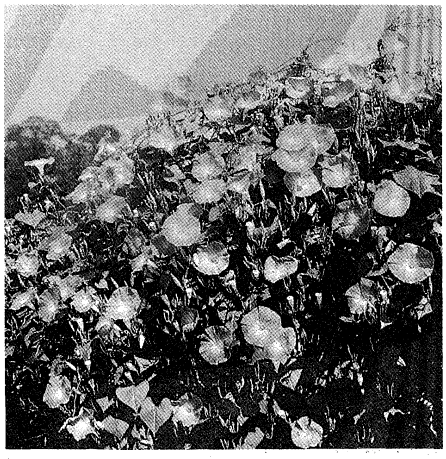
The countryside around Ipoh is pocked with large sandpits from which the ore is extracted, either by dredging or by washing with high-pressure hoses. Beneath the Kinta gravels is a limestone structure riddled by solution; north and south of the city limestone rocks rise through the alluvium with gigantic caves that are used as Chinese temples. In addition to tin, rubber from foothill plantations is marketed.

The Chenderoh Dam on the nearby Sungai Perak, together with diesel generators, supplies electricity for the Tasek Industrial Estates (more than 40 factories). Ipoh has a spacious rectangular layout, and in the suburbs are imposing residences of wealthy mineowners. As the nation's mining capital, Ipoh is the most important station on the Kuala Lumpur–Butterworth railway and the focus of highways across the valley. A small airstrip links the area with other major west coast cities. Ungku Omar Polytechnical Institute (1969) is located in the city. Pop. (1980) 293,849.

Ipomoea, also spelled IPOMAEA, genus of about 500 mostly warm-climate trees, shrubs, and twining and trailing herbaceous plants of the family Convolvulaceae with funnel-shaped flowers. Certain species of *Ipomoea* are sometimes considered as the separate genera *Batatas, Quamoclit, Calonyction, Pharbitis,* and *Exogonium.*

The genus *Ipomoea* is important to man for the beauty of its flowers and for the tuberous roots of two species. Sweet potato (*I. batatas*), a perennial, forms roots as it trails along the ground. The edible "potatoes" are enlarged food-storage portions of the roots. Its leaves are oval to lobed and the 5-centimetre (2-inch) flowers are pink to rose violet. It probably originated in tropical South America. Jalap (*I. purga*) is an upright herb with solitary, reddish flowers, native in tropical Mexico. Its apple-sized, turnip-shaped roots are the source of an ancient purgative, still in use. Heavenly blue morning glory (*I. violacea*)—a twining, perennial vine, usually cultivated as a garden annual—bears clusters of blue to purplish, sometimes white, flowers, 12 cm across, among heart-shaped leaves. It

is native to tropical America. This vine bears seeds containing the alkaloids *d*-lysergic and *d*-isolysergic acids (similar to LSD), and the seeds are used traditionally among Mexico's Zapotec Indians for ceremonial and curative purposes. Common morning glory (*I. purpurea*), an annual vine that bears heart-



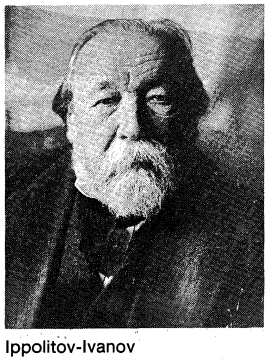
Common morning glory (*Ipomoea purpurea*)
Derek Fell

shaped leaves and purple, pink, or white flowers about 7 cm (3 inches) across, has become a troublesome weed in parts of southeastern North America. One of the largest flowering ipomoeas is the moonflower (*I. bona-nox,* or *Calonyction aculeatum*), a rampant, perennial climber with 15-centimetre (6-inch) white, fragrant, night-blooming flowers. It contains a milky juice used for coagulating *Castilla* rubber. Bush morning glory (*I. leptophylla*), with tuberous roots and erect branches to about 120 cm (47 inches) tall, bears 7.5-centimetre purple or pink flowers. It is native to central North America. The morning glory tree, or casahuate (*I. arborescens*), is one of several similar tropical American tree and shrub morning glories.

Ippitsusai Bunchō (d. 1791), Japanese artist in the ukiyo-e school, which depicted subjects drawn from everyday life.

Ippitsusai studied with Ishikawa Yukimoto, a painter of the traditional Kanō school. He gained repute as a colourist, particularly in his painting of actors (*nigeo-e,* "portraits"). His main works include the *E-hon butai ōgi* ("Picture Book of Stage Fans"), a work done with Suzuki Harunobu in 1770; the "Yamashita Kyōnosuke no ushiro men" (showing the dances of Yamashita Kyōnosuke); and the "Nakamura Matsue no shirotabi" ("White Cloth of Nakamura Matsue").

Ippolitov-Ivanov, Mikhail (Mikhaylovich) (b. Nov. 19, 1859, Gatchina, Russia—d. Jan. 28, 1935, Moscow), Russian composer



Ippolitov-Ivanov
Novosti Press Agency

of orchestral works and operas influenced by Caucasian and Georgian folk music.

Ippolitov-Ivanov studied under Nikolay Rimsky-Korsakov at the St. Petersburg Conservatory and in 1882 became conductor of the symphony orchestra and director of the music school in Tiflis (now Tbilisi), Georgia. He taught at the Moscow Conservatory (1893–1906), served as its director (1906–22), and was conductor of the Mamontova Opera (1899–1906). In 1924–25 he reorganized the Georgian State Conservatory, formerly the Tbilisi School. After 1925 he was conductor at the Bolshoi Theatre.

Ippolitov-Ivanov's 11 years in the Caucasus led to the lifelong interest in Georgian folk music that inspired several of his orchestral compositions: *Caucasian Sketches* (1895) suite, *Armenian Rhapsody* (1909), and the symphonic poem after a poem by Mikhail Lermontov, *Mtsyri* (1922; "The Novice"). These works were seldom performed after the mid-20th century; likewise, his seven operas did not remain popular.

iproniazid, the first drug of the monoamine-oxidase inhibitor series to be introduced into medicine (1958). It was employed as an antidepressant until it was found to cause liver damage. Prior to its introduction as an antidepressant, iproniazid was studied as a drug similar in function to the antituberculotic drug isoniazid, which it resembles in chemical structure. It prevents the enzymatic breakdown of norepinephrine, the brain-neurotransmitter substance concerned with emotional stimulation. It does so by inhibiting the enzyme monoamine oxidase.

Iproniazid has been replaced in antidepressant therapy by other members of the monoamine-oxidase inhibitor series (*e.g.,* isocarboxazid, phenelzine, and tranylcypromine) and the tricyclic antidepressant drugs (*e.g.,* imipramine, amitriptyline, and nortriptyline), which have less severe side effects.

Ipsen, Bodil, original name BODIL LOUISE JENSEN (b. Aug. 30, 1889, Copenhagen, Den.—d. Nov. 1964, Copenhagen), Danish actress who, with her frequent stage partner, the character actor Poul Reumert, reilluminated the dramas of Henrik Ibsen and August Strindberg.

Ipsen first appeared on the stage at the Royal Theatre, Copenhagen, in 1909. She showed wide versatility, achieving success in roles both comic (Rosalind in *As You Like It*) and serious (Nora in *A Doll's House*), although her mature career emphasized dramatic portrayals. Her Lady Macbeth achieved special distinction; her Ibsen principals, such as Mrs. Alving (*Ghosts*), garnered great acclaim, and her Strindberg heroines, such as the title role in *Miss Julie* and Alice in *Dance of Death,* brought her wide repute. In the latter roles Ipsen was complemented by the celebrated actor Reumert, whose dramatic career paralleled her own.

Ipsen appeared in Danish films as early as 1913; her best-known performances in silent films were in the Dickens classics *David Copperfield* (1922) and *Little Dorrit* (1924); later, she received particular acclaim in *Go Home With Me* (1941). Two films codirected with Lau Lauritzen, Jr., are among Ipsen's best-known works—*Afsporet* (1942) and *Red Meadows* (1945).

Ipsus, Battle of, military engagement fought at Ipsus, Phrygia, in 301 BC between two camps of the "successors" (*diodochoi*) of Alexander the Great, part of a struggle that accelerated the dismemberment of Alexander's empire begun after his death.

In 302 a coalition representing Lysimachus, king of Thrace, Seleucus I Nicator of Babylon, Ptolemy I Soter of Egypt, and Cassander of Macedonia moved against Antigonus I Monophthalmus, king in Asia Minor, and his son Demetrius I Poliorcetes. Although the combined strength of Seleucus and Lysimachus in troops was only slightly inferior to the 70,000 foot soldiers and 10,000 horses of Antigonus, it was the allies' superiority in elephants that proved invaluable for victory. The elephants prevented Demetrius, who had pursued too far after defeating the opposing cavalry, from returning to rescue his father. Antigonus was killed, Demetrius fled, and Asia Minor was added to the dominions of Lysimachus.

Ipswich, North Sea port and district (borough), county of Suffolk, England, at the head of the Orwell Estuary. It has an area of 16 square miles (40 square km). Ipswich prospered as a port for the export of East Anglian textiles from medieval times to the 17th century. In 1200 King John granted the town its first charter, and it was incorporated in 1446. A period of decline was followed by renewed expansion in the 19th century when light-engineering firms were established in the town. Today, engineering and various agricultural industries are important.

Outstanding buildings in Ipswich include Christchurch mansion (16th century) and Sparrowe's House, in part a 15th-century structure with a 17th-century pargeted facade. The older churches are nearly all towered flint structures, wholly or mainly Perpendicular in style. There are several old coaching inns, including the Great White Horse of *Pickwick Papers* fame. Ipswich was the birthplace of Cardinal Thomas Wolsey.

Ipswich harbour extends 11 miles (18 km) downstream to Shotley Point and is still of modest importance, but the city prospers mainly as a major agricultural market and service centre for the extensive and rich farming area of Suffolk. Pop. (1986 est.) 118,300.

Ipswich, town (township), Essex county, northeastern Massachusetts, U.S. It lies along the Ipswich River (there bridged since 1764), 25 miles (40 km) north-northeast of Boston. Settled in 1633 as Agawam, it was incorporated in 1634 and renamed after Ipswich, Eng. Lace making, the town's first industry, was carried out on machines smuggled to the American colonies in defiance of British export laws. The town's Rebellion Tablet commemorates the public denunciation of British taxation without representation by the Reverend John Wise in 1687. Ipswich was the home of several leading writers of the colonial period, including Nathaniel Ward and the poet Anne Bradstreet.

Modern Ipswich has developed as a summer resort noted for seafood (the celebrated Ipswich clam), with light manufactures, including electronic components and tools and dies. More than 50 colonial houses have been preserved, notably the John Whipple House (1640). Pop. (1988 est.) 11,809.

Ipuwer, ancient Egyptian sage. He perhaps served as a treasury official during the last years of Pepi II Neferkare (reigned *c.* 2294–*c.* 2200 BC) and is known only because of the discovery of one poorly preserved manuscript relating his speech to the king and the royal court. Ipuwer's manuscript, often called "The Admonitions of an Egyptian Sage," is especially valuable for its commentary on the political and economic situation at the close of the Old Kingdom.

IQ (from "intelligence quotient"), a number used to express the relative intelligence of a person. The IQ is determined by dividing a person's mental age as reported on a standardized test by his chronological age and then multiplying the resulting figure by 100. *See* intelligence test.

īqāʿāt, in Islāmic music, rhythmic modes—*i.e.,* patterns of strong, intermediate, and weak beats, separated by pauses of various lengths.

A well-developed system of such modes was described by medieval theorists. Although six or eight basic modes are included in most treatises, many more have actually been used.

The complete pattern, or period, repeated throughout the piece, is composed of smaller sections analogous to the feet of poetic metres. The various modes are said to be linked with the universe, and each has a character appropriate to music of a different mood.

Regularity of the rhythmic pattern is not obvious because the rhythmic accents do not necessarily coincide with melodic stresses. A voice or solo instrument carries the melody, while the rhythm is added by percussion or by slapping the knees. Pauses are often marked by gestures. The two lines (rhythm and melody) are united in the arrangement of large sections, but individual beats may clash. A rhythmic mode is somewhat variable, and the tempo can be varied within traditional limits.

The *īqāʿāt* are in use in today's Arabic music. Iranian music followed similar rhythmic principles in medieval times but now is much freer rhythmically.

Iqbāl, Sir Muḥammad, also spelled MAHOMED IKBĀL (b. Nov. 9, 1877, Siālkot, Punjab, India—d. April 21, 1938, Lahore, Punjab), Indian poet and philosopher, known for his influential efforts to direct his fellow Muslims toward the establishment of a separate Muslim state, an aspiration that was eventually realized in the country of Pakistan. He was knighted in 1922.

Early life and career. Iqbāl was born at Siālkot, India (now in Pakistan), of a pious family of small merchants and was educated at Government College, Lahore. In Europe from 1905 to 1908, he earned his degree in philosophy from Cambridge University, qualified as a barrister in London, and received a doctorate from the University of Munich. His thesis, *The Development of Metaphysics in Persia,* revealed some aspects of Islāmic mysticism formerly unknown in Europe.

On his return from Europe, he served briefly as professor of philosophy and English literature at Government College. His livelihood was then gained in the practice of law, but his fame came from his poetry, which was written in the classical style for public recitation. Through poetic symposia and in a milieu in which memorizing verse was customary, his poetry became widely known, even among the illiterate. Almost all the cultured Indian and Pakistani Muslims of his and later generations have had the habit of quoting Iqbāl.

Before he visited Europe, his poetry affirmed Indian nationalism, as in *Nayā shawālā* ("The New Altar"), but time away from India caused him to shift his perspective. He came to criticize nationalism for a twofold reason: in Europe it had led to destructive racism and imperialism, and in India it was not founded on an adequate degree of common purpose. In a speech delivered at Alīgarh in 1910, under the title "Islam as a Social and Political Ideal," he indicated the new Pan-Islāmic direction of his hopes. The recurrent themes of Iqbāl's poetry are a memory of the vanished glories of Islām, a complaint about its present decadence, and a call to unity and reform. Reform can be achieved by strengthening the individual through three successive stages: obedience to the law of Islām, self-control, and acceptance of the idea that everyone is potentially a vicegerent of God (*nāʾib* or *muʾmin*). Furthermore, the life of action is to be preferred to ascetic resignation.

Three significant poems from this period, *Shikwah* ("The Complaint"), *Jawāb-e shikwah* ("The Answer to the Complaint"), and *Khizr-e rāh* ("Khizr, the Guide"), were published later in 1924 in the Urdu collection *Bāng-e darā* ("The Call of the Bell"). In those works Iqbāl gave intense expression to the anguish of Muslim powerlessness. Khizr (Arabic Khiḍr), the Qurʾānic prophet who asks the most difficult questions, is pictured bringing from God the baffling problems of the early 20th century.

> What thing is the State? or why
> Must labour and capital so bloodily disagree?
> Asia's time-honoured cloak grows ragged
> and wears out . . .
> For whom this new ordeal, or by whose hand
> prepared?
>
> (Eng. trans. by V.G. Kiernan.)

Notoriety came in 1915 with the publication of his long Persian poem *Asrār-e khūdī* ("Secrets of the Self"). He wrote in Persian because he sought to address his appeal to the entire Muslim world. In this work he presents a theory of the self that is a strong condemnation of the self-negating quietism (*i.e.,* the belief that perfection and spiritual peace are attained by passive absorption in contemplation of God and divine things) of classical Islāmic mysticism; his criticism shocked many and excited controversy. Iqbāl and his admirers steadily maintained that creative self-affirmation is a fundamental Muslim virtue; his critics said he imposed themes from the German philosopher Friedrich Nietzsche on Islām.

The dialectical quality of his thinking was expressed by the next long Persian poem, *Rumūz-e bīkhūdī* (1918; "Mysteries of Selflessness"). Written as a counterpoint to the individualism preached in the *Asrār-e khūdī,* this poem called for self-surrender.

> Lo, like a candle wrestling with the night
> O'er my own self I pour my flooding tears.
> I spent my self, that there might be more light,
> More loveliness, more joy for other men.
>
> (Eng. trans. by A.J. Arberry.)

The Muslim community, as Iqbāl conceived it, ought effectively to teach and to encourage generous service to the ideals of brotherhood and justice. The mystery of selflessness was the hidden strength of Islām. Ultimately, the only satisfactory mode of active self-realization was the sacrifice of the self in the service of causes greater than the self. The paradigm was the life of the Prophet Muḥammad and the devoted service of the first believers. The second poem completes Iqbāl's conception of the final destiny of the self.

Later, he published three more Persian volumes. *Payām-e Mashriq* (1923; "Message of the East"), written in response to Goethe's *West-östlicher Divan* (1819; "Divan of West and East"), affirmed the universal validity of Islām. In 1927 *Zabūr-e ʿAjam* ("Persian Psalms") appeared, about which A.J. Arberry, its translator into English, wrote: "Iqbāl displayed here an altogether extraordinary talent for the most delicate and delightful of all Persian styles, the *ghazal,*" or love poem. *Jāvīd-nāmeh* (1932; "The Song of Eternity") is considered Iqbāl's masterpiece. Its theme, reminiscent of Dante's *Divine Comedy,* is the ascent of the poet, guided by the great 13th-century Persian mystic Jalāl ad-Dīn ar-Rūmī, through all the realms of thought and experience to the final encounter.

Iqbāl's later publications of poetry in Urdu were *Bāl-e Jibrīl* (1935; "Gabriel's Wing"), *Zarb-e kalīm* (1937; "The Blow of Moses"), and the posthumous *Armaghān-e Hijāz* (1938; "Gift of the Hejaz"), which contained verses in both Urdu and Persian. He is considered the greatest poet in Urdu of the 20th century.

Philosophical position and influence. His philosophical position was articulated in *The Reconstruction of Religious Thought in Islam,* a volume based on six lectures delivered at Madras, Hyderābād, and Alīgarh in 1928–29. He argued that a rightly focussed man should unceasingly generate vitality through interaction with the purposes of the living God. The Prophet Muḥammad had returned from his unitary experience of God to let loose on the earth a new type of manhood and a cultural world characterized by the abolition of priesthood and hereditary kingship and by an emphasis on the study of history and nature. The Muslim community in the present age ought, through the exercise of *ijtihād*—the principle of legal advancement—to devise new social and political institutions. He also advocated a theory of *ijmāʿ*—consensus. Iqbāl tended to be progressive in adumbrating general principles of change but conservative in initiating actual change.

During the time that he was delivering these lectures, Iqbāl began working with the Muslim League. At the annual session of the league at Allahābād, in 1930, he gave the presidential address, in which he made a famous statement that the Muslims of northwestern India should demand status as a separate state.

In the following years, he participated in two conferences in London and visited France, Spain, and Italy; he also attended a Muslim conference in Jerusalem. In the autumn of 1933, he went to Afghanistan to discuss the foundation of a university in Kābul.

After a long period of ill health, Iqbāl died in April 1938 and was buried in front of the great Bādshāhī Mosque in Lahore. Two years later, the Muslim League voted for the idea of Pakistan. That the poet had influenced the making of that decision, which became a reality in 1947, is undisputed. He has been acclaimed as the father of Pakistan, and every year Iqbāl Day is celebrated by Pakistanis.

(S.McD.)

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iqṭāʿ, in the Islāmic Empire of the Caliphate, land granted to army officials for limited periods in lieu of a regular wage, sometimes erroneously compared to the fief of medieval Europe. The *iqṭāʿ* system was established in the 9th century AD to relieve the state treasury when insufficient tax revenue and little booty from campaigns made it difficult for the government to pay army salaries.

Land subject to the *iqṭāʿ* was originally owned by non-Muslims and thus subject to a special property tax, the *kharāj.* While the land remained legally the property of its owner, the *iqṭāʿ* was a grant of appropriation to a Muslim officer entitling him to collect the *kharāj* from the owner. Out of this the officer was expected to pay the smaller *ʿushr,* or tithe, on income, but was allowed to keep the balance as his salary. However, it proved difficult for the government to extract any payments from the officers, and the Būyids, an Iranian dynasty (reigned 932–1062), made the *iqṭāʿ* a grant of usufruct by which the *muqṭaʿ* (recipient officer) collected taxes from the land—calculated to approximate his usual pay. As the officer usually lived in a city remote from his *iqṭāʿ,* he had little interest in the land or its cultivators. The grant was merely a wage, and as soon as the land or its people were depleted, it

was exchanged for a more productive area. By the time that the Seljuq regime (1038–1194) ended, the *iqṭāʿ* had been introduced into the provinces and the number and size of *iqṭʿat* had proliferated drastically, accounting for as much as half the land of the state, while the term of ownership also had grown, occasionally leading to hereditary succession. With this new permanence *muqṭaʿs* began to show an interest in the land and its maintenance, buying up neighbouring territory and binding the peasants to the soil by refusing to let them leave without having paid their taxes. The system survived the Mongol invasion of the 13th century but during subsequent Ottoman rule was replaced by an essentially similar arrangement that was called the timar.

The *iqṭāʿ* reappeared under the Il-Khans in Iran (reigned 1256–1353), where it was granted either as a hereditary allotment or for a specified period.

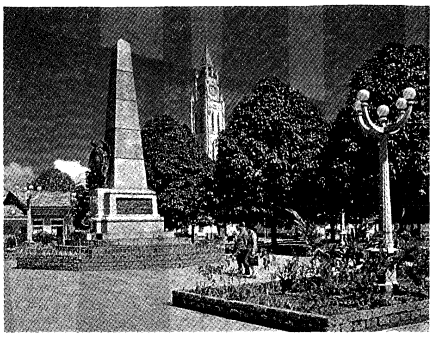
In Ayyūbid (1169–1250) Egypt, the *iqṭāʿ* approximated the *muqāṭaʿah* system, common in the caliphal domains, under which certain districts or peoples, such as Bedouins, Kurds, or Turkmen, paid a fixed tax directly to the state treasury, bypassing any intermediary tax collector. Thus, the Egyptian *iqṭāʿ*, primarily agricultural land, was leased for a limited time for a contracted sum of money. The power of the *muqṭaʿ* was strictly limited by extensive state controls and a deliberate distribution of land so as to avoid monopoly by any one *muqṭaʿ*.

Iquique, capital of Iquique *provincia* and of Tarapacá *región,* northern Chile. It is located on a rocky peninsula in the rainless Atacama Desert, overlooking the Pacific Ocean. Its anchorage is protected from the open sea by the low, barren offshore island of Serrano, which is connected to the mainland by a stone causeway. Founded in the 16th century, the city was partially destroyed in 1868 and 1875 by earthquakes, but some old wooden houses from that time still stand. During the desert's nitrate boom of the 19th and early 20th centuries, Iquique was Chile's major export port. Following the decline in nitrate prices, the city stagnated.

In an effort to revive the economy, new port facilities have been installed and new industries established. Fish-meal plants and canneries are in operation. Guano on the coast and offshore islands is exploited, and salt deposits to the south are worked. New lands have been opened up by irrigation for the cultivation of fruits (especially citrus), sugarcane, and olives. Tourism, based on sport fishing and beach facilities, also contributes to the economy. Iquique is linked to other cities by the main north–south Pan-American Highway and by railroad; it also has an airport. Pop. (1985 est.) 118,700.

Iquitos, Amazon River port and capital of Loreto *departamento,* northeastern Peru. It is located about 2,300 miles (3,700 km) upstream from the Atlantic Ocean and 640 miles (1,030 km) north-northeast of Lima. It was founded in 1864 at the site of an Indian village and became the chief shipping port for the region during the rubber boom of the late 19th century. After 1912, when production dropped drastically, the city's population declined.

Iquitos remained stagnant until the 1950s, when interest in the economic development of eastern Peru was renewed. The city has many older buildings dating from the late 19th century, with glazed tiles and ironwork imported from Europe. Iquitos is connected to Lima by air. It is the site of the National University of the Peruvian Amazon (founded 1961) and is the cultural, religious, and tourist centre of eastern Peru. Iquitos has become the centre



Central Plaza with the cathedral in the background, Iquitos, Peru

Walter Aguiar—EB Inc.

for oil exploration in the Peruvian Amazon. Pop. (1987 est.) 237,000.

IRA: *see* Irish Republican Army.

Iradier, Eduardo Dato: *see* Dato Iradier, Eduardo.

Iráklion, also spelled HERAKLEION, historically CANDIA, largest city, principal port of the Greek island of Crete, and capital of the *nomós* (department) of Iráklion. The city lies on the north coast just northwest of the ancient Minoan capital of Knossos. Its name derives from the ancient Roman port of Heracleum, which likely occupied the same site. As the capital of Saracen Crete in the 9th century AD, it took the Arabic name Khandaq ("Moat"), which was corrupted to Candia by the Venetians, to whom the island was sold in 1204. Most of the extensive system of walls built around the city by the Venetians survives.

In 1669 the city was ceded to the Turks after a siege of more than 20 years. During the long Turkish occupation, which ended in 1897, Candia was known as Megalokastro. The Turks permitted its harbour to silt up, and the port of Canea (Khaniá), the future capital of Crete, took over Megalokastro's former commercial preeminence. The Turkish rule ended after an insurrection (1897) by the Greek population, demanding union with Greece. Iráklion was part of the international protectorate of Crete (1897–1913) and then became part of Greece. During the German invasion in 1941 the city suffered heavy damage from bombing.

After World War II the city gained considerable commercial prominence, with a new harbour with moles, an airport, and several hotels to serve the tourist trade. Among the port's principal exports are grapes (especially sultanas), olives and olive oil, wine, carobs, citrus, almonds, soap, vegetables, and leather. Numerous earthquakes, notably in 1664, 1856, and 1926, have taken their toll of the city's buildings and monuments, including many fine churches and mosques. A modern museum contains one of the finest collections of Minoan antiquities in Greece. Pop. (1981) city, 102,398; *nómos,* 243,622.

Iran, officially ISLĀMIC REPUBLIC OF IRAN, Fārsī (Persian) JOMHŪRĪ-YE ESLĀMĪ-YE ĪRĀN, country, southwestern Asia, covering an area of 634,562 square miles (1,643,510 square km). The capital is Tehrān (Teheran).

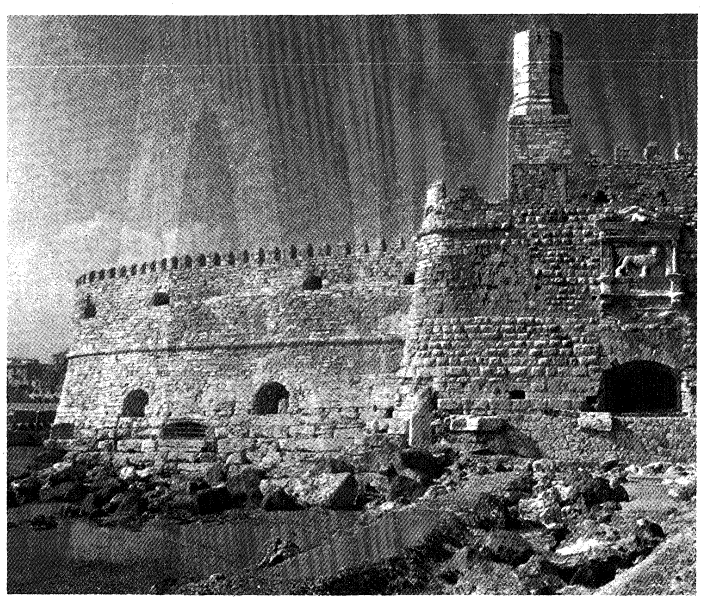
Extending about 2,200 miles (3,540 km) from northwest to southeast and 1,200 miles (1,900 km) from northeast to southwest at its widest point, Iran is bordered on the north by the Soviet Union and the Caspian Sea, on the east by Pakistan and Afghanistan, on the south by the Persian Gulf and the Gulf of Oman, and on the west by Turkey and Iraq. The population in 1988 was estimated to be 51,225,000.

A brief treatment of Iran follows. For full treatment, *see* MACROPAEDIA: Iran.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

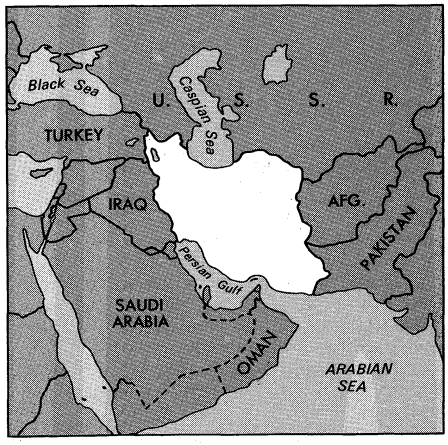
The land. Iran occupies a high plateau lying more than 1,500 feet (460 m) above sea level and rimmed on all sides by mountains whose average elevation is more than 6,500 feet (2,000 m). The only real lowlands are those of the Kārūn River basin along the border with Iraq, the narrow coastlands along the Persian Gulf and the Gulf of Oman, and the marshy coasts along the Caspian Sea. In the north are the Elburz Mountains, with towering volcanic peaks that include the country's highest, Mount Demavend (18,386 feet [5,604 m]). The Elburz run along the southern shore of the Caspian Sea to join the Khorāsān (Khurasan) border ranges in the east. The latter, along with the Baluchistan ranges to the south, demarcate the interior plateau on the east. The largely barren plateau is characterized by vast salt deserts. The country's largest mountain range, the Zagros, stretches from Iran's northwestern boundary with the Soviet Union to the Makran Mountains in the southeast.

Precipitation over Iran is generally light. Only the narrow coastal region along the



The Venetian fort, Iráklion, Greece

Tiers—Monkmeyer



Iran

Caspian Sea receives more than 40 inches (1,000 mm) of rainfall per year, and the interior salt deserts receive less than 4 inches (100 mm). Streams are seasonal, and much of Iran's interior drainage is dissipated into saline marshes, but some of it replenishes Iran's underground water supply. The Kārūn is the country's only navigable river. Temperature extremes are common in Iran and vary from a summer high near the Persian Gulf of 131° F (55° C) to a winter low recorded in Azerbaijan (Āzārbāyjān) in the northwest of −35° F (−37° C).

More than half of Iran's surface area is wasteland, most of which is uninhabitable salt deserts. About one-tenth of the country's land area is arable, and another one-fourth is suitable for grazing. Nearly one-third of the agricultural land area is irrigated, mostly in the hilly margins between desert and the mountains. About one-eighth of the country is forested, mostly near the Caspian Sea, with oak, beech, linden, elm, and a few broad-leafed evergreens. The abundant wildlife of the country includes wolves, foxes, leopards, lynx, gazelles, and deer. There are also wild goats and sheep.

Iran's enormous proved reserves of petroleum are located mostly in the southwestern part of the country near the head of the Persian Gulf. The country's reserves account for about 5 percent of global reserves and rank sixth in the world. Iran also has one-seventh of the world's reserves of natural gas, second only to the Soviet Union, and there are substantial reserves of coal, copper, and iron ore.

The people. Iran is a diverse and polyglot society. The Iranians themselves, or Persians, are the most numerous (45 percent of the total population) and widely distributed ethnic group. The Kurds, a nomadic people, dwell in the western mountains and have resisted government efforts to assimilate them. Also inhabiting the western mountains are the seminomadic Lurs, thought to be aboriginal Persians. Closely related are the Bakhtyārī tribes who live in the Zagros Mountains west of Eṣfahān (Isfahan). Both groups speak Lurī, a Persian dialect, as do the Baluchi, who inhabit Baluchistan. The Armenians, with a different ethnic heritage, have maintained their Indo-European linguistic identity.

Although the proportion of Turkic ethnic stock is small, approximately one-fourth of the Iranians speak Turkic languages. The three principal Turkic ethnic groups are the Azarbaijani in the northwest corner of Iran, the Qashqā'ī in the Shīrāz area to the east of the Persian Gulf, and the Turkmen of the Khorāsān region in the northeast. Semites—Jews, Assyrians, and Arabs—constitute only a small percentage of the population.

The vast majority of Iranians are Muslims, mostly of the Shī'ite sect; Shī'ite Islām is the official state religion. The Kurds and the Turkmen are Sunnite Muslims. Religious minorities include Christians, Jews, Bahā'īs, and Zoroastrians.

The population of Iran is relatively young; in the 1980s more than two-fifths was less than 15 years of age. Consequently, the birth rate is much higher than the death rate. By world standards Iran's annual rate of population growth is relatively high, but for the Middle East it is about average.

Economy. Iran has a centralized economy largely financed by petroleum production. In the late 1980s the country faced serious economic problems, including huge budget deficits and high unemployment, due largely to the economic dislocations of the 1979 revolution and the strain of the continuing war with Iraq. Iran produces the highest gross national product (GNP) in the Middle East, but its estimated GNP per capita is below average for the region.

Although the agricultural sector accounts for only about one-sixth of the GNP, it employs more than one-third of the work force in Iran. Production is hampered by poor cultivation methods, lack of water, and limited access to markets. It has not kept pace with domestic demand, resulting in heavy reliance on imported foodstuffs. The country's most important crops are wheat, potatoes, barley, grapes, rice, corn (maize), sugar beets, sugarcane, and tobacco. Iran also produces a huge amount of timber annually. The offshore-fishing industry is important in Iran both for domestic consumption and for export (particularly of sturgeon caviar).

Mining and industry, dominated by petroleum production, account for more than one-fourth of the GNP and employ about one-fifth of the labour force. Iran's petroleum industry, nationalized in the 1950s, suffered extensive damage to wells, refineries (particularly at Ābādān), and export terminals with the outbreak of the Iran–Iraq War in 1980. By the mid-1980s petroleum production amounted to only one-third of the amount produced in 1976. The state-owned gathering and distributing system for natural gas from Iran's enormous reserves is one of the largest in the Middle East. Other mineral resources are largely undeveloped.

Other major industrial products are textiles (particularly woven carpets, a traditional export), processed foods, automobiles, electrical machinery, iron and steel, and cement. Large investments in industry in the early and mid-1970s made possible by petroleum earnings have accelerated development, but serious problems persist, including a shortage of skilled labour, an inadequate infrastructure, and insufficient raw materials.

More than four-fifths of Iran's electricity is generated from domestic fuels; hydropower provides the remainder. Foundations for a national electrification network were laid in the 1970s, but progress has been slow.

Planned economic development, initiated in 1949, was ended by the revolution in 1979. The Islāmic republic nationalized all major industries, banks, and insurance companies. It committed itself to heavy investment in both the agricultural sector and selected industries, with the ultimate goal of economic independence, but unstable internal conditions and the war with Iraq have made meaningful economic measures virtually impossible.

Petroleum and petroleum products account for nearly all of Iran's exports, and major classes of imports include machinery and transport equipment, chemicals, and food and live animals. Iran's major trading partners are Japan, Germany, the United Kingdom, Italy, and Spain.

Government and social conditions. The constitution of the Islāmic republic, adopted in 1979, vests supreme political power in the *valiy-e faqih,* the leading theologian in the country. Upon his death, an elected council is empowered to select either a religious leader or a council of religious leaders to assume power. The supreme leader (or leadership) in Iran commands the military forces, approves the presidential candidates, chooses the highest judicial authorities, and appoints the six clerical members of the 12-member Council of Guardians. The council reviews all bills passed by the unicameral Islāmic Consultative Assembly (Majles) to determine both their constitutionality and their conformity to Islām. The Majles has 270 members popularly elected to four-year terms. Executive responsibility in Iran is shared by the president, who is elected to a four-year term by popular vote, and the prime minister, who is nominated by the president and approved by the Majles. Several political parties compete for elective office, but politics is dominated by the Islāmic Republican Party. The highest judicial power rests with the religious jurists composing the Supreme Court and the High Council of the Judiciary.

Health conditions outside the capital are poor. Many small towns and rural areas suffer from unsanitary conditions and a shortage of medical personnel and facilities. Contagious diseases such as scarlet fever, whooping cough, pulmonary tuberculosis, and typhoid fever are prevalent. The infant mortality rate is a serious problem; it is very high by world and Middle Eastern standards. Life expectancy is about 58 years for both males and females.

Although primary education for five years is compulsory, many rural children never attend school because of either parental objection or a lack of facilities. The secondary-school system in Iran is relatively undeveloped, and it serves mainly to prepare small numbers of students for university-level education. The illiteracy rate is high and compares poorly even to that of other Middle Eastern countries.

The press is supervised by the Islāmic Republic News Agency. A special press law, announced in 1979, prohibits newspapers from "insulting" senior religious leaders.

Cultural life. Iran has produced many internationally renowned poets, including Neẓāmī, Ferdowsī, Sa'di, and Omar Khayyam. The country is also famous for its architecture, especially its mosques. Persian rugs are still admired for their artistry and craftsmanship.

History. Habitation in Iran can be dated to Lower Paleolithic times (*c.* 100,000 BC), but recorded history and civilization began with the Elamites in Khūzestān, *c.* 3000 BC. After 2000 BC Indo-European Iranians appeared and began to coalesce into kingdoms. The Medes flourished about 728–550 BC but were overthrown (550 BC) by the Persians led by Cyrus II the Great. The Persians established a vast Middle Eastern empire that was the largest of its kind until the coming of the Romans. The invasion of Alexander the Great brought this great empire to an end, but the Macedonian Seleucid state that followed was eclipsed by the native Parthians (247 BC–AD 226), who created a Greek-speaking empire. Almost incessant clashes with Rome weakened the Parthian Empire, and it passed to the Sāsānians, an Iranian people from Fārs, the same area that had spawned the Achaemenid Persians a thousand years before.

The Sāsānians established Zoroastrianism as the official religion. Costly and debilitating wars with the Byzantines left the Sāsānian empire easy prey for conquest by Arab Muslims, which was accomplished by 640. For 850 years Iran was ruled by non-Iranian Islāmic princes, including the Ṣaffārids, the Sāmānids, the Ghaznavids, and the Seljuqs. The Ṣafavids, who gained ascendancy in 1502, were Iranians, but of a strain that had been in Iran only since the Arab conquest. Under the Ṣafavids, Shī'ī Islām became Iran's official religion.

The Ṣafavid dynasty (1502–1736) was fol-

lowed by frequent internal conflict. By 1779 the Qājārs had established their rule, but European politics intervened and seriously affected the future of Iran. The southward extension of the Russian empire toward the Middle East threatened Britain's empire in the Indian subcontinent, and these two nations engaged in trade and diplomatic rivalries in Iran, turning it into a semicolonial state that was economically controlled by the two European powers. Riots broke out at the turn of the 20th century in protest of the rule of the Qājār monarch Nāṣer ad-Dīn Shāh. His son Moẓaffar od-Dīn Shāh, an ineffectual ruler, was forced to convene a national assembly (the Majles) and to grant a constitution in 1906.

In the famine and bankruptcy that followed World War I, a coup in 1921 brought Reza Khan to power. In 1925 he deposed the last Qājār ruler and declared himself shah (styled Reza Shah Pahlavi). His collaboration with Nazi Germany in 1941 led to his abdication and the assumption of power by his son, Mohammad Reza Shah Pahlavi. Pahlavi embarked on a modernization and westernization program that alienated many of the country's religious leaders, whose power he restricted. Demonstrations against him occurred in the 1970s, and in 1979 his government collapsed and he fled the country. Ruhollah Khomeini, a Shīʿite ayatollah in exile in Paris, returned to lead the movement that set up an Islāmic republic in 1979.

After the revolution, fundamentalist Muslim codes were enacted and Western influence in Iran was suppressed. In 1980 Iraq launched a military invasion of Iran, with devastating effects on the economies of both countries. The war between the two countries became a bloody and expensive stalemate resulting in numerous casualties on both sides.

Iran–Contra Affair, U.S. political scandal in which the National Security Council (NSC) became involved in secret weapons transactions and other activities that either were prohibited by the U.S. Congress or violated the stated public policy of the government. In early 1985 the head of the NSC, Robert C. McFarlane, undertook the sale of antitank and antiaircraft missiles to Iran in exchange for the release of a number of American citizens who were being held captive in Lebanon by Shīʿite terrorist groups who were loyal to Iran. This and several subsequent weapon sales to Iran in 1986 directly contradicted the U.S. government's publicly stated policy of refusing either to bargain with terrorists or to aid Iran in its war with Iraq, a policy based on the belief that Iran was a sponsor of international terrorism. A portion of the $48,000,000 that Iran paid for the arms was diverted by the NSC and given to the contras, the U.S.-backed rebels fighting to overthrow the Sandinista government of Nicaragua. The monetary transfers were undertaken by NSC staff member Lieutenant Colonel Oliver North with the approval of McFarlane's successor as head of the NSC, Rear Admiral John M. Poindexter. North and his associates also raised private funds for the contras. These activities violated the Boland Amendment, a law passed by Congress in 1984 that banned direct or indirect U.S. military aid to the contras.

The NSC's illegal activities came to light in November 1986 and aroused an immediate public uproar. Poindexter and North lost their jobs, President Ronald Reagan's public image was tarnished, and the United States suffered a serious though temporary loss of credibility as an opponent of terrorism.

Iran–Iraq War, also called PERSIAN GULF WAR, or GULF WAR, prolonged military conflict between Iran and Iraq during the 1980s. The war began on Sept. 22, 1980, when Iraqi armed forces invaded western Iran along the countries' joint border.

The roots of the war lay in a number of territorial and political disputes between Iraq and Iran. Iraq wanted to seize control of the rich oil-producing Iranian border province of Khūzestān. Iraqi president Saddam at-Takrītī Hussein wanted to reassert his country's sovereignty over both banks of the Shatt al-Arab, a river formed by the confluence of the Tigris and Euphrates rivers that was historically the border between the two countries. Hussein was also concerned over attempts by Iran's new Islāmic revolutionary government to incite rebellion among Iraq's Shīʿite majority. He decided on a preemptive strike against Iran. By attacking when it did, Iraq took advantage of the apparent disorder of Iran's new government and of the demoralization of Iran's regular armed forces.

In September 1980 the Iraqi army carefully advanced along a broad front into Khūzestān province, taking Iran by surprise. Iraq's troops captured the city of Khorramshahr but failed to take the important oil-refining centre of Ābādān, and by December 1980 the Iraqi offensive had bogged down about 50–75 miles (80–120 km) inside Iran after meeting unexpectedly strong Iranian resistance. Iran's counterattacks using the revolutionary militia (Revolutionary Guards) to bolster its regular armed forces began to compel the Iraqis to give ground in 1981. The Iranians first pushed the Iraqis back across Iran's Kārūn River and then recaptured Khorramshahr in 1982. Later that year Iraq voluntarily withdrew its forces from all captured Iranian territory and began seeking a peace agreement with Iran. But under the leadership of Ruhollah Khomeini, who bore a strong personal animosity toward President Hussein, Iran remained intransigent and continued the war in an effort to overthrow Hussein. Iraq's defenses solidified once its troops were defending their own soil, and the war settled down into a stalemate with a static, entrenched front running just inside and along Iraq's border. Iran repeatedly launched fruitless infantry attacks, using human assault waves composed partly of untrained conscripts, which were repelled by the superior firepower and air power of the Iraqis. Both nations engaged in sporadic air and missile attacks against each other's cities and military and oil installations. They also attacked each other's oil tanker shipping in the Persian Gulf, and Iran's attacks on Kuwait's and other Gulf states' tankers prompted the United States and several western European nations to station warships in the Persian Gulf to protect those tankers.

The oil-exporting capacity of both nations was severely reduced at various times owing to air strikes and to pipeline shutoffs, and the consequent reduction in their income and foreign-currency earnings brought the countries' massive economic-development programs to a near standstill. Iraq's war effort was openly financed by Saudi Arabia and other moderate Arab states and was tacitly supported by the United States and the Soviet Union, while Iran's only major allies were Syria and Libya. Iraq continued to sue for peace in the mid-1980s, but its international reputation was damaged by reports that it had made use of lethal chemical weapons against Iranian troops. In the mid-1980s the military stalemate continued, but in 1988 Iran's deteriorating economy and recent Iraqi gains on the battlefield compelled Iran to accept a United Nations-mediated cease-fire that it had previously resisted.

Iranian languages, subgroup of the Indo-Iranian branch of the Indo-European language family. The subgroup's languages are spoken in Iran, Afghanistan, and parts of Iraq, Soviet Central Asia, Turkey, India, and scattered areas of the Caucasus Mountains.

Old Iranian, which is closely related to Sanskrit, the ancient Indo-Aryan language, is known from the Avesta (the sacred book of Zoroastrianism) and from Old Persian cuneiform inscriptions of the Achaemenid kings. The Middle Iranian stage (3rd century BC to 8th–10th century AD) was characterized by a significant simplification of the verbal system and, in some areas, by reductions in noun inflection as well. Among the most important representatives of Middle Iranian are Parthian, Pahlavi, and Sogdian. Major modern Iranian languages are Persian, the most widespread; the Kurdish dialects; Pashto, an official language of Afghanistan; and Ossetic, spoken in the Caucasus Mountains.

All Iranian languages currently spoken show a simplification of the earlier sound systems and a preference for the use of auxiliary verbs in place of the complex verb conjugations of the earlier Iranian languages.

Iranian literature, body of writings produced in the area traditionally known as Persia, in Fārsī, the Modern Persian language. *See* Persian literature.

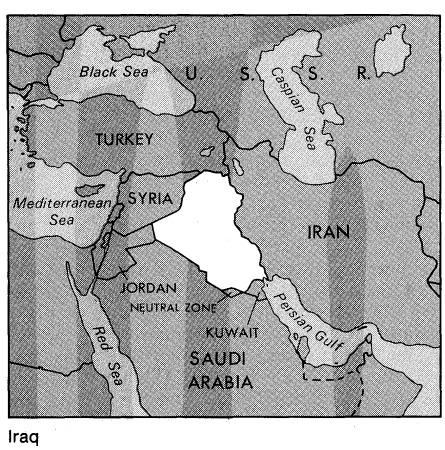
Irapuato, city, west-central Guanajuato *estado* ("state"), north-central Mexico. Situated in the fertile Bajío, a valley of the central plateau, the city lies along the Irapuato River, a tributary of the Lerma River, at 5,656 feet (1,724 m) above sea level. It is south-southwest of Guanajuato city, the state capital.

Irapuato was founded in 1547; an Indian hospital and chapel (La Misericordia) were later built there. The population was active in Mexico's colonial and revolutionary wars. Using irrigation waters from the upper Lerma River, Irapuato is an important agricultural and livestock-raising centre and is the state's second largest city. It is famed for its strawberries; corn (maize), wheat, beans, and chickpeas also thrive in the cool, dry climate, and cattle and pigs are raised. A branch railroad line and road join the main Mexico City–Ciudad Juárez railroad and highway at Irapuato. Pop. (1980) 170,138.

Iraq, officially REPUBLIC OF IRAQ, Arabic AL-ʿIRĀQ, or AL-JUMHŪRĪYAH AL-ʿIRĀQĪYAH, Middle Eastern country situated at the northwest end of the Persian Gulf, covering an area of 169,235 square miles (438,317 square km), including 357 square miles (924 square km) of inland water. The capital is Baghdad. Extending about 865 miles (1,390 km) from north to south and 775 miles (1,250 km) from east to west at its widest point, Iraq is bordered on the north by Turkey, on the east by Iran, on the southeast by the Persian Gulf, on the south by Kuwait and Saudi Arabia, and on the west by Syria and Jordan. The population in 1988 was estimated to be 16,630,000.

A brief treatment of Iraq follows. For full treatment, *see* MACROPAEDIA: Iraq.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.



Iraq

The land. Iraq consists primarily of lowlands seldom exceeding 1,000 feet (300 m) in elevation. Less than 15 percent of the country rises above 1,500 feet (450 m). The country can be divided into three major physiographic regions: the southwestern desert, the Tigris–Euphrates Basin, and the northeastern highlands. Occupying about 40 percent of the country, the southwestern desert descends gradually from the more elevated western volcanic plateau areas of Syria and Jordan to reach sea level at the head of the Persian Gulf. The Tigris–Euphrates Basin, separating the northeastern highlands from the southwestern desert, accounts for 5 percent of the land area. It extends from northwest to southeast and forms distinctive upper and lower basins. The lower basin has extensive marshlands because of its gentle gradient. From their juncture at al-Qurnah, the Tigris and Euphrates rivers become the Shatt al-Arab for the final 100 miles (160 km) to the Persian Gulf; this river forms the boundary with Iran below Basra.

Precipitation patterns change over the same general northwest-to-southeast orientation as the country's physiographic regions, with the Tigris–Euphrates Basin receiving roughly 16 inches (400 mm) of annual rainfall and the southwestern desert less than 4 inches (100 mm). The highlands receive as much as 40 inches (1,000 mm) at the highest elevations. The climate of the Tigris–Euphrates Basin is overwhelmingly hot in summer and humid near the rivers.

Unrestricted grazing and intensive cutting has reduced the country's forest to less than one-twentieth of the land area, much of it along the rivers. Southwest of the mountains there is steppe vegetation of perennial bushes and low shrubs, changing to thorns and other salt-resistant plants in drier places. Below al-Qurnah in the lower river basin area, the marshland contains reeds, tall grasses, and sedge.

Iraq's enormous proved reserves of petroleum account for more than 5 percent of total global reserves. Although there are petroleum reserves near the Persian Gulf, the major reserves are located in the northwestern part of the country. Iraq also has substantial reserves of natural gas.

The people. Arabs and the Arabized population constitute an overwhelming majority in the central and southern regions of Iraq. They are estimated to make up more than three-quarters of the total population. The Kurds of the northeast highlands continue to speak their own language and are the most numerous (constituting about one-fifth of Iraq's total population) of the ethnic minorities. Turks and Turkmen have become highly intermixed with the local Arab population. The country's official language is Arabic.

Muslims comprise more than 95 percent of the population, and among them the Shīʿite sect forms the majority. Iraq is the only Arab country in the Middle East with a Shīʿite majority. Sunnite Muslims account for the remainder of the Muslim population. The Shīʿites are Arabs and a few Turkmen; the Sunnite adherents include Arabs, Turks, Turkmen, and Kurds. Christians comprise nearly all of the non-Muslim population.

The birth rate is high even for the Middle East, while the death rate is comparatively low. The annual rate of population growth, which results almost entirely from natural increase, is high by world standards but is about average for the Middle East. Nearly half of the population is less than 15 years of age. About seven-tenths of the Iraqi population lives in cities and towns.

The economy. Iraq has a developing, largely state-owned economy. The gross national product (GNP) per capita is relatively low compared to other countries in the Middle East. Annual growth of the real GNP was 9.3 percent during the period preceding the Iran–Iraq War. The GNP, which originates primarily from exports of petroleum, however, declined after the outbreak of the war in 1980.

Arable land in Iraq is about one-eighth of the total land area; most of it is concentrated in the valleys of the Tigris and Euphrates, and nearly one-third of it is irrigated. Salinization of agricultural soils presents a serious problem in much of the irrigated lands. Agriculture produces about one-tenth of the GNP but employs nearly one-third of the labour force. Vegetables and cereals together occupy four-fifths of the arable land; the largest crops harvested are wheat, barley, watermelon, tomatoes, grapes, and dates. Nearly one-tenth of the land area is pasture, supporting sheep, goats, and cattle.

The mining sector accounts for about one-fourth of the GNP but employs less than 2 percent of the work force. Petroleum and natural gas are Iraq's richest mineral resources, but production of crude petroleum dropped considerably after 1980, largely because of war damage or sabotage. Most of the natural gas produced in association with petroleum continues to be burned off. Other minerals produced include sulfur, phosphate rock, gypsum, and salt.

Manufacturing contributes about one-tenth of the GNP and employs a comparable portion of the labour force. The principal products include refined petroleum products, cement, iron and crude steel, nitrogenous fertilizers, raw sugar, cotton and woolen textiles, and carpets. Nearly all of Iraq's electricity is produced by thermal power plants and the remainder by hydroelectric installations.

Construction generates almost one-fifth of the GNP and employs about one-tenth of the labour force. Iraq has initiated major programs, financed by oil revenues, to expand its petroleum-refining and power-production capacity, build dams and develop its irrigation network, and expand its transportation and communications infrastructure.

Iraq has nationalized the petroleum and other industries, financial enterprises, and transport and communications facilities, leaving to the private sector food processing, small manufacturing, traditional crafts, trade, restaurants, tourism, and hotels. The private sector accounts for a significant portion of Iraq's industrial production. Trade unions are under government control, but limited collective bargaining is permitted. Iraq has experienced shortages of both skilled and agricultural labour, and foreign workers staff many construction projects.

Iraqi Republic Railways is state-owned and has lines from Baghdad to Basra and from Baghdad north to Mosul and the Syrian border. Two-thirds of Iraq's road network is paved. There are more than 600 miles (950 km) of inland waterways, 65 miles (105 km) on the Shatt al-Arab navigable by seagoing ships. The principal ports are Basra, Umm Qaṣr, and al-Fāw. Basra was closed in late 1981 after Iranian bombing. Baghdad, Mosul, and Basra have international airports.

Exports consist almost entirely of crude petroleum; the small remainder includes dates and vegetables. Imports are mostly electrical and mechanical machinery, transport equipment (including airplanes), consumer goods, chemical and pharmaceutical products, and food items. Major trading partners are Japan, France, Italy, Germany, Spain, and the United States.

Government and social conditions. Iraq is a one-party state governed by the Arab Baʿth Socialist Party. The Revolutionary Command Council (RCC), whose nine members also compose the party's Regional Command, enacts legislation by decree. The RCC's president serves as the country's chief of state and supreme commander of the armed forces. Members of the RCC appoint a Council of Ministers (cabinet) to exercise the government's administrative functions. Iraq's nominal legislature is the 250-member National Assembly, a bicameral body elected to five-year terms. The country's provisional constitution, adopted in 1970, vests highest judicial authority in the Court of Cassation. Iraq is divided into 18 governorates, three of which constitute the Kurdish Autonomous Region (which has limited self-government). Although it has outlawed organized political opposition, the Sunnite-dominated leadership has met armed resistance from groups representing the Shīʿite Muslims and the Kurds.

The increasing commitment of the government to socialist policies has resulted in the expansion of welfare services, including health facilities and housing projects for the poor, particularly in Baghdad. Iraq continues to be saddled with major health problems, however, including numerous war casualities in the 1980s and high incidence of trachoma, influenza, measles, whooping cough, and tuberculosis. The infant mortality rate is also relatively high but is improving and is slightly better than for the Middle East as a whole. Trained medical personnel are in short supply, particularly outside the major cities of Baghdad and Basra. The general state of the country's health is reflected in Iraq's relatively low life expectancy of 62 years for men and 63 years for women.

Primary and secondary education in Iraq are free. In theory all children are required to attend primary school, which lasts for six years. In practice, however, many rural children never receive education because of a lack of facilities. Primary graduates may enroll in a six-year program of secondary education, consisting of intermediate-secondary and intermediate-preparatory levels. Iraq's illiteracy rate is relatively high for the Middle East and prompted the government to launch an anti-illiteracy campaign in the late 1970s.

The Iraqi press is owned and operated by the government. One of its primary tasks is to disseminate information and views that promote the interests of the Arab Baʿth Socialist Party.

History. Long known to the world as Mesopotamia, Iraq's history reaches back to the very origins of civilization, for it was here in the fertile valley of the Tigris and Euphrates rivers that the world's first urban, literate civilization was born. Possibly as early as 3500 BC the Sumerians appeared in the delta region of the two rivers. They developed cuneiform writing and grew into a confederation of city-states that included Ur, Uruk, Lagash, and Kish. These cities were forged into an empire under the Akkadian leader Sargon sometime around 2350 BC. As the Akkadians declined, two new centres of power developed: the Babylonians, who, under Hammurabi, achieved fame for their legal code; and the Assyrians, who by the 7th century BC had created a vast empire covering most of the ancient Middle East. This great empire came to an end in 609 BC. Another resurgence of Babylon followed under the Chaldeans, but all of Mesopotamia fell to the Persians *c.* 550 BC.

Alexander the Great conquered the Persians in 330 BC. Mesopotamia later became a battleground first between the Parthians and the Romans, then between the Sāsānians and the Byzantines. The constant warfare left the Sāsānians an easy prey for the invading Arab Muslims in the 7th century AD. Mesopotamia was again a battleground as rival contenders fought for the caliphate.

Baghdad became the capital of the ʿAbbāsid caliphate and the centre of the Muslim world. Both Baghdad and the ʿAbbāsid caliphate were destroyed by the Mongols in 1258.

The Ottomans took control of Iraq in the 16th century and held it until 1917. These centuries were marked by frequent insurrec-

tions from within and invasions, particularly by the Iranians, from without. European trading began in the Persian Gulf area in the mid-17th century and expanded during the 19th. An Ottoman railroad concession to the Germans in 1899 alarmed the British, who occupied Iraq during World War I. Under British protection a monarchy was established in 1921, a constitution signed in 1925, and full independence achieved in 1932.

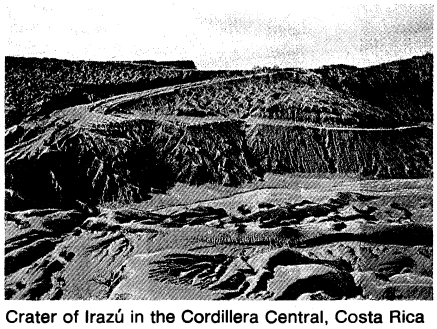
Pro-German activities in World War II led to another British occupation of Iraq in 1941. Political unrest was endemic after the war. A revolution ended the monarchy in 1958, and a succession of military coups went on until 1968, when the socialist Ba'th party took control. The Ba'thist leader Saddam Hussein ruled Iraq from the 1970s on. Hussein used the extensive revenues Iraq earned from its petroleum exports to industrialize the country and improve its social services. In the 1980s, however, Iraq became embroiled in a stalemated war with Iran after having invaded that country in 1980. The Iran-Iraq War ended in 1988, but in 1990 Hussein ordered the invasion of neighbouring Kuwait, an act that prompted severe United Nations sanctions against Iraq.

Iraq-Iran War: *see* Iran-Iraq War.

'Irāqī, in full FAKHR AD-DĪN IBRĀHĪM 'IRĀQĪ HAMADĀNĪ (b. *c.* 1211, Hamadān, Iran—d. November 1289, Damascus, Syria), one of the most outstanding poets of 13th-century Persia.

Very little is known about 'Irāqī's early life. There is evidence that he abandoned a teaching career to follow a group of wandering Ṣūfīs, or mystics, as far as India in search of higher mystical knowledge. After studying for 25 years with his master, Bahā' ad-Dīn Zakariyyā, in Multān, he journeyed to the Hejaz and to the city of Konya in Anatolia. At Konya he wrote what is considered to be his greatest work, *Kitāb al-lamaʿāt* ("The Book of Light Beams"), a profound work in both poetry and prose inspired by the mystical philosopher Ibn al-'Arabī (d. 1240). 'Irāqī later went to Egypt and finally to Syria. A great poet of mystical love, he also is famous for his *Divān* ("Collected Poems") and his *'Ushshāqnāmeh* (Eng. trans., *The Song of The Lovers: 'Ushshāqnāma,* edited and translated by A.J. Arberry), a mystical work written in *mašnavī* ("rhymed couplets") interspersed with ghazels ("lyrics").

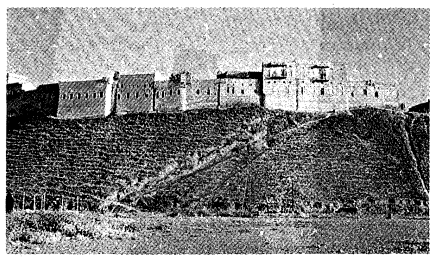
Irazú, active volcano in the Cordillera Central, east-central Costa Rica. The highest mountain in the Cordillera Central, Irazú reaches an elevation of 11,260 feet (3,432 m). It is a popular ascent for tourists, as its cone offers views of both the Atlantic and Pacific coasts of Costa Rica. The crater is linked by paved road to Cartago. The volcano's eruptions of 1963–65 produced ash that dammed a nearby small river, flooding the city of Cartago and causing serious damage to coffee crops. The eruptions also destroyed pastureland and temporarily produced highly acidic rains.



Crater of Irazú in the Cordillera Central, Costa Rica
Ernst Jahn

Irbid, town, northern Jordan. The town is built on successive Early Bronze Age settlements and was possibly the biblical Beth Arbel and the Arbila of the Decapolis, a Hellenistic league of the 1st century BC through the 2nd century AD. Modern Irbid is one of Jordan's fastest-growing industrial areas, as well as an agricultural centre for Jordan's most fertile region. The many springs in the area in addition to the Yarmūk River provide water for the irrigation of crops. Yarmūk University was founded in the town in 1976. Its languages of instruction are both Arabic and English, with faculties in arts, sciences, medical sciences, engineering, agriculture, and veterinary medicine. Pop. (1989 est.) 167,785.

Irbīl, also spelled ARBIL, or ERBIL, Assyrian ARBA-ILU, Greek ARBELA, ancient town, northern Iraq. It lies 48 miles (77 km) east of Mosul in the foothills of the mountains that rise to the east. It is a trade centre for agricultural produce. A rail terminus, it also is linked by roads to Turkey, Syria, and Iran.



The citadel mound, Irbīl, Iraq
Diane Rawson—Photo Researchers/EB Inc.

Irbīl is one of the oldest continuously inhabited towns in the world. The modern town occupies the top of the tell (mound formed by successive building over a long period of time), rising about 100 feet (30 m) above the level of the plain. The town was mentioned in the late 3rd-millennium-BC correspondence of Shulgi, king of Ur, as Urbillum, and later it was known as Arba-ilu by the Assyrians. It was a centre of communication in the Assyrian empire and remained a crossroad of caravan routes into the 20th century. In the Battle of Gaugamela, also known as the Battle of Arbela, fought near the town in 331 BC, Alexander the Great decisively defeated Darius III, opening the way for his conquest of Persia. The town became Christian at an early date, and, later (AD 340), Christians were persecuted there. The Muslim conquest in the 7th century did not prevent Irbīl from remaining an active centre of Christianity and the seat of a bishopric. Muẓaffar ad-Dīn, brother-in-law of Saladin, made Irbīl his capital from 1190 until 1232 and constructed several buildings that can still be seen at the foot of the upper town. Irbīl lost its major importance to Mosul in the 13th century but remained a leading town in the region. The population is still a mixture of Christians and Sunnite Muslim Kurds. There are two technical institutes (founded 1976 and 1978), one devoted to agriculture. The crops grown in the surrounding area include sesame, corn (maize), millet, and fruit. Pop. (1985 est.) 333,903.

Iredell, James (b. Oct. 5, 1751, Lewes, Sussex, Eng.—d. Oct. 20, 1799, Edenton, N.C., U.S.), associate justice of the United States Supreme Court (1790–99).

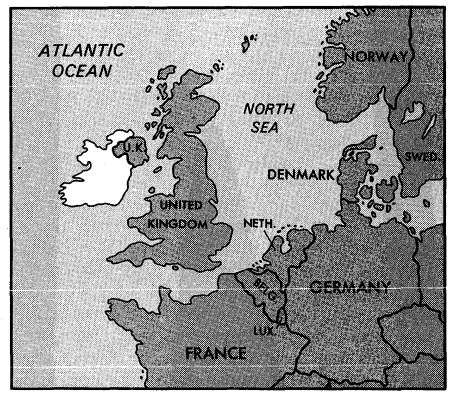
At the age of 17 Iredell was appointed comptroller of the customhouse at Edenton, North Carolina, to which his father, formerly a Bristol merchant, had migrated. He studied law and became active in the American cause. Although hopeful as late as June 1776 for a reconciliation with Britain, he worked as one of the commissioners to draft and revise the laws of the new state of North Carolina. He served briefly as a superior-court judge and as state attorney general and, in 1787, was charged by the legislature to codify the state's statutes; "Iredell's Revisal" appeared in 1791.

He was a leader of the North Carolina Federalists in supporting ratification of the Constitution, and his letters in its defense (published over the name Marcus) are said to have prompted President George Washington to appoint him to the U.S. Supreme Court. He was the original court's youngest member.

Iredell's opinion in *Calder* v. *Bull* (1798) helped establish the principle of judicial review five years before it was actually tested in *Marbury* v. *Madison.* He is, however, remembered primarily for his dissents, most notably that in *Chisholm* v. *Georgia* (1793), which maintained that an action of assumpsit could lie against a state only by authority of the Constitution, thus lending weight to the campaign for the 11th Amendment.

Iredell's health failed less than 10 years after his appointment, in large part as a result of the travel and strain of holding circuit courts, at the time required of Supreme Court justices.

Ireland, officially REPUBLIC OF IRELAND, Irish ÉIRE, or POBLACHT NA H-ÉIREANN, country occupying the greater part of an island lying to the west of Great Britain, and covering an area of 27,137 square miles (70,285 square km). The capital is Dublin. At its farthest extent, Ireland is about 302 miles (486 km) long from north to south and about 171 miles (275 km) from east to west. Ireland's only neighbour is Northern Ireland of the United Kingdom on the northeastern portion of the island. The remainder of Ireland's boundary consists of coastline, with the Atlantic Ocean to the north, west, and south, and the Irish Sea and St. George's Channel, separating it from Great Britain to the east. The population in 1990 was estimated to be 3,509,000.



Ireland

A brief treatment of Ireland follows. For full treatment, *see* MACROPAEDIA: Ireland. For information about the country's capital city, *see* Dublin.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. Ireland's topography consists of broad, north-central lowlands averaging 200–400 feet (60–120 m) above sea level, ringed almost entirely by coastal highlands. Low hills, lakes, bog areas, and low ridges interrupt the landscape of the lowlands in many places. Less than 15 percent of the country rises above 700 feet (200 m). Carrantuohill, the highest peak, is located in the southwestern highlands and reaches only 3,414 feet (1,040 m) above sea level. The only break in the coastal mountain fringe extends northward from Dublin along the eastern coast. The island's western coast is heavily indented where the mountains of Donegal, Mayo, and Kerry thrust out into the Atlantic Ocean and are there separated by deep, wide-mouthed bays.

The Shannon, the country's major river, drains a wide area of the central lowlands, forming a series of lakes as it flows sluggishly south-southwestward along 161 miles (259 km) of gentle gradient from the plateau country near Sligo Bay to tidewater level at Limerick.

Ireland's climate is especially mild, with Dublin's temperatures averaging more than 40° F (5° C) in January and February and less than 60° F (15° C) in July and August. No part of the country is more than 70 miles (110 km) from the sea, and the warm drifting waters of the Gulf Stream moderate temperatures uniformly throughout the island. The combined effects of high precipitation rates, which range from 100 inches (2,500 mm) annually in the western and southwestern highlands to 30 inches (750 mm) at Dublin in the northeast, and cool year-round temperatures result in extremely humid conditions. The country's general moistness and low elevation have resulted in large peat, or turf, deposits. Less than one-eighth of Ireland's land area is considered arable, but much of that is highly fertile, and ample grasslands support a substantial livestock population. Less than 5 percent of the country is forested, and there is little indigenous wildlife.

Ireland is not rich in mineral resources, although it does possess minable reserves of lead, zinc, and silver. Its energy resources consist largely of limited reserves of petroleum and natural gas, although the extensive peat deposits are of increasing importance for generating electricity.

The people. Although Ireland has been invaded and colonized within historic times by Celts, Norsemen, Normans, English, and Scots, racial and ethnic distinctions are virtually nonexistent in the republic today.

Almost 95 percent of the population of Ireland is Roman Catholic. Other religious groups include Church of Ireland Episcopalians, Presbyterians, Methodists, and Jews. The constitution recognizes Irish as the first official language and English as the second. English is universally spoken, however, and taught in all the schools.

The birth and death rates are comparable to those of other nearby European countries. The average annual growth rate of the population during 1980–85 was a comparatively low 1.1 percent. The rate of emigration from Ireland greatly exceeds the next highest rate in Europe, and the number of Irish-born people living outside their native land is thought to approximate half the population of the republic. Declining agricultural employment has led to a general movement of population from rural areas, particularly the poorer districts on the west coast, to urban centres. Almost three-fifths of the total population is urban.

Economy. Ireland has a mixed market economy largely based on agriculture, chemical industries, and services. Economic growth declined in the early 1980s but then grew slowly in the mid-1980s; unemployment, however, was widespread. The gross national product (GNP) per capita is lower than those of Ireland's western European neighbours but is still basically that of a developed country.

Agriculture employs about one-eighth of the work force and accounts for approximately one-tenth of the GNP. Ireland's accession to the European Economic Community (EEC) in 1973 provided a large market for agricultural products, and such products comprised more than one-fourth of total exports. Farming incomes, however, have been adversely affected by rising production costs. Although the Irish government has intervened with substantial public aid and regulation, agricultural employment is declining. Most of the gross agricultural output consists of livestock and livestock products, particulary cattle. Other important farm products include cereals, poultry and eggs, sugar beets, and potatoes.

State reforestation efforts since World War II have had some success. The fishing industry remains relatively undeveloped despite substantial resources off the island's shores.

Mineral exploration from 1960 led to the discovery and development of several valuable mineral deposits in Ireland. Europe's largest lead-zinc mines opened at Navan in 1977. Other mineral products include gypsum, barite, dolomite, limestone flour, and aggregates. Some oil and natural gas are extracted from offshore fields in the Atlantic Ocean south of County Cork.

Mining, manufacturing, construction, and public utilities together account for more than one-third of the GNP and employ almost one-fourth of the work force. The Industrial Development Authority (IDA) actively promotes industrial expansion, often recruiting foreign investment, especially computer and electronics companies. Other important industries include chemicals, metals and engineering, food products, textiles, and tobacco. Services account for as much as two-fifths of the GNP and employ a comparable fraction of the work force. Electricity is largely generated from imported fuels, although as much as one-third comes from domestic sources including peat, hydroelectric power, gas, and coal.

Tourism is the largest item in the country's net invisible earnings. Most of the tourists come from Great Britain, Northern Ireland, the United States, and Western Europe. A tradition of strong union spirit exists in Ireland, and approximately half of the work force belongs to trade unions, the vast majority of which are members of the Irish Congress of Trade Unions (ICTU). The Irish pound, or *punt,* replaced the pound sterling as the unit of currency in 1979, following Ireland's adherence to the European Monetary System.

Although Ireland's imports exceeded exports in the early 1980s, by the mid-1980s the balance of trade was positive. Major import commodities include machinery and transport equipment, chemicals, and mineral fuels. Major export commodities include office machinery, beef, electrical, machinery, dairy products, textiles, and live cattle. The country's principal trade partner is the United Kingdom, accounting for about two-fifths of imports and one-third of exports. Ireland has, however, forged stronger links with other European countries since its accession to the EEC.

Government and social conditions. The Irish republic is a parliamentary democracy. According to the country's constitution, which was adopted by plebiscite in 1937, the president of Ireland is head of state and first citizen. He is elected by direct vote of the people for a term of seven years and is eligible for reelection for a second term. The president generally acts on the advice of a 15-member cabinet, or government, headed by the *taoiseach* (prime minister), but he may act in consultation with an advisory Council of State in the exercise of certain functions. When so advised by the prime minister, he may summon and dissolve Parliament. In certain circumstances he may submit a bill passed by Parliament to the people in a referendum.

There are two houses of the Oireachtas—the Dáil (House of Representatives) and the Seanad (Senate). The 166 members of the Dáil are elected by adult suffrage in a secret ballot held at least every five years. The Seanad's 60 members are elected by various vocational, economic, and cultural constituencies, including the prime minister, who chooses 11. The Dáil initiates legislation; the Seanad can only delay. There are three major political organizations in the country: Fianna Fáil, Fine Gael, and the Labour Party.

Ireland's Pay Related Social Insurance provides widows' and orphans' pensions, unemployment and disability benefits, deserted wives' allowances, and old-age pensions.

Charges for public health services vary according to income level. Health conditions in Ireland are generally good; the country has a high number of doctors and hospital beds per capita, a low infant mortality rate, and a relatively long life expectancy of 73 years.

Education in Ireland is free and compulsory for children between the ages of 6 and 15. Primary education lasts six years. Graduates enroll in the secondary-school system and may earn an Intermediate Certificate at 15 or 16 years of age and a Learning Certificate at 17 or 18. Secondary schools are privately owned. Both primary and secondary schools are organized almost entirely by religious denominations. Of particular note among Ireland's institutions of higher education is the University of Dublin (also called Trinity College).

Ireland's constitution guarantees freedom of the press. A Censorship of Publications Act, however, forbids the publication of matter that undermines Roman Catholic morality.

Cultural life. Although a few highly successful novels and plays have been written in Irish, the language has little prospect of producing a modern literature of significant proportions, whereas literature in English by Irish authors has profoundly influenced the whole of English literature. The Irish language steadily lost ground in Ireland during the 18th and 19th centuries, but it never ceased to exert a strong, if subtle, influence on the English-speaking culture that was supplanting it. Many of the traditional modes of thought and expression characteristic of the Irish language were gradually absorbed into English, enriching the imaginations and expression of those who wrote and spoke it. It is noteworthy that so small a country should have nurtured such (English-speaking) literary giants as Jonathan Swift, Edmund Burke, George Augustus Moore, William Butler Yeats, Oscar Wilde, George Bernard Shaw, James Joyce, and Samuel Beckett.

History. Human settlement in Ireland was begun sometime around 6000 BC by hunters and fishers on the eastern coast. Celtic penetration dates from the Iron Age, perhaps *c.* 300 BC. In Celtic Ireland a large number of small kingdoms were loosely tied to the larger kingdoms—called the Five Fifths—of Ulster, Meath, Leinster, Munster, and Connaught, dating from the beginning of the Christian era.

St. Patrick arrived in Ireland in the 5th century and is credited with Christianizing the entire country. An extensive monastic life developed that shaped the Irish church. Irish missionaries were sent out over all of Europe.

The Norse invaded Ireland in 795. Norse domination extended into Annagassan, Dublin, Waterford, and Limerick, but it reached an end in 1014, when the Norse were defeated in battle by Brian Boru, Ireland's High King.

Effects of the ecclesiastical-reform movement taking place in Europe during the 11th and 12th centuries reached Ireland and resulted in the establishment of church administration by diocese, whose boundaries generally matched those of existing kingdoms. The English king Henry II, encouraged by Popes Adrian IV and Alexander III, invaded Ireland in 1171, proclaimed himself overlord of the entire island, and secured recognition of his actions from church leaders. The independence of Gaelic Ireland had come to an end.

The Anglo-Norman settlers tended to assimilate into the Gaelic Irish culture, and, by the 15th century, only the Pale, a small region of Ireland surrounding Dublin, remained firmly loyal to the English crown. The real rulers of Ireland were the earls of Kildare, who were officially lords deputy for the English. This arrangement continued into the 16th century

until the English Reformation brought new pressures upon Ireland to conform to the ecclesiastical acts of Parliament. For 150 years Ireland exported soldiers and churchmen to continental Catholic countries; at the same time there was an influx of Scottish and English migrants onto lands vacated by fleeing Catholic refugees.

By 1691 the Protestant Ascendancy, spurred by deposed King James II's defeat at the Battle of the Boyne, was complete. Anglicans, representing only about one-tenth of the population, gained control of land and political office, excluding not only Catholics but also Presbyterians and Nonconformists from basic civil rights.

During the next century, Irish Protestants began to agitate for lessened English control, and some civil rights were restored to Catholics. A revolt in 1798 finally forced British action and on Jan. 1, 1801, the United Kingdom of Great Britain and Ireland came into existence. The union was not popular in Ireland, however, and the breach between Catholics and Protestants widened. The negative economic consequences of the union were exacerbated by the disastrous famine of 1846–51, and over 2,000,000 people emigrated.

After the famine, a revolutionary movement known as Fenianism sprang up. Its efforts resulted in some Parliamentary reforms. Agitation continued, but several home rule measures failed. In 1912 another home rule measure was near passage when the Ulster Unionists resisted the measure and prepared for civil war. Despite the intervention of World War I fighting broke out within Ireland, and an Irish provisional government was proclaimed in 1916. In 1920 the Government of Ireland Act was adopted, creating a northern and southern Ireland. In 1921 southern Ireland became the Irish Free State. A new constitution was ratified in 1937 that ended the power of the crown and changed the nation's title from the Irish Free State to Eire.

Ireland, Church of, independent Anglican church within both Ireland and Northern Ireland. It traces its episcopal succession from the pre-Reformation church in Ireland.

Christianity was probably known in Ireland before the missionary activities of Patrick, the patron saint of the country, in the late 5th century. As the early church developed it was monastic, without parochial or diocesan divisions or central government. What authority there was rested with the abbots, and the bishops were limited to their purely spiritual functions. At a very early date the monasteries became centres of learning with a reputation that extended far outside Ireland.

The early Irish Church was independent of Rome and proudly clung to its own usages in preference to those adopted by the rest of Christendom. It maintained until 704 its method of calculating the date of Easter, despite pressures to adopt the Roman calendar. The Norse invasions in the late 8th century, however, caused a decay in culture and learning in Ireland. The weakness of an uncoordinated ecclesiastical organization became evident, and the Roman Church, through the see of Canterbury in England, began influencing the Irish. Obedience to Rome was finally accepted by the Irish Church in the 12th century. The native liturgies were abandoned, and the liturgy of the English Church was adopted. Throughout the medieval period Englishmen were appointed to the more important positions in the Irish Church.

The Reformation period began with the passage in 1537 of the Irish Supremacy Act, which asserted the English king's supremacy in the Irish as well as the English Church. It was, however, a superficial Reformation. The dissolution of the monasteries was only partial, and, because of the scant knowledge of English, liturgical changes were few. No attempt was made to win the mass of the Irish people to Reformation principles, nor were the differences of religious outlook of succeeding English sovereigns made known to the Irish as they were to the English. The majority of the Irish remained faithful to the Roman Catholic Church.

The (Anglican) Church of Ireland, however, was the established church. By the late 18th century Roman Catholics and Presbyterians both received more tolerant treatment, but the privileged position of the Church of Ireland minority continued to irritate many people.

The Act of Union of 1800 united the parliaments of England and Ireland, and the church became part of the United Church of England and Ireland. Discontent with the established church and its privileged position increased, because the church drew its tithes largely from Roman Catholic tenant farmers. In the 1830s agitation against this practice became known as the tithe war. The census of 1861 showed that less than one-eighth of the population belonged to the established church, and four-fifths were Roman Catholic. This fact led to the passing of the Irish Church Act of Disestablishment in 1869, which became law on Jan. 1, 1871.

The Church of Ireland was thus brought to rely on its own resources. It reorganized its ecclesiastical system during a convention of bishops, clergy, and laity held in 1870. Under the constitution then agreed on, the supreme governing body of the church is the General Synod, consisting of the bishops and clerical and lay representatives of the several dioceses, whose local affairs are managed by diocesan synods. Diocesan bishops are elected by an electoral college representative of all dioceses of the province in which the vacancy occurred. The seats of the archbishops of the two provinces are in Armagh and Dublin.

Ireland, John (Nicholson) (b. August 13, 1879, Bowdon, Cheshire, Eng.—d. June 12, 1962, Washington, Sussex), English composer known for his songs and his programmatic orchestral works.

Ireland studied at the Royal College of Music in London, where he later taught composition. He was much drawn to the mysticism and fantasy in the writings of Arthur Machen; some of his compositions, such as *The Forgotten Rite* (1913; for orchestra), were inspired by Machen. His songs, which include settings of poems of Shakespeare, A.E. Housman, and Rupert Brooke, are noted for their subtle evocation of mood. His works include *A London Overture,* the piano suite *Sarnia* (1940–41), a piano concerto, and the *London Pieces* (1917–20), for piano.

Ireland, John, also called JOHANNES DE IRLANDIA (*c.* 1435—d. *c.* 1500), Scottish writer, theologian, and diplomatist, whose treatise *The Meroure of Wyssdome* is the earliest extant example of original Scots prose.

Ireland left the University of St. Andrews without taking a degree and attended the University of Paris (licentiate, 1460). He lived in France until 1483–84, becoming a doctor of theology and being sent on several diplomatic missions by Louis XI. On Louis's death he returned to Scotland and became private chaplain to James III. He was rector of Yarrow and sat in the Scottish parliament. When James died in 1488, he continued as chaplain to the young James IV, and wrote for his edification, in 1490, the work which is his chief claim to fame, *The Meroure of Wyssdome,* a hortatory and pious treatise on the value of wisdom to temporal rulers.

Ireland, John (b. Sept. 11, 1838, Burnchurch, County Kilkenny, Ire.—d. Sept. 25, 1918, St. Paul, Minn., U.S.), first archbishop of St. Paul; head of the liberal Roman Catholic clergy who promoted the integration of predominantly immigrant parishes into the life of the U.S. church (and society as a whole)—in opposition to the separatist tendency of many ethnic groups to preserve their European-style churches, with priests of their own nationalities.

Ireland emigrated to the United States in 1849 with his parents, who settled at St. Paul, Minnesota Territory. Later educated in France, he was ordained priest at St. Paul in 1861. In 1862 he was chaplain for the 5th Minnesota Volunteer Infantry during the Civil War. Ireland was rector of St. Paul Cathedral when he was appointed bishop-coadjutor in 1875. He subsequently became bishop (1884) and archbishop (1888). Ireland's liberal views also gave him a wide influence and reputation outside of the church. Many Europeans considered him the chief Catholic intellectual leader in the U.S. His ideas on social reform and the relation of the church to a democratic society were prophetic. Through the Catholic Colonization Bureau, he encouraged the founding of Catholic colonies in the northwest. In 1889 he helped establish the Catholic University of America, in Washington, D.C., and founded (1894) St. Paul Seminary. He published *The Church and Modern Society* in 1896. James H. Moynihan's *Life of Archbishop John Ireland* appeared in 1953.

Irenaeus, SAINT (b. *c.* 120/140, Asia Minor—d. *c.* 200/203, probably Lyon; Western feast day June 28; Eastern feast day August 23), bishop of Lugdunum (Lyon) and leading Christian theologian of the 2nd century. His work *Adversus haereses* (*Against Heresies*), written in about 180, was a refutation of Gnosticism. In the course of his writings



Irenaeus as bishop (centre), detail of a stained-glass window, 13th century; in the cathedral of Saint-Jean, Lyon

J. Baur and A. Lennoz

Irenaeus advanced the development of an authoritative canon of Scriptures, the creed, and the authority of the episcopal office.

Early career. Though his exact birth date is unknown, Irenaeus was born of Greek parents in Asia Minor. His own works establish a few biographical points, such as that as a child he heard and saw Polycarp, the last known living connection with the Apostles, in Smyrna, before that aged Christian was martyred in 155. Eusebius of Caesarea also notes that after persecutions in Gaul in 177 Irenaeus succeeded the martyred Pothinus as bishop of Lugdunum. According to Eusebius, who wrote a history of the church in the 4th century, Irenaeus, prior to his becoming bishop, had served as a missionary to southern Gaul

and as a peacemaker among the churches of Asia Minor that had been disturbed by heresy.

The known biographical data—if taken together with his published works—are sufficient to give a picture of an unusual life. Historical sources testify to a close cultural connection between Asia Minor and southern France (the Rhône Valley) during the 2nd century. According to tradition, the Apostle John, as a very old man who had "seen the Lord" (*i.e.,* Jesus), lived at Ephesus in the days when Polycarp was young. Thus, there were three generations between Jesus of Nazareth and Irenaeus of southern France.

The era in which Irenaeus lived was a time of expansion and inner tensions in the church. In many cases Irenaeus acted as mediator between various contending factions. The churches of Asia Minor continued to celebrate Easter on the same date (the 14th of Nisan) as the Jews celebrated Passover, whereas the Roman Church maintained that Easter should always be celebrated on a Sunday (the day of the Resurrection of Christ). Mediating between the parties, Irenaeus stated that differences in external factors, such as dates of festivals, need not be so serious as to destroy church unity.

Irenaeus' writings: conflict with the Gnostics. Irenaeus adopted a totally negative and unresponsive attitude, however, toward Marcion, a schismatic leader in Rome, and toward Gnosticism, a fashionable intellectual movement in the rapidly expanding church that espoused dualism. Because Gnosticism was overcome through the efforts of the early Church Fathers, among them Clement of Alexandria and Irenaeus, Gnostic writings were largely obliterated. In reconstructing Gnostic doctrines, therefore, modern scholars relied to a great extent on the writings of Irenaeus, who summarized the Gnostic views before attacking them. After the discovery of the Gnostic library near Naj' Ḥammādī (in Egypt) in the 1940s, respect for Irenaeus increased: he was proved to have been extremely precise in his report of the doctrines he rejected.

All his known writings are devoted to the conflict with the Gnostics. His principal work consists of five books in a work entitled *Adversus haereses.* Originally written in Greek about 180, *Against Heresies* is now known in its entirety only in a Latin translation, the date of which is disputed (200 or 400?). A shorter work by Irenaeus, *Demonstration of the Apostolic Preaching,* also written in Greek, is extant only in an Armenian translation probably intended for the instruction of young candidates for Baptism.

Irenaeus asserted in a positive manner the validity of the Jewish Bible (the Old Testament), which the Gnostics denied, claiming that it upheld the laws of the Creator God of wrath. Though Irenaeus did not actually refer to two testaments, one old and one new, he prepared the way for this terminology. He asserted the validity of the two testaments at a time when concern for the unity and the difference between the two parts of the Bible was developing. Many works claiming scriptural authority, which included a large number by Gnostics, flourished in the 2nd century; by his attacks on the Gnostics, Irenaeus helped to diminish the importance of such works and to establish a canon of Scriptures.

The development of the creed and the office of bishop also can be traced to his conflicts with the Gnostics. On the basis of the New Testament alone, which is concerned with the salvation of man, the creed would not be expected to begin with an article about the creation of the world and man. But, because the Gnostics denied that the God revealed in the New Testament was the Creator, the first article of the creed was for polemical reasons directly connected with Genesis ("In the beginning God created the heavens and the earth"). Irenaeus refers to the creed as a "Rule of Truth" used to combat heresy.

The oldest lists of bishops also were countermeasures against the Gnostics, who said that they possessed a secret oral tradition from Jesus himself. Against such statements Irenaeus maintains that the bishops in different cities are known as far back as the Apostles—and none of them was a Gnostic—and that the bishops provided the only safe guide to the interpretation of Scripture. With these lists of bishops the later doctrine of "the apostolic succession" of the bishops could be linked. Even the unique position of authority of the bishop of Rome is emphasized by Irenaeus, though in an obscure passage.

Though there is no evidence, other than legendary, about his death, the last decade of the 2nd century is generally assumed to be the period in which Irenaeus died. (G.Win.)

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Irene (b. *c.* 752, Athens—d. Aug. 9, 803, Lesbos), Byzantine ruler and saint of the Greek Orthodox Church who was instrumental in restoring the use of icons in the Eastern Roman Empire.

The wife of the Byzantine emperor Leo IV, Irene became, on her husband's death in September 780, guardian of their 10-year-old son, Constantine VI, and co-emperor with him. Later in that year she crushed what seems to have been a plot by the Iconoclasts (opposers of the use of icons) to put Leo's half brother, Nicephorus, on the throne.

Irene favoured the restoration of the use of icons, which had been prohibited in 730. She had Tarasius, one of her supporters, elected patriarch of Constantinople and then summoned a general church council on the subject. When it met in Constantinople in 786, it was broken up by Iconoclast soldiers stationed in that city. Another council, which is recognized by both the Roman Catholic and Eastern Orthodox churches as the Seventh Ecumenical Council, met at Nicaea in 787 and restored the cult of images.

As Constantine approached maturity, he grew resentful of his mother's controlling influence in the empire. An attempt to seize power was crushed by the Empress, who demanded that the military oath of fidelity should recognize her as senior ruler. Anger at the demand prompted the themes (administrative divisions) of Asia Minor to open resistance in 790. Constantine VI was proclaimed sole ruler and his mother banished from court. In January 792, however, Irene was allowed to return to court and even to resume her position as co-ruler. By skillful intrigues with the bishops and courtiers she organized a conspiracy against Constantine, who was arrested and blinded at his mother's orders (797).



Irene, coin, 8th–9th century; in the British Museum
Peter Clayton

Irene then reigned alone as emperor (not empress) for five years. In 798 she opened diplomatic relations with the Western emperor Charlemagne, and in 802 a marriage between her and Charlemagne was reportedly contemplated. According to the contemporary Byzantine historian Theophanes, the scheme was frustrated by one of Irene's favourites. In 802 a conspiracy of officials and generals deposed her and placed on the throne Nicephorus, the minister of finance. She was exiled, first to the island of Prinkipo (now Büyükada) and then to Lesbos.

Irene's zeal in restoring icons and her patronage of monasteries ensured her a place among the saints of the Greek Orthodox Church. Her feast day is August 9.

Irene, in full IRENE DUCAS (b. *c.* 1066—d. 1120, Constantinople), wife of the Byzantine emperor Alexius I Comnenus, known from the description of her in the *Alexiad* of their daughter Anna Comnena.

When Alexius became emperor in April 1081 he reportedly planned to repudiate Irene and wed Mary, who had been married to the former emperors Michael VII Ducas and Nicephorus III Botaneiates. It was probably fortunate for Alexius that his plan was foiled, for his repudiation of his wife would have incurred the enmity of the powerful Ducas family. Irene was crowned on April 11, 1081, seven days after her husband.



Irene, detail of a 12th-century mosaic in Hagia Sophia, Istanbul
Colorphoto Hinz, Basel

In violation of the rights of John, the eldest son of Alexius and Irene, the Empress supported the attempts of her daughter Anna to secure the throne for her second husband, Nicephorus Bryennius. Shortly before his death, the Emperor, aware of the intrigues of his wife and daughter, ordered John to proclaim himself emperor. John had himself crowned in the church of Hagia Sophia and then, with his supporters, occupied the heavily fortified Sacred Palace. Alexius died in August 1118, and Irene, frustrated in her attempts to deprive John of the throne, retired to a

monastery that she had previously founded in Constantinople.

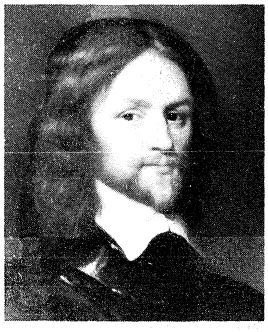
Irenidae, songbird family, order Passeriformes, consisting of the leafbirds, ioras, and fairy bluebirds, about 14 species of small brightly coloured birds of the forests and farms of southeastern Asia.

Members range in size from 13 to 25 centimetres (5 to 10 inches) long. They appear to be closely related to the bulbuls (family Pycnonotidae), even to the hairy patch on the nape. They have slightly downcurved bills, short legs, and rounded wings. Leafbirds proper are in the genus *Choropsis*, ioras are in the genus *Aegithina*, and fairy bluebirds in the genus *Irena*. They eat fruit, buds, and some insects. Many are noted for their striking aerial displays during courtship and for their musical whistles and flutelike calls.

The family, called Chloropseidae by some authors, belongs to the songbird suborder (Passeres).

Ireton, Henry (b. 1611, Attenborough, Nottinghamshire, Eng.—d. Nov. 28, 1651, Limerick, County Limerick, Ire.), English soldier and statesman, a leader of the Parliamentary cause during the Civil Wars between the Royalists and Parliamentarians.

At the outbreak of the Civil War, Ireton



Ireton, detail of an oil painting attributed to Robert Walker; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

joined the Parliamentary army. In November 1642 he commanded a cavalry force in the indecisive Battle of Edgehill, Worcestershire. The following year he met and befriended Oliver Cromwell, then a colonel in the army of eastern England. Cromwell appointed Ireton deputy governor of the Isle of Ely in 1644, and Ireton fought at the Parliamentary victories at Marston Moor, Yorkshire (July 1644), and Naseby, Northamptonshire (June 1645). In the summer of 1646 he married Cromwell's eldest daughter, Bridget.

Although Ireton's military record was distinguished, he earned his fame in politics. Elected to Parliament in 1645, he looked on while a conflict developed between the Independents in the army and the Presbyterians who controlled the House of Commons. In 1647 Ireton presented his "Heads of the Proposals," a constitutional scheme calling for division of political power among army, Parliament, and king and advocating religious tolerance for Anglicans and Puritans. These proposals for a constitutional monarchy were rejected by the King. At the same time they were attacked by the Levellers, a group that called for manhood suffrage, or abolition of property requirements for the franchise.

Ireton then turned against the King. When the Independents in the army triumphed over Parliament during the second phase of the Civil War, his "Remonstrance of the Army" provided the ideological foundation for the assault on the monarchy. He helped to bring Charles to trial and was one of the signatories of the King's death warrant. From 1649 to 1651 Ireton prosecuted the government's cause against Roman Catholic rebels in Ireland, becoming lord deputy of Ireland and acting commander in chief in 1650. He died after the siege of Limerick. A good biography is Robert Ramsey's *Henry Ireton* (1949).

Irgun Zvai Leumi (Hebrew: National Military Organization), byname ETZEL, Jewish right-wing underground movement in Palestine, founded in 1931. At first supported by many non-Socialist Zionist parties, in opposition to the Haganah, it became in 1936 an instrument of the Revisionist Party, an extreme nationalist group that had seceded from the World Zionist Organization and whose policies called for the use of force, if necessary, to establish a Jewish state on both sides of the Jordan.

Irgun committed acts of terrorism and assassination against the British, whom it regarded as illegal occupiers, and it was also violently anti-Arab. Irgun also participated in the organization of illegal immigration into Palestine after the publication of the British White Paper on Palestine (1939), which severely limited immigration. Irgun's violent activities led to execution of many of its members by the British; in retaliation, Irgun executed British army hostages.

Irgun's members were extremely disciplined and daring, and their actions included the capture of 'Akko (Acre) prison, a medieval fortress that not even Napoleon had succeeded in capturing. In the last days of the British mandate, it captured a large part of the city of Yafo (Jaffa).

On July 22, 1946, the Irgun blew up a wing of the King David Hotel in Jerusalem, killing 91 soldiers and civilians (British, Arab, and Jewish). On April 9, 1947, a group of Irgun commandos raided the Arab village of Dayr Yāsīn (modern Kefar Sha'ul), killing all 254 of its inhabitants.

After the creation of Israel in 1948 the Irgun's last units disbanded and took the oath of loyalty to the Israeli defense forces on Sept. 1, 1948. Politically, it was the precursor of the Ḥerut (Freedom) Party, one of Israel's most militant right-wing groups, later merged with the Liberals into the Gaḥal Party. *See also* Stern Gang.

Iri, city, Chŏlla-pukto (North Chŏlla Province), western South Korea, 16 mi (26 km) east of the port city of Kunsan. In the northern part of the Honam-p'yŏngya (plain), the largest granary of South Korea, it is the market centre for the agricultural products, particularly rice, of the area. The city is also the transportation junction of rail lines leading to Mokp'o, Mok'o, Taejŏn, and Kunsan. Despite its location, the city is underdeveloped industrially because of the lack of water. Such agricultural research organizations as the Agriculture Agency and Land Improvement Association are located there, as is Wŏngwang University (1953). Pop. (1980 prelim.) 145,358.

Irian Jaya, also spelled IRIAN DJAYA, formerly IRIAN BARAT, English WEST NEW GUINEA, or WEST IRIAN, *propinsi* (province), Indonesia, the western half (area 162,928 sq mi [412,981 sq km]) of the island of New Guinea and its offshore islands (including Yapen, Adi, Numfoor, Waigeo, Batanta, Kofiau, Salawati, Misool, and Yos Sudarsa islands) and the Schouten and Raja Ampat island groups. Irian is the Indonesian name for New Guinea: *barat,* "west"; *jaya,* "glorious," or "victorious." Irian Jaya fronts the Ceram Sea and the Banda Sea on the west, the Arafura Sea on the southwest, and the Pacific Ocean on the north; it is bounded by Papua New Guinea on the east.

The first Europeans to sight the island were the Portuguese in 1511, and what is now Irian Jaya was subsequently visited by Spanish, Dutch, German and English explorers. The English made an attempt at colonization near Manokwari in 1793. The Dutch claimed the western half of New Guinea in 1828, but their first permanent administrative posts, at Fakfak and Manokwari, were not set up until 1898. Haji Misbach, an Islāmic Communist, was exiled by the Dutch to Irian in 1924. In 1927, about 1,300 Communists were imprisoned in Irian after an uprising in Java. The Japanese occupied the northern part of Irian Barat in World War II until Allied forces recaptured Hollandia (now Jayapura) in 1944. After the war, The Netherlands regained sovereignty until the granting of independence to Indonesia in 1949. Irian Barat was placed under United Nations administration in 1962 and was transferred to Indonesia in 1963, with provision for the holding of a plebiscite by 1969 to decide Irian Barat's future. The plebiscite was held in 1969, and as a result the area became the Indonesian province of Irian Jaya, with its capital at Jayapura.

The Pegunungan (mountains) Maoke, an extension of the mountains composing the central highlands of Papua New Guinea, extend about 400 mi (640 km) east–west across the central part of Irian Jaya and rise to an elevation of 16,503 ft (5,030 m) at Puncak (mount) Jaya. The summits, except for the highest ones, are covered with snow and glaciated. To the north is the east–west valley of the Tariku and Taritatu rivers, tributaries to the northwestward-flowing Sungai (river) Mamberamo). The Pegunungan Van Rees and the Pegunungan Gauttier (rising to 7,454 ft) separate the east–west valley from the northern coastal lowlands. The mostly lowland Jazirah (peninsula) Bomberai lies to the west, and the more mountainous Jazirah Doberai (Vogelkop; Dutch, meaning "bird's head") is to the northwest. Extending south of the Pugunungan Maoke is a wide swampy area imperfectly drained by the Digul, Pulau, Braza, Baliem, Loren, Armandville, Blumen, Semara, and Mapi rivers. The high mountain regions are broken by valleys covered with coarse grass, and tropical-rain-forest vegetation is common. The low-lying areas north of the central mountain range are clothed with dense tropical rain forests. Among the many varieties of trees are sago, coconut, nipa palm, sandalwood, ebony, rubber, casuarina, cedar, breadfruit, and mangrove; orchids and ferns thrive in the rain forests. Wildlife includes marsupials, monotremes, snakes, crocodiles, butterflies, cassowary, birds of paradise, moundbuilders, bowerbirds, anteaters, flying fox, wild dog, wild pig, opossum, tortoise, frilled lizard, water rat, tree kangaroo, plumed heron, green pigeon, and lory.

Most of the population is engaged in agriculture; the chief products are cocoa, fish, nutmeg, rice, shells, timber, vegetables, copra, and copal. Industries comprise sawmilling, rice milling, and shipbuilding. Crafts include wood carving, leather tanning, basket and mat weaving, and handloom weaving.

The largest concentration of copper in the world is at Tembagapura. Despite a continuing guerrilla war, exploitation of these deposits has taken place at nearby Kokenau, on the south central coast, the ore being shipped at Amaferi. Oil is also drilled, and gold and uranium are mined. Irian Jaya was, in the early 1980s, the scene of intense exploration for nickel, petroleum, and additional copper deposits. Crude oil, copra, copal, crocodile skins, shells, scrap metal, mace, nutmeg, resin, and wood are exported. Internal transport consists of a few secondary coastal roads, riverboats, and airways linking Sorong, Manokwari, Inanwaten, Fakfak, Biak, Nabire, Kokenau, Enarotali, Merauke, Wamena, and Jayapura. The population comprises Melanesians, the original settlers of western New Guinea, together

with Negritos, Papuans, and Europeans. Immigrants from the Celebes, Java, and the Moluccas have settled as traders and fishermen along the coasts and river mouths and on satellite islands. There are numerous local languages, some spoken by only a few people. Although indigenous animism prevails, there are some Muslims and Christians. Pop. (1980) 1,173,875.

Iridales, the iris order of flowering plants, belonging to the class called monocotyledon (*q.v.*; characterized by a single seed leaf). Of the four families comprising this order, the iris family (Iridaceae), is best known because of the popularity of genera such as *Iris, Gladiolus,* and *Crocus.* A unifying feature of this order is that stomates (tiny pores, allowing the exchange of gases in leaves) are surrounded by two guard cells and no subsidiary ones.

A brief treatment of Iridales follows. For full treatment, *see* MACROPAEDIA: Angiosperms.

Three smaller families account for 19 additional genera and about 140 species; only three genera are shrubby, the others are herbaceous (nonwoody). Most species are long-lived perennials that inhabit the tropics, subtropics, and temperate zones of the world; a few are annuals. These minor families are nearly all saprophytes, deriving their nourishment from dead organic matter with the aid of fungi living with them. Neither the higher plants nor the fungi can manufacture their own food.

Members of Iridales thrive in a variety of habitats. Species of *Iris, Gladiolus,* and *Crocus* grow best in rich soil. A few irises, however, grow in swampy locations, and a few withstand the rigours of subarctic substrates. Most saprophytic members of this order grow only in humid, tropical forests in which organic material has accumulated. The Iridaceae consists of 60 genera and about 1,500 species. Of these, *Iris* and *Gladiolus* are important ornamental plants in home gardens and in commerce.

Additional ornamental genera of the Iridaceae are the blackberry lily, or leopard flower (*Belamcanda*), a native of China and Japan, and the blue-eyed grasses (*Sisyrinchium*), which are widely dispersed in the Western Hemisphere. The capsule wall of the former recurves at maturity to display shiny, black seeds resembling the fruit of blackberry; it is grown widely for dry bouquets. The blue-eyed grasses are attractive plants for small gardens.

The Iridaceae also yields orrisroot (a substance used in the manufacture of perfumes, soaps, powders, and dentrifices), and leaves of a few species of *Iris* are used as animal feed. The feathery stigmas of *Crocus sativa* yield saffron, which is used as flavouring, food colouring, and as a medicinal ingredient.

Underground stems of the iris family fit into at least three structural types. In *Iris* the stem is horizontal, robust, and ringed with leaf-scars. It is a rhizome that often grows partially exposed, but is firmly rooted in the soil.

Species of *Iris* native to southwestern Europe produce bulbs. This type of stem is short and conical and from it many leaf bases arise, one inside the other. These bases are seamless and constitute the bulk of the bulb. Bulblets arise from the stem, between the leaf bases, to propagate the plant.

The corm of *Gladiolus* is an underground stem in the shape of a doughnut without a hole. On the concave upper surface a small cluster of leaves is located. Among the leaf bases, cormlets arise to reproduce the plant. Rhizomes, bulbs, and corms are efficient in the vegetative reproduction of the Iridales.

Reproduction by seeds is also very important in the iris family and is essential in the development of new hybrids. In *Crocus* only one flower may develop from each corm, but in many other genera, as in *Iris* and *Gladiolus,* an inflorescence (flower cluster), sometimes branched, arises from the underground stem.

Flowers of the showy garden irises possess three sepals (falls), three petals (standards), and three broad, pollen-receptive stigma branches, under which the pollen-producing anthers are hidden. These flower parts are located above the ovary (inferior ovary), which consists of three carpels unified into a single pistil. Ovules within the ovary portion become seeds and the ovary matures into fruit. Members of the Iridaceae produce dry capsules, a fruit that splits open to release the seeds.

Bulbous irises may be stored under carefully controlled temperatures, and, when potted, they are brought into flower in cooler months of the year. Temperature also controls the opening of the crocus flower. When near the critical temperature, the perianth (sepals and petals) opens with an increase of less than one degree Fahrenheit.

Insects are the pollinators in the iris family, attracted by the showy flower parts. In some gladioli a coordination exists between certain moths and the shape of the flower. While hovering, the moth can reach to the base of the floral tube with its long tongue. Pollen already adhering to the body of the moth is left on the stigma, and fresh pollen sticks to the moth to be left in another flower.

iridescence, interference of light either at the surface or in the interior of a material that produces a series of colours as the angle of incidence changes. Best known are the colours seen in precious opal resulting from the interference of light by submicroscopic layers of nearly spherical particles 1,500–3,000 angstroms in diameter that are arranged in a regular pattern; common opal lacks this layering and scattered light gives a milky opalescence. Internal iridesence is due to closely spaced fractures or lamellae such as planes of differing composition caused by exsolution. Most familiar are the colours of labradorite and peristerite resulting from lamellae about 1,000 angstroms thick. Surface iridescence occurs on some ore minerals (*e.g.,* hematite and sphalerite).

iridium (Ir), chemical element, one of the platinum metals of Group VIII of the periodic table, very dense and rare, used in platinum alloys. A precious, silver-white metal, iridium is hard and brittle; it becomes ductile and can be worked at a white heat, from 1,200° to 1,500° C (2,200° to 2,700° F). It is one of the densest terrestrial substances. In the massive state the metal is practically insoluble in acids and is not attacked even by aqua regia. It can be dissolved in concentrated hydrochloric acid in the presence of sodium perchlorate at 125° to 150° C (257° to 302° F).

Because of difficulties in preparation and fabrication, the pure metal has few applications, except for crucibles used in air at very high temperatures. Iridium is chiefly used in the form of platinum alloys. Platinum–iridium alloys (5 to 10 percent iridium) are readily workable metals, much harder and stiffer and more resistant to chemical attack than the soft pure platinum. Such alloys are used for jewelry, penpoints, surgical pins and pivots, and electrical contacts and sparking points. The international prototype standard kilogram of mass is made from an alloy containing 90 percent platinum and 10 percent iridium.

Pure iridium probably does not occur in nature. Though rare, iridium does occur in natural alloys with other noble metals: in iridosmine up to 77 percent iridium, in platiniridium up to 77 percent, in aurosmiridium 52 percent, and in native platinum up to 7.5 percent. Iridium generally is produced commercially along with the other platinum metals as a by-product of nickel or copper production.

The element was discovered (1804) in the acid-insoluble residues of platinum ores by the English chemist Smithson Tennant and named by him in reference to the various colours of its compounds. Natural iridium consists of a mixture of two stable isotopes, iridium-191 (37.3 percent) and iridium-193 (62.7 percent). The chemistry of iridium centres on oxidation states of +1, +3, and +4, though compounds of all states from 0 to +6 are known with perhaps the exception of +2.

atomic number	77
atomic weight	192.2
melting point	2,410° C (4,370° F)
boiling point	4,527° C (8,181° F)
specific gravity	22.4 (20° C)
valence	1, 3, 4
electronic config.	2-8-18-32-17 or (Xe)$4f^{14}5d^{9}$

iridosmine, also called OSMIRIDIUM, mineral consisting of an alloy of iridium and a smaller proportion of osmium. It occurs in gold-bearing conglomerates, as at the Witwatersrand in South Africa, and in gold sands, as in California and Oregon. Because of their hardness and resistance to corrosion, both natural and synthetic iridosmine are used for tips of pen nibs, surgical needles, and sparking points in engines. Similar alloys composed of more osmium than iridium are called siserskite. Both iridosmine and siserskite crystallize in the hexagonal system. For detailed properties, *see* native element (table).

Iriga, chartered city, Camarines Sur province, southeastern Luzon, Philippines. It is located in the central part of Bicol Peninsula, in the southeastern corner of the province near its border with Albay. Iriga is named for the extinct volcano (3,976 ft [1,212 m]) in whose shadow it stands. The city is a major trading centre. The land surrounding Mount Iriga is extremely rough and suitable mainly for abaca (Manila hemp) plantations. Agriculture is the main economic activity in the area. Inc. city, 1968. Pop. (1980) 66,113.

Irigoyen, Hipólito, Irigoyen also spelled YRIGOYEN (b. July 12, 1852, Buenos Aires—d. July 3, 1933, Buenos Aires), Argentine statesman and first president elected by broad popular suffrage, who was driven from office during his second term by a military coup in 1930.

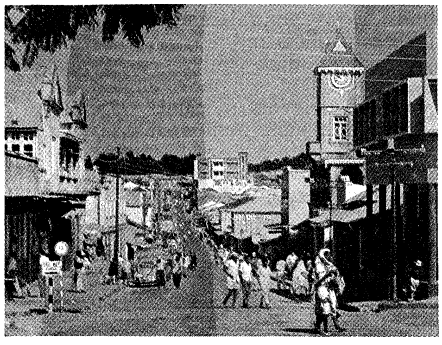
Irigoyen became a lawyer, teacher, rancher, and politician and in 1896 took control of the Radical Party. His relentless effort to obtain free elections succeeded in winning from the conservative oligarchy the Sáenz Peña Law (1912). Under this provision for the secret ballot he was elected president. During his term (1916–22) he and his Radical Party followers in Congress maintained Argentina's neutrality in World War I. Measures regulating labour conditions were also passed, but these were not strongly enforced, and in 1919 a serious strike, in part politically inspired, was violently broken by the government.

Reelected overwhelmingly in 1928, despite the opposition of his former close associate, Marcelo T. de Alvear, who had served as president from 1922 to 1928, the increasingly senile Irigoyen lost his grip on affairs. Corruption and stagnation within his administration cost him much support, which went over to the opposition formed by his long-time conservative enemies. The business depression that began in 1929 further weakened his position, and a relatively bloodless conservative military coup in 1930 ended his career.

Austere in personal life, obscure in many of his public declarations, yet popular almost to the end of his career, Irigoyen failed to implement in Argentina the democratic reforms that he had advocated before reaching power.

Iringa, administrative region, south central Tanzania, East Africa. It was established in 1963 and has an area of 21,950 sq mi (56,850

sq km), bounded by the Great Ruaha River (northeast), the Njombe River (north), the Ruhuhu River (southeast), and Lake Nyasa (southwest). In the south are the Uwemba Mountains (7,400 ft [2,260 m]), the Kipengere Range (9,715 ft), and the Livingstone Mountains (9,600 ft), whose precipitous slopes flank Lake Nyasa's eastern shore in the Great Rift Valley. To the east the Central Plateau's escarpment overlooks the Kilombero Valley. The plateau climate is hot and dry, but rainfall is heavy (60 in. [1,524 mm]) on the high ground. Iringa produces most of the nation's pyrethrum, wattle (*Acacia*) extract, tea, and corn (maize); but tobacco, millet, coffee, sisal, and peanuts are also important cash crops. Coal is mined in the Ruhuhu Valley; but there are also titanium, iron, limestone, salt, and gold deposits. Mainly inhabited by the Hehe, the region also has clusters of Bena, Kinga,



Street scene in Iringa town, Tanzania
Helen & Frank Schreider—Photo Researchers

Nyakyusa, Pangwa, Wanji, and Vidunda peoples and European settlers. Iringa town is the regional headquarters. Pop. (1978 prelim.) 922,801.

Iris, in Greek mythology, the personification of the rainbow and a messenger of the gods. According to the Greek poet Hesiod, she was the daughter of Thaumas and the ocean nymph Electra. In Hesiod's works, at least, she had the additional duty of carrying water from the River Styx in a ewer whenever the gods had to take a solemn oath. The water would render unconscious for one year any god who perjured himself. In art, Iris was normally portrayed with wings, and her attributes were the herald's staff and a vase.

Iris (Greece): *see* Evrótas River.

Iris, genus of about 300 species of plants in the family Iridaceae including some of the world's most popular and varied garden flowers, centred in the North Temperate Zones. Some of its most handsome species, however, are native to the Mediterranean and central Asian areas. The iris is the fleur-de-lis of the French royalist standard. It is a popular subject of Japanese flower arrangement, and it is also the source of orrisroot, from which "essence of violet" perfume is made. Irises are either bulbous or rhizomatous (with thick, creeping underground stems) and have six petallike floral segments, the more erect inner ones called standards and the usually drooping outer ones called falls.

Best known are the bearded or German group—the common garden irises. These are hybrids of pale-blue *I. pallida,* yellow *I. variegata,* purple-blue *I. germanica,* and perhaps other southern European species. They are hardy, rhizomatous types with sturdy, swordlike leaves and tall stems (to 90 centimetres [3 feet]) of three to many flowers. With the introduction in 1900 of taller, heavier, larger-flowered *I. mesopotamica,* even larger



Blue flag (*Iris versicolor*)
J.C. Allen and Son

hybrids were created, many of them fragrant, in a full range of colours and combinations, often with brightly contrasting "beards" on the falls. Dwarf bearded irises, most of which flower in early spring, are for the most part varieties of the almost stemless *I. pumila* and the taller *I. chamaeiris,* both from dry, rocky places in southern Europe.

Best known of the beardless, rhizomatous group is perhaps the water-loving Japanese iris (*I. kaempferi*), frequently featured in Japanese watercolours. Its almost flat flowers consist of long, somewhat drooping falls, surrounding narrower, shorter standards. The Siberian iris (*I. sibirica*), from grasslands in central and eastern Europe, has slender, straight stalks with clustered heads of violet-blue or white blooms. Similar but shorter and more sturdy, *I. spuria* has round falls, short standards, and rather lax foliage. The yellow, or water, flag (*I. pseudacorus*) is a swamp plant native to Eurasia and North Africa; the blue flag (*I. versicolor*) occupies similar habitats in North America.

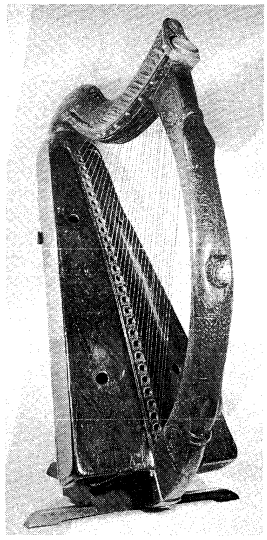
Two outstanding bulbous irises are both from mountains of Spain. They have narrow standards, somewhat broader falls, and spiky, linear foliage. Spanish iris (*I. xiphium*), violet with yellow or yellow-spotted falls, grows in damp, sandy places. English iris (*I. xiphioides*), so named because of its popularity in British horticulture, bears bright-blue flowers. Dutch irises are sturdier, earlier flowering hybrids created in The Netherlands.

iris, in anatomy, pigmented muscular curtain at the front of the eye, between the cornea and the lens and perforated by an opening called the pupil. The iris consists of two sheets of smooth muscle with contrary actions, expansion and contraction. These muscles control the size of the pupil and thus determine how much light reaches the sensory tissue of the retina. The sphincter pupillae is a circular muscle that constricts the pupil in bright light; the dilator pupillae expands the opening when it contracts. The amount of pigment contained in the iris determines eye colour. When there is very little pigment, the eye appears blue; with increased pigment, the shade becomes deep brown to black.

Irish elk, genus (*Megaloceros*) of extinct giant elk commonly found as fossils in Pleistocene deposits in Europe and Asia (the Pleistocene Epoch began 2,500,000 years ago and ended about 10,000 years ago). The Irish elk, about the size of the modern moose, had the largest antlers of any form of deer known—in some specimens, 4 metres (about 13 feet) across. The antlers differed from those of the modern elk; the main part was a massive single sheet from which arose a series of pointed projections, or tines. Several species of *Megaloceros* are known; those from Ireland and Denmark are the largest. It is possible that *Megaloceros* survived as late as 700 BC or even 500 BC.

Irish harp, Irish Gaelic CLAIRSEACH, Scottish Gaelic CLARSACH, traditional harp of medieval Ireland and Scotland, characterized by a huge soundbox carved from a solid block of wood; a heavy, curved neck; and a deeply outcurved forepillar—a form shared by the medieval Scottish harp. It was designed to bear great tension from the heavy brass strings (normally 30 to 50), which were plucked by the fingernails to produce a ringing, bell-like sound. It is strung diatonically (seven notes per octave).

Known in the above form since the 11th century, it belonged to the world of strongly coloured medieval instruments and survived almost unchanged in Ireland until the end of the 17th century. The disappearance of aristocratic patrons, coupled with changes in musical styles, contributed to the disappearance of the instrument, its musical style, and playing technique by the end of the 18th century.



Irish harp, probably 14th century; in the British Museum, London
By courtesy of the trustees of the British Museum, London

The modern, lighter, gut-strung Irish harp stems from the efforts of John Egan of Dublin (*c.* 1820) to revive the older harp. To produce a full chromatic (12-note) octave, it is provided with turnable hooks on the neck near each string, raising the string's pitch by a semitone when necessary.

Irish Hospitals' Sweepstakes: *see* Irish Sweepstakes.

Irish language, also called ERSE, or GAELIC, Irish GAEILGE, a member of the Goidelic group of Celtic languages, spoken in Ireland. As one of the national languages of the Republic of Ireland, Irish is taught in the public schools and is required for certain civil-service posts.

Grammatically, Irish still has a case system, like Latin or German, with four cases to show differing functions of nouns and pronouns in a sentence. In phonology it exhibits initial sandhi, in which the first consonant of a word is modified according to the prehistoric final sound of the previous word in the phrase (*e.g., an tobar* "the well," *mo thobar* "my well").

Records of the Irish language date back to the Ogham inscriptions, written in sets of strokes or notches, of the 5th century AD; the Latin alphabet began to be used shortly thereafter.

Irish literature dates from the 8th century. *See also* ogham writing.

Irish literary renaissance, flowering of Irish literary talent at the end of the 19th and the beginning of the 20th century that was closely allied with a strong political nationalism and a revival of interest in Ireland's Gaelic literary heritage. The renaissance was inspired by the nationalistic pride of the Gaelic revival (*q.v.*); by the retelling of ancient heroic legends in books such as the *History of Ireland* (1880) by Standish O'Grady and *A Literary History of Ireland* (1899) by Douglas Hyde; and by the Gaelic League, which was formed in 1893 to revive the Irish language and culture. The early leaders of the renaissance wrote rich and passionate verse, filled with the grandeur of Ireland's past and the music and mysticism of Gaelic poetry. They were mainly members of the privileged class and were adept at English verse forms and familiar with lyric poetry that extolled the simple dignity of the Irish peasant and the natural beauty of Ireland.

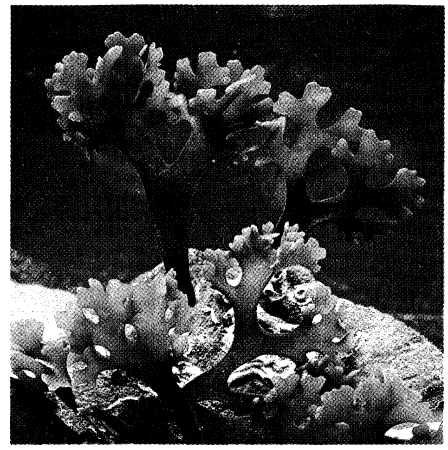
The movement developed into a vigorous literary force centred on the poet and playwright William Butler Yeats. Though he contributed to the foundation of the Abbey Theatre, the first Irish national theatre, he wrote only a few plays, which were beautiful but difficult to stage. His chief colleague at the Abbey was Lady Isabella Augusta Gregory, who took a leading part in the Abbey's management and wrote many plays, mostly peasant comedies. The Irish Literary Theatre, established in 1898, also excelled in the production of peasant plays. The greatest dramatist of the movement was John Millington Synge, who wrote plays of great beauty and power in a stylized peasant dialect. Later, the theatre turned toward realism, mostly rural realism. Lennox Robinson, best-known for his political play, *The Lost Leader* (1918), and his comedy, *The Whiteheaded Boy* (1916), and T.C. Murray, author of *The Briary Gap* (1917), were among the early realists. In reaction to peasant realism, Sean O'Casey wrote three great dramas of the Dublin slums: *The Shadow of a Gunman* (1923), *Juno and the Paycock* (1924), and *The Plough and the Stars* (1926).

In poetry, in addition to Yeats, George Russell ("Æ"), mystic, patriot, and agricultural reformer, composed works of enduring interest. Notable among their younger contemporaries were Padraic Colum, Austin Clarke, Seumas O'Sullivan (James Sullivan Starkey), F.R. Higgins, and Oliver St. John Gogarty. The Irish Republican movement had its poets in Patrick Henry Pearse, Thomas MacDonagh, and Joseph Plunkett, all executed in 1916 for their part in the Easter Rising.

The noteworthy prose fiction of the renaissance includes the historical tales of Emily Lawless and Standish James O'Grady. James Stephens also wrote stories and poetry.

Irish literature, either of two literatures, one in the native language (Irish, or Gaelic) of Ireland and the other in the language of the English conquerors; the latter is often called Anglo-Irish literature. For a discussion of the former, *see* Celtic literature. The history of Anglo-Irish literature is inextricably intertwined with that of English literature (*q.v.*).

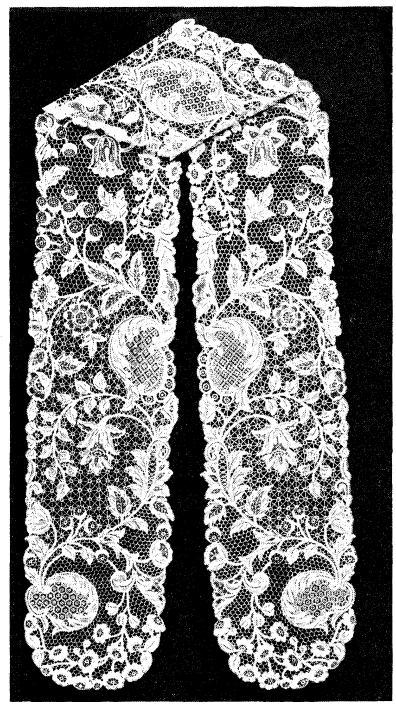
Irish moss, also called CARRAGEEN (*Chondrus crispus*), species of red algae, a small, tufted seaweed with thin fronds from 5 to 25 cm (2 to 10 inches) long, that grows abundantly along the rocky parts of the Atlantic coast of the British Isles, Europe, and North America. The name is also used loosely for several other red seaweeds found associated with *Chondrus*. Other names descriptive of its appearance are pearl moss, curly moss, and jelly moss. In its fresh condition the plant is soft and cartilaginous, varying in colour from a greenish yellow to a dark purple; when sun-dried and bleached it has a yellowish,



Irish moss (*Chondrus crispus*)
Walter Dawn

translucent, hornlike aspect and consistency. The principal constituent of Irish moss is a gelatinous substance, carrageenan. Carrageen extract is produced commercially by boiling dried Irish moss and is used for curing leather and as an emulsifying and suspending agent in pharmaceuticals, certain food products, cosmetics, and shoe polishes. In North America it is harvested from shallow water by dredging with special rakes; in Europe it is obtained from plants cast ashore.

Irish needle lace, lace made with a needle in Ireland from the late 1840s, when the craft was introduced as a famine-relief measure. Technically and stylistically influenced by 17th-century Venetian needle lace, it arose in several centres through the enterprise of individuals, especially the mother superiors of convents, who unraveled old examples to learn



Irish needle lace from Youghal, Ire., last quarter of the 19th century; in the Victoria and Albert Museum, London
By courtesy of the Victoria and Albert Museum, London

the technique and then taught the pupils of the convent or local school. Tyrran in County Armagh was a needle-lace centre from 1849 to 1865. Among other centres were Youghal in County Cork and its offshoots at Kenmare in County Kerry and New Ross in County Wexford.

Irish Rebellion (1798), an uprising of Irish Catholics seeking parliamentary reform and complete Catholic emancipation.

During 1795 an alliance between radicals and discontented sections of the working class had brought a new association of United Irishmen into being; it was secret and organized on military lines and aimed at a radical reform of the Irish Parliament and "a national government." Agrarian discontent was rife, and many of the Irish peasantry who had formed secret societies of their own joined the new society. But in the north of Ireland, agrarian strife took a sectarian form, the Catholic "defenders" clashing with the Protestant Peep O'Day Boys and with the Orange Society, founded in 1795, which was strongly conservative. A large French expedition sailed for Ireland in 1796 under the command of General Lazare Hoche, together with the radical Irishman T. Wolfe Tone, who had gone to France at the beginning of the year to obtain help for the United Irishmen. Storms scattered the fleet; and, though some ships reached Bantry Bay, no troops were landed.

The Irish government, threatened by internal conspiracy and foreign invasion, displayed an unconciliatory determination, passing an Insurrection Act in 1796 and supending the Habeas Corpus Act. During 1797 General Gerard (afterward 1st Viscount) Lake confiscated private arms in the north and suppressed the *Northern Star,* a lively radical newspaper published in Belfast. In the early months of 1798 the tension greatly increased: the United Irishmen were preparing for rebellion, and the government was desperately trying to break their organization. The government managed to arrest a number of the radical leaders in the spring, but in May the rising broke out. Only in eastern Ulster and Wexford was the rising widespread. The rebels in the north were defeated at Antrim and Ballinahinch; while the Wexford rebels defeated the government troops in some engagements but failed to take New Ross and Arklow. By the middle of June large forces of government troops under General Lake were concentrated in Wexford, and the rebels were defeated at Vinegar Hill (June 21, 1798). The rebellion was almost over when a small French force landed near Killala; it won a victory at Castlebar but was soon surrounded and captured. A large number of the Irish rebels were sent off to the penal colonies of Australia.

The chief effect of the rebellion was Prime Minister William Pitt's Act of Union, which abolished the Irish Parliament, Ireland being henceforth represented in the British Parliament at Westminster.

Irish Republican Army (IRA), unofficial semimilitary organization based in the Republic of Ireland that sought complete Irish independence from the United Kingdom. In its later stages it and several successor organizations strove for the unification of the Republic of Ireland with Northern Ireland, which had remained a part of the U.K.

The IRA was created in January 1919 as successor to the Irish Volunteers, which was a militant nationalist organization founded in 1913. The IRA's purpose was to render British rule in Ireland ineffective by the use of armed force and thus to assist in achieving the broader political objective of an independent republic, an objective being pursued at the political level by Sinn Féin, the Irish nationalist party. From its inception, however, the IRA has operated independently, and in times of crisis it has rarely been under effective political control, even though its membership overlaps that of Sinn Féin.

During the Irish War of Independence (1919–21) the IRA employed guerrilla tactics that

included ambushes and raids, by groups of from 15 to 30 men, and sabotage. This activity forced the British to negotiate a political settlement, the terms of which provided for the creation of an Irish Free State having dominion status within the British Empire. These terms, however, proved unacceptable to a substantial number of IRA members. The organization consequently split into two factions: one supporting the peace settlement, the other opposing it. The former group became the core of the official Irish Free State Army, while the latter group, who came to be known as "the Irregulars," began to organize armed resistance against the new independent government. In the ensuing civil war (1922–23), the two groups engaged in a bitter conflict, which ended with the surrender of the Irregulars.

The Irregulars did not surrender their arms or disband as an organization but remained in the background as a constant reminder to successive governments that the aspiration for a united, republican Ireland, achieved by force if necessary, was still alive. Recruiting and illegal drilling by the IRA continued, as did intermittent acts of violence. The organization was consequently declared illegal in 1931 and again in 1936. In 1939 it organized a series of bombings in England, and the Dáil Éireann (Irish house of representatives) took stringent measures against it, including provision for internment without trial. Its activities against the British during World War II severely embarrassed the government of the Free State, and five IRA leaders were executed and many more interned.

After the withdrawal of the Irish Free State from the British Commonwealth and its reconstitution as a republic (December 1948), the IRA turned its attention to agitating for the unification with the Irish republic of predominantly Protestant Northern Ireland, which remained a part of the United Kingdom. Sporadic incidents occurred during the 1950s and early 1960s, but lack of active support by Roman Catholics in Northern Ireland rendered such efforts futile. The situation changed in the late 1960s, when Catholics in Northern Ireland (Ulster) began to demonstrate against discrimination in voting, housing, and employment by the dominant Protestant majority. Units of the IRA composed of Ulster Catholics, supported by the organization in the Republic of Ireland, began a campaign of violence against both Ulster Protestants and British governmental personnel.

A conflict over the extent to which widespread violence should be employed quickly led to a split in the IRA. Following a Sinn Féin conference held in Dublin in December 1969, the IRA divided into an "official" and a "provisional" wing. The former was committed to the union of all Irish and Ulster Catholics and Protestants in a revolutionary socialist Irish republic, while the latter, who were also called Provos, or IRA Provos, consisted of the younger, overtly sectarian Ulster Catholics who were committed to the use of terror tactics in an effort to force the withdrawal of British troops from Northern Ireland as a necessary prelude to the latter's unification with the rest of (Catholic) Ireland. During the early 1970s the Provos carried out terrorist activities that killed or wounded many Ulster Protestant civilians and British troops. Terrorist activity decreased in 1973–75, but from 1975 the Provos again resorted to bombings and ambushes to call attention to their movement. One of their most publicized attacks was the assassination of Louis Mountbatten, 1st Earl Mountbatten of Burma, aboard his fishing boat in Donegal Bay, Ire., on Aug. 27, 1979. In the early 1980s imprisoned members of the Provisional IRA carried out protests and hunger strikes in an unsuccessful effort to gain legal recognition as political rather than criminal prisoners.

Irish Sea, Irish MUIR ÉIREANN, arm of the North Atlantic Ocean that separates Ireland from Great Britain. The Irish Sea is bounded by Scotland on the north, England on the east, Wales on the south, and Ireland on the west. The sea is connected with the Atlantic by the North Channel between Northern Ireland and Scotland and by St. George's Channel between the southeastern tip of Ireland and southwestern Wales. The sea is about 130 miles (210 km) long and 150 miles (240 km) wide. Its total area is approximately 40,000 square miles (100,000 square km). Its greatest depth measures about 576 feet (175 m). In classical times the Irish Sea was known as Oceanus Hibernicus.

There are two principal islands in the Irish Sea. The Isle of Man lies in the centre of the northern part, and Anglesey lies close to the coast of North Wales. The sea is largely underlain by rocks much younger than those that surround it. Geological studies seem to indicate that the Irish Sea originated by rifting during the Tertiary period (66.4 to 1.6 million years ago), and subsidence of its basins was probably initiated or renewed at that time.

Surface tidal currents reach a speed of more than 4 knots in St. George's Channel, near the Irish coast, and are locally strong elsewhere. Currents are weakest in the west-central Irish Sea. The greatest ranges of tide occur on the northwest English coast. Tidal streams enter the Irish Sea from both the north and the south, meeting near latitude 54° N, just south of the Isle of Man.

On the sea's eastern shores, Liverpool is the largest British port; Manchester is joined to the Irish Sea by the Manchester Ship Canal. On the west, Dublin, with extensive quays on the River Liffey, handles more than half of the cargo trade of the Republic of Ireland. Herring is fished in the sea in summer months and whiting in winter, and there is some trawling for cod and flatfish, but the Irish Sea catch is only about one-tenth of that of the North Sea. Fleetwood, lying north of Liverpool, is the chief British fishing port, and Dun Laoghaire and Howth, both near Dublin, are important fishing ports for Ireland.

Irish Sweepstakes, in full IRISH HOSPITALS' SWEEPSTAKES, the largest lottery promoted internationally; it was authorized by the Irish government in 1930 to benefit Irish hospitals. A private trust was formed to run the lottery and market tickets throughout the world. During the 57 years of its existence, the contest derived more revenue from the United States than from any other country, although all the tickets were smuggled into that country and sold illegally. There was much counterfeiting of tickets, seldom detectable because the purchaser had no further interest in the ticket if it was not a winning ticket.

Ticket stubs were returned to Ireland to be drawn from a barrel and matched with the name of a horse running in a major Irish or British race. The largest prizes went to ticket holders whose horses won, placed, or showed. The Irish Sweepstakes ended in 1987, and a state lottery was begun.

Irish system, penal method originated in the early 1850s by Sir Walter Crofton; it emphasized training and performance as the instruments of reform. The Irish system consisted of three phases: a period of solitary confinement; a period of congregate work, in which the prisoner advanced to higher levels by credits earned for industry and good behaviour; and, finally, a period in "intermediate prisons" with minimal supervision, during which the prisoner demonstrated his dependability and employability in the outside world. Release was conditional upon the continued good conduct of the offender, who could be returned to prison if it seemed advisable.

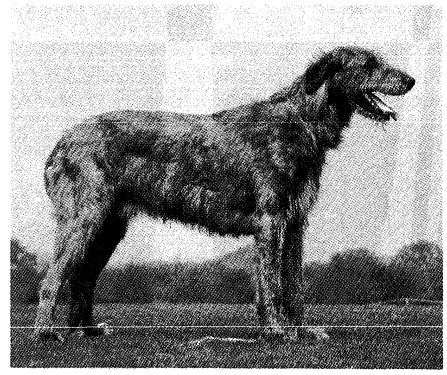
Irish terrier, dog developed in Ireland, one of the oldest breeds of terriers. Nicknamed the "daredevil," it has earned the reputation of being adaptable, loyal, spirited, and recklessly courageous. It served as a messenger



Irish terrier
Sally Anne Thompson—EB Inc.

and sentinel dog in World War I, and it has been used to hunt and to retrieve game. The Irish terrier is a sturdily built dog with racier lines than those of other terriers. It stands 16 to 18 inches (41.5 to 46 cm), weighs 22 to 26 pounds (10 to 12 kg), and is distinguished by its wiry golden-red to reddish brown coat.

Irish wolfhound, tallest of all dog breeds, a keen-sighted hound used in Ireland for many years to hunt wolves and other game. An ancient breed, first mentioned about the 2nd century AD, it is similar in build to the greyhound but far more powerful. The female, which is smaller than the male, stands a minimum of



Irish wolfhound
Sally Anne Thompson—EB Inc.

30 inches (76 cm) and weighs a minimum of 105 pounds (48 kg); male wolfhounds may greatly exceed this size. The coat is rough and is long on the brows and underjaw; colours include gray, brindle, red-brown, black, and white. Noted for speed, strength, and hunting ability, the Irish wolfhound is also valued as a gentle, even-tempered companion.

Irish yew, ornamental evergreen of the yew family. *See* English yew.

Irkutsk, *oblast* (province), east-central Russian S.F.S.R., occupying an area of 296,486 square miles (767,895 square km) west and north of Lake Baikal. It consists mostly of the hills and broad valleys of the Central Siberian Plateau and of its eastern extension, the Patom Plateau. In the south the *oblast* extends to the eastern crestline of the Sayan Mountains. Dense taiga dominated by Siberian and Dahurian larch, with pine, stone pine, fir, and spruce occurs throughout the *oblast;* in the south there are small patches of mixed forest and steppe. Soils nearly everywhere are underlain by per-

mafrost. Climate conditions are strongly continental. Within the *oblast* is the Ust-Ordynsky Buryat autonomous *okrug* (*q.v.*; area), now inhabited mainly by Russians (about 60 percent), but also by Buryats (about 30 percent) and some Tatars, Ukrainians, and Belorussians. Irkutsk city is the administrative centre and nearly all the *oblast's* population is concentrated along the Trans-Siberian Railroad and Angara River, where there is a developing industrial region based on Cheremkhovo and Azey coal, Zheleznogorsk-Ilimsky iron ore, and local salt and mica deposits. Hydroelectricity is supplied by the Irkutsk, Bratsk, and Ust-Ilimsk barrages on the Angara. Petroleum is piped from the Volga-Urals oil field. Metallurgical, engineering, and chemical industries have grown rapidly in the main towns. In the northeast, near Bodaybo on the Vitim, gold is mined. Over the rest of the *oblast*, timber working is the only important industry. Agriculture is largely confined to the neighbourhood of the towns. Reindeer herding and hunting are carried on by the Evenks of the north. The BAM (Baikal-Amur Magistral) Railroad spans through the centre of the *oblast*, east from Ust-Kut. Pop. (1983 est.) 2,676,000.

Irkutsk, city and administrative centre of Irkutsk *oblast* (region), east central Russian Soviet Federated Socialist Republic, on the Angara River at its confluence with the Irkut. It was founded as a wintering camp in 1652, during the first Russian colonization of the area; a fort was built in 1661, and Irkutsk rapidly became the main centre of Cisbaikalia and of the Russian trade route to China and Mongolia. It acquired town status in 1686. Its importance grew after the coming of the Trans-Siberian Railroad in 1898. Modern Irkutsk is one of the major industrial cities of Siberia, especially for a wide range of engineering products. There are railway, aircraft, ship, and vehicle repair yards. Other industries include mica processing and consumer-goods manufacture. The Irkutsk hydroelectric station on the Angara is within the city; its reservoir extends back to include Lake Baikal. The city, with attractive embankments along the river and many surviving wooden houses on its tree-lined streets, is an administrative and cultural centre for Eastern Siberia and of the Soviet Far East. The A.A. Zhdanov University (1918) and the Siberian branch of the Academy of Sciences of the Soviet Union are among 26 teaching and research institutes. Pop. (1983 est.) 582,000.

Irminger Current, branch of the warm North Atlantic Current, flowing generally westward along the south coast of Iceland. It divides into two currents west of Iceland. One proceeds northward and then eastward around Iceland, and the other flows westward and then southwestward, merging with the East Greenland and, eventually, the West Greenland currents. The Irminger Current is a rather saline flow that represents a combination of waters from the North Atlantic and the Arctic oceans. The thermal mixing forms important fishing grounds near the Icelandic coast. The current is named for Carl L. Irminger, a Danish admiral who conducted hydrographic studies in the area in 1854.

Irnerius, also spelled GUARNERIUS, or WARNERIUS (b. *c.* 1055, Bologna, Italy—d. in or after 1125), one of the scholars who revived Roman legal studies in Italy and the first of a long series of noted legal glossators and teachers of law (late 11th–middle 13th centuries) at the University of Bologna.

Originally a teacher of the liberal arts, Irnerius studied law in Rome at the insistence of Countess Matilda of Tuscany, who later employed him on diplomatic missions, as did the Holy Roman emperor Henry V. He is believed to have delivered his first law lectures at Bologna about 1088 and to have taught Bulgarus, the most prominent of the second generation of Bolognese glossators. Irnerius' most ambitious work was an annotation of the Corpus Juris Civilis of the Byzantine emperor Justinian I (reigned 527–565).

IRO: *see* International Refugee Organization.

iroko wood, wood of the iroko tree (*Chlorophora excelsa*), native to the west coast of Africa. Although it is sometimes called African or Nigerian teak, the iroko is unrelated to the teak family. The wood is tough, dense (40 lbs. per cubic foot [641 kg. per cubic metre]) and very durable; it is often used in cabinetmaking and panelling as a substitute for teak, which it resembles both in color (light brown to deep golden brown) and grain.

iron (Fe), chemical element, metal of Group VIII of the periodic table, most used and cheapest metal.

Occurrence, uses, and properties. Iron makes up 5 percent of the Earth's crust, second in abundance to aluminum among the metals and fourth in abundance behind oxygen, silicon, and aluminum among the elements. Iron, which largely constitutes the core, is the most abundant element in the Earth as a whole (about 35 percent) and is relatively plentiful in the Sun and other stars. In the crust the free metal is rare, occurring as terrestrial iron (alloyed with 2–3 percent nickel) in basaltic rocks in Greenland and carbonaceous sediments in the United States (Missouri) and as a low-nickel meteoric iron (5–7 percent nickel), kamacite. Nickel–iron, a native alloy, occurs in terrestrial deposits (21–64 percent iron, 77–34 percent nickel) and in meteorites as taenite (62–75 percent iron, 37–24 percent nickel). (For mineralogical properties of native iron and nickel–iron, *see* native elements [table].) Meteorites are classified as iron, iron-stone, or stony according to the relative proportion of their iron and silicate-mineral content. Iron is found combined with other elements in hundreds of minerals; of greatest importance as iron ore are hematite, magnetite, limonite, and siderite. The metal is extracted by smelting with carbon (coke) and limestone. For specific information on the mining and production of iron, *see* MACROPAEDIA: Industries, Extraction and Processing.

The average quantity of iron in the human body is about 4.5 grams (about 0.004 percent) of which approximately 65 percent is in the form of hemoglobin, which transports molecular oxygen from the lungs throughout the body; 1 percent in the various enzymes that control intracellular oxidation; and most of the rest stored in the body (liver, spleen, bone marrow) for future conversion to hemoglobin. Red meat, egg yolk, carrots, fruit, whole wheat, and green vegetables contribute most of the 10–20 milligrams of iron required each day by the average adult. For the treatment of hypochromic anemias (caused by iron deficiency), any of a large number of organic or inorganic iron (usually ferrous) compounds are used.

Iron, as commonly available, nearly always contains small amounts of carbon, which modify its properties. The unalloyed metal may be prepared by passing hydrogen over purified iron compounds (*e.g.*, oxides) at high temperatures or by electrodeposition from solutions of iron salts. Three true allotropes of iron occur. Delta iron, body-centred cubic, is stable above about 1,403° C (2,557° F), at which temperature there is a transition to gamma iron. The gamma form has a face-centred cubic structure and is paramagnetic (weakly affected by a magnet); its ability to form solid solutions with iron carbide, Fe_3C, is important in steelmaking. At 906° C (1,663° F) there is a transition to paramagnetic alpha iron (formerly called beta iron), body-centred cubic. At 768° C (1,414° F) alpha iron becomes ferromagnetic, indicating a change in electronic structure but no change in crystal structure. Pure iron cannot be permanently magnetized; above 768° C (its Curie point) it loses its ferromagnetism altogether. Alpha iron is a soft, ductile, gray-white metal of high tensile strength. Natural iron is a mixture of four stable isotopes: iron-56 (91.66 percent), iron-54 (5.82 percent), iron-57 (2.19 percent), and iron-58 (0.33 percent). Iron-57, which exhibits a marked Mössbauer effect (recoil-free gamma-ray resonance absorption), has been used in studying magnetism and hemoglobin derivatives and for making a very precise nuclear clock.

Compounds. The most imporant oxidation states of iron are +2 and +3, though a number of +4 and +6 states are known. Iron(II) compounds are designated ferrous and contain the pale green Fe^{2+} ion or complex ions. Iron(III) compounds are called ferric and contain the Fe^{3+} ion (which is yellow to orange to brown, depending on the extent of hydrolysis) or complex ions.

Three oxygen compounds of ion are known: iron(II) oxide, or ferrous oxide, FeO; iron(III) oxide, or ferric oxide, Fe_2O_3; and ferrosoferric oxide, or ferroferric oxide, Fe_3O_4, which contains iron in both oxidation states. Ferrous oxide is a greenish to black powder used primarily as a pigment for glasses. It occurs in nature as the mineral wuestite and it can be prepared by heating an iron(II) compound in the absence of air or by passing hydrogen over ferric oxide. Ferric oxide is a reddish-brown to black powder that occurs naturally as the mineral hematite. It can be produced synthetically by igniting virtually any ferrous compound in air. Ferric oxide is the basis of a series of pigments ranging from yellow to a red known as Venetian red. The finely powdered red form, often called jewelers' rouge, is used for polishing precious metals and diamonds, as well as in cosmetics. Ferric oxide forms a number of hydrates with variable structures and compositions. A common form is iron rust, produced by the combined action of moisture, carbon dioxide, and oxygen in the air on metallic iron. Ferrosoferric oxide occurs as the mineral magnetite in the form of magnetic, black or red-black crystals. It is prepared by passing steam over red-hot iron. The oxide is widely employed in ferrites, substances with high magnetic permeability and high electrical resistivity used in certain computer memories and coatings for magnetic tape. It is also used as a pigment and a polishing agent.

The action of sulfuric acid on iron results in the formation of two sulfur compounds: iron(II) sulfate, or ferrous sulfate, $FeSO_4$, which is commonly available as the heptahydrate $FeSO_4 \cdot 7H_2O$; and iron(III) sulfate, or ferric sulfate, $Fe_2(SO_4)_3$. Ferrous sulfate heptahydrate, known in commerce as green vitrial or copperas, is obtained as a by-product of industrial processes using iron ores that have been treated with sulfuric acid. It serves as a starting material for the manufacture of various other iron(II) compounds and as a reducing agent. It is also employed in making inks, fertilizers, and pesticides, and for iron electroplating. Ferric sulfate is produced on a large scale by adding sulfuric acid and an oxidizing agent (*e.g.*, nitric acid or hydrogen peroxide) to a hot solution of iron(II) sulfate. It is used to make iron alums and other iron(III) compounds; as a coagulant in water purification and sewage treatment; and as a mordant (fixative) in textile dyeing and printing.

With chlorine, iron forms another group of industrially important compounds: iron(II) chloride, or ferrous chloride, $FeCl_2$; and iron(III) chloride, or ferric chloride, $FeCl_3$. Ferrous chloride is obtained as yellow-green deliquescent (moisture-absorbing) crystals by

passing dry hydrogen chloride gas over red-hot iron. It also can be prepared in hydrated form, $FeCl_2 \cdot 4H_2O$, by dissolving metallic iron in hydrochloric acid. It is used in the dye industry as a mordant and as a reducing agent. Ferric chloride is generally prepared from ferrous chloride through the action of chloride or nitric acid. It is used to make many other iron(III) compounds and as a chlorinating agent for silver, copper, and some organic compounds. Treating a solution of trivalent iron with the complex iron cyanide hexacyanoferrate(II), $[Fe(CH_6)]^{4-}$, yields a deep-blue precipitate called Prussian blue (*q.v.*). This pigment has a slight reddish tint and is employed in paints, enamels, and lacquers.

A number of iron compounds have been found medically useful. For example, ferrous gluconate, $Fe(C_6H_{11}O_7)_2 \cdot 2H_2O$, and ferric pyrophosphate, $Fe_4(P_2O_7) \cdot xH_2O$, are among the compounds frequently used to treat anemia. Various ferric salts, which act as coagulants, are applied to wounds to promote healing.

For statistical data on mine production of ore, refining of metal, reserves (or production capacity), and trade worldwide and for major national industries, *see* mining (table).

atomic number	26
atomic weight	55.847
melting point	1,535° C (2,795° F)
boiling point	3,000° C (5,432° F)
specific gravity	7.86 (20° C)
valence	2, 3, 4, 6
electronic config.	2-8-14-2 or $(Ar)3d^64s^2$

Iron Act (1750), in U.S. colonial history, one of the British Trade and Navigation acts, intended to stem the development of colonial manufacturing in competition with home industry by restricting the growth of the American iron industry to the supply of raw metals. To meet British needs, pig iron and iron bar made in the colonies were permitted to enter England duty free. In the colonies the following were prohibited: the new establishment of furnaces that produced steel for tools, and the erection of rolling and slitting mills and of plating forges; the manufacture of hardware; and the export of colonial iron beyond the empire. The British policy was successful in its goal of suppressing the manufacture of finished iron goods in the colonies, but colonial production of basic iron and pig iron (which were then shipped to England) flourished under the Iron Act.

Iron Age, final technological and cultural stage in the Stone–Bronze–Iron-Age sequence. The date of the full Iron Age, in which this metal largely replaced bronze in implements and weapons, varied geographically, beginning in the Middle East and southeast Europe about 1200 BC but in China not until about 600 BC. Although in the Middle East iron had limited use as a scarce and precious metal as early as 3000 BC, there is no indication that people at that time recognized its superior qualities over bronze. Between 1200 and 1000, however, the export of knowledge of iron metallurgy and of iron objects was rapid and widespread. With the large-scale production of iron implements came new patterns of more permanent settlement. On the other hand, utilization of iron for weapons put arms in the hands of the masses for the first time and set off a series of large-scale movements of peoples that did not end for 2,000 years and that changed the face of Europe and Asia.

Iron Cross, German EISERNE KREUZ, Prussian military decoration instituted in 1813 by Frederick William III for distinguished service in the Prussian War of Liberation. Use of the decoration was revived by William I for the Franco–Prussian War of 1870, recreated in 1914 for World War I, and was last revived by Adolf Hitler on Sept. 1, 1939, the same day that German forces invaded Poland.

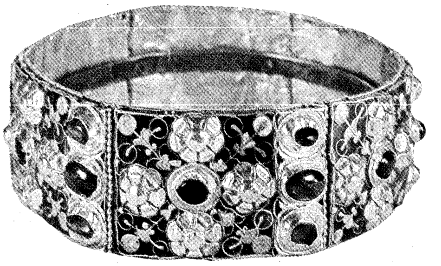
Originally, the Cross had three classes, listed in ascending order: second class, first class, and Grand Cross, the latter being awarded only 19 times through the end of World War I (1918). A special class, the Grand Cross on a radiant star, was created especially for Field Marshal G.L. Blücher after the Battle of Waterloo (1815). It was awarded only once more, to Field Marshal Paul von Hindenburg in 1918. A civilian order of the Cross was created for and conferred upon (1915) the English Germanophile Houston Stewart Chamberlain. From the time of its creation until the end of World War I, 5,719,300 Iron Crosses first and second class were awarded.

During World War II, Hitler decreed the Cross could be conferred on Germans and citizens of countries allied with Germany for exceptional bravery and/or leadership in the face of the enemy. The number of grades was expanded to eight, which, listed in ascending order, are: second class; first class; Knight's Cross; Knight's Cross with oak leaves; with oak leaves and swords; with oak leaves, swords, and diamonds; with golden oak leaves, swords, and diamonds (conferred only once); and an even larger Grand Cross (awarded only once, to Hermann Göring for the Air Force's part in the 1940 French campaign).

The basic design of the medal has remained constant, that of a Maltese Cross of cast iron edged with silver. The World War II design had "1939" etched on the bottom arm, where formerly the dates had been "1813," "1870," or "1914." The reverse side of the World War II medal had "1813" inscribed. The World War II badge also had a swastika, which replaced the previous symbols of the crown and royal cipher. A West German statute of 1957 permitted the Iron Cross to be worn only with the swastika removed.

Iron Crown of Lombardy, originally an armlet or perhaps a votive crown, as suggested by its small size, that was presented to the cathedral of Monza, where it is preserved as a holy relic. No firm record exists of its use for coronations before that of Henry VII as Holy Roman emperor in 1312.

The Iron Crown of Lombardy is composed of a broad circle of six plates of gold joined to each other by hinges and kept rigid by an interior ring of iron not quite 0.5 inch (1.25 cm) broad. It is decorated with jewels



Iron Crown of Lombardy, 9th century; in the collection of the cathedral of Monza, Italy
SCALA—Art Resource/EB Inc.

and translucent enamel and is apparently of Byzantine workmanship. The iron ring does not appear in early descriptions, and possibly it was added in the 12th century; only about 1585 or later was it described as being made from a nail used at the Crucifixion of Christ. After much argument the Congregation of Relics at Rome in 1717, though giving no definite ruling on the point, authorized the exposure of the crown for veneration.

Iron Curtain, the political, military, and ideological barrier erected by the Soviet Union after World War II to seal off itself and its dependent eastern European allies from open contact with the West and other non-communist areas. The first use of the term Iron Curtain is now accredited to the Nazi minister of propaganda, Joseph Goebbels, but it only came to prominence after it was used by the British wartime prime minister Winston Churchill in a speech at Fulton, Mo., U.S., on March 5, 1946, when he said of the communist states, "From Stettin in the Baltic to Trieste in the Adriatic, an iron curtain has descended across the Continent."

The restrictions and the rigidity of the Iron Curtain were somewhat reduced in the years following Stalin's death in 1953, although the construction of the Berlin Wall (*q.v.*) in 1961 restored them. The Iron Curtain largely ceased to exist in 1989–90 with the communists' abandonment of one-party rule in eastern Europe.

iron-deficiency anemia, most frequent type of anemia, which may develop when the body's iron loss is high and its iron stores are depleted (*e.g.,* during periods of rapid growth, pregnancy, or menstruation or other sources of chronic blood loss) or when a person's dietary iron intake is low or his assimilation of iron is inefficient (*e.g.,* starvation, intestinal parasite infestation, removal of part or all of stomach). It is estimated that, in the United States, up to 20 percent of small children and 5–10 percent of women ages 15–45 suffer from iron-deficiency anemia. Symptoms include weakness, fatigue, and sometimes pallor, shortness of breath, coldness of extremities, changeable appetite, sore tongue, loss of hair, brittle fingernails, or dry skin. In advanced cases, the red blood cells are small and pale with a low hemoglobin content, body iron stores are depleted, free iron in the blood plasma is decreased, the iron-binding capacity of the plasma increased, and the ability of the intestines to assimilate iron from the diet increased. Treatment consists of the administration of iron; quick improvement is common.

Iron Gate, Romanian PORŢILE DE FIER, Serbo-Croatian GVOZDENA VRATA, the last gorge of the Djerdap gorge system on the Danube River, dividing the Carpathian and Balkan mountains and forming part of the boundary between Yugoslavia and Romania. It is about 2 miles (3 km) long and 530 feet (162 m) wide, with towering rock cliffs that make it one of the most dramatic natural wonders of Europe. Near the town of Sip a large rock reef (called Perigrada) obstructed nearly the whole width of the river until the construction of the Sip Canal in 1896. A joint Yugoslavian-Romanian development project on the Danube River (including a dam and hydroelectric-power plant) was completed in 1972, providing equal amounts of energy to each country and quadrupling the annual tonnage of shipping. The name Iron Gate is commonly applied to the whole 90-mile- (145-metre-) long gorge system.

Iron Guard, Romanian GARDA DE FIER, Romanian fascist organization that constituted a major social and political force between 1930 and 1941. In 1927 Corneliu Zelea Codreanu founded the Legion of the Archangel Michael, which later became known as the Legion or Legionary Movement; it was committed to the "Christian and racial" renovation of Romania and fed on anti-Semitism and mystical nationalism. Codreanu established the Iron Guard, a militant subdivision of the Legion, in 1930 and its name became the one commonly applied by outsiders to the movement as a whole. The Legion was dissolved by government fiat in December 1933, but it reappeared as Totul Pentru Ţară (Everything for the Fatherland) and flourished, with some support from King Carol II. Suppressed again after King Carol proclaimed a personal dictatorship (1938), it was revived when the king abdicated (1940). Guardists served in Gen. Ion Antonescu's Cabinets (1940–41), but the group was

discredited when the Germans disavowed its pro-German revolt against Antonescu in January 1941.

Iron Knob, town, northeastern Eyre Peninsula, South Australia, 247 mi (397 km) northwest of Adelaide by rail. It is the centre for one of the richest deposits of iron ore in the Southern Hemisphere. Mining rights were acquired in 1897 and in 1901 the Broken Hill Proprietary Company, Ltd. (BHP) began developing the deposits of iron ore in Iron Knob hill. The modern town lies in an extremely arid region and is supplied with water from the Morgan–Whyalla pipelines. The hematite ore, which has an iron content of up to 60 percent, is shipped by rail to the port of Whyalla, 35 mi southeast, where it is either smelted or loaded aboard ship for export. Pop. (1981) 398.

iron mask, the man in the, French L'HOMME AU MASQUE DE FER, political prisoner famous in French history and legend who died in the Bastille in 1703 during the reign of Louis XIV. There is no historical evidence that the mask was made of anything but black velvet (*velours*), and only afterward did legend convert its material into iron.

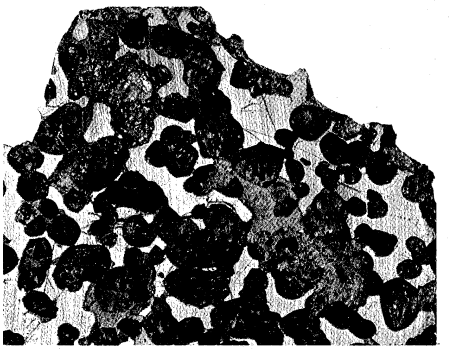
He was first imprisoned at Pignerol (Pinerolo, in Piedmont) sometime before 1681, then at other prisons before finally being transferred to the Bastille in Paris on Sept. 18, 1698; he died there on Nov. 19, 1703. Buried the next day in the parish cemetery of Saint-Paul, he was registered there under the name of "Marchioly," and his age was given as "about 45." His several moves during his lifetime corresponded with the successive postings of the prison governor Benigne D'Auvergne de Saint-Mars, in whose charge he was evidently especially committed.

The identity of the man in the mask was already a mystery before his death; and, from the 18th century on, various suggestions as to his identity were made: in 1711, an English nobleman; in 1745, Louis de Bourbon, comte de Vermandois, a son of Louis XIV and Louise de La Vallière; between 1738 and 1771, an elder brother of Louis XIV (Voltaire popularized this unlikely solution, which was later taken up by Alexandre Dumas in *Dix Ans plus tard oule Vicomte de Bragelonne* [1848–50], translated into English as *The Man in the Iron Mask*); in 1883 Molière, imprisoned by the Jesuits in revenge for *Tartuffe*; etc. Of the dozen or more hypotheses, only two have proven tenable: those for Ercole Matthioli and for Eustache Dauger.

Matthioli, a minister of Ferdinand Charles, duke of Mantua, had been entrusted with the secret negotiation of the treaty of 1678 whereby the impoverished duke was to deliver the stronghold of Casale over to France in return for 100,000 *écus;* but as soon as the agreement was signed, Matthioli nullified its effect by betraying the secret to several foreign courts. Furious at having been tricked, Louis XIV had him quietly abducted and imprisoned at Pinerolo (1679). It is generally agreed, however, that Matthioli died in the Îles Sainte-Marguerite in April 1694 and that the prisoner in the mask was Eustache Dauger.

The correspondence of Louis XIV's minister Louvois indicates that Dauger was only a valet who was arrested on his orders for an unknown reason near Dunkirk in July 1669. At Pinerolo this Dauger served as the valet of another prisoner, Nicolas Fouquet, and after Fouquet's death (1680) he was kept in close confinement with another man who had also served Fouquet. From Pinerolo, Saint-Mars took him in 1681 to Exiles (whereas Matthioli then stayed behind), before moving to the Îles in 1687. It is possible that Louvois, an enemy of Fouquet, wanted these prisoners kept in custody, lest they should divulge secrets that Fouquet could have told them. Perhaps this consideration, rather more than his original crime, explains the absolute secrecy to which Dauger was condemned and the precaution of the mask.

iron meteorite, any meteorite consisting mainly of iron with up to 11 percent nickel. When such meteorites, called irons, fall, a thin, black crust of iron oxide may form that quickly weathers to rust. Relatively easy to distinguish from terrestrial rock, irons are found more often than stony or stony iron meteorites. Irons are grouped according to their



Iron meteorite found at Springwater, Sask., in 1931

By courtesy of the Illinois State Museum; photograph, John H. Gerard—EB Inc.

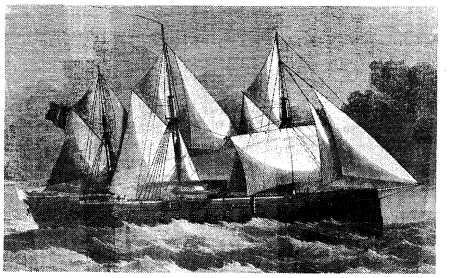
structure, which can be revealed through etching a polished cross section with dilute acid; there are three groups grading into one another: octahedrites, hexahedrites, and ataxites.

Iron Mountain, city, seat (1891) of Dickinson County, southwestern Upper Peninsula of Michigan, U.S., 52 mi (84 km) west of Escanaba. Settled in 1879 and incorporated in 1889, it was named for its proximity to a bluff heavily stratified with iron ore. In the 1930s underground mining became uneconomic, but the industry has revived with open-pit mining and the pelletizing of ore. Tourism and winter sports (based at Pine Mountain ski resort and Vulcan USA) are significant economic factors. Manufactures include wood products, chemicals, and machinery. The Iron Mountain Iron Mine, which ceased production in 1945, now has guided tours of its underground shafts. The adjoining city of Kingsford (incorporated village, 1925; city, 1947) developed with the establishment of a Ford Motor Company plant. Pop. (1980) 8,341.

iron pyrites (mineral): *see* pyrite.

iron storage disease: *see* hemochromatosis.

ironclad, type of warship developed in Europe and the United States in the mid-19th century, characterized by the iron casemates that protected the hull. In the Crimean War (1853–56) the French and British successfully attacked Russian fortifications with "floating batteries," ironclad barges mounting heavy guns, that were towed into position. The French built the first iron warship, the "Gloire," completed in 1859. The "Gloire's" iron plates were about 4½ inches (11 centimetres) thick and backed by heavy timber. Displacing 5,617 tons, she carried 36 guns. A sister ship, "Couronne," soon followed; two British ironclads, the "Black Prince" and "Warrior," each of 9,210 tons and capable of 14½ knots, were completed in 1861 and 1862. Meanwhile, at the outbreak of the American Civil War in 1861, Capt. James Buchanan Eads of St. Louis, Mo., constructed shallow-draft armoured gunboats for use on the Mississippi and its tributaries. A flotilla of them captured Confederate Ft. Henry (Feb. 6, 1862) and successfully engaged a Confederate squadron in April 1862 at Memphis, Tenn., the first ironclads to fight enemy warships. On March 9, 1862, the "Monitor" and the "Merrimack" (correctly, the "Virginia") fought their historic duel at Hampton Roads, Va., the first battle between ironclads.



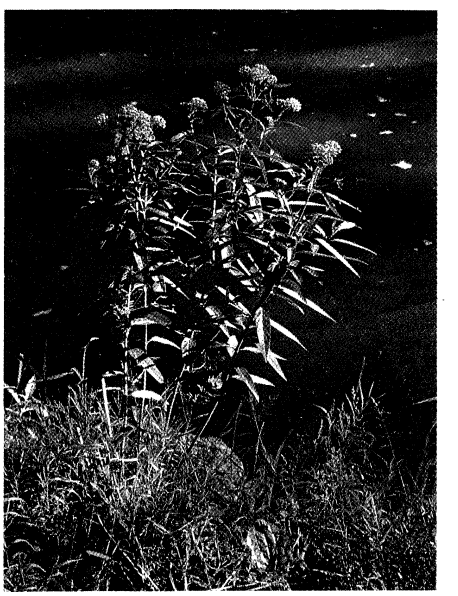
French ironclad "Gloire," engraving by Smythe after a painting by A.W. Weedon

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

A number of refinements in the years following converted the ironclad into the battleship (*q.v.*).

ironstone china, type of stoneware introduced in England early in the 19th century by Staffordshire potters who sought to develop a porcelain substitute that could be mass-produced for the cheaper market. The result of their experiments was a dense, hard, durable stoneware that came to be known by several names—*e.g.,* semiporcelain, opaque porcelain, English porcelain, stone china, new stone—all of which were used to describe essentially the same product. The first successful manufacture of ironstone was achieved in 1800 by William Turner of the Lane End potteries at Longton, Staffordshire. In 1805 Turner sold his patent to Josiah Spode the Second, Stoke-on-Trent, who called his bluish-gray wares stone china and new stone. A patent was granted to Charles James Mason, Lane Delph, in 1813 for the manufacture of "English porcelain," a white ware that he marketed as Mason's Ironstone China. Job and George Ridgway also produced a similar product under the name stone china. The wares, usually service pieces and vases based on Oriental shapes, were most often decorated with painted Chinese and Japanese motifs, some of which were executed by transfer printing. An ironstone china called graniteware or white granite was a standard of American potteries from around 1860 to 1900.

ironweed, any of about 500 species of perennial plants comprising the genus *Vernonia* of the family Asteraceae. Small herbaceous



Western ironweed (*Vernonia fasciculata*)

Dan Morrill

species are distributed throughout the world, while shrubs and trees are native primarily to tropical regions.

Members of the genus have lance-shaped, toothed leaves that alternate along the stem; clusters of flower heads composed only of disk flowers (no ray flowers); and a ring of overlapping bracts (leaflike structures) below the flower heads. Some autumn-blooming species are cultivated as border plants for their attractive white, purple, or pink flower clusters.

Ironwood, city, Gogebic County, western Upper Peninsula of Michigan, U.S., on the Montreal River at the Wisconsin border, 90 mi (145 km) east of Duluth, Minn. It is the retail centre of a bistate urban complex in the Gogebic Range, site of the once prosperous deep-shaft iron-mining industry, which includes Wakefield and Bessemer (east) and Hurley, Montreal, Saxon, and Iron Belt (west). Laid out in 1885 by the Milwaukee, Lake Shore and Western Railway, its name was derived from the early iron dealer James R. Wood, who was known as "Iron" Wood. Iron mining, which reached its peak in 1920, ceased in 1967, and many miners shifted to work the copper mines in adjacent Ontonagon County. Other economic factors include tourism, food processing, and the manufacture of clothing and sports equipment. Ironwood is the seat of Gogebic Community College (1932). It is headquarters for the Ottawa National Forest and is a year-round recreation centre noted for winter sports (skiing at Mt. Zion, Big Powderhorn Mountain, and Copper Peak Ski Flying Hill). A 50-ft (15 m) statue of Hiawatha is an imposing city landmark. Inc. village, 1887; city, 1889. Pop. (1980) 7,741.



Statue of Hiawatha, Ironwood, Mich.
Milt and Joan Mann from CameraMann

ironwork, architectural features of buildings, artwork, utensils, and weapons made of iron. The earliest iron artifacts, which date from about 4000 BC, were made from meteoric iron and were therefore rare. Smelting iron from its ores came into general use about 1400 BC in the Middle East. During the next 500 years iron began to displace bronze in the manufacture of weapons and tools. Before the Middle Ages, iron was primarily a utilitarian metal, with only secondary efforts in decoration. Arms, armour, and firearms were often decorated, however, usually with simple designs, sometimes with elaborate ornamentation.

During the Middle Ages, iron began to achieve wide uses for a variety of domestic needs. Ironclad doors offered an added degree of protection but also provided new opportunities for decoration. Chests wrapped in iron provided both security and beauty. Wrought iron gates, grilles, railings, and balustrades not only fulfilled a functional requirement for strong structures but also provided the artisan with a new means for expressing ornamentation in architecture. From the 16th century, ironwork developed highly ornate designs, with scrolls, leaves, flowers, and interlaced patterns. As iron became more common, it found wider use in household utensils, fireplace implements, stoves, grates, pans, caldrons, locks, and hardware. Lanterns, torch holders, candleholders, and chandeliers were also wrought from iron. Most ironwork was forged with hammer and anvil until the 19th century, when cast ironwork became common.

irony, language device, either in spoken or written form (verbal irony), in which the real meaning is concealed or contradicted by the literal meanings of the words, or in a theatrical situation (dramatic irony) in which there is an incongruity between what is expected and what occurs. Verbal irony arises from a sophisticated or resigned awareness of contrast between what is and what ought to be and expresses a controlled pathos without sentimentality. It is a form of indirection that avoids overt praise or censure as in the casual irony of the statement "That was a smart thing to do!" (meaning "very foolish").

Dramatic irony depends on the structure of a work rather than its use of words. In plays it is often created by the audience's awareness of a fate in store for the characters that they themselves are unaware of, as when Agamemnon accepts the flattering invitation to walk upon the purple carpet that is to become his shroud. The surprise ending of an O. Henry short story also is an example of dramatic irony, as is the more subtly achieved effect of Chekhov's story "Lady with the Dog," in which an accomplished Don Juan engages in a routine flirtation only to find himself seduced into a passionate lifelong commitment to a woman who is no different from all the others.

The term irony has its roots in the Greek comic character *eirōn,* a clever underdog, who by his wit repeatedly triumphs over the boastful character *alazōn.* The Socratic irony of the Platonic dialogues derives from this comic origin. Feigning ignorance and humility, Socrates goes about asking silly and obvious questions of all sorts of people on all sorts of subjects, only to expose their ignorance as more profound than his own. The nonliterary use of irony is usually considered sarcasm.

Iroquois, any member of the Iroquois League or, more broadly, of the North American Indian tribes speaking a language of the Iroquoian family—notably the Cayuga, Cherokee, Huron, Mohawk, Oneida, Onondaga, Seneca, and Tuscarora. The Iroquoian linguistic groups occupied a continuous territory around the lower Great Lakes, with outlying groups to the southeast at tidewater and in the Appalachian highlands. The region contained part of the so-called Eastern Woodlands culture.

The Iroquois-speaking tribes were semisedentary, practiced agriculture, palisaded their villages in time of need, and dwelt in longhouses which lodged many families. Elm bark was used for sheathing these houses, for making such containers as dishes and barrels, and for building canoes. A village band of several hundred persons was the social and economic unit. Groups of men built houses, erected palisades, fished, hunted, travelled, traded, gamed, defended the village against attacks, and went on the warpath. Outside the towns, parties of women, each directed by a matron, worked fields of corn (maize), beans, and squash. After harvest, family deer-hunting parties ranged far into the forests to camp, returning home at midwinter. Spring runs of fish drew families to nearby streams and lake inlets.

The longhouse family was the image of Iroquois society. Households, or blood lineages, were projected into clans, clans into moieties (half tribes), moieties into tribes or nations, and nations into confederacies. Kinship and locality were the bases for political life. Each community had its council of adult males, who guided the village chief or chiefs. The Iroquois were fond of meetings, spending considerable time in council. Groupings for council were determined by locality, sex, age, and the specific question at hand; and each had its own protocol and devices for gaining consensus. An elaborate Iroquois cosmology was based on the myth of a woman who fell from the sky, and it featured deluge and earth-diver motifs. No other tribes showed such a preoccupation with supernatural aggression and cruelty, sorcery, torture, and cannibalism. This literature was relieved by occasional beautiful star myths and journeys to the otherworld. Formal religion consisted of six agricultural festivals featuring long prayers of thanks. There were also rites for sanctioning political activity, such as treaty making. Much of this culture still survives.

Warfare was ingrained in Iroquois personality, and self-respect was dependent on achieving personal glory. The elders continually complained that they could not control the warriors, their young men. Warfare kept down the native population, and thus captives were often enslaved or adopted to replace dead kinsmen and made up much of the Iroquois population in the late 17th century.

Iroquois Falls, town, Cochrane District, east central Ontario, Canada, on the Abitibi River, just west of Lake Abitibi, 190 mi (300 km) north-northwest of North Bay. It was named after the falls on the river, where, according to Indian legend, Iroquois braves, asleep in their war canoes, were cut loose by captive Huron women and swept to their deaths. Originating as a company town in 1912–13, when the provincial government granted the townsite to the Abitibi Power and Paper Company, Iroquois Falls has planned parks, schools, and a hospital. The nearby falls provide hydroelectric power for the company's huge pulp, paper, newsprint, and sulfite mills. The town, 35 mi northeast of Timmins, is a branch terminus on the Ontario Northland Railway. Inc. 1915. Pop. (1981) 6,339.

Iroquois League, in U.S. colonial history, confederation of five (later six) Indian tribes across upper New York State; in the 17th and 18th centuries, this confederation played a strategic role in the struggle between the French and British for mastery of North America. The five Iroquois nations, characterizing themselves as "the people of the long house," were the Mohawk, Oneida, Onondaga, Cayuga, and Seneca. After the Tuscarora joined in 1722, the league became known to the English as the Six Nations and was recognized as such at Albany, N.Y. (1722).

Tradition credits the formation of the league, between 1570 and 1600, to Dekanawidah, born a Huron, who is said to have persuaded Hiawatha, an Onondaga living among Mohawks, to abandon cannibalism and advance "peace, civil authority, righteousness, and the great law" as sanctions for confederation. Cemented mainly by their desire to stand together against invasion, the tribes united in a common council composed of clan and village chiefs; each tribe had one vote, and unanimity was the rule. The joint jurisdiction of 50 peace chiefs, known as sachems, embraced all civil affairs at the intertribal level.

The Iroquois League differed from other American Indian confederacies in the northeastern woodlands primarily in being better organized, more consciously defined, and

more effective. The Iroquois used elaborately ritualized systems for choosing leaders and making important decisions. They persuaded colonial governments to use these rituals in their joint negotiations, and they fostered a tradition of political sagacity based on ceremonial sanction rather than on the occasional outstanding individual leader. Because the league lacked administrative control, the nations did not always act in unison; but spectacular successes in warfare compensated for this and were possible because of security at home.

During the formative period of the league around 1600, the Five Nations remained concentrated in central and upper New York state, barely holding their own with the neighbouring Huron and Mahican, who were supplied with guns through their trade with the Dutch. By 1628, however, the Mohawk had emerged from their secluded woodlands to defeat the Mahican and lay the Hudson Valley and New England tribes under tribute for goods and wampum. The Mohawk traded beaver pelts to the English and Dutch in exchange for firearms, and the resulting depletion of local beaver populations drove the league members to wage war against far-flung tribal enemies in order to procure more supplies of beaver. In the years from 1648 to 1656 the league turned west and dispersed the Huron, Tionontati, Neutral, and Erie tribes. The Andaste succumbed to the league in 1675, and then various eastern Siouan allies of the Andaste were attacked. By the 1750s most of the tribes of the Piedmont had been subdued, incorporated, or destroyed by the league.

The Iroquois also came into conflict with the French in the later 17th century. The French were allies of their enemies, the Algonkins and Hurons, and, after the Iroquois had destroyed the Huron confederacy in 1648–50, they launched devastating raids on New France for the next decade and a half. They were then temporarily checked by successive French expeditions against them in 1666 and 1687, but after the latter attack, led by the Marquis de Denonville, the Iroquois once again carried the fight into the heart of French territory, wiping out Lachine, near Montreal, in 1689. These wars were finally ended by a series of successful campaigns by New France's governor, the Count de Frontenac, against the Iroquois in 1693–96.

For a century and a quarter before the American Revolution, the Iroquois stood athwart the path from Albany to the Great Lakes, keeping the water-level route from permanent settlement by the French and containing the Dutch and the English. In the 18th century the Six Nations remained consistent and bitter enemies of the French, who were allied with their traditional foes. The Iroquois became dependent on the British in Albany for a supply of European goods (which were cheaper there than in Montreal), and thus Albany was never attacked. The Iroquois' success in maintaining their autonomy vis-à-vis both the French and English was a remarkable achievement for an aboriginal people that could field only 2,200 men from a total population of scarcely 12,000.

During the U.S. War of Independence a schism developed among the Iroquois. The Oneida and Tuscarora espoused the American cause, while the rest of the league, led by Chief Joseph Brant's Mohawk Loyalists, fought for the British out of Niagara, decimating several isolated American settlements (*see* Cherry Valley Raid; Wyoming Massacre). The fields, orchards, and granaries, as well as the morale of the Iroquois, were destroyed in 1779 when U.S. Major General John Sullivan led a retaliatory expedition of 4,000 Americans against them, defeating them near present-day Elmira, N.Y. Having acknowledged defeat in the Second Treaty of Ft. Stanwix (1784; *see* Fort Stanwix, Treaties of), the Iroquois League effectively came to an end. In a treaty that was made at Canandaigua, N.Y., 10 years later, the Iroquois and the United States each pledged not to disturb the other in lands that had been relinquished or reserved. Of the Six Nations, the Onondaga, Seneca, and Tuscarora remained in New York, eventually settling on reservations; the Mohawk and Cayuga withdrew to Canada; and, a generation later, the Oneida departed for Wisconsin.

irrational number, any real number that cannot be expressed as the quotient of two integers. For example, there is no number among integers and fractions that solves the problem of finding the square root of two. A counterpart problem in measurement would be to find the length of the diagonal of a square whose side is one unit long; there is no subdivision of the unit length that will divide evenly into the length of the diagonal. It thus became necessary in the history of mathematics to extend the concept of number to include irrational numbers. Each irrational number can be expressed as an infinite decimal expansion with no regularly repeating digit or group of digits. Together with the rational numbers, they form the real numbers (*see* real number).

irrationalism, a chiefly 19th-century philosophical trend that claimed to enrich man's apprehension of life by expanding it beyond the rational to its fuller dimensions. Rooted either in metaphysics or in an awareness of the uniqueness of human experience, irrationalism stressed the dimensions of instinct, feeling, and will as over and against reason. The term is used chiefly by continental European philosophers, who regard irrationalism as one of several strong currents flowing into the 20th century.

There were irrationalists before the 19th century. In ancient Greek culture—which is usually assessed as rationalistic—a Dionysian (*i.e.,* instinctive) strain can be discerned in the works of the poet Pindar, in the dramatists, and even in such philosophers as Pythagoras and Empedocles and in Plato. In early modern philosophy—even during the ascendancy of Cartesian Rationalism—Blaise Pascal turned from reason to an Augustinian faith, convinced that "the heart has its reasons" unknown to reason as such.

The main tide of irrationalism, like that of literary romanticism—itself a form of irrationalism—followed the Age of Reason and was a reaction to it. Irrationalism found much in the life of the spirit and in human history that could not be dealt with by the rational methods of science. Under the influence of Charles Darwin and Sigmund Freud, irrationalism began to explore the biological and subconscious roots of experience. Pragmatism, existentialism, and vitalism (or "life philosophy") all arose as expressions of this expanded view of human life and thought.

For Arthur Schopenhauer, a typical 19th-century irrationalist, voluntarism expressed the essence of reality—a blind, purposeless will permeating all existence. If mind, then, is an emergent from mute biological process, it is natural to conclude, as the pragmatists did, that it evolved as an instrument for practical adjustment—not as an organ for the rational plumbing of metaphysics. Charles Sanders Peirce and William James thus argued that ideas are to be assessed not in terms of logic but in terms of their practical results when put to the test of action.

Irrationalism is also expressed in the historicism and relativism of Wilhelm Dilthey, who saw all knowledge as conditioned by one's private historical perspective and who thus urged the importance of the *Geisteswissenschaften* (the humanities). Johann Georg Hamann, spurning speculation, sought truth in feeling, faith, and experience, making personal convictions its ultimate criterion. Friedrich Heinrich Jacobi exalted the certitude and clarity of faith to the detriment of intellectual knowledge and sensation.

Friedrich Schelling and Henri Bergson, who were preoccupied with the uniqueness of human experience, turned to intuitionism, which "sees things invisible to science." Reason itself was not repudiated; it had simply lost its commanding role inasmuch as personal insights are impervious to testing. In its aspect as a vitalism, Bergson's philosophy—as well as that of Friedrich Nietzsche—was irrationalistic in holding that instinctive, or Dionysian, drive lies at the heart of existence. Nietzsche viewed moral codes as myths, lies, and frauds created to mask forces operating beneath the surface to influence thought and behaviour. For him, God is dead and man is free to formulate new values. Ludwig Klages extended life philosophy in Germany by urging that the irrational springs of human life are "natural" and should be followed in a deliberate effort to root out the adventitious reason; and Oswald Spengler extended it to history, which he viewed intuitively as an irrational process of organic growth and decay.

In existentialism, Søren Kierkegaard, Jean-Paul Sartre, and Albert Camus all despaired of making sense out of an incoherent world; and each chose his own alternative to reason—the leap of faith, radical freedom, and heroic revolt, respectively.

In general, irrationalism implies either (in ontology) that the world is devoid of rational structure, meaning, and purpose; or (in epistemology) that reason is inherently defective and incapable of knowing the universe without distortion; or (in ethics) that recourse to objective standards is futile; or (in anthropology) that in human nature itself the dominant dimensions are irrational.

Irrawaddy River, principal river of western Myanmar (Burma), transversing the centre of the country and running throughout its entire course within Myanmar territory. It is the country's most important commercial waterway, having a length of about 1,238 miles (1,992 km).

A brief treatment of the Irrawaddy River follows. For full treatment, *see* MACROPAEDIA: Asia.

The Irrawaddy is formed by the confluence of the Nmai and the Mali rivers, which rise in the glaciers of the high mountains of northern Myanmar. The Nmai, which is larger than the Mali at the confluence, is the eastern branch, and the Mali the western. From their confluence the Irrawaddy flows generally southward, varying in width from 150 to 12,000 feet (46 to 3,660 m) as it passes through three defiles (narrow gorges) between the confluence and the city of Mandalay.

The upper, or third, defile begins south of Sinbo and ends north of Bhamo. It averages about 300 feet (90 m) in width. At one point two prism-shaped rocks narrow the river to 150 feet and the water banks up in the middle with a whirlpool on each side of the raised pathway. The second defile, which begins near Sinkan, is not as narrow as the upper defile, nor is its current as strong. The hills flanking the river are higher, but the passage is much shorter. The first defile begins south of Thabeikkyin and is tame compared to the others. The river merely flows between low hills or high wooded banks.

Farther downriver the Irrawaddy meanders across the densely populated alluvial flats of the Dry Zone—the ancient Myanmar cultural heartland—in a broad, open course. Within the Dry Zone the river's major tributary, the Chindwin, unites with the Irrawaddy. Continuing south, the lower course flows through a narrow valley between forest-covered mountain ranges—the Arakan Yoma ridge to the

west and the Pegu Yoma ridge to the east—after which it enters the Andaman Sea through a wide delta.

The Irrawaddy's total drainage basin covers approximately 158,700 sq mi (411,000 sq km). Its annual average discharge is 460,000 cu ft/sec (13,000 cu m/sec), but the volume of the river and its tributaries fluctuates greatly through the year due to monsoonal rains that occur between June and September. The rapid melting of glaciers in the summer adds further to the volume. In general, from December to March the Irrawaddy varies between its lowest level and 5 ft (1.5 m) above it, while from mid-June to mid-October the river is 20 to 30 ft above its lowest level. Commercial steamer service is maintained throughout the year from Henzada on the delta to Bhamo 670 mi to the north. The river ports (Mandalay, Chauk, Prome, and Henzada are among the most important) find it necessary to have separate high- and low-water landing points.

In the Dry Zone the cultivation of wheat, cotton, and oilseeds dominates, while to the south the Irrawaddy delta comprises one of the world's largest rice-growing areas. Rice, other foodstuffs, petroleum, cotton, and teak logs are the major items transported on the river system.

Irredentist, Italian IRREDENTISTA, plural IRREDENTISTI, any of the Italian patriots prominent in the last quarter of the 19th century and the early 20th century who sought to deliver Italian lands from foreign rule. Their name was derived from the words *Italia irredenta* ("unredeemed Italy"), and their object was to emancipate the lands of Trentino (south Tirol), Gorizia, Istria, Trieste, Ticino, Nice, Corsica, and Malta from Austrian, French, and British rule.

The Irredentists aimed especially at gaining several Italian-inhabited areas still controlled by Austria after the process of Italian unification (1860–70). In the last two decades of the 19th century, they opposed Italy's adherence to the Triple Alliance, which included Austria. The Irredentists contributed to the pressure that caused the Italian government to enter World War I on the side of the Allies (May 1915). Italy's acquisition of the Istrian peninsula on the north Adriatic and of south Tirol from Austria after the war fulfilled the hopes of many of the Irredentists.

irrigation, the artificial application of water to land. Modern irrigation and the associated practices of drainage, fertilization, mechanization, and mass production for special markets under professional management have produced a revolution in agricultural efficiency.

A brief treatment of irrigation follows. For full treatment, *see* MACROPAEDIA: Farming and Agricultural Technology.

Normally vegetation grows on soil watered by rain. Where rain is so seasonal that it does not meet the requirements of a particular crop or is deficient or practically nonexistent, the drying of the soil to an ever-increasing degree retards, and eventually prevents, vegetable growth. Irrigation can compensate for the vicissitudes of nature by supplying water regularly and in sufficient volume.

The use of irrigation for agricultural purposes is an ancient practice. It can be traced to the early Egyptians, who were irrigating fields with water from the Nile River by 5000 BC. Evidence shows that other ancient civilizations, such as those of the Babylonians and the Chinese, also developed largely as a result of irrigation-based agriculture.

Over the centuries various kinds of techniques and devices were devised to facilitate field irrigation. A major system of irrigation canals and ditches, for example, was constructed during the reign of the Babylonian king Hammurabi (*c.* 1792–50 BC). The one-man scoop for bailing water from rivers for use on fields was eventually replaced by mechanical lifting aids, such as the counterweighted and animal-powered devices introduced in the Middle East and the portable Archimedes screw invented in Syracuse. Another notable development was the use of large storage reservoirs.

With the advent of steam power, the internal combustion engine, and electricity, irrigation became in many parts of the world a fully mechanized operation. An important mechanical development after World War II was the use of portable irrigation systems of lightweight aluminum pipe.

Much irrigation water is pumped from ponds, lakes, streams, and wells. The more abundant and cheaper water supplies are found in the larger streams and usually are obtained therefrom by diversion dams without pumping. Often these structures raise the level of the water in the river and sometimes provide storage in reservoirs. From them, concrete-lined canals and related structures convey and distribute the water over the land through gravity flow.

There are two main forms of irrigation: the basin system and the perennial system. The former, in which the area to be served is surrounded by embankments and filled with water by means of canals, obviously originated in the fact that a river can be easily made to give a supply once a year during its flood period, whereas enormous expense would be required to make it do so at other times. The modern and considerably more expensive system, which makes use of a perennial water supply, such as a reservoir, may also be fed by canals, but in this case the canal system is enormously developed compared with that of the basin system. Other less common methods include warping, an old English practice in which silt from flooding is accumulated as new topsoil; subirrigation, in which water is applied laterally and upward from drains or pipes located below the surface of the ground; and sewage irrigation, in which nitrogen-rich runoff from sewage settling tanks is channeled to cultivable areas.

Irtysh River, river rising from the glaciers on the southwestern slopes of the Altai Mountains in Sinkiang, China. It flows west across the Chinese border through Lake Zaysan, and then northwest across the Kazakh Soviet Socialist Republic to join the Ob River near Khanty-Mansiysk in Soviet Siberia. The largest tributary of the Ob, the Irtysh is 2,640 mi (4,248 km) long and is navigable for most of its course. The Narym, Bukhtarma Om, and Tara are its chief right-bank tributaries, and the Osha, Ishim, Vagay, Tobal, and Konda are its main left-bank ones. The Ust-Kamenogorsk hydroelectric station was completed in 1952 and that at Bukhtarma in 1960. The main river ports are Khanty-Mansiysk, Tobolsk, Tara, Omsk, Pavlodar, Semipalatinsk, and Ust-Kamenogorsk.

Iruma, city, Saitama Prefecture (*ken*), Honshu, Japan, on the Iruma-gawa (Iruma River). The city is located on the Musashino uplands and the southern part of the Kaji hills. Iruma is renowned for the cultivation of Sayama green tea. It is the site of a base of the Japanese Air Self-Defense Force. Iruma has undertaken an industrialization program to exploit its railway connections with Tokyo, to the southeast. Its rich archaeological sites have been damaged by urbanization. Pop. (1984 est.) 114,720.

Irún, city, Guipúzcoa province, in the autonomous Basque Country, northern Spain, situated on the left bank of the Río Bidasoa. At Irún the river is bridged to Hendaye, Fr. Irún is the northern terminus of the Spanish Northern Railway and is the most important customs station for Spanish overland trade with the rest of Europe. The city has ironworks, tanneries, potteries, and paper mills. A dependency of neighbouring Fuenterrabía until 1766, Irún became a city in 1913. It underwent heavy siege by Nationalist forces during the Spanish Civil War, capitulating after fierce resistance in September 1936. Pop. (1981) 53,445.

Irvine, royal burgh, seaport, and new town on the Atlantic coast of Scotland, Cunninghame district, Strathclyde region. The last of Scotland's five new towns, Irvine was designated in 1967 in an attempt to rehouse overflow population from Glasgow and provide a focus for the economic and industrial rehabilitation of the area. Silting of the harbour and competition from Troon and Ardrossan during the 18th and 19th centuries had earlier resulted in the decline of Irvine as Glasgow's chief outport. The new town, Scotland's largest, planned for a population of 100,000, incorporates the existing burgh, an old coal-mining area, and an important chemical complex. A new industrial emphasis for Irvine focuses on chemicals, engineering, electrical goods, and clothing, with a significant proportion of European firms already established there. Pop. (1982 est.) 56,000.

Irving, Edward (b. Aug. 4, 1792, Annan, Dumfries, Scot.—d. Dec. 7, 1834, Glasgow), Church of Scotland minister whose teachings became the basis of the religious movement known as Irvingism, later called the Catholic Apostolic Church.

After working as a mathematics teacher and studying theology part time, Irving was called in 1822 to the Caledonian chapel in London as a preacher. His chapel congregation grew so rapidly that in 1827 a new and larger church was built for him in Regent Square. His popularity waned, however, because of his increasing stress on apocalypticism and eschatology, including his prediction in 1825 that the Second Coming of Christ would occur in 1864.

From 1826 he was the centre of a "school of the prophets," which published the *Morning Watch, or Quarterly Journal of Prophecy,* periodically from 1829 to 1833. In 1828 his *Doctrine of the Incarnation Opened* aroused opposition for its denigration of the human side of Christ's nature. After a similar work by him appeared in 1830, he was charged in ecclesiastical courts with maintaining "the sinfulness of Christ's humanity." Despite his protest that he had been misinterpreted, he was excommunicated by the London presbytery, and in 1833 he was deposed from his ministry by the Church of Scotland.

By then a convinced believer in such pentecostal phenomena as speaking in tongues, Irving preached throughout Great Britain, returning to London to assume a minor position in the evolving Catholic Apostolic Church. Formed shortly after his death by several disciples and associates, the sect sought to emphasize the unity of all Christians in a universal church and to prepare for the Second Coming. The church flourished until the end of the 19th century, though later members rejected the name "Irvingites" for their group. A close friend of the English authors Thomas Carlyle, Charles Lamb, and Samuel Taylor Coleridge, Irving was honoured by burial in the Glasgow cathedral crypt.

Irving, Sir Henry, original name JOHN HENRY BRODRIBB (b. Feb. 6, 1838, Keinton Mandeville, Somerset, Eng.—d. Oct. 13, 1905, Bradford, Yorkshire), one of the most famous of English actors, the first of his profession to be knighted (1895) for services to the stage. He was also a celebrated theatre manager and the professional partner of the actress Ellen Terry for 24 years (1878–1902).

Irving's father, Samuel Brodribb, was a salesman who collected orders for the tailoring department of the local store. His mother, Mary,



Sir Henry Irving, pencil sketch by Phil May, 1889; in the National Portrait Gallery, London
By courtesy of the National Portrait Gallery, London

was the daughter of a Cornish farming family. In 1842 Samuel found better employment in Bristol, and, rather than risk the child's health in the damp and dirt of the city, the parents decided to send their young son to Mary's sister, Sarah Penberthy, in Cornwall. For the next six years John was brought up by his aunt and her husband, Isaac, the captain of a Cornish tin mine at Halse Town near St. Ives. Growing up in Cornwall endowed John with a strong constitution. Cornish Methodism, to which his mother was a dedicated adherent, gave him his first taste of spellbinding oratory—the language of John Wesley. When Isaac died suddenly in 1848, Sarah could no longer carry responsibility for the child and returned him to his parents, who by this time had moved to London. There John attended Dr. Pinches' private school.

After leaving school he entered a merchant's office as a clerk, but his spare time and thoughts centred on the plays and players of the London theatre. In 1856 a Brodribb uncle gave him a legacy of £100, which he invested in theatrical necessities such as wigs, swords, and costumes. The legacy also allowed him to buy the leading part in an amateur production of *Romeo and Juliet* at the Royal Soho Theatre. As was the custom of the day, he adopted a stage name—Irving—his choice determined by the romances of Washington Irving and the evangelical sermons of the Scottish preacher Edward Irving. A warm reception of his performance gave him the encouragement he needed. He gave up clerking and joined a theatrical stock company in Sunderland in the north of England as a "walking gentleman" (*i.e.*, in non-speaking parts).

The stock companies that travelled from town to town throughout England at this time constituted the only theatrical academy for a young aspiring actor. In three years Irving played more than 400 different parts in 330 plays, including most of the Shakespeare repertoire. This apprenticeship continued for 10 years in the provincial towns of England, Scotland, and Ireland. His first success in London came in 1866 in a play called *Hunted Down.*

During a Dublin tour the following year he was introduced to Florence O'Callaghan, the daughter of a surgeon general; in July 1869 they were married. A leading part in a long-running comedy titled *Two Roses* sustained the young couple over the birth of their first son, Henry Brodribb, the following August; but a quarrel following the first night of *The Bells* precipitated a permanent separation a month before the birth of their second son, Laurence Sidney.

The Bells, staged by the American impresario H.L. Bateman at the Lyceum Theatre, was an instant success, and Irving emerged as one of the leading actors of his day. The part of Mathias, an unconvicted murderer haunted by his conscience, suited Irving's gift for the macabre and the melodramatic, and the play was to remain a feature of Irving's repertoire until his death.

For four years Irving was the star of Bateman's company. When Bateman died in 1875, he continued to play under the management of Bateman's widow until 1877. In 1878 Irving became lessee and manager of the Lyceum Theatre and built around him a dedicated if subservient company. He possessed a strong personal vision of the best that could be accomplished: he paid prodigious attention to detail, took no account of expense for settings and costumes, and hired the best designers and musicians in the country. The Victorian public responded to his lead with packed houses, for the romantic historical fare satisfied their concept of what the theatre ought to be. Although he was criticized for his unusual diction, his special mannerisms, and the shakiness of his literary scholarship, Irving took note of the press only as a useful instrument in support of his grand design. Box-office figures spoke louder than the word of the critics, and success brought acclaim from the rich and the famous. The Lyceum became the scene for sumptuous post-performance supper parties at which society was further entertained at Irving's expense.

In 1878 he engaged Ellen Terry as his leading lady and thereby began one of the most famous partnerships in the history of the English stage. Their theatrical qualities complemented each other admirably: he the brooding introvert, she the spontaneous, impulsive creature whose charm won every heart. Together, as Hamlet and Ophelia, Shylock and Portia, they drew enormous audiences.

In 1883 Irving embarked on an American tour with the whole company of actors and technicians, as well as the scenic and lighting effects for which his theatre was famous. His reputation had gone before him, and the company enjoyed a triumphal winter season.

For the next few years Irving and the Lyceum company were at the height of their financial success. Each new production sought to outshine the existing repertoire in sumptuousness and elaboration, though each absorbed the profits of the previous season. The plays themselves were of no lasting literary merit, as a young critic named George Bernard Shaw pointed out. He regretted that an actress as talented as Ellen Terry should waste her time on such ponderous trifles. Shaw had written a play, *The Man of Destiny,* that he hoped Irving and Terry might perform. Irving read it, gave Shaw a retainer, and forgot about it. Shaw then accused him of suppressing the play. Irving's retainer, however, had been only a kind gesture to a struggling young author. The two men now became antagonists. In July 1895, when Irving was honoured by Queen Victoria with a knighthood, his status as a national institution made a more inviting target for Shaw. At the same time, through Ellen Terry, Shaw implored Irving to consider the work of the Norwegian playwright Henrik Ibsen. She managed to read Irving two acts of Ibsen's *John Gabriel Borkman,* but Irving's comment was "Threadworms and leeches are an interesting study, but they have no interest to me." Irving's success had been built on the strength of his own theatrical presence expressed through dramatic vehicles of a certain type. With all the signs of popular success around him, he saw no reason to change the formula. His conception of the theatre was that of an "actor's theatre," in which the dramatist was the servant of the performer. Shaw and Ibsen marked the emergence of the "author's theatre," whereby an actor was judged on the fidelity with which he interpreted the vision and message of the playwright.

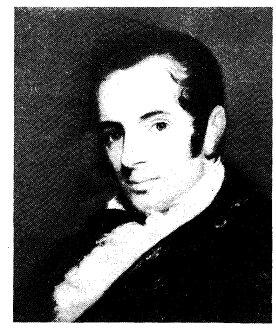
In 1897 Irving suffered three severe blows. A production by his son Laurence of a play about Peter the Great was a financial disaster. A far more devastating blow was the loss through fire of all the stored scenery for many of the classic productions in the Lyceum repertoire. Insurance coverage was inadequate, and the capital loss was crippling. Then, in 1898, Irving had his first serious illness. The company toured without him, and the box-office receipts fell accordingly.

The final years of Irving's life became a struggle to keep the Lyceum company a going concern. New productions of Shakespeare's *Coriolanus,* as well as of the French playwright Victorien Sardou's play on Dante, hastened rather than stemmed the decline. Tours to America were exhausting, without compensating profits. In 1902 the company went into liquidation, and Irving's reign at the Lyceum ended. On Oct. 13, 1905, after a performance of Alfred, Lord Tennyson's *Becket* at the Theatre Royal in Bradford, Irving died, penniless, at the age of 68.

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Irving, Washington (b. April 3, 1783, New York City—d. Nov. 28, 1859, Tarrytown, N.Y., U.S.), writer called the "first American man of letters," whose greatest literary success was *The Sketch Book.*

The favourite and last of 11 children of an austere Presbyterian father and a genial Anglican mother, young, frail Irving grew up in an atmosphere of indulgence. He escaped a college education, which his father required of his older sons, but read intermittently at the law, notably in the office of Josiah Ogden Hoffman, with whose pretty daughter Matilda he early fell in love. He wrote a series of whimsically satirical essays over the signature of Jonathan Oldstyle, Gent., published in Peter Irving's newspaper, the *Morning Chronicle,* during 1802–03. He made several trips up the Hudson, another into Canada for his health, and, during 1804–06, took an extended tour of Europe.



Washington Irving, oil painting by J.W. Jarvis, 1809; in the Sleepy Hollow Restorations collection
By courtesy of Sleepy Hollow Restorations

On his return, he passed the bar examination late in 1806 and soon set up as a lawyer. But during 1807–08 his chief occupation was to collaborate with his brother William and James K. Paulding in the writing of a series of 20 periodical essays entitled *Salmagundi.* Concerned primarily with passing phases of

contemporary society, the essays retain significance as an index to the social milieu.

His *History of New York... by Diedrich Knickerbocker* (1809) was a comic history of the Dutch regime in New York, prefaced by a mock-pedantic account of the world from creation onward. Its writing was interrupted in April 1809 by the sudden death of Matilda Hoffman. Grief incapacitated him for a while. In 1811 he moved to the newer and wider scene of Washington, D.C., as a lobbyist for the Irving brothers' hardware-importing firm, but his life seemed aimless for some years. He prepared an American edition of Thomas Campbell's poems, edited the *Analectic Magazine,* and acquired a staff colonelcy during the War of 1812. In 1815 he went to Liverpool to look after the interests of his brothers' firm, which could not stave off bankruptcy. More profitable were his literary associations in London, especially with Sir Walter Scott, who encouraged him to renewed effort. The result was *The Sketch Book of Geoffrey Crayon, Gent* (1819–20), a composite of satire and whimsicality, fact and fiction, and the old and new worlds. Its 30-odd pieces include what have been called the first modern short stories ("The Legend of Sleepy Hollow," "Rip Van Winkle," and "The Spectre Bridegroom"). The tremendous success of the book assured Irving that he could live by his pen. In 1822 he produced *Bracebridge Hall,* a sequel to *The Sketch Book.* He traveled in Germany, Austria, France, Spain, the British Isles, and later in his own country.

Early in 1826 he accepted the invitation of Alexander H. Everett to attach himself to the American legation in Spain, where he wrote his *Columbus* (1828), followed by *The Companions of Columbus* (1831). Meanwhile, Irving had become absorbed in the legends of the Moorish past and wrote his *Conquest of Granada* (1829) and *The Alhambra* (1832), a Spanish counterpart of *The Sketch Book.*

After 17 years' absence, Irving returned to New York in 1832, where he was warmly received. He made a journey west and produced in rapid succession *A Tour of the Prairies* (1835), *Astoria* (1836), and *The Adventures of Captain Bonneville* (1837). Except for four years (1842–46) as minister to Spain, Irving spent the remainder of his life at his home, "Sunnyside," in Tarrytown, N.Y., on the Hudson, devoted to literary pursuits.

Irvington, town, Essex county, northeastern New Jersey, U.S., bordering on Newark. Settled in 1666 as part of a land grant from Sir George Carteret, proprietor of New Jersey, it was known as Camptown until 1852, when it was renamed to honour the author Washington Irving. Heavily industrialized, its manufactures include textiles, metal and rubber products, paper, and pigments. Inc. village, 1874; town, 1898. Pop. (1987 est.) 62,635.

Irwin, Edward Frederick Lindley Wood, Baron: *see* Halifax, Edward Frederick Lindley Wood, 1st Earl of.

Irwin, Elisabeth Antoinette (b. Aug. 29, 1880, Brooklyn, N.Y.—d. Oct. 16, 1942, New York City), educator, one of the leaders of the progressive-education movement.

Irwin attended Smith College (B.A., 1903) and became involved in the social-settlement movement, working first in the New York City parks (1903–04) and then at the College Settlement in New York City's Lower East Side (1904–05 and 1909–10). From 1905 to 1909 she worked at odd jobs and as a free-lance journalist, writing about slum conditions in the city. In 1910 she began working as a "visiting teacher," or social worker, for the Public Education Association of New York City (founded 1894). While working for the association as a psychologist, Irwin in 1916 initiated a program of testing and grading according to mental ability. Her next and perhaps best-known innovation was an experiment dubbed the "Little Red School House." This program continued for 10 years. It revised the standard curriculum, incorporating elements of play and group activities and varying the teaching methods, placing less emphasis on strictly academic learning. Financial considerations and other objections finally forced Irwin's program out of the public school in 1932, but a private school modeled on the Little Red School House was set up the following year. In 1941 a high school was added.

Irwin wrote a number of articles on progressive education, drawing attention to a child's social and emotional development as well as academic growth. Many of her ideas on progressive education were later adapted to public-school education.

Irwin, James B(enson) (b. March 17, 1930, Pittsburgh, Pa., U.S.), American astronaut, pilot of the Lunar Module on the Apollo 15 mission (July 26–Aug. 7, 1971), in which he and the mission commander, David R. Scott, spent almost three days on the Moon's surface investigating the Hadley-Apennine site, 462 miles (744 km) north of the lunar equator. The two spent 18 hours outside the Lunar Module; traveled on the Moon's surface in a specially designed vehicle; and collected many rocks and core samples. Alfred M. Worden piloted the Command Module, orbiting the Moon while the others worked below.

Irwin graduated from the U.S. Naval Academy, Annapolis, Md., in 1951 and transferred to the Air Force. He was awarded a master's degree by the University of Michigan, Ann Arbor, in 1957. At the time he was selected for the manned space program (1966), he was assigned to the Air Defense Command, Colorado Springs, Colo.

Irwin resigned from the Air Force and the space program in 1972 to form and become president of High Flight Foundation, a religious organization. He and William A. Emerson wrote *To Rule the Night* (1973).

Irwin, May, original name ADA CAMPBELL (b. June 27, 1862, Whitby, Canada West [now Ontario, Can.]—d. Oct. 22, 1938, New York City), American comedienne and music-hall performer who popularized such songs as "After the Ball" and "A Hot Time in the Old Town Tonight."



May Irwin
Culver Pictures

Brought to the United States as a young girl, Irwin made her professional debut in 1875 with her sister Georgia (later known as Flo Irwin). They appeared together as The Irwin Sisters in variety houses until 1883. May Irwin developed into a high-spirited comedienne and performed with great success on the legitimate stage (1883–87) with such luminaries as John Drew, Ada Rehan, and Otis Skinner. A witty and nimble entertainer, she preferred the less-formal, improvisational music hall and toured (1887–89) with the Howard Athenaeum Company in farcical sketches. A brief episode from the play *The Widow Jones* (1895), in which she starred with John Rice, was filmed as *The Kiss* (1896); its prolonged close-up of a kiss scandalized audiences and provoked the first demands for screen censorship.

Irzykowski, Karol (b. Jan. 25, 1873, Błażkowa, near Tarnów, Austria-Hungary [now in Poland]—d. Nov. 2, 1944, Żyrardów, Pol.), Polish novelist and literary critic.

Educated at the University of Lwów, Irzykowski moved in 1908 to Kraków where he joined the editorial board of *Nowa Reforma,* a liberal newspaper. After World War I he moved to Warsaw, where he contributed articles and theatrical reviews to *Robotnik,* a socialist daily. In 1933 he was elected a member of the Polish Academy of Literature. During the German occupation of Poland he was active in the Polish underground and died as a result of serious wounds received during the Warsaw uprising.

Described as one of the most eccentric figures of the Polish Neoromantic literary world, Irzykowski is remembered as the author of *Pałuba* ("The Hag"), a huge novel begun in 1891 and published in 1903. The book combines a penetrating psychological analysis of its characters with a series of digressions on novel writing. Derided upon its publication, in 1948 *Pałuba* was reprinted following attempts by several critics to rehabilitate Irzykowski's reputation. His diaries appeared in 1964.

ʿIsā ibn Mūsā (d. 784), nephew of the first two ʿAbbāsid caliphs, military leader, and at one time presumptive heir to the caliphate.

The caliph as-Saffāḥ nominated his brother al-Manṣūr and, after him, ʿIsā, as heirs. On the accession of al-Manṣūr, ʿIsā was governor of Kūfah. The new caliph sent him to lead an army against an ʿAlid revolt in Medina, apparently with the hope that he might be killed. In a series of battles, ʿIsā secured al-Manṣūr's rule but was forced by intimidation to renounce his rights of succession to al-Manṣūr's son Muḥammad al-Mahdī. On al-Manṣūr's death, ʿIsā again pressed his claim and was defeated in favor of al-Mahdī's son Mūsā al-Hādī.

Isa Town (Bahrain): *see* Madīnah ʿĪsā.

Isaac, in the Old Testament (Genesis), second of the patriarchs of Israel, only son of Abraham and Sarah, father of Esau and Jacob. Although Sarah was past the age of childbearing, God promised Abraham and Sarah that they would have a son, and Isaac was born. Later, to test Abraham's obedience, God commanded Abraham to sacrifice the boy. Abraham made all the preparations for the ritual sacrifice, but God spared Isaac.

In the Old and New Testaments, God is called the God of Abraham, Isaac, and Jacob, because with them God's relationship of promise and purpose was fixed for all those who descended from them. The story of Abraham's acquiescence to God's command to sacrifice Isaac was used in the early Christian Church as an example of faith (Heb. 11:17) and of obedience (James 2:21). In later Jewish tradition the sacrifice of Isaac was cited in appeals for the mercy of God.

Isaac I COMNENUS (b. *c.* 1005—d. 1061, Constantinople), Byzantine emperor who restored economic stability at home and built up the neglected military defenses of the empire.

Isaac was a son of Manuel Comnenus, an officer of the Byzantine emperor Basil II. On his deathbed, Manuel commended Isaac and his other son, John, to the Emperor's care. After having them educated, Basil advanced them to high positions. Isaac, by his prudent conduct in protecting the peoples of the empire, won the confidence of the army during the reigns of Basil's successors.

In 1057 Isaac entered into a military plot to depose the emperor Michael VI and in June of that year Isaac was proclaimed emperor in Paphlagonia in Asia Minor. The rebels marched on Constantinople, captured Nicaea, and defeated Michael's forces at Petroë on August 20. Michael abdicated on August 31, and Isaac was crowned emperor the following day.



Isaac I, effigy on a Byzantine gold coin, 1057–59; in a private collection
Peter Clayton

Although the patriarch Michael I Cerularius had helped bring Isaac to power, the two men soon quarrelled over Isaac's stringent financial policies, including the confiscation of some church property, and over the Patriarch's attempt to subordinate civil power to the church. Isaac demanded that Cerularius resign, and when the Patriarch refused, the Emperor had him arrested and exiled (1058). Cerularius was charged with treason and heresy but died before his trial could take place.

In the spring of 1059 Isaac led a military expedition against the Hungarians, and in the summer of that year he fought against the Pechenegs, who were ravaging the northern frontiers. In November 1059 he became ill. Believing his illness to be mortal, he abdicated (Dec. 25, 1059) and appointed as his successor Constantine X Ducas. Although he recovered, Isaac did not resume his throne, but retired to a monastery, where he spent the remaining two years of his life as a monk, alternating menial offices with literary studies.

Isaac II ANGELUS (b. *c.* 1135—d. February 1204), Byzantine emperor who, although incapable of stemming administrative abuses, partly succeeded, by his defeat of the Serbians in 1190, in retrieving imperial fortunes in the Balkans.

In September 1185 Isaac was unexpectedly proclaimed emperor by the Constantinople mob that murdered his cousin, the emperor Andronicus I Comnenus. His reign was inaugurated by the decisive victory of his general Alexius Branas over the Normans, who, after invading the empire and sacking Thessalonica (1185), were then driven off Greek soil, except for the islands of Cephalonia and Zacynthus (modern Zante). Isaac was unsuccessful, however, in recovering Cyprus from the rebel Isaac Comnenus, who set himself up as an independent ruler of that island in 1185. Isaac II failed to crush the revolt of the Bulgarians and Walachians that broke out toward the end of that year, even though he led expeditions against them in 1186–87. In 1187 he



Isaac II, coin, 12th century; in the British Museum
Peter Clayton

was forced to recognize the second Bulgarian empire.

In 1189 the Byzantine ruler was confronted with the Third Crusade, which, led by German emperor Frederick I Barbarossa, was passing through Byzantine territory. Isaac tried to protect himself by concluding a treaty with Saladin, the sultan of Egypt, but he was soon forced to assist Frederick; he concluded the Treaty of Adrianople with him in February 1190, and in the following month Frederick's forces were transported across the Hellespont to Asia Minor.

Free to turn his attention to the Balkans, Isaac restored Byzantine prestige by defeating Stephen Nemanja of Serbia (1190). With Hungarian help he planned an expedition against the Bulgarians, assembling a Byzantine army for this purpose near the city of Cypsela in the spring of 1195. On April 8, however, he was suddenly overthrown by his brother, who imprisoned and blinded him and assumed the throne as Emperor Alexius III.

In 1201 Isaac's son Alexius made his way to Germany, where he succeeded in bringing about the diversion of the Fourth Crusade to Constantinople in order to restore his father to power. In July 1203 the crusaders captured the city, and on August 1, Isaac, after eight years' imprisonment, was crowned co-emperor with Alexius, who assumed the title Alexius IV. Friction between the crusaders and the townspeople of Constantinople, however, led to a revolution in January 1204; the co-emperors were dethroned, Alexius IV was assassinated on Feb. 8, 1204, and Isaac died several days later.

Consult the INDEX *first*

Isaac OF ANTIOCH, also called ISAAC THE GREAT (d. *c.* 460), Syrian writer, probably a priest of an independent Syrian Christian church and author of a wealth of theological literature and historical verse describing events in Rome and Asia Minor.

According to 5th-century Byzantine chroniclers, Isaac was a native of Amida, near modern Erzurum, Tur. At Rome he composed verse on the civic festivals of 404 and the capture of Rome by the Visigoths under Alaric in 410. During later travels, he was imprisoned briefly by the Byzantines in Constantinople for unknown reasons.

Isaac then settled with the Christian community at Antioch, modern Antakya, Tur., and probably received holy orders from a Jacobite bishop, the head of the Monophysite Christians, a Syrian church that emphasized the divinity in Christ to the diminution of his humanity.

Isaac is credited with a lengthy poetic account of Antioch's destruction by earthquake in 459. He is also the reputed author of two collections of works containing, respectively, 60 and 40 *mēmrē*, or poetic discourses. These writings and a series of commentaries on theological and ascetical subjects are now generally held by contemporary scholars to be the work of perhaps three writers with the same name residing in or about Antioch but of differing theological views. The works have been edited by G. Bickell, *Sancti Isaaci Antiocheni, doctoris Syrorum, opera omnia*, 2 vol. (1873–77; "Complete Works of Holy Isaac of Antioch, Doctor of the Syrians"), and, by P. Bedjan, *Sancti Isaaci Syri Antiocheni homiliae syriacae* (1903; "Syriac Homilies of the Holy Syrian Isaac of Antioch").

Isaac OF NINEVEH, also called ISAAC THE SYRIAN, or ISAAC SYRUS (d. *c.* 700, near Susa in Umayyad Iran), Syrian bishop, theologian, and monk whose writings on mysticism became a fundamental source for both Eastern and Western Christians.

Originally a monk of Bet-Qatraje in Kurdistan, northern Iraq, Isaac was consecrated bishop of Nineveh, near modern Mosul, Iraq, *c.* 670, by the head of the East Syrian Nestorian Church, an independent Christian body that adhered to a doctrine accentuating Christ's human personhood while minimizing his divinity. After five months he resigned his office, possibly because of doctrinal differences with the Nestorians and a closer approximation to the Christology of Greek Orthodoxy (belief affirming in Christ human and divine natures in a single personhood).

Retiring to a solitary monastic life in the desert of Rabban Shapur, Isaac devoted himself to writing on mystical themes. He is reputed to have lost his sight because of assiduous reading. The celebrated 14th-century Syrian theologian Abhdisho bar Berikha records that Isaac wrote seven volumes of ascetical treatises, verse, dialogues, and other writings, of which only 82 chapters on Christian mysticism survive.

Translated at an early date into Arabic, Ethiopic, and Greek, Isaac's extensive writings affected Byzantine and Russian theologians and philosophers from the 10th to the 19th centuries. Latin and, later, Italian and Spanish versions influenced Christian mysticism in the West. The Greek and Latin texts of Isaac's extant works are contained in the series *Patrologia Graeca,* J.-P. Migne (ed.), vol. 86 (1866). An English version, *Mystic Treatises of Isaac of Nineveh,* by A.J. Wensinck, appeared in 1923.

Isaac OF STELLA, French ISAAC D'ÉTOILE (b. *c.* 1100, England—d. *c.* 1169, Étoile, near Poitiers, Aquitaine), monk, philosopher, and theologian, a leading thinker in 12th-century Christian humanism and proponent of a synthesis of Neoplatonic and Aristotelian philosophies.

After studies in England and Paris, Isaac entered the abbey of Cîteaux, near Dijon, in the midst of the Cistercian monastic reform carried out by Bernard of Clairvaux. In 1147 Isaac was elected abbot of Étoile, a Cistercian community. Several years later, he attempted to found a monastery on l'Île (island) de Ré, near the French port of La Rochelle. There he composed a series of Lenten conferences that proposed a proof for God's existence by arguing from the insufficiency of created things and also submitted a theory of atonement. The addresses reflected not only the logical method of the leading 11th-century philosopher Anselm of Canterbury but also adopted notions from the 5th-century Latin and Greek Neoplatonism of Augustine of Hippo and Pseudo-Dionysius the Areopagite.

Returning to Étoile, Isaac later composed his principal work, the *Epistola de anima ad Alcherum* ("Letter to Alcher on the Soul"), a compendium of psychology in the Cistercian tradition of providing a logical basis for theo-

ries of mysticism, done in 1162 at the request of the monk-philosopher Alcher of Clairvaux. This treatise served as the basis for the celebrated medieval tract *De spiritu et anima* ("On the Spirit and the Soul"), long believed to have been Augustine's but now attributed by some scholars to Alcher.

The *Epistola de anima* integrates Aristotelian and Neoplatonic psychological theories with Christian mysticism. In the Platonic tradition, Isaac considers the hierarchical order of reality—body, soul, God—in ascending order of knowability and advances the tripartite division of the soul, viz., rational, appetitive, and emotional functions. His theory of knowledge, however, includes the Aristotelian view of five forms of sense perception, of memory and imagination, and of a reasoning power that abstracts universal concepts from the images of individual objects. The intellect, or the capacity to grasp eternal ideas in time, and the intelligence that enables man to intuit the reality of God exhibit further Neoplatonic orientation. The influence of mysticism appears in his suggestion that the highest level of knowledge depends on the intervention of divine illumination and in his *via negativa* ("way of negation") for knowing God, viz., the reality of God is the negation of every material and human quality. Unexcelled in his grasp of Neoplatonism, Isaac interpreted biblical texts in a philosophical perspective.

An English translation, *Sermons on the Liturgical Year*, Vol. 1, was published in 1979.

Isaac THE ELDER: *see* Israeli, Isaac ben Solomon.

Isaac THE GREAT, SAINT, Armenian SAHAK (b. *c.* 345—d. probably Sept. 7, 439, Ashtishat, Armenia; feast days two weeks before Lent and early in July), celebrated catholicos, or spiritual head, of the Armenian Apostolic (Orthodox) Church, principal advocate of Armenian cultural and ecclesiastical independence and collaborator in the first translation of the Bible and varied Christian literature into Armenian.

Descended from a family of Armenian patriarchs, Isaac was educated in the Hellenistic culture of Asia Minor and at Constantinople. After the death of his wife, he became a monk and *c.* 388, with royal support, was named catholicos of Armenia. He furthered Armenian monasticism and converted his residence into a monastery, integrating his patriarchal administration with the ascetical life of the monks. A reformer, Isaac tightened clerical discipline and enforced celibacy on Armenian bishops. He also established schools and churches and gained Constantinople's recognition of Armenian patriarchal rights, thus creating a distinctive and autonomous Armenian form of Christianity free from direct Greek Orthodox control. With the help of his auxiliary bishop, the monk Mesrob (Mashtots), later a saint, Isaac began *c.* 391 the development of a Greek-inspired Armenian alphabet and literature. The two then directed a group of scholars in translating the Greek and Syriac versions of the Bible into Armenian, completing it *c.* 435. This linguistic achievement and the formation of an Armenian liturgy and ritual preserved Armenian unity during its partition under Greek and Persian rule.

Although he won toleration for the Armenian Church by the Persian overlords, Isaac was forced to resign his office *c.* 428 because of intrigues among the Armenian princes. He resumed the church leadership in 432 in response to popular clamour. A semi-legendary 8th-century history of Armenia Major credits Isaac with writing liturgical texts and music, biblical commentaries on the Old Testament, and a series of letters to the Byzantine emperor, to Proclus, patriarch of Constantinople, and to other Eastern prelates on the Christological controversy. At the national Armenian synod of Ashtishat (435), Isaac promoted the Orthodox doctrine of Christ's personal divinity and denounced the emphasis on his humanity as expressed by Theodore of Mopsuestia. Isaac's letters have been published in the French translation (1841) of the 8th-century history of Armenia Major. Frederick C. Conybeare produced an English version (1898) of partially authentic church legislation attributed to Isaac.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Isaac, Heinrich, Isaac also spelled ISAAK (b. *c.* 1450, Brabant—d. 1517, Florence), one of the three leading composers (with Jakob Obrecht and Josquin des Prez) of the Flemish school in the late 15th century.

A pupil of Florentine organist Antonio Squarcialupi, he taught in the household of Lorenzo de' Medici in Florence (*c.* 1484–92) and set to music some of Lorenzo's own carnival songs. He apparently left Florence during the Medicean exile, entering the service of the emperor Maximilian I about 1494; in 1497 he was appointed court composer. Between 1497 and 1514 he travelled extensively, finally settling in Florence.

Isaac's main publications were a collection of masses (1506) and the posthumous *Choralis Constantinus* (1550–55), one of the few complete polyphonic settings of the Proper of the Mass for all Sundays (and certain other feasts); it also contains five settings of the Ordinary. At least in part the work was commissioned for the diocese of Constance in 1508 and employs plainsongs unique to the Constance liturgy. Isaac left his great monument unfinished; it was completed by his pupil Ludwig Senfl.

In his sacred music Isaac treats the cantus firmus (fixed melody) resourcefully, placing the chant in any voice or sharing it between two parts, either in long notes or embroidered with shorter notes. He also uses it as a thematic basis for composing contrapuntal imitations, a technique that came to dominate 16th-century music.

He wrote about 40 secular songs. His Italian frottole (simply accompanied songs) have charming treble melodies. His polyphonic German lieder normally present the tune in the tenor but, unlike many contemporary lieder, do not cadence into several sections. His famous "Innsbruck, ich muss dich lassen" ("Innsbruck, I must leave you") recalls the style of the simpler frottola. This song was later reworked as a chorale, "O Welt ["World"], ich muss dich lassen," familiar through arrangements by J.S. Bach and by Brahms.

His *Missa carminum*, motets from *Choralis Constantinus*, music for the court of Lorenzo de' Medici, and secular works *Virgo prudentissima* have been recorded.

Isaac ben Moses OF VIENNA, byname ISAAC OR ZARU'A (b. *c.* 1180—d. *c.* 1250, Vienna), medieval codifier of Jewish law (Halakha) whose vast compilation, *Or Zaru'a* ("Light Is Sown"), was widely quoted in later Halakhic works. *Or Zaru'a* is also valued by historians for its descriptions of Jewish life in medieval France, Germany, and Italy.

By his own testimony, Isaac was born in Bohemia. Although poor he was determined to become an educated man and embarked upon a nomadic life that brought him into contact with the most respected Jewish scholars of Bohemia, France, and Germany. The *Or Zaru'a* is a compendium of the knowledge he gathered from eminent rabbis—some in the form of correspondence—and his own commentaries and responsa (answers to specific questions) on matters of law. The original manuscript, so vast that it presented a problem for copyists, was copied in sections, over a long period of time, and was widely disseminated only by means of quotations in the works of other Halakhists. Of the surviving manuscripts no two are alike in sequence, thus obscuring any order intended by the author. The first two parts did not appear in published form until 1862. Several abridged versions were produced, including one by Isaac's son Ḥayyim.

Isaac Israeli: *see* Israeli, Isaac ben Solomon.

Isaacs, Barnett: *see* Barnato, Barney.

Isaacs, Jorge (b. April 1, 1837, Cali, Cauca, Colom.—d. April 17, 1895, Ibagué), Colombian poet and novelist whose best work, *María* (1867; *Maria: A South American Romance,* 1977), was one of the most famous Latin-American novels of the 19th century.

The son of a prosperous English Jew, Isaacs received an excellent education. During the War of the Cauca (1860–63) he was reduced to poverty by the destruction of his estates. Settling in Bogotá in 1864, he published a slight volume of *Poesías,* which attracted considerable attention and, in 1867, the romantic novel *María,* which won immediate recognition and remains his best known work. An idyllic picture, very likely autobiographical, of life in his native Cauca Valley, *María* was translated into several languages. Thereafter, he combined a career in public life with his career in literature.

Although Isaacs continued to write until his death, none of his later efforts fulfilled the promise of his first two volumes.

Isaacs, Rufus Daniel: *see* Reading, Rufus Daniel Isaacs, 1st marquess of.

Isaak, Heinrich (Flemish composer): *see* Isaac, Heinrich.

Isabeau (French personal name): *see under* Isabella.

Isabel (Portuguese, Spanish personal name): *see under* Isabella, or Elizabeth.

Isabela, province, northeastern Luzon, Philippines. It has an area of 4,118 sq mi (10,665 sq km). Its eastern section comprises the rugged, sparsely populated Sierra Madre Mountains, which extend to the Philippine Sea. The province was created and named for Queen Isabella II of Spain in 1856. The economy depends on the agricultural production of the valley of the Cagayan River (*q.v.*). The province is one of the rice granaries of the Philippines, and it is known for the fine quality of its tobacco. The main towns include Ilagan (the provincial capital), Cabagan, Tumauini, Cauayan, and San Agustin. There is a technological institute in Cabagan and an agricultural college in Echaque. Fuyot Hot Spring National Park, a 2,024-ac (819-ha) recreational area, is in Ilagan. Most of the inhabitants are Illocanos and Ibanags. During the 1960s and 1970s Isabela became a stronghold of Filipino Communists. Pop. (1980) 870,604.

Isabela Island, largest (area 2,249 sq mi [5,825 sq km]) of the Ecuadorian Galápagos Islands, in the eastern Pacific Ocean 600 mi (965 km) west of Ecuador. Named in the 17th century for George Monck, duke of Albemarle, only its northern tip, cut by the Equator, is now known as Albemarle. Five volcanic craters reaching an altitude of 5,540 ft (1,689 m), two of which are still active, dominate the island's centre; hills covered with forests, vines, and orchids separate them from the sandy coastline. Unique to the island are flightless cormorants and penguins. There are also large numbers of land iguanas and a flamingo colony. Villamil, the main port on the southern coast, handles the island's



Giant land tortoises gathered in a rain pond in the Caldera of Alcedo on Isabela Island, Galápagos Islands
Tui De Roy Moore

products, including potatoes, cattle, wild hogs, reptile hides, and fish. Pop. (1981 est.) 616.

Isabella (personal name): *see under* Elizabeth, except as below.

Isabella, name of rulers grouped below by country and indicated by the symbol •.

Foreign-language equivalents:
French ..... Isabelle
Spanish ..... Isabel

JERUSALEM

• **Isabella I,** byname ISABELLA OF ANJOU, French ISABELLE D'ANJOU (b. 1172—d. 1205), queen of Jerusalem (1192–1205).

Daughter of Almaric I of Jerusalem and Mary Comnenus, she succeeded to the throne of Jerusalem after the death of her sister, Sibyl (Sibylle), in 1190 and the deposition of Sibyl's husband and consort in 1192.

First married to Humphrey IV, lord of Toron, she was separated from her effeminate and irresponsible husband in order to be married to Conrad of Montferrat, lord of Tyre, and, after his assassination (1192), to Henry of Troyes (d. 1197). Her fourth husband was Almaric II, king of Cyprus.

Isabella's daughter Mary (Marie) of Montferrat, succeeded her as queen and was married to John of Brienne (1210).

• **Isabella II,** original name YOLANDE DE BRIENNE (b. 1212—d. May 1, 1228, Palermo), queen of the Latin kingdom of Jerusalem (1212–28) and consort of the Holy Roman emperor Frederick II.

The daughter of John of Brienne and Mary (Marie) of Montferrat, Isabella inherited the throne on her mother's death in 1212, but her father ruled as regent and guardian and even continued to style himself as king (though he had been legally only king consort).

In 1225 Isabella married the emperor Frederick II, the Pope hoping by this bond to attach the Emperor firmly to the crusade in the Holy Land. Immediately upon his marriage, Frederick demanded all the rights of sovereignty in the kingdom of Jerusalem, which he claimed to exercise in his wife's name. His action led to difficulties with John of Brienne, who did not relish the loss of his position. When Isabella died in 1228 after the birth of a son, Conrad, her husband Frederick then continued to rule, though not without opposition.

SPAIN

• **Isabella I,** byname ISABELLA THE CATHOLIC, Spanish ISABEL LA CATÓLICA (b. April 22, 1451, Madrigal de las Altas Torres, Castile—d. Nov. 26, 1504, Medina del Campo, Spain), queen of Castile (1474–1504) and of Aragon (1479–1504), ruling the two kingdoms jointly from 1479 with her husband, Ferdinand II of Aragon (Ferdinand V of Castile). During their rule there were effected the permanent union of Spain and the beginning of an overseas empire in the New World, discovered by Christopher Columbus under Isabella's sponsorship.

Early life. Isabella was the daughter of John II of Castile and of his second wife, Isabella of Portugal. Three years after her birth her half brother became king as Henry IV. Despite the fact that she had a younger brother, Alfonso,



Isabella I, portrait by an unknown artist; in the Real Academia de la Historia, Madrid
Archivo Mas, Barcelona

and that her early years were spent quietly with her mother at Arévalo, Isabella was soon drawn into Castilian politics. She was brought to court when she was 13 in order to be under the King's eye. At first the opposition to Henry IV gathered round Alfonso, but when the latter died in July 1468, the rebellious magnates naturally turned to Isabella. She did not, however, play the role thus designed for her, and the fruit of her wisdom was recognition as his heiress by Henry IV at the agreement known as the Accord of Toros de Guisando (Sept. 19, 1468).

As heiress of Castile, the question of Isabella's future marriage became a matter of increasing diplomatic activity at home and abroad. Portugal, Aragon, and France each put forward a marriage candidate. Henry seems to have wanted his half sister to marry Afonso V, king of Portugal. As between the Portuguese and Aragonese candidates, she herself, no doubt assisted in her decision by her small group of councillors, came down in favour of Ferdinand of Aragon. A third suitor, the French duc de Guiènne, was sidestepped, and without Henry's approval she married Ferdinand in October 1469 in the palace of Juan de Vivero, at Valladolid. The prospect of an Aragonese consort led to the development of an anti-Aragonese party that put forward the claims of a rival heiress, Henry's daughter Joan, known as la Beltraneja by those who believed that her true father was Beltrán de la Cueva, duque de Albuquerque. The King encouraged this group by going back on the accord of 1468 on the grounds that Isabella had shown disobedience to the crown in marrying Ferdinand without the royal consent. He now rejected Isabella's claim to the throne and preferred that of Joan, for whom he sought the hand of the Duc de Guiènne. Though Isabella and Henry were to some extent reconciled, the long-threatened war of succession at once broke out when the King died in 1474.

Reign. Isabella was at the time in Segovia, which was secured for her claim. She was supported by an important group of Castilian nobles, including Cardinal Mendoza, the constable of Castile (a Velasco), and the Admiral (an Enríquez), who was related to Ferdinand's mother. The opposing faction, which put forward the counterclaims of Joan, included the Archbishop of Toledo; a former supporter, the master of Calatrava (an influential military order); and the powerful young marqués de Villena. They were supported by Afonso V of Portugal, who hastened to invade Castile and there betrothed himself to Joan. The first four years of Isabella's reign were thus occupied by a civil war, which ended in defeat for her Castilian opponents and for the Portuguese king (Feb. 24, 1479). Upon the death of John II of Aragon in the same year, the kingdoms of Castile and Aragon came together in the persons of their rulers.

Spain had emerged as a country. But it was to be long before this personal union would lead to effective political unification. Ferdinand, indeed, in his first will (1475) made Isabella his heir in Aragon and openly declared the advantages his subjects would derive from the union with Castile. But each kingdom continued to be governed according to its own institutions. The two sovereigns were certainly united in aiming to end the long process of *Reconquista* by taking over the last Muslim stronghold in Spain—the Kingdom of Granada. In the event, however, the conquest (which began in 1482) proved difficult and drawn out, and it strained the finances of Castile to the utmost. Although some of the features of the campaign were medieval (like the order of battle), others were novel. Isabella took a close interest in the conduct of the war and seems to have been responsible for improved methods of supply and for the establishment of a military hospital. In 1491 she and Ferdinand set up a forward headquarters at Santa Fe, close to their ultimate objective, and there they stayed until Granada fell (Jan. 2, 1492).

While she was at Santa Fe another event with which the Queen was to become personally associated was in the making, for Columbus visited her there to enlist support for the voyage that was to result in the European settlement of America. Although the story of her offering to pledge her jewels in order to help finance the expedition cannot be accepted, and Columbus secured only limited financial support from her, Isabella and her councillors must receive credit for making the decision to approve the momentous voyage. The terms on which the expedition was to set out to discover a new route to the Indies were drawn up on April 17, 1492. The New World that was discovered as a result of that decision was, with papal confirmation, annexed to the crown of Castile, in accordance with existing practice in regard to such previous Atlantic discoveries as the Canary Islands.

The Queen and her advisers hardly needed Columbus to remind them of the opportunity now offered for the spreading of Christianity. Yet, the unexpected discoveries quickly brought fresh problems to Isabella, not the least of which was the relationship between the newly discovered "Indians" and the crown of Castile. The Queen and her councillors were more ready to recognize the rights of the Indians than was Columbus; she ordered some of those he had brought back as slaves to be released. The Queen was still concerned with these problems when she died in 1504.

Meanwhile, in 1480 the Inquisition had been set up in Andalusia. There is little doubt that this represented the culmination of a long and popular movement against non-Christians and doubtful converts, which had manifested itself frequently in the late Middle Ages in Castile. The expulsion of those Jews who refused conversion was the logical result of the establishment of the Inquisition. Yet, however meritorious the expulsion may have seemed at the time in order to achieve greater religious and political unity, judged by its economic consequences alone, the loss of this valuable element in Spanish society must have been a serious mistake.

It is difficult to disentangle Isabella's personal responsibility for the achievements of her reign from those of Ferdinand. But, undoubtedly, she played a large part in setting up the court as a centre of influence. With her blue eyes, her fair or chestnut hair, and wearing jewels and magnificent dresses, she must have made a striking figure. At the same time display was matched with religious feeling. Her choice of spiritual advisers brought to the fore such different and remarkable men as Hernando de Talavera and Cardinal Cisneros. A policy of reforming the Spanish churches had begun early in the 15th century. But the movement gathered momentum only under Isabella and Talavera. When in 1492 Talavera became archbishop of Granada, his place at the Queen's side was taken by Cisneros, for whom the monarchs secured the crucial position of archbishop of Toledo in 1495. The monarchs were interested in the reform of the secular clergy and still more in that of the orders of monks, friars, and nuns; Isabella took a particular interest in the reform of the Poor Clares. Although when she died there was still much to be done, the rulers and Cisneros together had gone far toward achieving their goals.

Though intensely pious and orthodox in her beliefs and though granted with Ferdinand the title of the "Catholic Kings" by Pope Alexander VI, Isabella could be both imperious and pertinacious in her dealings with the papacy. This was particularly true when she thought the Pope was making bad appointments to Spanish benefices or in any way encroaching on the customary rights of the crown over the Spanish churches. For the vacant see of Cuenca in 1478, for instance, she rejected the Italian cardinal appointed by the Pope, who four years later accepted her alternative Spanish candidate. Subsequently, she successfully rejected the suggestion that the Pope's nephew should become archbishop of Seville. In seeking to control appointments to Castilian sees, the Queen was not simply inspired by national sentiments. She also sought candidates of high standards; judged by her choices of men such as Talavera and Cisneros, Isabella was, indeed, remarkably effective in achieving her objective.

Isabella was almost as interested in education as she was in religion. After she reached the age of 30, she set herself the task of acquiring proficiency in Latin and succeeded in her aim. At court she encouraged such notable scholars as Pietro Martire d'Anghiera, whom she set up as the head of a new palace school for the sons of the nobility. Naturally, many of the outstanding literary works of her reign, such as Antonio de Nebrija's *Gramática Castellana* (1492; "Castilian Grammar"), were dedicated to her. She was also the patron of Spanish and Flemish artists; part of her extensive collection of pictures survives.

The last decade of her reign took place against a background of family sorrows brought about by the deaths of her only son and heir, Juan (1497), of her daughter Isabella, queen of Portugal, in childbirth (1498), and of her grandchild Miguel (1500), who might have brought about a personal union between Spain and Portugal. Instead, her daughter Joan, wife of Philip I and mother of the Holy Roman emperor Charles V, became the heiress of Castile; but this offered little comfort to the Queen because Joan had already, by 1501, shown signs of the mental imbalance that would later earn her the title of "the Mad."

One of the achievements of Isabella's last decade was undoubtedly the success with which the Catholic Kings, acting on her initiative, extended their authority over the military orders of Alcántara, Calatrava, and Santiago, thus giving the crown control over their vast property and patronage. These orders had been for too long exploited by the nobility and were the subject of intense rivalry among those who sought to be elected master of one or other of them. In 1487 Ferdinand became grand master of Calatrava, and by 1499 he had acquired the grand masterships of Alcántara and Santiago. With the capture of Granada, the main work of the orders had been done, and a process that envisaged their ultimate absorption into the lands of the crown was logical and sensible.

Assessment. Good sense and statesmanship were equally reflected in Isabella's will and codicil. Because she left no memoirs, her will is in many ways the most reliable picture of her. In it she sums up her aspirations and her awareness of how much she and Ferdinand had been unable to do. With prudence she comments on the basis of her political program—the unity of the states of the Iberian Peninsula, the maintenance of control over the Strait of Gibraltar, a policy of expansion into Muslim North Africa, of just rule for the Indians of the New World, and of reform in the church at home. If the overall impression is inevitably piecemeal, it is also clear that she gave to her successors an exceptional document. It assures scholars that, in allotting to Isabella the foremost place among their rulers, Spaniards do not misjudge this remarkable woman. (J.R.L.H.)

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• **Isabella II** (b. Oct. 10, 1830, Madrid—d. April 9, 1904, Paris), queen of Spain (1833–68) whose troubled reign was marked by political instability and the rule of military politicians. Isabella's failure to respond to growing demands for a more progressive regime, her questionable private life, and her political irresponsibility contributed to the decline in monarchical strength and prestige that led to her deposition in the Revolution of 1868.

The elder daughter of Ferdinand VII by his fourth wife, María Cristina, Isabella was proclaimed queen on her father's death in 1833. Her right to succeed to the throne was disputed by supporters of her uncle, Don Carlos, and her accession precipitated civil war (First Carlist War, 1833–39). During Isabella's minority (1833–43), her mother and Gen. Baldomero Espartero, a hero of the civil war, acted successively as regents. In 1843 Espartero was desposed by military officers and Isabella was declared of age.

The period of Isabella's personal rule (1843–68) was characterized by political unrest and a series of uprisings. Her government was dominated by military politicians, most notably Gen. Ramón María Narváez and the somewhat more liberal Gen. Leopoldo O'Donnell. Liberal opposition to the regime's authoritarianism became increasingly directed at the Queen. Scandalous reports on the private conduct of Isabella, who lived apart from her husband, Francisco de Asís de Borbón, as well as her arbitrary political interference, further damaged the monarchical cause. The abortive uprising of 1866, and the deaths of O'Donnell (1867) and Narváez (1868), weakened her position further. In the autumn of 1868 a successful revolution drove her into exile.

Isabella settled in Paris, where in 1870 she abdicated in favour of her eldest surviving son, the future Alfonso XII (1874–85). She returned to Spain for a time after Alfonso's accession but was unsuccessful in influencing political affairs.

Isabella FARNESE, Spanish ISABEL DE FARNESIO, original Italian ELISABETTA FARNESE (b. Oct. 25, 1692, Parma, Duchy of Parma—d. July 11, 1766, Aranjuez, Spain), queen consort of Philip V of Spain (reigned 1700–46), whose ambitions to secure Italian possessions for her children embroiled Spain in wars and intrigues for three decades. Her capability in choosing able and devoted ministers, however, brought about beneficial internal reforms and succeeded in improving Spain's economy.

Isabella was the daughter of Odoardo Farnese (d. 1693), the eldest son of Ranuccio II of Parma and Piacenza. She was chosen as the second wife of Philip and arrived in Spain in December 1714, whereupon she dismissed the resident royal favourite and quickly established over her weak husband an ascendancy that she continued to exercise until his death in 1746.

Since Philip's two sons by his first wife were in line to succeed him, the ambitious Isabella sought to secure lands in Italy for the children (four sons and three daughters) she bore the sovereign. This quest dominated her reign, and in the end Spanish imperialism in Italy achieved marked success. Isabella's eldest son, Charles (afterward Charles III of Spain), and his brother Philip both gained titles to Italian domains.

Isabella favoured ministers who could acquire the resources needed to advance her schemes, and the men she chose not only carried out her foreign policy but also undertook useful economic, administrative, and military improvements.

After Philip's death and the accession of her stepson Ferdinand VI (reigned 1746–59), Isabella ceased to exert any real influence and spent many of her later years away from court.

Isabella OF ANJOU: *see* Isabella I *under* Isabella (Jerusalem).

Isabella OF BAVARIA, Isabella also rendered ELIZABETH, French ISABEAU, or ÈLISABETH, DE BAVIÈRE (b. 1371—d. September 1435, Paris), queen consort of Charles VI of France, who frequently was regent because of her husband's periodic insanity. Her gravest political act was the signing of the Treaty of Troyes (May 21, 1420), which recognized King Henry V of England as heir to the French crown in place of her son Charles (afterward Charles VII), who was to be exiled from France.

The daughter of Stephen III, duke of Bavaria-Ingolstadt, she was married to Charles VI on July 17, 1385. Her husband's first severe attack of insanity (Aug. 5, 1392) caused her great distress; for years she sought remedies, both medical and supernatural. She bore

the King six children between 1393 and 1403, but, as his illness grew worse, his rebuffs (he occasionally did not recognize her) drove her into flagrant sexual misconduct. Her brother-in-law, Louis, duc d'Orléans, became her constant companion, though it has not been proved that he was her lover. After the murder of Orléans (1407) she relied on John the Fearless, duke of Burgundy, who rescued her from imprisonment by her son, the dauphin Charles (1417), and with her set up governments, at Chartres and then at Troyes, that rivalled the administration at Paris.

Capricious and politically unskilled, Isabella saw John the Fearless desert her with the intention of joining the dauphin Charles against the English, who were preparing to attack Paris. She died despised by both the French and the English.

Isabella OF FRANCE (b. 1292—d. Aug. 23, 1358), queen consort of Edward II of England, who played a principal part in the deposition of the King in 1327.

The daughter of Philip IV the Fair of France, Isabella was married to Edward on Jan. 25, 1308, at Boulogne. Isabella's first interventions in politics were conciliatory. During the height of the influence of the King's favourite Piers Gaveston and after Gaveston's murder in 1312, she attempted to promote peace between Edward and the barons. In the 1320s, however, Edward's new favourites, the Despensers, aroused her antagonism. Isabella sailed for France in 1325 to settle a long-standing dispute over Gascony. Joined there by her son, the future Edward III, she announced her refusal to return to England until the Despensers were removed from court. She became the mistress of Roger Mortimer of Wigmore and with Mortimer and other baronial exiles crossed to Essex in 1326 and routed the forces of Edward and the Despensers.

After the accession of Edward III (1327) Isabella and Mortimer enjoyed a brief period of influence until 1330 when the young king asserted his independence by the arrest and execution of Mortimer. Isabella was sent into retirement. In her old age she joined an order of nuns, the Poor Clares.

Isabella Clara Eugenia, ARCHDUCHESS OF AUSTRIA, German ERZHERZOGIN VON ÖSTERREICH (b. Aug. 12, 1566, Segovia, Spain—d. Dec. 1, 1633, Brussels), infanta of Spain who became the instrument of her father's claims to the thrones of England and France; as archduchess of Austria, she ruled the Spanish Netherlands with her husband, Archduke Albert, from 1598 to 1621.

The daughter of King Philip II of Spain and his third wife, Elizabeth of Valois, Isabella was unsuccessfully proposed by her father as the Catholic heir to the throne of England after the execution (1587) of Mary, Queen of Scots, and as a claimant through her mother to the throne of France after the murder of her uncle, the French king Henry III (1589). On her betrothal to Albert, archduke of Austria, she received as dowry joint sovereignty with Albert of the Low Countries, with the stipulation that, if they had no children, the throne would revert to the Spanish crown.

Because the seven northern provinces (the United Provinces) of the Low Countries were effectively independent, Isabella and Albert, on their marriage (April 1599), had control over only the 10 southern provinces of the Netherlands.

Their attempts, both diplomatic and military, to reunite the 17 provinces met with failure. After Albert's death (1621), sovereignty of the Spanish Netherlands reverted to Spain, and Isabella ruled as governor of the country for her nephew, King Philip IV of Spain, until her death.

Isabelle (French personal name): *see under* Isabella.

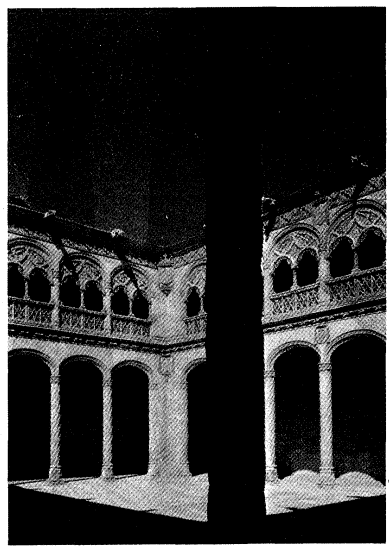
Isabelline, vigorous, inventive, and cosmopolitan architectural style created during the joint reign of Ferdinand of Aragon and Isabella of Castile, which in turn formed the basis for the Plateresque style. The Isabelline style is not a pure style in that but few of the buildings created during the decades that it encompasses (*c.* 1480–1510) represent a true architectural synthesis. Many of the characteristics of later Spanish (and Spanish colonial) architecture in the period of Spain's preeminence, following its successful explorations in the New World, can be traced to the innovations first seen in Isabelline buildings. One of the outstanding architects of the period, Juan Guas (died *c.* 1496), a Frenchman trained in Flanders, can be credited with introducing two of the most popular features of Spanish ecclesiastical architectural decoration: the interior facade-tribune that spans the nave at the entrance, often functioning as a choir loft, and the elaborately carved high retablo, or altarpiece.



"Congress of Vienna," drawing by Jean-Baptiste Isabey, 1815; in the Louvre, Paris

By courtesy of the Musee du Louvre; photograph, Archives Photographiques

It is a younger contemporary, Lorenzo Vázquez, born in Segovia but probably (on the basis of his style) trained in Bologna, who



Isabelline cloister of San Gregorio in Valladolid, Spain, attributed to Juan Guas, 1488

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is credited with having introduced many of the Italian Renaissance ideas and ornamental motifs into Spanish architecture of the time. Major monuments in the Isabelline style include San Juan de los Reyes, in Toledo; Infantado Palace, in Guadalajara; San Gregorio, in Valladolid; Parral monastery and Santa Cruz, in Segovia; Medinaceli Palace, in Cogolludo; Calahorra Castle, in Granada; and Santa Engracia, in Zaragoza.

Isabey, Jean-Baptiste (b. April 11, 1767, Nancy, Fr.—d. April 18, 1855, Paris), gifted French painter of miniatures who enjoyed official favour from the time of Louis XVI until his death. His portrait "Napoleon at Malmaison" (Musée National de Versailles et des Trianons) is considered one of the best likenesses of the Emperor.

Isabey studied under, among others, the celebrated French Neoclassical painter Jacques-Louis David and received one of his first commissions from Marie-Antoinette, Louis XVI's consort. Patronized by Napoleon and Joséphine, he arranged the ceremonies of their coronation and prepared 32 drawings (Louvre, Paris), intended as an official commemoration of the event. He had an immense success at the Salon of 1820 with "Isabey's Boat," a drawing of himself and his family. During the reign of King Louis-Philippe (1830–48) he directed the artists' studio at the Sèvres porcelain factory. Less known than the portraits are Isabey's caricatures of many famous European politicians of the first half of the 19th century. Though most of these remained unpublished, they were known to many artists of the time. The genre painter Eugène Isabey (1804–86) was his son and student.

Isaeus (b. *c.* 420 BC—d. *c.* 350 BC), professional speech writer at Athens specializing in testamentary law, whose lucidity and logical method were a landmark in the development of forensic oratory.

Accounts of his life are scanty and contradictory. According to one ancient source Isaeus was a Chalcidian, according to another an Athenian. At any rate, he spent his professional life in Athens, where he appears to have taken no part in public life.

His profession was to write speeches for clients. He appears to have confined himself entirely to forensic speeches and almost entirely to those concerned with private suits. He had a minute knowledge of the laws of inheritance and expert skill in exploiting this knowledge to win a case. Every one of his 11 extant speeches deals, directly or indirectly, with a will.

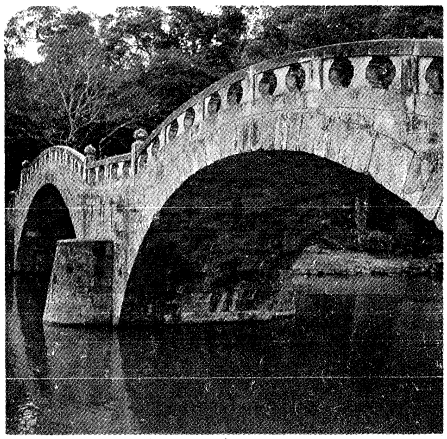
Perhaps Isaeus' most significant contribution to forensic oratory lay in his method of argument; he appears to have been the first orator to build up his case point by point with logic and reason.

In the arrangement of his matter he showed himself remarkably independent of the rules for subdivision prescribed by rhetoricians. He

followed no single plan but varied the structure according to the needs of each particular speech. He showed particular skill in interweaving narrative and proof, thereby avoiding a long, unbroken relation of facts, which in testamentary cases might be complicated and difficult to follow. In general, Isaeus' style is lucid and businesslike, and the fact that it lacked literary charm probably added to its effectiveness.

Ísafjördhur, town, northwestern Iceland, on Vestfjarda Peninsula, overlooking Ísa Fjord (Ísafjördhur). It is a regional market centre and is the principal fishing port of northwestern Iceland. In addition to fishing and fish-processing industries, Ísafjördhur has a plant that manufactures windows. Boatbuilding and net making are also important industries. The town has a commercial airport. Pop. (1988 est.) 3,448.

Isahaya, city, Nagasaki *ken* (prefecture), Kyushu, Japan, at the neck of the three peninsulas of Shimabara, Nagasaki, and Nishisonoki. The city has been an important commercial centre for the surrounding agricultural area since the 13th century. It



Megane Bridge, Isahaya, Japan
World Photo—Shostal/EB Inc.

became a castle town of the Isahaya family in the Tokugawa era (1603–1867). Since the late 19th century, coastal reclamation has increased the area used for the cultivation of high-quality rice. Isahaya is now a local administrative and cultural centre. Its economy is based on the food-processing industry and tourism to Unzen-Amakusa National Park and Tara-dake Prefectural Park. Pop. (1985) 88,376.

Isai (biblical figure): *see* Jesse.

Isaiah, Hebrew YESHAʿYAHU ("God Is Salvation") (fl. 8th century BC, Jerusalem), prophet after whom the biblical Book of Isaiah is named (only some of the first 39 chapters are attributed to him), a significant contributor to Jewish and Christian traditions. His call to prophecy in about 742 BC coincided with the beginnings of the westward expansion of the Assyrian empire, which threatened Israel and which Isaiah proclaimed to be a warning from God to a godless people.

Isaiah's vision. The earliest recorded event in his life is his call to prophecy as now found in the sixth chapter of the Book of Isaiah; this occurred about 742 BC. The vision (probably in the Jerusalem Temple) that made him a prophet is described in a first-person narrative. According to this account he "saw" God and was overwhelmed by his contact with the divine glory and holiness. He became agonizingly aware of God's need for a messenger to the people of Israel, and, despite his own sense of inadequacy, he offered himself for God's service: "Here am I! Send me." He was thus commissioned to give voice to the divine word. It was no light undertaking; he was to condemn his own people and watch the nation crumble and perish. As he tells it, he was only too aware that, coming with such a message, he would experience bitter opposition, willful disbelief, and ridicule, to withstand which he would have to be inwardly fortified. All this came to him in the form of a vision and ended as a sudden, firm, and lifelong resolve.

Personal history. Presumably, Isaiah was already prepared to find meaning in the vision before the arrival of that decisive moment. Information about that period of his life is inconclusive, however, and consists mainly of inferences drawn from the biblical text.

At times the prophet's private life shows through the record as an aspect of his public message. Once when he went to confront a king, he took with him, to reenforce his prophetic word, a son with the symbolic name Shear-yashuv ("A Remnant Shall Return"). Again, to memorialize a message, he sired a son on the "prophetess" (his wife) and saddled the child with his message as a name: Maher-shalal-hash-baz ("Speed-spoil-hasten-plunder"), referring to the imminent spoliations by the Assyrians. If the sons had not been wanted as walking witnesses to the prophet's forebodings, posterity would not know of this wife or these sons.

Of Isaiah's parental home it is known only that his father's name was Amoz. Since he often spoke with kings, it is sometimes suggested that Isaiah was an aristocrat, possibly even of royal stock. The same reasoning, however, might apply to any number of prophets; from Nathan in David's time onward, prophets had dealings with kings and were, like Isaiah, well informed about public affairs. Moreover, Isaiah's sympathies were emphatically with the victimized poor, not with the courtiers and well-to-do. Also, it is sometimes argued that he was of a priestly family, but his knowledge of cultic matters and the fact that his commissioning seemingly occurred in the Temple in Jerusalem are slender evidence for his priestly descent as against his unreserved condemnation of the priests and their domain: "I am fed up with roasting rams and the grease of fattened beasts," he has God proclaim in a famous passage in the first chapter.

One could argue with equal force that Isaiah is descended from a family of prophets (though his father, the otherwise unknown Amoz, is not to be confused with the prophet Amos). He is thoroughly schooled in the traditional forms and language of prophetic speech. It is an educated speech—strong, vivid, the finest of classical Hebrew. Isaiah is particularly well acquainted with the prophetic tradition known to his slightly older contemporary, Amos. Four eminent Hebrew prophets addressed themselves to the people of Israel and Judah in the latter half of the 8th pre-Christian century: Amos, Hosea, Micah, and Isaiah. Strangely, no evidence suggests that any of these knew in person any of the others. Seemingly, they were apart and alone, yet Isaiah and Amos follow essentially the same lines of thought and differ significantly only in that Amos had addressed the northern kingdom (Israel) while Isaiah would emphatically include Judah and Jerusalem. The basic similarities in style and substance strongly suggest influence, direct or indirect, of the one on the other—and both invoke a recognizable Israelite tradition.

Isaiah's experience bridges the classes and occupations. Whatever his family circumstances, still in his youth he came to know the face of poverty—and the debauchery of the rich. He was at home with the unprotected, the widowed and orphaned; with the dispossessed, homeless, landless; and with the resourceless victims of the moneyed man's court. He was also acquainted with the rapacious authors of the prevailing misery: promulgators of discriminatory laws, venal judges, greedy land-grabbers, fancy women, thieving and carousing men of means, and irresponsible leaders, both civil and religious. In other words, he was intimately aware of the inequities and evils of human society—which may have been no worse in Israel in the 8th century before Christ than many critics believe they are almost everywhere in the 20th century after Christ.

Isaiah's theology. It is in his theology that Isaiah leans most heavily on Israelite tradition and shows an acquaintance with the thoughts of Amos. Isaiah shared with him and with the people the long-standing tradition that a special bond united Israel and its God. Since patriarchal times there had been an agreement, a solemn "Covenant" between them: Israel was to be God's people and he their God. He had chosen them and cared for them. His solicitude for their welfare had been clearly established. Such was the traditional message. Isaiah knew and honoured this ancient tradition; but, more significantly, he also shared the conviction of Amos that this arrangement was wholly conditional, contingent on the people's conduct. Behaviour such as Amos saw about him in Samaria and Isaiah saw about him in Jerusalem could cancel that Covenant—had in fact done so; that is the meaning of the vineyard parable in the fifth chapter of Isaiah. There God is compared to the careful and industrious cultivator of a vineyard—Israel—who, angry at the "wild grapes" of injustice and violence that is his crop, threatens to take away his care and protection.

As Isaiah knew him, Israel's God did not fit into the picture of utter injustice and consequent misery rampant in 8th-century Israel. To that people's God, as Isaiah knew him, persons mattered. God was, in fact, more concerned about people than about how his subjects performed for him their oft-rehearsed rituals. A literal interpretation of the 13th verse of chapter 29 and verses 10 to 15 of chapter 1 would suggest that God finds the motions of worship repugnant, and this may well have been Isaiah's meaning. He was overawed by the holiness—the otherness—of his God and must have thought that the customary gifts of meat, grain, and flattery were unseemly or, at the least, irrelevant. Although, like Amos, Isaiah appears most often to speak in absolutes, it is indeed possible to interpret these two passages less strictly (as some scholars do) and to say that he spoke in relative terms and that, in his scale of religious values, he merely ranked moral conduct above ritual conformity.

Isaiah's theology included the sometimes comforting view that God shapes history, traditionally entering the human scene to rescue his people from national peril. But, according to Isaiah's discomfiting surmise, God could intervene quite as properly to chastise his own aberrant nation, and he could employ a human agent (*e.g.,* a conquering foe) to that end.

More readily than Amos, perhaps because a decade had passed, Isaiah could identify the agent: Assyria. Isaiah's call to prophecy roughly coincides with the beginning—after a period of relative inactivity—of the westward expansion of the Assyrian empire under the victorious generalship of Tiglath-pileser III (reigned 745–727 BC). Current events did not escape the prophet's attention. Isaiah appears to have read the omens, as Amos had done; he could clearly see in Assyria the instrument of God's wrath: "Ah, Assyria, the rod of my anger, the staff of my fury! Against a godless nation I send him . . ." (10:5–6).

Prophetic mission. If, then, Isaiah was prepared by schooling in tradition and life for the vision that set him on his prophetic course, the preparation involved the mingling in his nature of such elements as those sketched above. In the year that King Uzziah died (742 BC), according to chapter 6, Isaiah was one of a crowd gathered for an occasion at the

Jerusalem Temple when of a sudden it occurred—and he became a prophet: "Go, and say to this people . . . ." The experiences that had gone into the shaping of his young life—his acquaintance with the arrogant rich and the suffering poor; his seeming knowledge of Amos and his heritage of tradition, ethnic and religious; his dismay at the threat of Assyria; above all, perhaps, a new and overwhelming sense of the majestic holiness of God—all merged, coalesced; and he knew that his God was sending him with words for his people and that, reluctant or not, he was compelled to go. From the start or retrospectively, he was aware of a frantic need—impossible to satisfy—to call his people back from the brink of peril. His vision was his moment of insight and resolve when, with complete clarity and instantaneously, he knew what he must do and say.

In its present sophisticated form the record of this experience is hardly contemporary with the event; he did not go home from the Temple and write down chapter 6. The record is the reflection not of a confident and eager youth but of a man buffeted by long experience, embittered and despairing. Three times in other chapters the prophet says of his people that they have "refused" to hear him; it was as though he, a messenger, had been ordered irrationally to "close their minds, plug their ears, veil their eyes," as he says in chapter 6 of his errand to those to whom he was sent. The message that he had to deliver was bad news—unwelcome tidings. And when he spoke of it, as repeatedly he did, he chose such unambiguous language and spoke with so much moral certainty that, as men normally do, his hearers tuned him out; he was foredoomed to speak unheard. A great deal of anguished living intervened between the vision itself and the writing of it. His words "How long, O Lord?" are an expression of utter weariness.

If chapter 6 marks the beginning of his career as prophet, the judgment oracle about the conquest of Jerusalem in chapter 22 probably brings his grim story to a close. It is at any rate the latest Isaianic product that can be dated with any degree of certainty. The last recorded words of Isaiah, in chapter 22, do nothing to relieve the sombre tone of his message, but they do shed further light on his mood and personality. After he had exclaimed in the vision in chapter 6, "How long, O Lord?" he learned to his dismay that even a last remaining 10th of the populace must in turn succumb; just so here the oracle ends with assurance of total disaster: the nation's guilt can be purged by nothing short of death—"Surely this iniquity will not be forgiven you till you die . . . ." Chapters 6 and 22 set the tone of his message and the hue of his mood, and from the first to the last the gloom has not lifted.

This 22nd chapter contains the most personally revealing of all Isaiah's words. Quite unexpectedly the Assyrians have lifted the siege and departed, and the amazed defenders of Jerusalem, flushed and jubilant, give way to celebration; Isaiah cannot share the holiday spirit since for him there has been only a postponement. Nothing has changed, and in his "valley of vision" he sees the day of rout and confusion that God yet has in store for Zion. And so it is that he lays bare his private grief:

> Look away from me, let me weep bitter tears; do not labor to comfort me for the destruction of the daughter of my people.

Message to Israel. The historical allusions in the scattered chapters of Isaiah's work agree with the title verse, according to which he was a contemporary of the Judaean kings Uzziah, Jotham, Ahaz, and Hezekiah. His prophetic call is precisely dated by him "in the year that King Uzziah died." At least a part of chapter 7 refers to the event of the year 734 when Ephraim and Syria jointly threatened King Ahaz of Judah. In 732 Tiglath-pileser conquered Damascus, the fall of which Isaiah had anticipated. In 722 Samaria, the capital of Ephraim, fell to King Sargon of Assyria, which event Isaiah had also foreseen. By the end of the century (701) Sennacherib had laid siege to Jerusalem—and had subsequently withdrawn. Chapters 1:4–8; 10:27–34; 28:14–22; 30:1–7; and 31:1–4 point to those difficult days when Jerusalem was beleaguered and King Hezekiah feverishly sought help from Egypt. Isaiah brought sparse comfort to his kings—even when the siege was lifted, as noted in the passage cited from chapter 22.

It would be wrong to suppose that Isaiah came to Israel simply to announce the approaching disaster. Painfully sensitive to the rottenness of his society, Isaiah foresaw its consequent collapse. But he also knew and offered an alternative to tragedy: his people's survival depended on their acceptance again of the ancient moral demands. By returning they might be saved. To obtain their return was his program. Or, differently and more properly stated, because he spoke for God and of God, his goal was to redirect his people into the ways acceptable to the God whom by their conduct they had alienated, and so to save them from catastrophe. He screamed dread warnings and pleaded for amendment. He gave way to despair only because his program had no success. His people seemed to him bent on self-destruction; that was the sickening course of their destiny as he saw it unfolding.

His impossible program comes through in the crisis of 701, during which he stands in violent opposition to the generals ready to go to Egypt for help against the Assyrians laying siege to Zion. Isaiah looked neither to allies nor to armaments for security. If it is God who decides the destiny of nations, security is for God to grant and for men to deserve. Isaiah held the daring view that the best defense is no defense—none other than the reconciling response to the moral demand. No men are secure when some are denied security. "This," he said, "is rest [*i.e.,* security]: give rest to the weary."

A case can be made for a theory that Isaiah drew back at the brink, incapable of conceiving a world wholly emptied of his people. What supports this view is a paradox: the observation that, irrationally, he entrusted his rejected message to his disciples and preserved it in a book for the instruction of the survivors of a people doomed to leave no survivors.

There is no consensus as concerns the precise limits of the words of the 8th-century Isaiah or the degree of consistency with which he sustained his tragic monotone. Certainly in his book as it has come down, his nature is elusive—both stern and tender. Magnificently hopeful passages constantly mingle with the prevailing atmosphere of doom. Probably his son's name, Shear-yashuv, means something like "a mere fragment will survive," but possibly it has a hopeful ring: no total disaster—some shall survive. Possibly the name Immanuel (God Is with Us), prophesied for the child who shall be a sign from God that Judah will not be overcome by Israel and Syria, expresses the confidence that God will never forsake his people. And possibly other such assurances are in fact words of Isaiah himself, compelled by his love to palliate the blow.

But there is an alternative solution. Although Isaiah was far from popular in his day, he does appear to have attracted some followers: "Seal the teaching among my disciples." These may have been the circle that kept alive his name and his words—in writing or learned "by heart"—the nucleus of what was to become, through a developing tradition, the biblical Book of Isaiah. And quite possibly successive generations of such Isaiah-men, piously keeping his words alive through radically changing times, added the sustaining messages of hope, well designed to seize the fancy of suffering humanity down the centuries.

Later interpretations of Isaiah's message. Ironically, perhaps, the Book of Isaiah is most widely known and loved just for those comforting words—which may not be his. A passage in the Babylonian Talmud (one of the two Talmud compilations, the other being Palestinian) can say that from beginning to end the book is consolation. The presence of Isaiah scrolls in the archives of the Qumrān (Dead Sea) community is not surprising. By that time (*c.* 1st century BC) it had become the fashion to assume that prophets spoke not to their times only but of things to come, and in times of stress men studied prophetic texts intent on learning when redemption was to come.

The Greek translation of Isaiah by Jewish scholars (the Septuagint), accomplished before the Christian Era, reflects a developing tradition of interpretation; it renders the Hebrew *'alma* ("young woman") as *parthenos* ("virgin") in the verse (7:14) about Immanuel, thus drawing Isaiah further into the messianic ring. Now it is a virgin who "shall conceive and bear a son." The promise of a more than ordinary king, a "messiah," was enticing. According to the New Testament accounts, when Jesus entered a synagogue in Nazareth and got up to read they handed him a scroll of Isaiah. He read the beginning of chapter 61: "The Spirit of the Lord God is upon me, because the Lord has anointed me . . ." and he said: "Today this scripture has been fulfilled."

The Gospels lean more heavily on the Book of Isaiah than on any other prophetic text. Beyond any denominational differences is the utopian dream, the "swords-into-plowshares" passage in Isaiah 2. These and many gleaming words from the expanded Book of Isaiah live on in the present day and today's culture. The word "prophetic" has now become a value-term, closely associated with the primacy of the moral demand and the bearing of justice on the stability of nations, quite in accord with the emphasis of the early Isaiah.

(S.H.Bl.)

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Consult the INDEX *first*

Isaiah, Ascension of, pseudepigraphal work surviving intact only in a 5th–7th-century-AD Ethiopic edition. Fragments exist in Greek, Coptic, Latin, and Old Slavonic. Three separate works comprise the total book, the final version by a Christian editor, which appeared in the 2nd century AD. The first section is entitled "The Martyrdom of Isaiah," a Midrash on the Manasseh story in II Kings 21, possibly written originally in Hebrew or Aramaic in the early 1st century AD. It includes a legendary martyr motif and extensive passages on demonology. The second is the "Testament of

Hezekiah," a Christian work, dating from the late 1st century AD, that contains a concept of Antichrist as a spirit dwelling in the Roman emperor Nero (AD 54–68), whose persecution of Christians in 64–65 was thought to be the chaos preceding the advent of the messianic age. The third work is called the "Ascension (or Vision) of Isaiah," also written by a Christian at the beginning of the 2nd century. It contains a description of the seven tiers of heaven paralleling that found in the *Second Book of Enoch* and in the New Testament.

Both of the Christian sections are apocalypses, although they contain certain historical details on the state of the church at the end of the 1st century that coincide with descriptions given in the Second Letter of Peter, Second Letter of Paul to Timothy, and the letters of Clement of Rome. The martyr legend in the Jewish section has been linked with the tradition of royal persecutors associated with Antiochus IV Epiphanes of Syria (175–164/163 BC), although the details of Isaiah's martyrdom may represent the incorporation into Judaism of the myth of Adonis, the Near Eastern (later Greek) god. It has also been suggested that *The Martyrdom of Isaiah* was written by a member of the Qumrān sect of Essene Jews, who saw Isaiah as a type figure of their leader, the Teacher of Righteousness.

Isaiah, Book of, also spelled ISAIAS, one of the major prophetical writings of the Old Testament. The superscription identifies Isaiah as the son of Amoz and his book as "the vision of Isaiah . . . concerning Judah and Jerusalem in the days of Uzziah, Jotham, Ahaz, and Hezekiah, kings of Judah." According to 6:1, Isaiah received his call "in the year that King Uzziah died" (742 BC), and his latest recorded activity is dated in 701 BC. Only chapters 1–39, however, can be assigned to this period. Chapters 40–66 are much later in origin and therefore known as Deutero-Isaiah (Second Isaiah). Sometimes a further distinction is made between Deutero-Isaiah (chapters 40–55) and Trito-Isaiah (chapters 56–66).

Chapters 1–39 consist of numerous sayings and reports of Isaiah along with several narratives about the prophet that are attributed to his disciples. The growth of the book (1–39) was a gradual process, its final form dating from perhaps as late as the 5th century BC, a date suggested by the arrangement of the materials and the late additions. In spite of the lengthy and complicated literary history of the book, however, Isaiah's message is clearly discernible. He was much influenced by the cult in Jerusalem, and the exalted view of Yahweh in the Zion traditions is reflected in his message. He was convinced that only an unshakable trust in Yahweh, rather than in political or military alliances, could protect Judah and Jerusalem from the advances of their enemies—specifically, in this period, the Assyrians. He called for a recognition of the sovereignty of Yahweh and passionately denounced anything that worked against or obscured Yahweh's purposes—from social injustices to meaningless cultic observances. Although Isaiah pronounced Yahweh's judgment upon Judah and Jerusalem for their unfaithfulness, he also announced a new future for those who relied on Yahweh.

Deutero-Isaiah (40–55), consisting of a collection of oracles, songs, and discourses, dates from the Babylonian Exile (6th century BC). The anonymous prophet is in exile and looks forward to the deliverance of his people. The destruction of Babylon is prophesied and the return of the exiles to their homeland is promised. The servant-of-Yahweh songs in Deutero-Isaiah (42:1–4; 49:1–6; 50:4–9; 52:13–53:12) have generated animated discussions among scholars, but the ideas reflected in the songs suggest that they were written under the influence of the ideology of the king—the anointed one who, through his righteous rule, had the power to effect his people's deliverance.

Trito-Isaiah (56–66), coming from a still later period, reflects a Palestinian point of view, with the latter chapters in particular addressed to the cultic concerns of the restored community. The diversity of materials in these chapters suggests multiple authorship. How the three "Isaiahs" came together is not known.

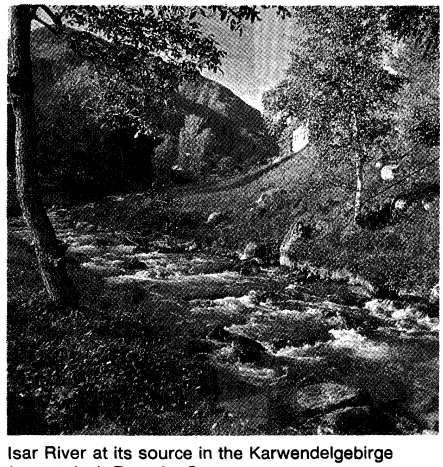
Īśānavarman (fl. AD 554), chief of the Maukhari family of northern India, originally a feudatory of the Gupta Empire, who by the middle of the 6th century had declared his independence from the Guptas and set himself up as a king in the Ganges Valley.

Little is known of Īśānavarman except that during the second half of the 6th century he and his successors were involved in continuous conflict with the kings of the later Gupta line; they seem to have ruled the greater portion of the modern state of Uttar Pradesh and to have had some control over Magadha (southern Bihār state). There is some evidence of Maukhari raids in the Deccan. Their capital was Kanyakubja (modern Kannauj), and they played an important role in the development of this city.

Īśānavarman's only notable successor was Grahavarman, who was defeated and killed by the Guptas soon after his accession and whose capital was occupied. His brother-in-law, Harṣa, however, drove out the Guptas around 606 AD and thus gained control of the Maukhari kingdom. After this, the Maukhari family disappeared into obscurity.

Isandhlwana and Rorke's Drift, Battles of (Jan. 22–23, 1879), the major battles of the Zulu War, in South Africa. At Isandhlwana, the British failure to defend their encampment led to the obliteration of an imperial force of about 1,700 men by more than 20,000 Zulu, who advanced unnoticed. Though the Zulu lost 3,000 to 4,000 men, their unscathed rear guard advanced on the British base at nearby Rorke's Drift, which was, however, forewarned by the few survivors of Isandhlwana and was well fortified. Just over 120 men fended off the Zulu attack with minimal losses. Contrary to popular belief at the time, even had Rorke's Drift fallen, it is unlikely that the Zulu would have attacked the British settlement of Natal. The subsequent Battle of Kambula (March 28–29, 1879), in which the Zulu lost more than 2,000 men, was a more decisive British victory. In July the British took the Zulu capital, Ulundi, and the Zulu army ceased to be effective.

Isar River, river, Bavaria *Land* (state), southern Germany. Rising at an elevation of 5,741 feet (1,750 m) in the Karwendelgebirge, just northeast of Innsbruck, Austria, the Isar runs west and then north crossing into Germany at Scharnitz Pass. The river there flows through a deep gorge that was used by the ancient Romans, who called it Porta Claudia. A rail line and road now thread the gorge. Turning east and north once again, the Isar emerges upon the Bavarian plain to flow northeast through Munich; it finally enters the Danube downstream from Regensburg. Much of the river, which is 183 miles (295 km) long, is swift and too shallow for navigation. Principal tributaries of the Isar are the Loisach, Würm, and Amper.



Isar River at its source in the Karwendelgebirge (mountains), Bavaria, Germany

Charles Bear—Shostal/EB Inc.

Isauria, ancient inland district of south central Anatolia. Its inhabitants, a mountain people described by Greco-Roman authors as warlike and uncivilized, were conquered by the Roman general Servilius "Isauricus" early in the 1st century BC. Their country with its capital, Isaura Palaia, was joined with Cilicia by Pompey; and under the emperor Augustus (reigned 27 BC–AD 14) it became part of the Roman province of Galatia. Isauria was later prominent as the birthplace of the East Roman (Byzantine) emperor Zeno, whose reign (474–491) is sometimes known as the "Isaurian Ascendancy." The Byzantine emperor Leo III (reigned 717–741) was once called the Isaurian, but on the mistaken belief that he had been born in Isauria.

Isboseth (Old Testament): *see* Ishbosheth.

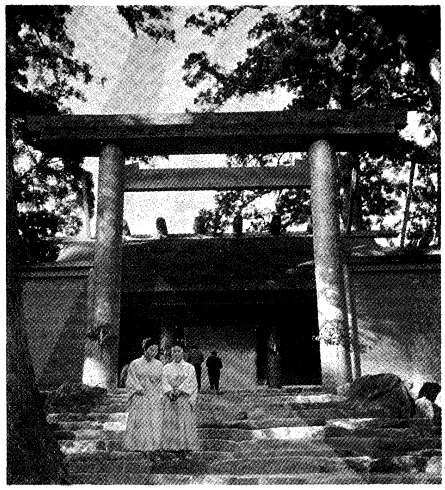
ischemic heart disease: *see* coronary heart disease.

Ischia, Antonio Canova, marchese d' (sculptor): *see* Canova, Antonio.

Ischia, Island of, Italian ISOLA D'ISCHIA, Latin AENARIA, island at the northwest entrance to the Bay of Naples, opposite Capo (cape) Miseno, Napoli province, Campania region, southern Italy, just west-southwest of Naples. Oblong in shape, with a circumference of 21 mi (34 km) and an area of 18 sq mi (47 sq km), the island consists almost entirely of volcanic rock and rises to 2,585 ft (788 m) at Monte Epomeo, an extinct volcano. The date of the first eruption is estimated to have been about 2200 BC; an eruption of the 7th century BC, according to the Roman scholar Pliny the Elder, drove away the first Greek settlers, and another in 470 BC put a Syracusan garrison to flight. There were several eruptions in Roman times. The last on record occurred in 1301–02, when the population fled to Baia on the mainland and did not return for four years. There have been destructive earthquakes more recently, the last in 1883 when the entire town of Casamicciola was destroyed. The island was known to the Greeks as Pithecusa (probably meaning "island of monkeys") and to the Romans as Aenaria. From the Middle Ages it was subjected to frequent attacks and invasions, usually related to the struggles for supremacy on the mainland. Its volcanic soils are fertile, and the wine, called Epomeo, that is produced on Ischia is famous. Wheat, olive oil, and citrus fruits are also economically important. The clay of Ischia is believed to have been used by the ancient potteries of Cumae and Puteoli (Pozzuoli). Well known for its mild climate, picturesque scenery, and numerous thermal mineral springs, Ischia is much frequented as a health and vacation resort. The more important towns are in the north of the island: Ischia, the administrative centre and seat of a bishop, consisting of the fishing village of Ischia Ponte with a medieval castle, and Ischia Porto; Casamicciola Terme; Lacco Ameno; and Forio. There are regular shipping services from Naples and Pozzuoli and a car ferry from Pozzuoli. Pop. (1981 prelim.) mun., 15,914.

Ischl (Austria): *see* Bad Ischl.

Ise, formerly (until 1956) UJI-YAMADA, city, Mie Prefecture (*ken*), southern Honshu, Japan, on Ise Bay (Ise-wan) of the Pacific Ocean. The city contains several major Shintō shrines. Central among these is the Grand Shrine of



Entrance to the Outer Shrine of the Grand Shrine, Ise, Japan
FPG—EB Inc.

Ise (Ise-daijingū; more commonly called the Ise Shrine, or Ise-jingū), which consists of the Inner and Outer shrines, about 4 miles (6 km) apart. According to tradition, the Inner Shrine (Naikū) was built in 4 BC. It is dedicated to Amaterasu Ōmikami, the sun goddess and traditional progenitor of the Japanese Imperial family. The Sacred Mirror, one of the Three Sacred Treasures of Japan (Sanshu no Jingi), is preserved there. The Outer Shrine (Gekū), founded in the late 5th century, is dedicated to Toyuke (Toyouke) Ōkami, the god of food, clothing, and housing.

At both shrines the main building is a thatched hut built in ancient Japanese style with unpainted Japanese cypress (*hinoki*). From the 7th century to the early 17th century, the buildings were reconstructed every 20 years; since then they have been rebuilt every 21 years. Pilgrimages to the shrines are popular and supplement the city's tourism industry. Pop. (1985 prelim.) 105,455.

Ise-Shima National Park, Japanese ISE-SHIMA KOKURITSU KOËN, national park on the Shima Peninsula, central Honshu, Japan. Its two main cities are Ise (*q.v.*), famous for its Shintō shrines, and Toba, a seaport that guards the southern entrance to Ise Bay (Ise-wan). The bay has many islands and is renowned for its Mikimoto cultured-pearl industry. Pearl Island in Toba Harbour is the site where Mikimoto Kōkichi first succeeded in producing a cultured pearl at the beginning of the 20th century. The Toba area now produces the great majority of Japan's cultured pearls. Between Ise and Toba is Futamigaura beach and resort, famed for its two rocks Meotoiwa, or "Wedded Rocks," which one legend says sheltered the creators of Japan, Izanagi and Izanami.

Ise Shintō, also called WATARAI SHINTŌ, school of Shintō established by priests of the Watarai family who served at the Outer Shrine of the Ise Shrine (Ise-jingū). Ise Shintō establishes purity and honesty as the highest virtues, realizable through religious experience.

The school began in the Kamakura period (1192–1333) as an attempt to emancipate Shintō from the domination of Buddhist thought (for example, it reversed the Buddhist teaching of the period and declared that the Buddhas and *bodhisattvas,* or Buddhas-to-be, were manifestations of Shintō *kami*). Later, Confucian elements were added. The theology of Ise Shintō was summarized in a five-volume apologia, the *Shintō gobusho,* which appeared in the 13th century.

Iselin, Columbus O'D(onnell) (b. Sept. 25, 1904, New Rochelle, N.Y., U.S.—d. Jan. 5, 1971, Vineyard Haven, Mass.), American oceanographer who, as director of the Woods Hole Oceanographic Institution (1940–50; 1956–57) in Massachusetts, expanded its facilities 10-fold and made it one of the largest research establishments of its kind in the world.

The scion of a New York banking family (his great-grandfather had helped found the Metropolitan Opera House and the Metropolitan Museum of Art), Iselin attended Harvard University (A.B., 1926; A.M., 1928). From 1926 on, he made a series of summer sea excursions toward Labrador and the Arctic with his own schooner and crew, collecting material and data for Harvard's Museum of Comparative Zoology. For Harvard he served as assistant curator of oceanography (1929–48) and research oceanographer of the Museum of Comparative Zoology. Concurrently, in 1932 he joined the newly established Woods Hole institution and, from 1936, taught oceanography at Harvard.

In 1940 he was named director of Woods Hole and, with wartime funds from the U.S. Navy, vastly increased the institution's budget and size. Wartime studies—factors in seaborne invasions, ocean currents, underwater explosions, and other matters—turned in 1946 to peacetime studies of fisheries, the dynamics of currents, the profiles of ocean floors, and other oceanographic concerns. Later, Iselin was professor of oceanography at the Massachusetts Institute of Technology (1959–70) and Harvard University (1960–70).

Isengrim, greedy and dull-witted wolf who is a prominent character in many medieval European beast epics. Often cast as a worldly and corrupt churchman, he appears first as a character in the Latin *Ecbasis captivi* (*c.* 940), in which the beasts are unnamed, and under his own name in *Ysengrimus* (1152). He is the main character in both epics. In the first he is represented as a monk to symbolize slothful and degenerate clergy of the period; in one episode of *Ysengrimus* he is tricked into becoming a monk by Reynard the Fox's report of the good food in monasteries. While Isengrim is being tonsured and ordained with blows and insults, Reynard goes to his house and possesses his wife. In beast epics written after *Ysengrimus,* Reynard the Fox supplants the wolf as the chief character. In these tales the clever animals have French traits of manner and speech, while the uncouth Isengrim is German.



Meotoiwa ("Wedded Rocks") at Futamigaura beach, Ise-Shima National Park, Japan
©Bob Davis—Aspect Picture Library, London

isentropic chart, meteorological map that shows the moisture distribution and flow of air along a surface of constant entropy; which is also a surface of constant potential temperature (the temperature a parcel of dry air would have if brought from its initial state to a standard pressure [1,000 millibars] without exchange of heat with its environment). The isentropic surface varies in height from place to place over the Earth, the variation being indicated on the isentropic chart by isobars, lines showing the pressure at which the isentropic surface is found. The moisture distribution is shown by lines of constant mixing ratio (which expresses the mass of water vapour per unit mass of dry air) and of constant specific humidity (which expresses the mass of water vapour per unit mass of air). The flow of air at the isentropic surface is represented by streamlines, computed from the field of pressure and temperature.

The isentropic chart was first suggested by Sir Napier Shaw in Great Britain in 1933 and later, in 1936, by Carl-Gustav Rossby in the United States, when the network of weather stations taking upper-air observations became sufficient to make construction practical. Because air particles tend to flow along isentropic surfaces rather than at constant levels, the life history of air currents can be conveniently followed from day to day by means of isentropic charts. In addition, they give a fair picture of many of the physical processes that produce the weather.

Iseo, Lake, Italian LAGO D'ISEO, Latin LACUS SEBINUS, lake in Lombardia (Lombardy) region, northern Italy, between Bergamo and Brescia provinces, at the southern foot of the Alps at an altitude of 610 feet (186 m). The lake is 15.5 miles (25 km) long with a maximum width of 3 miles (5 km), a maximum depth of 820 feet (250 m), and a surface area of 24 square miles (62 square km). It is fed by the Oglio River, a tributary of the Po River, which enters the northern end near Lovere from the deep, wide Val (valley) Camonica and leaves the southern end at Sarnico. Monte Isola, in the centre of the lake, is Italy's largest lacustrine island (area 5 square miles [13 square km]); it rises to 1,965 feet (599 m) and is crowned by a chapel. The islet of San Paolo, south of Monte Isola, is occupied by the buildings of a small disused Franciscan convent, and that of Loreto, north, has a ruined chapel containing frescoes.

Olives, vines, and fruits are grown on the lake's shores. Iseo, at the southern end of the lake, is a summer resort.

Iser River (Europe): *see* Jizera River.

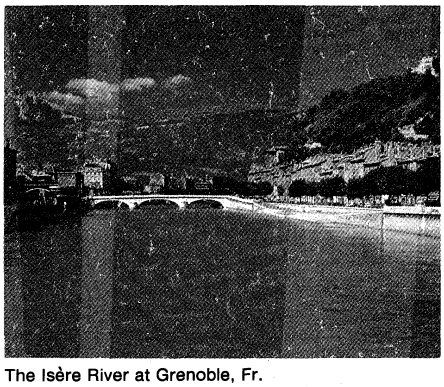
Isère, *département,* Rhône-Alpes region, southeastern France, created from the northern part of the historic province of Dauphiné. It occupies an area of 2,869 square miles (7,431 square km), extending from the Hautes-Alpes *département* in the southeast almost to Lyon,

in neighbouring Rhône *département,* in the northwest. The Rhône River makes a great bend along the northern boundary, leaves it to traverse Lyon, and bends again to form the border and flows southward past Vienne. The mountain-bound capital, Grenoble, lies in south central Isère at the juncture of the Isère River and its tributary the Drac. The highest mountains are in the southeast, where peaks of the Massif de Loisans and the Massif du Pelvoux rise to more than 12,800 feet (3,900 m). The country northwest of the Isère and of the Pre-Alps embraces the forests and wastelands of Bas Dauphiné, extending to the fertile Rhône Valley.

Isère receives abundant rain and snow and has hot summers and cold winters. Fertile strips of farmland are found in the great Graisivaudan depression northeast of Grenoble and in other valleys. The mountains, forested to heights of more than 6,000 feet (1,800 m), are exploited for timber. The development of hydroelectric power has permitted the rapid growth of industry, particularly in the environs of Grenoble, the valley of the Drac River, and along the cluses (mountain gaps) that mark the mountains' faces toward the lowlands; these industries include electrometallurgical, electrochemical, paper, and food-processing enterprises. More than half of the population is occupied in the transportation sector.

Winter and summer sports and scenery draw great numbers of tourists to the mountains. The Grande Chartreuse monastery near Grenoble is not open to the public, but monks distilling the liqueur that bears its name may be seen in neighbouring Voiron. The historic château of Vizille (16th–17th century) is open to the public. Isère was the homeland of the novelist Stendhal and the composer Hector Berlioz. Divided into three *arrondissements*—Grenoble, La Tour-du-Pin, and Vienne—it is in the educational division of Grenoble. Pop. (1985 est.) 970,000.

Isère River, river, southwestern France, originating in the Savoy Alps on the Italian frontier and flowing 180 miles (290 km) to its confluence with the Rhône above Valence, draining a basin of approximately 4,600 square miles (12,000 square km). It rises in an amphitheatre of glaciers at 7,900 feet (2,400 m) near the Col (pass) de l'Iseran and rushes down past Val d'Isère into the artificial lake formed by Tignes Dam. It continues through the Tarentaise Valley past Bourg-Saint-Maurice, where it is dammed again. The river then zigzags across mountain ranges passing through Albertville, where it receives the Arly and turns southwest, flowing through the Combe de Savoie depression. The Arc River, which rises in the Mont Levanna glaciers to the southwest of the Isère on the Italian frontier and flows along the Maurienne Valley through Modane and Saint-Jean-de-Maurienne, joins it from the west, midway along the Combe de Savoie depression. The combined stream crosses into the Isère *département* and flows along the Vallée de Graisivaudan depression, passing through Grenoble. It makes a sharp northwestward bend before continuing its southwesterly course to the Rhône. The Isère is not navigable, but it is used in many places for hydroelectric power.



The Isère River at Grenoble, Fr.
Shostal—EB Inc.

Isergebirge (eastern Europe): *see* Jizera Mountains.

Iserlohn, city, North Rhine-Westphalia *Land* (state), western Germany, at the entrance to the hilly, wooded Sauerland region, southeast of Dortmund. First mentioned in the 11th century, Iserlohn was chartered in 1237 and was famous in the Middle Ages for armaments and light metalware. Although the city was burned down in 1712 and was the scene of a rebellion in 1849, the 11th-century St. Pankratius Church and the Oberste Stadtkirche (*c.* 1350) survive. Manufactures include machinery, chemicals, and rubber, leather, and metal products. Pop. (1989 est.) 93,337.

Isernia, capital of Isernia province (formed 1970), Molise region, south central Italy, between the Carpino and Sordo rivers, west of Campobasso. It originated as Aesernia, a town of the Samnites (an ancient Italic people), and later became a Roman colony. Isernia suffered severe damage in World War II but has been rebuilt. Notable landmarks include a Roman bridge, the cathedral (rebuilt after an earthquake in 1805), the Fraterna Fountain, and the civic museum. A commercial centre and transport junction, the town manufactures food products, textiles, and lace. Pop. (1984 est.) mun., 20,777.

Isesaki, city, Gumma Prefecture (*ken*), Honshu, Japan, on the Ryomo Line (railway) between Takasaki and Oyama. Isesaki prospered as a market town around a castle built in the early Tokugawa period (1603–1867) and was known for its silk manufacture, which employed a large number of women. After the Meiji Restoration (1868) the city rapidly became a centre of the silk-weaving industry; synthetic textiles were introduced in 1957. Other industrial products include machinery, transport equipment, and electrical appliances. Pop. (1985 prelim.) 112,458.

Iseult (medieval romance): *see* Tristan and Iseult.

Iseyin, town, Oyo State, southwestern Nigeria, at the intersection of roads from Oyo to Iwere and from Abeokuta to Okaka. In the early 1860s, the Yoruba Mission opened an Anglican church in the town. The Iseyin riots of 1916 protested the policy of Lord Lugard, the British governor-general, who made the traditional Yoruba *alafin* ("king") at Oyo (25 miles [40 km] east-southeast) a public ruler responsible to the British colonial authorities.

A traditional centre for cotton spinning and weaving, Iseyin is best known for its dyeing (using locally grown indigo as well as imported dyes) of heavy, imported cloth. The town's Yoruba inhabitants cultivate tobacco and teak, as well as cotton and vegetable dyes, for export; most of their cassava, yam, corn (maize), and peanut (groundnut) crops are consumed locally. Although Iseyin was formerly a centre for opencast mining and the making of pig iron, its blacksmiths now depend upon imported iron for their metalworking. The town is the headquarters of a local government council and has several Christian-sponsored secondary schools and a hospital. Pop. (1983 est.) 157,000.

Isfahan (Iran): *see* Eṣfahān.

Iṣfahānī, al-: *see* Abū al-Faraj al-Iṣbahānī.

İsfendiyar DYNASTY: *see* Candar dynasty.

Isham, John, Isham also spelled ISUM (b. *c.* 1680—d. June 1726), English composer and organist.

Educated at Merton College, Oxford, he went to London and became an assistant to the organist and composer William Croft, whom he succeeded as organist of St. Anne's, Soho (serving 1711–18). He accompanied Croft to Oxford in 1713 and there acquired a bachelor of music degree. In 1718 he became organist of St. Andrew's, Holborn (London), and, the following year, organist of St. Margaret's, Westminster, and held both posts until his death. During his career a few of his anthems and songs were published, including the popular "Bury delights my roving eye."

Isham, Ralph Heyward (b. July 2, 1890, New York City—d. June 13, 1955, New York City), American collector of rare manuscripts who discovered the long-missing manuscripts of James Boswell's *Life of Samuel Johnson* and other Boswell papers and letters.

The son of a wealthy railroad executive, Isham attended Cornell University (1908–09) and Yale University (1910–11), went big-game hunting in Mexico and the Malay Peninsula, and then wrote a series of newspaper articles. In London from 1916 to 1919 he served in the British Army, rising in the ranks to become a colonel (with the permanent rank of lieutenant colonel) and acquiring a somewhat British accent and manner. In civilian life thereafter he continued to affect the name of "Colonel Isham."

Although, back in New York City, he held some corporate offices at times, he became principally a book and manuscript collector, traveling frequently abroad. In 1927 he sought out some Boswell papers from Boswell's great-great-grandson, the 6th Baron Talbot de Malahide, at Malahide Castle, near Dublin. For more than 20 years Isham continued the reassembly of Boswell's papers, finding most of the papers at Malahide Castle or at Fettercairn House, Scotland; the manuscripts were uncovered in old boxes and bundles in attics and other half-hidden reaches. In 1948 Isham announced the completion of the collection (though a few more pieces were still to be discovered at Malahide, Fettercairn, and other sites after Isham's death).

Isham himself privately published *The Private Papers of James Boswell, from Malahide Castle, in the Collection of Lt.-Colonel Ralph Heyward Isham* (1928–34) and secured the commercial publication of *Boswell's Journal of a Tour to the Hebrides* (1936). In 1949 he sold the bulk of the collection to Yale University for $450,000, a great sum at the time; he sold his remaining Boswellian items to Yale in 1950. In January 1950 Professor Frederick A. Pottle of Yale began the massive task of sorting and cataloging the Boswell papers; the first volume, *London Journal, 1762–1763,* was published in November.

Ishbosheth, also spelled ISBOSETH, also called ISHBAAL, or ESHBAAL (fl. 11th century BC), in the Old Testament (II Samuel 2:8–4:12), fourth son of King Saul and the last representative of his family to be king over Israel (the northern kingdom, as opposed to the southern kingdom of Judah). His name was originally Ishbaal (Eshbaal; I Chronicles 8:33; 9:39), meaning "man of Baal." *Baal,* which could mean "master," was a title of dignity. Because the name came to be increasingly associated with Canaanite fertility gods, Hebrew editors later substituted *bosheth,* meaning "shame," for *baal.*

Ishbosheth was proclaimed king of Israel by Abner, Saul's cousin and commander in chief, who then became the real power behind the throne. The House of Judah, however, followed David, and war broke out between the two kingdoms. When Abner took Rizpah, one of Saul's concubines, Ishbosheth objected, because Abner's action was a symbolic

usurpation of power. Abner then defected to David, leaving the northern tribes without effective leadership, and Ishbosheth was soon murdered by two of his captains. David had the murderers put to death. Ishbosheth's stand against Abner, weak as it was, led to Abner's defection to David and then to Abner's death at the hand of one of his enemies, events that caused strife in David's divided kingdom for some time to come.

Although the Bible states that Ishbosheth was 40 years old when he became king and that his reign lasted two years, scholars have found that these figures are incorrect. More likely he was quite young and his reign equaled that of David at Hebron, about 7½ years.

Ishekiri (people): *see* Itsekiri.

Isherwood, B(enjamin) F(ranklin) (b. Oct. 6, 1822, New York City—d. June 19, 1915, New York City), U.S. naval engineer who, during the American Civil War, greatly augmented the U.S. Navy's steam-powered fleet.

The son of a physician, Isherwood attended Albany (N.Y.) Academy (1831–36) and then learned mechanics and engineering working successively on the Utica & Schenectady Railroad, on the Croton Aqueduct, on the Erie Railroad, at various U.S. Treasury lighthouses, and at the Novelty Iron Works (New York City). In 1844 he joined the Engineer Corps of the U.S. Navy, serving thereafter on several ships and land-based posts. After the American Civil War began, he became engineer in chief of the Navy and, in 1862, the first chief of its Bureau of Steam Engineering. At the beginning of the war the Navy had but 28 steam-powered ships and boats; by the end of the war it had about 600. Isherwood oversaw the design and construction of most of these ships and, in large part, personally designed the machinery and hulls of ships of the Wampanoag class, which, when built, were the world's fastest at 17¾ knots.

During these years Isherwood wrote two major treatises on steam power for ships: *Engineering Precedents for Steam Machinery,* 2 vol. (1859), and *Experimental Researches in Steam Engineering,* 2 vol. (1863–65). The latter became a standard text and was translated into a number of foreign languages.

Isherwood remained on active duty until 1884, when he retired as chief engineer, the highest permanent rank in the Engineer Corps. Through his later years of duty he presided over many experimental researches involving both U.S. Navy ships and bases and foreign navies. After his death, the United States Naval Academy, Annapolis, named Isherwood Hall in his honour.

Isherwood, Christopher, byname of CHRISTOPHER WILLIAM BRADSHAW-ISHERWOOD (b. Aug. 26, 1904, High Lane, Cheshire, Eng.—d. Jan. 4, 1986, Santa Monica, Calif., U.S.), Anglo-American novelist and playwright best known for his novels about Berlin in the early 1930s.



Isherwood, 1966

Camera Press—Pictorial Parade/EB Inc.

After working as a secretary and a private tutor, Isherwood gained a measure of coterie recognition with his first two novels, *All the Conspirators* (1928) and *The Memorial* (1932). During the 1930s he collaborated with his friend W.H. Auden on three verse dramas, including *The Ascent of F6* (1936). But it had been in 1929 that he found the theme that was to make him widely known. Between 1929 and 1933 he lived in Berlin, gaining an outsider's view of the simultaneous decay of the Weimar Republic and the rise of Nazism. His novels *Mr. Norris Changes Trains* (1935; *The Last of Mr. Norris*) and *Goodbye to Berlin* (1939), which were later published together as *The Berlin Stories,* established his reputation as an important writer and inspired the play *I Am a Camera* (1951; film 1955) and the musical *Cabaret* (1966; film 1972). These books are detached but humorous studies of dubious characters leading seedy expatriate lives in the German capital. In 1938 Isherwood published *Lions and Shadows,* an amusing and sensitive account of his early life and friendships while a student at the University of Cambridge.

The coming of World War II saw not merely a change of outlook in Isherwood's writing but also a permanent change of domicile. He immigrated to the United States in 1939 and settled in southern California, where he taught and wrote for Hollywood films. He was naturalized in 1946. It was also in 1939 that Isherwood turned to pacifism and the self-abnegation of Indian Vedānta, becoming a follower of Swami Prabhavananda. In the following decades, Isherwood produced several works on Vedānta and translations with Prabhavananda, including one of the *Bhagavadgītā.*

Isherwood's postwar novels continued to demonstrate his personal style of fictional autobiography. *A Single Man* (1964), a brief but highly regarded novel, presents a single day in the life of a lonely, middle-aged homosexual. His avowedly autobiographical works include a self-revealing memoir of his parents, *Kathleen and Frank* (1971); a retrospective biography of himself in the 1930s, *Christopher and His Kind* (1977); and a study of his relationship with Prabhavananda and Vedānta, *My Guru and His Disciple* (1980).

From 1953 on, Isherwood lived with a companion, Don Bachardy, a painter and portraitist, and both later became involved in homosexual-rights causes.

Ishibashi Tanzan (b. Sept. 25, 1884, Tokyo—d. April 25, 1973, Tokyo), politician, economist, and journalist who was prime minister of Japan from December 1956 to February 1957.

The son of a Nichiren-sect Buddhist priest, Ishibashi studied philosophy and graduated from Waseda University and then entered the field of journalism. He joined the *Tōyō keizai shimpō,* a weekly magazine on economics, and became known for his outspoken commentaries on economic affairs. In 1934 Ishibashi began publishing an English-language magazine, the *Oriental Economist,* and by 1939 had become president of the company. He served as an adviser to various government economic organs and in 1946 became minister of finance in the Cabinet of Prime Minister Yoshida Shigeru. From 1947 to 1951 he was ineligible for public office because of an Allied Occupation directive based on his journalistic activities during World War II.

Ishibashi became international trade and industry minister in the Cabinet of Hatoyama Ichirō in 1956 and won a narrow party election victory to become president of the majority Liberal-Democratic Party and prime minister in December of that year. He advocated "independent diplomacy" for Japan and sought trade relations with the People's Republic of China. At home he tried to stimulate production to achieve full employment in a welfare-state structure. But his Cabinet proved unstable amid intraparty factional dissensions, and serious illness caused him to resign in favour of his former rival Kishi Nobusuke in February 1957.

Despite ill health, he became president of the Japan–Soviet Friendship Association (1960) and the International Trade Promotion Association of Japan. He toured Russia and Europe (1964) to promote trade. In 1959 he visited China and returned there in 1963 as chairman of a Japanese trade fair. He advocated a multilateral peace treaty among Japan, the United States, China, and the Soviet Union, but his increasingly progressive policies had made him unpopular with the Liberal-Democratic Party, and he was defeated in an election bid for the House of Representatives (1963).

Ishida Baigan (b. Oct. 12, 1685, Tamba Province, Japan—d. Oct. 29, 1744, Kyōto), Japanese scholar who originated the moral-education movement called Shingaku ("Heart Learning"), which sought to popularize ethics among the common people.

The son of a farmer, Ishida began studying ethical doctrines in Kyōto as a young man while apprenticed to a merchant house. In 1729 he launched the Shingaku movement with lectures in his home. Confucianism supplied the fundamental ethics, but Ishida also incorporated Taoist, Buddhist, and Shintō elements. Explaining moral education in simple terms, Ishida used many parables in speaking directly to the people. He toured the country lecturing and in 1739 published *Tohi mondō* ("Question and Answer Between City and Countryside").

Some 400 disciples carried on the movement after Ishida's death, and Shingaku grew, partly with government encouragement, until it had 81 schools all over Japan. As the teaching became more dogmatic and stereotyped, however, it declined in popularity, and by the end of the Tokugawa period in 1867 the movement was in a final decline. Ishida's works include *Seika ron* (1774), an essay on family government espousing the Confucian view that a man who cannot govern his family cannot govern a nation. His disciples published *Ishida sensei goroku* ("The Sayings of Professor Ishida") in 1806.

Ishida Mitsunari (b. 1563, Ōmi Province, Japan—d. Nov. 6, 1600, Kyōto), Japanese warrior whose defeat in the famous Battle of Sekigahara (1600) allowed the Tokugawa family to become undisputed rulers of Japan.

Distinguished in the service of Toyotomi Hideyoshi, the warrior who reunified Japan after more than a century of civil war, Ishida was appointed head of a small fief and soon became one of the most prominent officials in the new government. After Hideyoshi's death in 1598, Ishida maintained his government position, but real power was exercised by a council of five regents, acting in the name of Hideyoshi's infant son Hideyori. Foremost among the regents was Tokugawa Ieyasu, and in 1599, when Ishida attempted to improve his own position by plotting to sow dissension among Japanese lords, several of Tokugawa's retainers resolved to execute him, but Tokugawa spared his life.

The following year, however, Ishida persuaded Uesugi Kagekatsu, one of the five regents, to marshal his forces against Tokugawa. While Tokugawa's troops were diverted fighting Uesugi in the north, Ishida rallied many of the other lords to his side and attacked the Tokugawa position from the rear. When several of Ishida's crucial allies failed to commit their full strength to the battle, Tokugawa quickly returned from the north to deal a decisive defeat to Ishida's troops at Sekigahara. Ishida's capture and execution marked the last

major opposition to Tokugawa rule, and in 1603 Tokugawa assumed the hereditary title of shogun, or military dictator, a post that was held by the Tokugawa family until 1868.

Ishii Kikujirō, SHISHAKU (Viscount) (b. March 10, 1866, Awa Province, Japan—d. May 25, 1945, Tokyo), Japanese statesman and diplomat who effectively championed a cautious expansion of Japan and cooperation with the West in the decades immediately before and after World War I.



Ishii Kikujirō
BBC Hulton Picture Library

In 1907 he was sent to investigate rising anti-Japanese sentiment in San Francisco and Vancouver, B.C. He helped negotiate the "gentlemen's agreement" between Japan and the United States, by which the Japanese government promised to withhold passports from labourers intending to migrate to the United States. In 1917 he negotiated the Lansing–Ishii Agreement, in which the United States rather ambiguously acknowledged Japan's special interests in China, while Japan affirmed its respect for the U.S. Open Door policy, which sought to preserve China's independence and territorial integrity and to allow all nations equal trading rights with China (at that time outside nations were trying to carve China into special spheres of influence). Ishii was killed in a U.S. bombing raid during World War II. His memoirs, *Gaikō yoroku*, have been partially translated into English as *Diplomatic Commentaries.*

Ishikari-gawa (Japanese: Ishikari River), river, in Hokkaido, Japan, rising near the centre of the Kitami-sammyaku (Kitami Mountains). It flows for 120 mi (200 km) southwest in a broad arc, draining the Kamikawa-bonchi (Kamikawa Basin), the Sorachi-gawa (Sorachi River) lowland, and the Ishikari-heiya (Ishikari Plain). The river empties into Ishikari-wan (Ishikari Bay) of the Sea of Japan. Its name is derived from the Ainu term *ishikaribetsu* ("greatly meandering river"), which describes the flow of its lower course. Inundations usually occur twice a year, after the thaw of spring and the rains of summer. An extensive flood control project, providing a dependable water supply for heavy industries, has induced serious water pollution in the river valley, which was sacred to the Ainu.



Ishikari-gawa and plain, Hokkaido, Japan
Photos Pack—EB Inc.

Ishikawa, prefecture (*ken*), western Honshu, Japan, facing the Sea of Japan. Its area of 1,620 sq mi (4,196 sq km) includes the western stretch of the Japanese Alps (southeast). Although snowfall is abundant, temperatures are not low. There is a predominance of rice paddies, and agriculture is characterized by comparatively large individual landholdings. Industry is centred on the prefectural capital, Kanazawa; products include machinery, silk and rayon, lacquer ware, and the traditional Kutaniware china. During the 1960s Ishikawa industrialized rapidly. Pop. (1983 est.) 1,138,000.

Ishikawa Takuboku, pseudonym of ISHIKAWA HAJIME (b. Oct. 28, 1886, Hinoto, Iwate Prefecture, Japan—d. April 13, 1912, Tokyo), Japanese poet, a master of tanka, a traditional Japanese verse form, whose works enjoyed immediate popularity for their freshness and startling imagery.

Although Takuboku failed to complete his education, through reading he acquired surprising familiarity with both Japanese and Western literature. He published his first collection of poetry, *Akogare* ("Yearning"), in 1905. In 1908 he settled in Tokyo, where, after associating with poets of the romantic Myōjō group, he gradually shifted toward naturalism and eventually turned to politically oriented writing.

In 1910 his first important collection, *Ichiaku no suna* (*A Handful of Sand,* 1934), appeared. The 551 poems were written in the traditional tanka form but were expressed in vivid, untraditional language. The tanka acquired with Takuboku an intellectual, often cynical, content, though he is also noted for the deeply personal tone of his poetry.

In Tokyo he earned his living as a proofreader and poetry editor of the *Asahi* newspaper, enduring financial hardship occasioned partly by his own improvidence. His life during this period is unforgettably described in his diaries, particularly *Rōmaji nikki* (first published in full in 1954; partial trans., *The Romaji Diary,* 1956). In this diary, which he wrote in Roman letters so that his wife could not read it, Takuboku recorded with overpowering honesty his complex emotional and intellectual life.

He also published fiction; but, despite its flashes of brilliance, it fails to match his poetry. A collection of poems in nontraditional forms, *Yobuko no fue* (1912; "The Flute"), shows some influence of anarchistic and socialistic thought. He died of chronic illness complicated by malnutrition, leaving the posthumous collection *Kanashiki gangu* (1912; *A Sad Toy,* 1962).

Ishikawajima-Harima Heavy Industries Company, Ltd., Japanese ISHIKAWAJIMA-HARIMA JŪKŌGYŌ KK, major Japanese manufacturer of heavy machinery and oceangoing ships. Headquarters are in Tokyo.

The company was founded by the Mito branch of the Tokugawa family in 1853 as a shipbuilding yard in Edo (modern Tokyo); it was incorporated in 1889. The Harima Dock (later Harima Shipbuilding and Engineering) was established in 1907 in Kōbe. The merger of the two shipyards in 1960 resulted in the present company. Ishikawajima-Harima pioneered in the development of tankers to transport liquid natural gas, and the company remains in the forefront of ship design for the energy industry. One of its largest projects was the construction of a floating pulp factory, designed to process pulpwood.

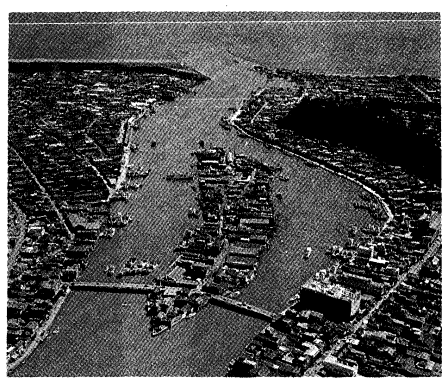
Aggressive merger tactics have helped bring the company to its present status as one of Japan's major corporations, and acquisition of a number of varied companies in the 1960s has diversified the scope of the firm beyond shipbuilding. The company and its subsidiaries also produce marine and aircraft engines, chemical products, iron and steel manufacturing equipment, and material-handling machinery.

The company operates on a global scale, with offices throughout North and South America, Europe, and the Far East. Export revenues account for approximately half of the company's annual sales.

Ishim River, Russian REKA ISHIM, also spelled IŠIM, Kazakh Soviet Socialist Republic and Tyumen and Omsk *oblasti* (administrative regions), Russian Soviet Federated Socialist Republic. A left-bank tributary of the Irtysh, it rises in the Niyaz Hills in the north of the Kazakh Uplands, flows west through Tselinograd, and then north through Petropavlovsk and the flat Ishim Steppe before entering the Irtysh at Ust-Ishim. Its total length is 1,522 mi (2,450 km), and it drains an area of 55,600 sq mi (144,000 sq km). Mainly snow fed, it overflows its banks in spring and becomes shallow in summer. There is some navigation. From the Sergeyevka Reservoir southwest of Petropavlovsk large water mains carry water 2,175 mi to farm settlements in Severo-Kazakhstan, Kokchetav, and Kustanay *oblasti.*

Ishimbay, also spelled IŠIMBAJ, or ISHIMBAI, city, Bashkir Autonomous Soviet Socialist Republic, western Russian S.F.S.R., on the Belaya (White) River. It was the earliest centre of the oil industry in the Volga–Urals oil field, first mined in 1932, and of the first refinery started in 1936. Deposits have been depleted, but the city now is part of the Sterlitamak–Ishimbay–Salavat petrochemical complex, one of the most important in the U.S.S.R. Pop. (1983 est.) 61,000.

Ishinomaki, city, Miyagi Prefecture (*ken*), Honshu, Japan, on the estuary of the Kitakami-gawa (Kitakami River). The city was founded in the 4th century and was a prosperous rice-shipping port during the Tokugawa era (1603–1867). The opening of the Tohoku Line (railway) in the late 19th century caused a decline in river traffic, but the port revived as a major deep-sea fishing (skipper and tuna) centre. Oysters and seaweed are cultivated along the coast. Ishinomaki's industry produces processed marine products, whaling harpoons, and pulp. Fruit and vegetables are grown on reclaimed land in the city's western sector. Ishinomaki serves as a distribution centre for both the Pacific coast and inland areas of the Tohoku region (*chihō*). Efforts have been made to protect the city from tidal



Ishinomaki port at the mouth of the Kitakami River, Japan
Kokunai Jigyo Kouku

waves by building breakwaters and cement walls. Pop. (1983 est.) 123,034.

Ishkur, in Mesopotamian religion, Sumerian god of the rain and thunderstorms of spring. He was the city god of Bit Khakhuru (perhaps to be identified with modern al-Jidr) in the central grasslands region.

Ishkur closely resembled Ninhar (Ningubla) and as such was imagined in the form of a great bull and the son of Nanna (Akkadian Sin), the moon god. When he is portrayed in human shape, he often holds his symbol, the lightning fork. Ishkur's wife was the goddess Shala. In his role as god of rain and thunder, Ishkur corresponded to the other Sumerian deities Asalluhe and Ninurta. He was identified by the Akkadians with their god of thunderstorms, Adad (*q.v.*).

Ishmael ben Elisha (fl. 2nd century AD), Jewish tanna (Talmudic teacher) and sage who left an enduring imprint on Talmudic literature and on Judaism. He is generally referred to simply as Rabbi Ishmael.

As a young child, Ishmael, whose parentage is not known but who traced his lineage through a high priest, was taken captive and transported to Rome when the second Temple was destroyed at Jerusalem. He was ransomed from Rome by the older tanna and sage, Rabbi Joshua (Joshua ben Hananiah), on one of the latter's trips there. Ishmael was taught by Rabbi Joshua, who reputedly had seen in him, even as a captive, great promise as a teacher of the Jews. He lived and taught in southern Palestine. He was a close colleague of Rabbi Akiba (Akiba ben Joseph), who also had studied under Rabbi Joshua. Ishmael used set, rational rules and a simple, literal approach to Biblical exposition, and he occasionally upbraided Akiba for the latter's excessive interpretations of superficial Biblical words or phrases. As tanna he was held in affection for his human approach; one of his dicta was, "Receive all men joyfully." He is remembered for his flexible approach to Judaic practice, and he interpreted the Law so as to mitigate rather than introduce hardship.

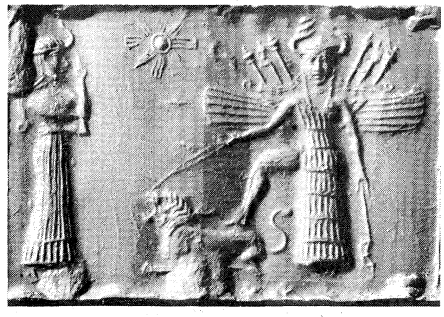
Ishmael founded a Talmudic school, known simply as "the house of Ishmael," that is credited with the Midrash, or commentary, on the book of Exodus, the *Mekhilta* (Measure), and the *Sifre* (a form of commentary) on Numbers and part of the *Sifre* on Deuteronomy. Ishmael himself refined the exegetical principles known as the Seven Rules of Hillel and amplified them to thirteen in number.

The literature of the tanna period dealing with mysticism mentions Ishmael, and a number of mystical works are attributed to him, including several of the type known as *ma'ase bereshit* ("work of creation") and several in the genre of *ma'ase Merkava* ("work of the chariot," a reference to the divine chariot seen by the prophet in Ezekiel I). *Ma'ase bereshit* dealt with mystical cosmology and cosmogony, while *ma'ase Merkava* was the basic element of Jewish mysticism of the era. Ishmael is best remembered, however, for his work as tanna and exegete of the Torah.

Ishpeming, city, Marquette County, northwestern Upper Peninsula of Michigan, U.S., in the Marquette Iron Range, 12 mi (19 km) southwest of Marquette. Founded in 1844 as a centre for iron-mining activities, its name is Indian for "high grounds." Since the 1880s Ishpeming has been a popular ski resort. The mining of iron ore, the manufacture of explosives, lumbering, marble quarrying, and winter sports are economically important. The National Ski Hall of Fame and Museum is in Ishpeming, and an international ski tournament is held annually. Nearby are Van Riper State Park and Mud Lake, where Lewis H. Morgan collected data for his book, *The American Beaver and Its Works* (1868). Inc. village, 1871; city, 1873. Pop. (1980) 7,538.

Ishrāq, Shaykh al-: *see* Suhrawardī, as-.

Ishtar (Akkadian), Sumerian INANNA, in Mesopotamian religion, goddess of war and sexual love. Ishtar is the Akkadian counterpart of the West Semitic goddess Astarte. Inanna, an important goddess in the Sumerian pantheon, came to be identified with Ishtar, but it is uncertain whether Inanna is also of Semitic origin or whether, as is more likely, her similarity to Ishtar caused the two to be identified. In the figure of Inanna several traditions seem to have been combined: she is sometimes the daughter of the sky god An, sometimes his wife; in other myths she is the daughter of Nanna, god of the moon, or of the wind, Enlil. In her earliest manifestations she was associated with the storehouse and thus personified as the goddess of dates, wool, meat, and grain; the storehouse gates were her emblem. She was also the goddess of rain and thunderstorms—leading to her association with An, the sky god—and was often pictured with the lion, whose roar resembled thunder. The power attributed to her in war may have arisen from her connection with storms. Inanna was also a fertility figure, and, as goddess of the storehouse and the bride of the god Dumuzi-Amaushumgalana, who represented the growth and fecundity of the date palm, she was characterized as young, beautiful, and impulsive—never as helpmate or mother. She is sometimes referred to as the Lady of the Date Clusters.



Ishtar, with her cult-animal the lion, and a worshipper, modern impression from a cylinder seal, *c.* 2300 BC; in the Oriental Institute, University of Chicago

By courtesy of the Oriental Institute, University of Chicago

Ishtar's primary legacy from the Sumerian tradition is the role of fertility figure; she evolved, however, into a more complex character, surrounded in myth by death and disaster, a goddess of contradictory connotations and forces: fire and fire-quenching, rejoicing and tears, fair play and enmity. The Akkadian Ishtar is also, to a greater extent, an astral deity, associated with the planet Venus: with Shamash, sun god, and Sin, moon god, she forms a secondary astral triad. In this manifestation her symbol is a star with 6, 8, or 16 rays within a circle. As goddess of Venus, delighting in bodily love, Ishtar was the protectress of prostitutes and the patroness of the alehouse. Part of her cult worship probably included temple prostitution, and her cult centre, Erech, was a city filled with courtesans and harlots. Her popularity was universal in the ancient Middle East, and in many centres of worship she probably subsumed numerous local goddesses. In later myth she was known as Queen of the Universe, taking on the powers of An, Enlil, and Enki.

Ishtar Gate, enormous burnt-brick entryway located over the main thoroughfare in the ancient city of Babylon (now in Iraq). It was built in about 575 BC, the eighth fortified gate in the city. The Ishtar gate structure was more than 38 feet (12 metres) high and was decorated with glazed brick reliefs, in tiers, of dragons and young bulls. The gate itself was a double one, and on its south side was a vast antechamber. Through the gatehouse ran a stone- and brick-paved avenue, the so-called Processional Way, that has been traced over a length of more than half a mile.

The sides of the street were decorated with brick lions passant. It has been estimated that there were 120 lions along the street and 575 dragons and bulls, in 13 rows, on the gate. Not all of these reliefs were visible at the same time, however, for the level of the street was raised more than once; and originally even the lowest rows, which were irregularly laid, may have been treated as foundation deposits. The Iraq antiquities department reconstructed the thoroughfare at one of the higher levels.

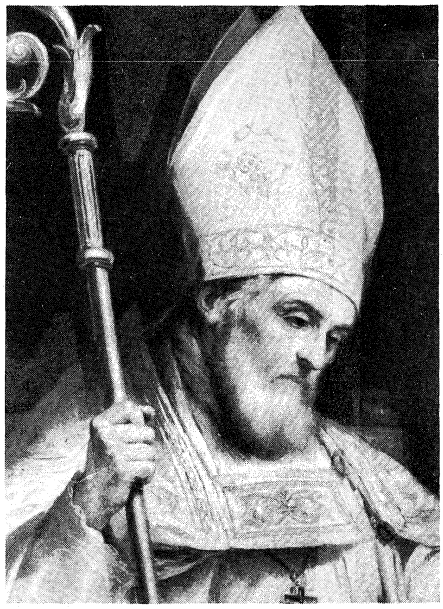
Ishtumegu (king of Media): *see* Astyages.

Isidore OF KIEV (b. *c.* 1385, southern Greece—d. April 27, 1463, Rome), Greek Orthodox patriarch of Russia, Roman cardinal, Humanist, and theologian who strove for reunion of Greek and Latin Christendom but was forced into exile because of concerted opposition, particularly from the Byzantine and Russian Orthodox churches, and by the fall of Constantinople to the Ottoman Turks in 1453.

Abbot of St. Demetrius monastery in Constantinople and recognized for his cultured rhetoric, Isidore was sent abroad as envoy of the Byzantine emperor John VIII Palaeologus to arrange for a council to unite the Eastern and Western churches. Unsuccessful, he returned to Constantinople and in 1436 was named patriarch of Kiev and of all Russia; his mission was to convince the Russian grandduke Vasily II to participate in the movement for reunion set by Pope Eugenius IV as the agenda for the general Council of Ferrara-Florence (Italy). Failing to gain Vasily II's support, Isidore attended the council, first in Ferrara (1438), then in Florence (1439), at which he was one of six Greek spokesmen. Together with the Greek cardinal John Bessarion, he drew up the document of unification that was proclaimed on July 5, 1439; soon after, he was made a Roman cardinal, thenceforth referred to as "the Ruthenian (Ukrainian Roman Catholic) cardinal." Commissioned papal legate by Eugenius IV, Isidore successfully implemented the decree of union at Kiev, but, by energetically attempting to introduce it in Moscow, he encountered the hostility of Vasily II and the Russian Church. He was convicted by an ecclesiastical court of apostasy to the Orthodox faith and imprisoned but escaped on Easter 1444 and received sanctuary from King Ladislas of Hungary-Poland. From Siena, Isidore was dispatched by Pope Nicholas V to Constantinople and in December 1452, on the eve of the city's fall to the Turks, solemnly announced to the hard-pressed Byzantines in the basilica of Hagia Sophia ("Holy Wisdom") the union of the Greek and Latin churches. Although the court and hierarchy were agreeable, the people rejected relations with the papacy. Isidore and his staff then joined in the futile defense of Constantinople. Wounded, he escaped capture by fleeing to Crete. Returning to Rome in 1454, he wrote of the traumatic experience of Constantinople's collapse in his *Epistula lugubris* ("The Mournful Letter"). After resigning his other ecclesiastical offices in 1459, he received the honorary title Greek Patriarch of Constantinople from Pope Pius II, at whose election he assisted.

Isidore OF SEVILLE, SAINT, Latin ISIDORUS HISPALENSIS (b. *c.* 560, Cartagena or Seville, Spain—d. April 4, 636, Seville; canonized 1598; feast day April 4), theologian, last of the Western Latin Fathers, archbishop, and encyclopaedist, whose *Etymologies,* an encyclopaedia of human and divine subjects, was

one of the chief landmarks in glossography and was for many centuries one of the most important reference books.



St. Isidore, detail of a mural; in Seville Cathedral
Archivo Mas, Barcelona

Isidore succeeded his brother St. Leander as archbishop of Seville *c.* 600, during a time when the Spanish Church witnessed numerous councils, one of the greatest being the fourth Council of Toledo (633). Isidore headed this council, which, among other politico-religious matters, decreed union between church and state, toleration of Jews, and uniformity in the Spanish Mass. He successfully continued Leander's conversion of the Visigoths from Arianism (the heretical doctrine teaching that the Son was neither equal with God the Father nor eternal) to orthodox Christianity.

Outstanding among Isidore's extraordinary literary production was his *Etymologies,* which, in 20 sections, compiled for posterity much that he had extracted from works of previous encyclopaedists, specialists, and various Latin writers; the etymological part (Book X) became a great mine for later glossographers. Isidore's principal sources are Servius (the 5th-century Latin grammarian and teacher), the Fathers of the Church, and Aelius Donatus (the 4th-century rhetorician and commentator). The *Etymologies,* which became one of the most studied works during the Dark and Middle Ages, treats the seven liberal arts by applying them to general, comprehensive knowledge—such as anthropology, cosmology, architecture, history, and agriculture.

Isidore's other special treatises included linguistic studies (*Differentiarum libri,* or "Books of Differences"), works on natural science and cosmology (*De natura rerum,* or "On the Nature of Things," and *De ordine creaturarum,* or "On the Order of Creatures"), and on history (including a re-elaboration and continuation of St. Jerome's history under the title of *Chronica majora,* or "Greater Chronicles"). His theological works include *De ortu et obitu patrum* ("On the Origin and Death of the Fathers"), biographies of 86 biblical persons; *Sententiarum libri tres* ("Three Books of Sentences"), a handbook of morals and theology in the form of collected sentences, mainly based on St. Augustine of Hippo's works and on Pope St. Gregory I the Great's *Moralia in Job* ("Morals in Job"); *De officiis ecclesiasticis* ("On Church Duties"), a liturgical work dealing with offices and clerical members; and *Synonima* ("Synonyms"), a spiritual meditation.

It is uncertain whether Isidore produced the original edition of the *Hispana collectio,* the canon law of the Spanish Church sometimes known as the *Collectio canonum Isidoriana* ("The Collection of the Canons of Isidore"); a mid-9th century enlarged edition of the *Hispana,* falsely attributed to Isidore, is now called the Pseudo-Isidorian Decretals. He was canonized by Pope Clement VIII in 1598. Pope Innocent XIII formally declared him a doctor of the church in 1722.

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Išim River (Kazakh S.S.R.): *see* Ishim River.

Išimbaj (Russian S.F.S.R.): *see* Ishimbay.

Isin, ancient Mesopotamian city, probably the origin of a large mound near ad-Dīwānīyah, in al-Qādisīyah *muḥāfaẓah* (governorate), Iraq. An independent dynasty was established there *c.* 2017 BC by Ishbi-Erra, "the man of Mari." He founded a line of Amorite rulers of whom the first five claimed authority over the city of Ur to the south. The fifth of the rulers of Isin, Lipit-Ishtar (reigned 1934–24 BC), is famous as having published a series of laws in the Sumerian language anticipating the code of Hammurabi by more than a century. About 1794 Isin lost its independence, first to the neighbouring city of Larsa and later to Babylon. The city revived between *c.* 1156 and 1025 under its 2nd dynasty, a number of whose kings exercised authority over Babylonia (southern Iraq).

isinglass, thin sheets of mica, particularly of muscovite (*q.v.*).

Isis, Egyptian ASET, or ESET, one of the most important goddesses of ancient Egypt. Her name is the Greek form of the ancient Egyptian hieroglyph meaning "throne." Because "throne" was feminine in gender, its personification was a woman, the mother of the king. The royal throne was, in effect, the creator of the king.



Isis with Horus, bronze figurine of the Late Period; in the Ägyptisches Museum, Berlin
By courtesy of the Staatliche Museen Preussischer Kulturbesitz, Berlin

Little is known of Isis' early cult, and even in the Pyramid Texts (*c.* 2375–*c.* 2200 BC) she is rarely mentioned except as the mourner for her murdered husband, the god Osiris (*q.v.*). Legends about her suggest that she was originally an independent deity. In her role as the wife of Osiris, she was the principal actor, but only after his death: she discovered and reunited the pieces of her dead husband's body, was the chief mourner at his funeral, and through her power brought him back to life.

Isis traditionally hid her son, Horus, from Seth, the murderer of Osiris, until Horus was fully grown and could avenge his father. But because Isis was also Seth's sister, she wavered during the eventual battle between Horus and Seth, and some traditions record that Isis pitied Seth and was beheaded by Horus during their struggle. Both official theology and popular belief, however, proclaimed Isis and Horus the perfect mother and son. The shelter she afforded her child gave her the character of a goddess of protection. Her chief aspect, however, was that of a great enchantress, whose power transcended that of all other deities. She was invoked on behalf of the sick, for even Anubis, the god of death, was subject to her. Together with the goddesses Nephthys, Neith, and Selket, Isis protected the dead in particular. As a primary and mother goddess, she became connected with various other goddesses who possessed similar functions, and thus her nature became increasingly diverse. Because of the close connections between Horus and the goddess Hathor (her name means "the house of Horus"), she and Isis also became similar in many respects. In the astral interpretation of the gods, Isis was equated with the dog star Sothis (Sirius).

Isis was represented as a woman with the hieroglyphic sign of the throne on her head, either sitting on a throne, alone or holding the child Horus, or kneeling before a coffin. Her cult seemed to show that her dealings were with human beings rather than with crops: as mourner she was a principal deity in all rites connected with the dead; as enchantress, she cured the sick and brought the dead to life; and as mother, she was herself a life-giver.

The cult of Isis probably began in Lower Egypt and spread throughout the whole country. In Akhmīm she received special attention as the "mother" of the fertility god Min. She had important temples throughout Egypt, and her cult later spread to Nubia. Several temples were dedicated to her in Alexandria, where she became the "patroness of seafarers." From Alexandria her cult was brought to all the shores of the Mediterranean, including Greece and Rome. In Hellenistic times the widespread mysteries of Isis and Osiris developed, the essence of which was similar to the famous Eleusinian Mysteries of Greece.

Iskandar Muda (b. 1590—d. Dec. 27, 1636), sultan of Acheh (Atjeh) in northern Sumatra, under whom the region achieved its greatest territorial expansion and an international reputation as a centre of trade and of Islāmic learning.

When Iskandar Muda began his reign in 1607, he immediately undertook a series of naval actions that won for him effective control over the northwestern portion of the Indonesian archipelago. His overlordship included all major ports on the west coast of Sumatra and much of the east coast, as well as Kedah, Perak (with its tin), and Pahang on the Malay Peninsula. He seriously threatened the Portuguese position in Malacca, but an alliance of smaller powers including Portuguese Malacca, Johore, and Patani (now part of Thailand) built a fleet that crushed Acheh in a naval battle near Malacca in 1629. The economic basis of Acheh's position was the spice trade, and these conflicts grew out of Acheh's attempt to consolidate a monopoly over the pepper trade.

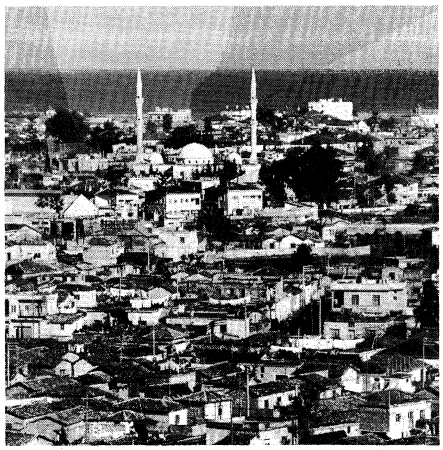
During the reign of Iskandar Muda eminent Islāmic writers such as the Ṣūfī mystics Hamzah Fansuri and Sjamsuddin dari Pasai, as well as their enemy Nūr ud-Dīn ibn Ali ar-Rānīri, made Acheh an important centre of scholarship. In addition, Iskandar Muda's system of law and administration served as a model for other Islāmic states of the archipelago. After the Sultan's death, however, Acheh's fortunes declined with the military defeat suffered in 1629, the increasingly aggressive Dutch presence in the area, particularly after their capture of Malacca in 1641, and Acheh's failure to produce another outstanding leader.

Iskandarīyah, al-: *see* Alexandria.

Iskandarīyah, al-, *muḥāfaẓah* (governorate), Lower Egypt. The *muḥāfaẓah* is densely settled in the north in and around its capital, Alexandria (Arabic al-Iskandarīyah); it includes a desert hinterland extending south more than 50 mi (80 km) into the Western Desert. Its area is 1,034 sq mi (2,679 sq km). Alexandria, in the northeastern "panhandle" of the *muḥāfaẓah,* is built on a strip between the Mediterranean and Buḥayrat Maryūṭ, the classical Lake Mareotis, and juts northward into the Mediterranean on an artificial T-shaped promontory, creating two harbours. Ongoing land reclamation has brought about 190,000 ac (77,000 ha) into agricultural production. There are natural gas wells at Abū Qīr, on a natural promontory just northeast of the city. The Alexandria urban area has numerous industries and port and land transportation facilities. At Abū Qīr are the extensive remains of the ancient Egyptian centre of Pe-Gewat, known in Hellenistic times as Canopus. A pleasure resort in Ptolemaic times, it had an important temple of the god Sarapis; the temple was destroyed in the 4th century AD. Pop. (1983 est.) 2,708,000.

Iskele (Cyprus): *see* Larnaca.

İskenderun, formerly ALEXANDRETTA, seaport and chief city of İskenderun *ilçe* (district), Hatay *il* (province), southern Turkey, on the eastern shore of the Gulf of Iskenderun. It lies on or near the site of Alexandria ad Issum, founded to commemorate Alexander the Great's victory over Darius III at Issus (333 BC). The port was an outlet for the medieval and early modern overland trade from Iran, India, and eastern Asia, before the development of alternate shipping routes around the Cape of Good Hope and later through the Suez Canal. Traditionally it was the port for the Ottoman province of Aleppo, now in Syria, and in 1918–37 it served as the capital of the autonomous *sancak* (subdivision of an Ottoman province) of Alexandretta under French mandate.



İskenderun, Tur., with the Gulf of Iskenderun in the background

Farrell Grehan—Photo Researchers

After the return of the district (renamed Hatay) to Turkey (1939), İskenderun was replaced by Antioch (Antakya) as provincial capital but grew rapidly through improvement in its port facilities, its choice as a military centre and Turkish naval base on the Mediterranean, the establishment of industries (chiefly fertilizer and steel), and the construction of the oil pipeline from Raman Dağı. By 1955 it had surpassed Antioch in population.

Lying on an alluvial plain below the Nur Dağları (mountains), modern İskenderun has fine buildings and avenues and is well served by highways and a railway linking it with other Turkish towns. It is also linked by air with Adana, Ankara, and Istanbul. Pop. (1980) city, 124,824; *ilçe,* 209,815.

Iskowitz, Edward Israel (U.S. entertainer): *see* Cantor, Eddie.

Iskŭr River, also spelled ISKER, or ISKAR, Latin OESCUS, longest river in Bulgaria, formed south of Samokov in the Rila Mountains by its headstreams, the Beli (White) Iskŭr and Cherni (Black) Iskŭr. It cuts a 40-mi (65-km) gorge through the Balkan Mountains to bring the high basin of Sofia (1,800 ft [550 m]) into communication with the Danube tableland. The river empties into the Danube about 20 mi west of Nikopol after a course of 250 mi. Along its lower course, southeast of Sofia, is a chain of small hydro stations associated with the Iskŭr Reservoir. The Malŭk Iskŭr and Panega are tributaries.

Consult the INDEX *first*

Isla, José Francisco de, in full JOSÉ FRANCISCO DE ISLA DE LA TORRE Y ROJO, byname EL PADRE ISLA (b. March 24, 1703, Vidanes, Spain—d. Nov. 2, 1781, Bologna, Papal States), Spanish satirist and preacher noted for his novel known as *Fray Gerundio.*

Isla showed intellectual promise early and entered the Jesuit order as a novice in 1719, studying at the University of Salamanca. He was named professor of sacred literature in 1727 and taught this subject in various Spanish schools until 1754, when he retired to Villagarcía to begin work on his masterpiece, *Historia del famoso predicador Fray Gerundio de Campazas, alias Zotes* (1758; *History of the Famous Preacher Friar Gerundio of Campazas, alias Zotes*). This work is a brilliant satire on the vain and tastelessly bombastic preaching that predominated in Spanish churches. The book provoked a controversy that ended with its being banned by the Inquisition in 1760. Exiled from Spain with the general expulsion of the Jesuits in 1767, Father Isla went to live temporarily in Corsica and finally in Bologna. Among his other works is a masterly Spanish translation of *Gil Blas* by the French novelist Lesage.

Islām, a world religion founded by the Arabian apostle, or prophet, Muḥammad in the 7th century AD and emphasizing an uncompromising monotheism and a strict adherence to certain religious practices. Although there have been many sects and movements within the religion, and although there are striking cultural and religious differences among the regions of the Islāmic world, all followers of Islām are bound by a common faith and a sense of belonging to a single community.

Islam is treated in a number of articles in the MACROPAEDIA. For full treatment of the religion, *see* Islām, Muḥammad and the Religion of. For full coverage of Islāmic arts, *see* Islāmic Arts. For a broad discussion of the prehistory and history of the Muslim community, *see* Islāmic World, The.

The word *islām* is used repeatedly in the Qur'ān, the Islāmic scripture, in the sense of "surrender to the will of Allāh (God)." For Muslims, as adherents of Islām are called, the Qur'ān is the Word of God, confirming and consummating earlier revealed books and thereby replacing them. The Word's instrument or agent of revelation is the Prophet Muḥammad, the last and most perfect of a series of messengers of God to mankind—from Adam through Abraham to Moses and Jesus, the Christian claims for whose divinity are strongly rejected. Although Muḥammad is only a human creature of God, he has nevertheless an unequaled importance in the Qur'ān itself, which sets him next only to God as deserving of moral and legal obedience. Hence, his sayings and deeds (*sunnah*) served as a second basis, besides the Qur'ān, of the belief and practice of Islām.

The Qur'ānic theology is rigorously monotheistic: God is absolutely unique, omnipotent, omniscient, and merciful. Men are exhorted to obey his will (*i.e.,* to be Muslim), and special responsibility is laid on man. The Muslim creed consists of five articles of faith: (1) belief in one God; (2) in angels; (3) in the revealed books; (4) in the prophets; and (5) in the Day of Judgment. To these was added, during the early development of the dogma, the belief in God's predetermination of good and evil. The profession of the faith (*shahāda*) is: "There is no God but God, and Muḥammad is the prophet of God."

All Muslims are enjoined to practice the Five Pillars of Islām: (1) to recite the profession of faith at least once in one's lifetime; (2) to observe the five daily public and collective prayers; (3) to pay the *zakāt* ("purification") tax for the support of the poor; (4) to fast from daybreak to sunset during the entirety of the month of Ramaḍān; and (5) to perform if physically and financially possible the *ḥajj,* or pilgrimage to the holy city of Mecca.

The most important and fundamental religious concept of Islām is that of the Sharī'ah (*q.v.*), or the Law, which embraces the total way of life as explicitly or implicitly commanded by God. The Sharī'ah, as formulated by Muslim religious teachers in the 2nd and 3rd centuries of the Muslim era (8th–9th century AD), includes both the doctrine, or belief, and practice, or the law. Historically, the formulation and systemization of the law took place earlier than the crystallization of the formal theology.

Despite the notion of a unified and consolidated community, as taught by the Prophet, violent differences arose among Muslims within a few years after his death. The Khārajīs, for example, responding to what they regarded as the nepotism and misrule of the third caliph (deputy or successor of Muḥammad), interpreted the Qur'ān as enjoining *jihād,* or holy militancy, and thus as justifying the caliph's assassination. The group incessantly resorted to rebellion and, as a result, were virtually wiped out during the first two centuries of Islām.

In the increasing world-consciousness of 8th- and 9th-century Arabia, a powerful movement of rational theology emerged; its representatives, known as the Mu'tazilah (Seceders), held that human reason, independent of revelation, was capable of discovering what is good and what is evil, and viewed God as pure Essence, without eternal attributes. Thus the Qur'an, regarded by other Muslims as the immutable record of God's attribute of speech, was seen by the Mu'tazilah as created in time and not eternal. Mu'tazilism became the state creed of the caliphate in the 9th century, but in the century following, reaction against it culminated in the formulation and general acceptance of what came to be called Sunnī, or "orthodox," theology.

While Sunnī orthodoxy, the central com-

munity of Islām, condemned schisms and branded dissent as heretical, it developed at the same time the opposite trend of accommodation, catholicity, and synthesis. A broad theological platform was adopted that saved the integrity of the community at the expense of moral strictness and doctrinal uniformity.

Shī'ite Islām, the only important surviving sect outside orthodoxy, arose from a purely political conflict in the late 7th century. Gradually, however, the group's political stand acquired a theological content. Probably under Gnostic and old Iranian dualistic influences, Shī'ism developed a doctrine of esoteric knowledge, centred upon the figure of the imam, or exemplary "leader," through whom the truths of the Qur'ān are revealed. Such a doctrine was adopted also by the Ṣūfīs, an ascetic movement that arose, largely within orthodoxy, in reaction to the worldliness of the early Muslim dynasties. Five centuries after the initial spread of Islām under the banner of jihad, the Ṣūfīs inaugurated a much more massive expansion that was mainly responsible for the establishment of the faith in India, Central Asia, Turkey, and sub-Saharan Africa. Muslim traders also contributed significantly to the enlargement of the Muslim world.

Despite the loss of political power during the period of Western colonialism in the 19th and 20th centuries, the concept of the Islāmic community became stronger and helped various Muslim peoples in their struggle to gain political independence and sovereignty in the mid-20th century.

Islam, Nation of, also called AMERICAN MUSLIM MISSION, OR WORLD COMMUNITY OF AL-ISLAM IN THE WEST, OR BLACK MUSLIM MOVEMENT, religious and cultural community that evolved in the 20th century in the United States out of various quasi-religious black nationalist organizations. Prominent among these precursor groups was the Moorish Science Temple, founded in Newark, N.J., in 1913 by Prophet Drew Ali, born Timothy Drew, who posited the Moorish, and thus Muslim, origins of all blacks and advocated a return to Islām as the only means of redemption from racial oppression. The secular Universal Negro Improvement Association, founded in 1914 by Marcus Garvey, also espoused principles later adopted by the black Muslims.

The movement proper was founded by Wallace Fard Muhammad (also called W.D. Fard, or Wali Farad), believed to have been an orthodox Muslim born in Mecca around 1877. He immigrated to the United States in 1930 and established a temple (or mosque) in Detroit a year later.

Most of Fard's initial followers were black migrants from the southern United States who, because of prevailing racial policies and economic conditions, were clustered together in the black ghettos of the great northern industrial cities. They believed Fard to be an incarnation of Allāh who had come to liberate what he called the "Lost-Found Nation of Islam in the West." Fard promised that if they would heed his teachings and learn the truth about themselves, they would overcome their white "slave masters" and be restored to a position of dignity and primacy among the peoples of the world.

The chief developer of the movement was Elijah Muhammad (*q.v.*), who succeeded Fard as leader of what had come to be called the Nation of Islam after the latter's mysterious disappearance in 1934. Shortly thereafter Muhammad founded the movement's second temple in Chicago. The movement spread slowly at first. By the end of World War II American blacks had caught the spirit of protest and black nationalism that was sweeping Africa. The Nation of Islam benefited directly from the pent-up frustrations of the black masses and offered those frustrations a militant, if avowedly nonviolent, expression. Soon there were mosques in all larger cities with sizable black populations.

Under Muhammad's leadership, the Nation of Islam professed the moral and cultural superiority of "black men," who were seen as destined by Allāh to assume cultural and political leadership of the Earth. Blacks were enjoined to give up Christianity, which was regarded as the white man's chief stratagem for the enslavement of nonwhite people. The white race was conceived of as a race of devils whose time to reign was coming to an end. Meanwhile black people were urged to work together to reclaim their fallen (criminals, drug addicts, etc.), learn their true history, strive for economic independence, and prepare for the Battle of Armageddon, the final struggle between good and evil.

During the 1960s the movement achieved national prominence through the personality of Malcolm X, Elijah Muhammad's spokesman, whose forceful articulations of racial pride and Muslim principles made him a cultural hero, especially among black youth. The publication of a book by C. Eric Lincoln entitled *The Black Muslims in America* (1961) established during this period what became the standard, though never official, name for the movement in the public mind. Disagreements among the sect hierarchy eventually led to Malcolm's suspension and to the establishment of a rival group, the Muslim Mosque, Inc., under his leadership. Violent disputes between the two groups were suspected as a contributing factor to Malcolm's assassination in 1965.

A series of changes in the social, intellectual, and spiritual direction and development of the Nation of Islam was effected in the late 1970s under the leadership of Elijah Muhammad's successor, his son Warith Deen (or Wallace D.) Muhammad. During this period all precepts of colour-consciousness, racism, and the deification of Fard were repudiated, and the organization was renamed the American Muslim Mission. In May 1985 W.D. Muhammad announced the dissolution of the American Muslim Mission in order that its members might become a part of the worldwide orthodox Islāmic community. The centralized leadership and organization that had previously characterized the movement thus came to an end, although its network of mosques and their attendant religious, educational, and economic programs continued to function.

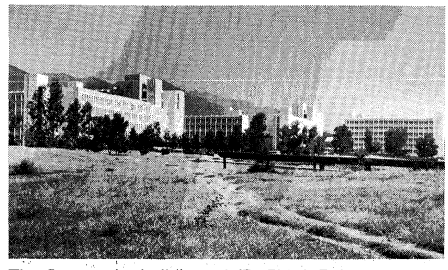
A splinter group based in New York City and under the leadership of Louis Farrakhan retained both the name and the founding principles of the Nation of Islam.

Islām, Pillars of, Arabic ARKĀN AL-ISLĀM, the five duties incumbent on every Muslim: *shahādah* (*q.v.*), the Muslim profession of faith; salat (*q.v.*), or ritual prayer, performed in a prescribed manner five times each day; zakat (*q.v.*), the alms tax levied to benefit the poor and the needy; *ṣawm* (*q.v.*), fasting during the month of Ramaḍān; and hajj (*q.v.*), the major pilgrimage to Mecca.

Islāmābad (Jammu and Kashmir): *see* Anantnāg.

Islāmābād, capital of Pakistan, on the Potwar Plateau, 9 miles (14 km) northeast of Rāwalpindi, the former interim capital.

The city's site was chosen by a commission in 1959 after Karāchi was found unsuitable as the capital. Construction began in 1961 with an effort to blend traditional Islāmic architecture with modern patterns and requirements. Such world-renowned names in town planning and architecture as Konstantínos Doxiádes, Edward Durell Stone, and Gio Ponti have been associated with the city's development. It is a compact city (area 25 square miles [65 square km]), lying at elevations ranging from 1,500 to 2,000 feet (450 to 600 m). The second phase of construction ended with completion of the Secretariat, Pakistan House, President's House, National Assembly



The Secretariat buildings, Islāmābād, Pak.
Frederic Ohringer from the Nancy Palmer Agency—EB Inc.

Building, Grand National Mosque, and housing for government staff. The University of Islāmābād was established in 1965 and the People's Open University (later renamed the Allama Iqbal Open University) in 1974. The war with India in 1971 slowed construction temporarily.

The urban area is divided into eight zones: administrative, diplomatic, residential, institutional, industrial, commercial, a greenbelt, and a national park that includes an Olympic village and gardens and dairy, poultry, and vegetable farms, as well as such institutions as the Atomic Research Institute and the National Health Centre. The name Islāmābād (City of Islām, or City of Peace) was chosen to reflect the country's ideology.

The planned capital area (350 square miles) is an expanse of natural terraces and meadows surrounding the city. A further 1,049 square miles of hinterland, known as the Specified Areas and subject to planning control, is roughly a trapezoid, with the Margala Hills, 3,000–5,000 feet, in the north and northeast. The southern portion is an undulating plain. It is drained by the Kurang River, on which the Rāwal Dam forms a lake holding about 50,000 acre-feet (61,650,000 cubic m) of water. Pop. (1981) city, 204,364; (1983 est.) capital area, 359,000.

Islāmic arts, the literary, performing, and visual arts of the vast populations of the Middle East and elsewhere that adopted the Islāmic faith from the 7th century onward.

A brief treatment of Islāmic arts follows. For full treatment, *see* MACROPAEDIA: Islāmic Arts.

Islāmic visual arts are decorative, colourful, and, in the case of religious art, nonrepresentational. The characteristic Islāmic decoration is known as arabesque. Arabesque is an ornament or style that employs flower, foliage, or fruit motifs and sometimes animal and figural outlines or geometric patterns to produce an intricate design of interlaced, sometimes angular and sometimes curved, lines. This decoration is used on both architecture and objects.

Ceramics, glass, metalwork, textiles, manuscript illustration, and woodwork have been of primary importance in Islāmic culture. Pottery was the most important of the early Islāmic decorative arts. Lustreware, the greatest Islāmic contribution to ceramics, is pottery decorated by applying metallic compounds to the glazes that when fired become iridescent metallic films. Other outstanding objects produced during the period of the caliphates (AD 750 to the mid-11th century) are Egyptian bronzes and carved wood, stuccoes from Iraq, and carved ivories from Spain.

In the Seljuq period (mid-11th to the mid-13th century) pottery, textiles, and glass continued to be important. In addition, utilitarian objects of bronze and brass were inlaid with silver and copper and intricately adorned. Manuscript illustration also became an im-

portant and greatly respected art. Miniature painting was the greatest and most characteristic art of Iran in the period following the Mongol invasions (1220–60).

In Islām the written word is accorded a special status as the medium of divine revelation. Calligraphy therefore developed in many rich and complex ways using a variety of elegant scripts. The calligraphic arts were used not only in manuscripts but also as an important feature of architectural and other decoration.

Islāmic architecture finds its highest expression in the mosque and related religious buildings. Early Islāmic religious architecture, exemplified by the Dome of the Rock (691) in Jerusalem and the Great Mosque (705) in Damascus, drew upon Christian architectural features such as domes, columnar arches, and mosaics but also included large courtyards for congregational prayer. Religious architecture came into its own in the period of the caliphates with the creation of the hypostyle mosque in Iraq and Egypt. A building with the roof resting on rows of columns, its square or rectangular plan was flexible in that it could be increased or decreased by adding or removing columns.

In Seljuq and Ṣafavid Iran a different mosque plan was used that consisted of four *eyvāns* (vaulted halls) opening onto a central courtyard. These brick-built mosques also incorporated domes and decorated squinches. Persian architectural features spread to India where they are found in the Pearl Mosque (1653) and the Tāj Mahal (1645). Ottoman architecture, derived from Islāmic and Byzantine traditions, is exemplified by the Selimiye Mosque (1575) at Edirne, Tur., with its great central dome and slender minarets. One of the greatest examples of secular Islāmic architecture is the Alhambra (13th–14th century) at Granada, Spain.

Islāmic literature is written in four main languages: Arabic, Persian, Turkish, and Urdu. Arabic is of overwhelming importance as the language of the revelation of Islām and of the Qur'ān, which Muslims regard as the epitome of literary excellence.

The basic elements of Arabic poetry, inherited from pre-Islāmic models, are monorhyme (a scheme in which all the lines of a poem have the same end rhyme) and complicated metres (long and short syllables arranged into 16 basic metres). There are three main poetic genres in Arabic poetry. The *ghazal,* usually a love poem, is written in 5 to 12 monorhymed verses. The *qaṣīdah* consists of from 20 to more than 100 monorhymed verses and is used for the expression of formal and elaborate praise.

The Persians used the genres, forms, and rules of Arabic poetry in their own language but elaborated on them. The Persians also developed a new genre, the *maṣnavī,* composed of a series of rhyming couplets, which they employed for epic poetry (a form not known to the Arabs), the most famous example being the *Shāh-nāmeh,* or *Book of Kings,* by Ferdowsi (d. 1020). Persian literature in turn influenced both Urdu and Turkish literature, especially with regard to vocabulary and metres. Turkish literature also has a rich separate tradition of folk poetry.

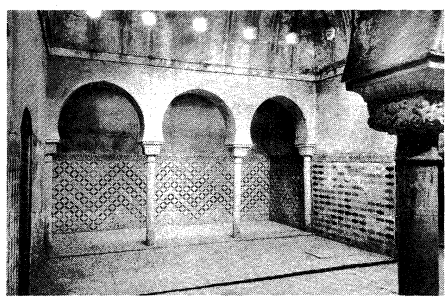
Islāmic literature also includes literary, didactic, and popular prose. The literary form typifying Islāmic prose is the *maqāmah,* in which a relatively simple story is told in an elaborate and complicated manner, with many metaphors and puns and other plays on words. In the realm of popular literature, the best known work is *The Arabian Nights' Entertainment,* a rich collection of fairy tales from different parts of the Muslim world.

Islāmic music is monophonic, devoid of harmony, and characterized by distinctive systems of rhythms and melodies, extensive ornamentation of the single melodic line, and virtuoso improvisation. Rhythms and melodies are organized following certain conventions or modes. Ornamentation of the melody is achieved by the use of microtones—*i.e.,* tones that are not an exact number of half steps apart, such as the three-quarter tone—and the use of both smaller and larger intervals.

Islāmic music is usually performed by a small ensemble—a singer and several instrumentalists who alternate solo vocal and instrumental passages. The melody is carried by the singer or instrumentalist, and rhythm is supplied by a percussion instrument, among which are frame drums, cymbals, and percussion sticks. Wind instruments include the *zornā* (an oboelike instrument), various flutes, a long trumpet, a horn, and double-piped single reed instruments resembling clarinets. The stringed instruments, however, are the most favoured. The best known is the oud (*'ūd*), a short-necked lute having four or five strings. Additionally there are trapezoid shaped instruments: the *santūr,* whose strings are hit with two thin sticks, and the *qānūn,* which is plucked. Other stringed instruments include the violin and bowed lutes such as the *kamān, kamanjā,* and *rabāb.*

Islāmic Association (Indonesian political party): *see* Sarekat Islām.

Islāmic bath, Arabic HAMMĀN, public bathing establishment developed in countries under Islāmic rule that reflects the fusion of a primitive Eastern bath tradition and the elaborate Roman bathing process. A typical bath



Bath in the Alhambra, Granada, Spain
Archivo Mas, Barcelona

house consists of a series of rooms, each varying in temperature according to the height and shape of the domed roof and to the room's distance from the furnace. Each series of rooms is composed of a warm room, a hot room, and a steam room, corresponding roughly to the tepidarium, caldarium, and laconicum of the Roman thermae. In some bath houses, the cold room, or frigidarium, is replaced by a basin of cold water at one end of the warm room. In addition to these vaulted chambers, there are dressing rooms and frequently a luxurious rest area, where refreshments are served after bath and massage. Separate facilities for men and women are provided.

Some Islāmic baths are opulently decorated with mosaic, fountains, and pools. Excellent examples can be seen in the Alhambra in Granada, Spain (1358); the Citadel at Aleppo, Syria (1367); and the Haseki Hürrem Hammān in Istanbul (1556).

Islāmic calendar: *see* Muslim calendar.

Islāmic caste, any of the units of social stratification that developed among Muslims in India and Pakistan as a result of the proximity of Hindu culture. Most of the South Asian Muslims were recruited from the Hindu population; despite the egalitarian tenets of Islām, the Muslim converts persisted in their Hindu social habits. Hindus, in turn, accommodated the Muslim ruling class by giving it a status of its own.

In South Asian Muslim society a distinction is made between the *ashrāf* (Arabic, plural of *shārīf,* "nobleman"), who are supposedly descendants of Muslim Arab immigrants, and the non-*ashrāf,* who are Hindu converts. The *ashrāf* group is further divided into four subgroups: Sayyids (originally a designation of descendants of Muḥammad through his daughter Fāṭimah and son-in-law 'Alī); Shaykhs (Arabic: "chief"; though they claim descent from Arab or Persian immigrants, they are known to include converted Rājputs); Pashtuns (members of Pashto-speaking tribes in Afghanistan and northwestern Pakistan); and Mughals (of Turkish origin, who came into India with the Mughal armies).

The non-*ashrāf* Muslim castes are of three levels of status: at the top, converts from high Hindu castes, mainly Rājputs, insofar as they have not been absorbed into the Shaykh castes; next, the artisan caste groups, such as the Julāhās, originally weavers; and lowest, the converted untouchables, who have continued their old occupations. These converts of Hinduism observe endogamy in a manner close to that of their Hindu counterparts.

Two of the principal indexes of Hindu caste, commensality and endogamy (principles governing eating and marital arrangements), do not appear as strongly in Islāmic castes. Commensality is prohibited between *ashrāf* and non-*ashrāf,* between Muslim and Hindu, and between the various castes of the non-*ashrāf.* The principle of endogamy is altered by the Muslim preference of marriage within very narrow limits (*e.g.,* to the daughter of the father's brother), which in South Asia is known as *biyāhdārī.*

Islāmic Conference, Organization of the, Arabic MUNAẒAMAT AL-MŪ'TAMIR AL-ISLĀMĪ, an Islāmic organization established in Jeddah, Saudi Arabia, in May 1971, following summits by Muslim heads of state and government in 1969 and by Muslim foreign ministers in 1970. Membership extends to more than 40 states, including Afghanistan, Algeria, Bahrain, Bangladesh, Burkina Faso (formerly Upper Volta), Cameroon, Chad, Comoros, Djibouti, Egypt, Gabon, The Gambia, Guinea, Guinea-Bissau, Indonesia, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Malaysia, Maldives, Mali, Mauritania, Morocco, Niger, Oman, Pakistan, Palestine Liberation Organization (PLO), Qatar, Saudi Arabia, Senegal, Somalia, The Sudan, Syria, Tunisia, Turkey, Uganda, United Arab Emirates, Yemen (Aden), and Yemen (San'ā').

The conference aims at promoting Islāmic solidarity by coordinating social, economic, scientific, and cultural activities. Under the banner of strengthening the struggle of Muslims, the conference pledges to eliminate racial segregation and discrimination, especially in regard to the PLO. Projects include the International Islāmic News Agency, the Islāmic Development Bank, the Islāmic Solidarity Fund, and the World Centre for Islāmic Education. Egypt was suspended in 1979 after it signed the agreement known as the Camp David accords with Israel; in 1984 it accepted an offer to rejoin the organization.

Islāmic Development Bank, Arabic AL-BANK AL-ISLĀMĪ LIL-ISTITHMĀR, Muslim bank directed toward financing the economic and social development of members in accordance with the principles of the Sharī'ah (Islāmic sacred law). Conceived by the Organization of the Islāmic Conference in 1973, the bank was headquartered in Jeddah, Saudi Arabia, and formally opened in October 1975. Its member nations are drawn from the ranks of those states belonging to the Organization of the Islāmic Conference.

The Islāmic Development Bank seeks to spur economic and financial growth by participating in equity capital, by investing in economic and social infrastructure projects, and by making loans to the public and private sectors.

Special funds are available for technical assistance to Muslim communities in nonmember countries. (*See* Islāmic Conference, Organization of the.)

Ísland: *see* Iceland.

island, any area of land smaller than a continent and entirely surrounded by water. Islands may occur in oceans, seas, lakes, or rivers. A group of islands is called an archipelago.

Islands may be classified as either continental or oceanic. Oceanic islands are those that rise to the surface from the floors of the ocean basins. Continental islands are simply unsubmerged parts of the continental shelf that are entirely surrounded by water. Many of the larger islands of the world are of the continental type. Greenland (840,000 square miles [2,175,000 square km]), the largest island, is composed of the same materials as the adjacent North American continent, from which it is separated by a shallow and narrow sea. Likewise the world's second largest island, New Guinea (309,000 square miles [800,000 square km]), is part of the Australian continental platform and is separated from it only by the very shallow and narrow Torres Strait. A slight warping of the sea bottom in the vicinity of Torres Strait would be sufficient to join New Guinea to Australia; conversely, a slight rise in sea level may submerge a hilly coast and leave the hilltops remaining as small islands just off shore (such are those off the coast near Boston, Mass., and the islands off the Maine coast).

The islands that rise from the floors of the ocean basins are volcanic. Lava accumulates to enormous thickness until it finally protrudes above the ocean surface. The piles of lava that form Hawaii rise as high as 32,000 feet (9,700 m) above the ocean floor.

Island life exhibits features of special interest. The sea is a barrier to some forms of life but acts as a carrier of others, which, once established in their new home, frequently develop new features in their isolated surroundings. A long-established sea barrier results in marked differences between the animal life and vegetation even of adjacent islands, and from these differences may be deduced the origin of an island. Further, any detailed map of the biological regions of the globe illustrates the importance of islands in the determination of the boundaries of animal-life and vegetational types. For example, to the west of a line (Wallace's Line) running between Bali and Lombok and between Borneo and Celebes, the islands are biologically Asian, but to the east of the line, notwithstanding the narrowness of the Lombok Strait, the vegetation and animal life are Australian. Oceanic islands are usually colonized by only a few animal forms, chiefly seabirds and insects. They are often covered with abundant vegetation, the seeds of which have been carried there, for example, by air and water currents or by birds; but the plant variety is relatively limited.

island arc, long, curved chain of oceanic islands associated with intense volcanic and seismic activity and orogenic (mountain-building) processes. Prime examples of this form of geologic feature include the Aleutian-Alaska Arc and the Kuril-Kamchatka Arc.

A brief treatment of island arcs follows. For full treatment, *see* MACROPAEDIA: Oceans.

Most island arcs consist of two parallel, arcuate rows of islands. The inner row of such a double arc is composed of a string of explosive volcanoes, while the outer row is made up of nonvolcanic islands. In the case of single arcs, many of the constituent islands are volcanically active.

An island arc typically has a land mass or a partially enclosed, unusually shallow sea on its concave side. Along the convex side there almost invariably exists a long, narrow oceanic trench (*q.v.*). The greatest ocean depths are found in these depressions of the seafloor, as in the case of the Mariana and Tonga trenches.

Destructive earthquakes occur frequently at the site of island arcs. Unlike the shallow earthquakes that are recorded in other areas of the world, these are deep-focus seismic events emanating from as much as 370 miles (600 km) below the base of an arc. The quakes tend to have foci of progressively greater depth toward the arc's concave side.

The majority of island arcs occur along the western margin of the Pacific Basin. The few exceptions are the East Indian and the West Indian arcs and the Scotia Arc in the South Atlantic. According to prevailing theory, island arcs are formed where two lithospheric plates (enormous rigid slabs that constitute segments of the Earth's surface) converge. Upon colliding, one of the plates—that bearing heavy, oceanic crust—buckles downward and is forced into the partially molten lower mantle beneath the second plate with lighter, continental crust. An island arc is built up from the surface of the overriding plate by the extrusion of basalts and andesites. The basalts are thought to be derived from the semimolten mantle, whereas the andesites are probably generated by the partial melting of the descending plate and the sediments that have accumulated on its surface.

island stage: *see* theatre-in-the-round.

Islands, Bay of, bay of the South Pacific Ocean and geographic region, northern North Island, New Zealand, formed when the sea flooded an old river valley system. The bay has a shoreline of 500 miles (800 km) and about 150 islands. It opens to the sea through an 11-mile- (18-kilometre-) wide passage flanked by Brett Cape on the east and Wiwiki Cape on the west.

The first European to enter the inlet was Captain James Cook in 1769. Three years later the French explorer Marion du Fresne founded a short-lived settlement on Moturoa Island. In 1814 the Reverend Samuel Marsden established the first permanent European settlement in New Zealand at Rangihoua. A centre for whalers during the 1830s, the bay was the site of the signing of the Treaty of Waitangi in 1840 between Great Britain and native Maoris. The bay is now a resort area. It offers historic sites such as the Waitangi Treaty House, as well as deep-sea fishing, hunting, and scenic beauty. Principal towns are Russell, Paihia, and Kerikeri. Urapukapuka is a tourist centre. A deepwater port of entry for overseas shipping is located at Opua.

islands area, any one of three areas created in Scotland by the administrative reorganization of 1975: Orkney, Shetland, and Western Isles, with a combined land area of 2,149 square miles (5,566 square km). Each islands area's authority combines most regional and district functions but is linked with the Highland region for police and fire services. Pop. (1987 est.) 72,815.

islands of Langerhans (biology): *see* Langerhans, islets of.

Islay, most southerly island of the offshore Atlantic group known as the Inner Hebrides (*q.v.*), in the district of Argyll and Bute, Strathclyde region, Scotland. It is separated from the island of Jura by the Sound of Islay (0.9 miles [1.5 km] wide). The island is 25 miles (40 km) long, with a maximum width of 20 miles (32 km). The westerly district of the Rhinns is almost separated from the remainder by deeply incised sea lochs (inlets). The island is rich and productive, with good salmon and trout fishing, and has been called the "Queen of the Hebrides." It is also known for its distilleries. Pop. (latest est.) 3,855.

Islay, Archibald Campbell, earl of: *see* Argyll, Archibald Campbell, 3rd duke of.

Isle of ———: *see under* substantive word (*e.g.,* Wight, Isle of).

Isle Royale, centre of a wilderness archipelago and the largest island in Lake Superior, northwestern Michigan, U.S. Administered as part of Keweenaw county, it lies 56 miles (90 km) from the Upper Peninsula shore and 20 miles (32 km) from the Canadian shore and is 45 miles (72 km) long and 9 miles (14 km) across at its widest point. Visited by the French explorer Étienne Brûlé in 1622, its early name was Minong (Chippewa Indian for "good high place"); it was renamed by French Jesuit missionaries to honour their royal patrons.

Its streams and inland lakes contain pike, perch, and other game fish. Coniferous and deciduous forests provide an outstanding example of forest transition; many species of wildflowers, ferns, lichens, mosses, and fungi grow undisturbed. Moose and fur-bearing animals are common, and a small population of timber wolves lives on the island. There are more than 200 kinds of birds, including herring gulls and warblers. According to radioactive-carbon tests, prehistoric copper-mining pits date back nearly 4,000 years. A greenstone (chlorastrolite) from Isle Royale was adopted as the state gem in 1972.

Travel is possible only on foot or by canoe. Ferry service from the mainland is available from Houghton and Copper Harbor, or from Grand Portage, Minn. Isle Royale, with its surrounding islets and numerous rocks, was established as a national park in 1931. Pop. (1986 est.) 300.

islets of Langerhans (biology): *see* Langerhans, islets of.

Islington, inner borough of Greater London, with an area of 6 square miles (15 square km). A densely built-up borough, it lies astride the Great North Road (A1). The London–Edinburgh main-line railway approaches King's Cross Station through the borough.

As the City of London spread beyond its northern wall, Finsbury (the southern part of the borough) became residential, with waves of building following the dissolution of the monasteries (1536–39) and the Great Fire of London (1666). Further north, medicinal wells were discovered, and one famous spa gave its name to the Sadler's Wells Theatre built on its site. Gradually, however, the rural pleasure gardens were overtaken by urban growth associated with new roads (New North Road, 1812), the Regent's Canal (started 1812), and North London Railway (1850). Many of the squares and terraces built in the late 19th century have been rehabilitated by new residents attracted by Islington's proximity to London.

Various light industries are found throughout the borough. Educational institutions include the City University (formerly Northampton College of Advanced Technology) and the Polytechnic of North London. Many famous religious dissenters, including John Bunyan, Daniel Defoe, Isaac Watts, and William Blake are buried at Bunhill Fields, City Road. Pop. (1986 est.) 168,000.

Islwyn: *see* Thomas, William.

Islwyn, district, western Gwent county, southeastern Wales. It was created in 1974 and covers an area of 39 square miles (101 square km). It is bordered by the districts of Torfaen to the east, Rhymney Valley to the west, and Newport to the south. It extends northward along the deep, wooded Ebbw and Sirhowy river valleys to the border of Balenau Gwent district. An Iron Age fort and a medieval castle mound have been discovered north of the town of Risca. Situated on the western edge of the Welsh Marches (border country), the area covered by the district experienced significant

Largest islands of the world

name and *location*	area*	
	sq mi	sq km
Africa		
Madagascar	226,657	587,041
Réunion, *Indian Ocean*	970	2,512
Bioko, *Equatorial Guinea*	779	2,017
America, North		
Greenland	840,000	2,175,000
Baffin, *Northwest Territories*	195,928	507,451
Victoria, *Northwest Territories*	83,896	217,290
Ellesmere, *Northwest Territories*	75,767	196,236
Newfoundland, *Canada*	42,031	108,860
Cuba	40,543	105,007
Hispaniola, *Haiti–Dominican Republic*	29,418	76,192
Banks, *Northwest Territories*	27,038	70,028
Devon, *Northwest Territories*	21,331	55,247
Axel Heiberg, *Northwest Territories*	16,671	43,178
Melville, *Northwest Territories*	16,274	42,149
Southampton, *Northwest Territories*	15,913	41,214
Prince of Wales, *Northwest Territories*	12,872	33,338
Vancouver, *British Columbia*	12,079	31,284
Somerset, *Northwest Territories*	9,570	24,786
Bathurst, *Northwest Territories*	6,194	16,042
Prince Patrick, *Northwest Territories*	6,119	15,848
King William, *Northwest Territories*	5,062	13,111
Ellef Ringnes, *Northwest Territories*	4,361	11,295
Bylot, *Northwest Territories*	4,273	11,067
Jamaica	4,244	10,991
Cape Breton, *Nova Scotia*	3,981	10,311
Prince Charles, *Northwest Territories*	3,676	9,521
Kodiak, *Alaska*	3,588	9,293
Puerto Rico	3,435	8,897
Disko, *Greenland*	3,312	8,578
Anticosti, *Quebec*	3,066	7,941
Prince of Wales, *Alaska*	2,731	7,073
Cornwallis, *Northwest Territories*	2,701	6,996
Graham, *British Columbia*	2,456	6,361
Andros, *The Bahamas*	2,300	5,957
Prince Edward, *Canada*	2,184	5,657
Coats, *Northwest Territories*	2,123	5,499
Chichagof, *Alaska*	2,062	5,340
Amund Ringnes, *Northwest Territories*	2,029	5,255
Mackenzie King, *Northwest Territories*	1,949	5,048
Trinidad	1,864	4,828
St. Lawrence, *Alaska*	1,780	4,610
Stefansson, *Northwest Territories*	1,723	4,463
Long Island, *New York*	1,723	4,463
Admiralty, *Alaska*	1,709	4,426
Baranof, *Alaska*	1,636	4,237
Nunivak, *Alaska*	1,600	4,144
Unimak, *Alaska*	1,600	4,144
Milne Land, *Greenland*	1,400	3,700
Trail, *Greenland*	1,300	3,300
Mansel, *Northwest Territories*	1,228	3,181
Akimiski, *Northwest Territories*	1,159	3,002
Revillagigedo, *Alaska*	1,134	2,937
Kupreanof, *Alaska*	1,084	2,808
Borden, *Northwest Territories*	1,079	2,795
Manitoulin, *Lake Huron, Ontario*	1,068	2,766
Unalaska, *Alaska*	1,060	2,760
America, South		
Tierra del Fuego, *Argentina–Chile*	18,530	47,992
Marajó, *Pará, Brazil*	15,500	40,100
Bananal, *Goiás, Brazil*	7,720	20,000
Chiloé, *Chile*	3,241	8,394
East Falkland	2,550	6,605
Wellington, *Chile*	2,549	6,604
Riesco, *Chile*	1,973	5,110
Caviana, *Pará, Brazil*	1,930	5,000
Gurupá, *Pará, Brazil*	1,878	4,864
West Falkland	1,750	4,532
Hoste, *Chile*	1,590	4,117
South Georgia, *Falkland Islands*	1,450	3,756
Santa Inés, *Chile*	1,407	3,645
Antarctica		
Alexander I	16,700	43,200
Roosevelt	2,900	7,500
Kerguelen, *Indian Ocean*	2,239	5,700
Adelaide	1,400	3,600
Bear	1,300	3,500
Asia		
Borneo, *Indonesia–Malaysia–Brunei*	283,400	734,000
Sumatra, *Indonesia*	167,600	434,000
Honshu, *Japan*	89,217	231,072
Celebes, *Indonesia*	69,100	179,000
Java, *Indonesia*	49,000	126,900
Luzon, *Philippines*	40,420	104,688
Mindanao, *Philippines*	36,537	94,630
Hokkaido, *Japan*	32,247	83,519
Sakhalin, *Russian S.F.S.R.*	29,500	76,400
Sri Lanka (Ceylon)	25,332	65,610
Kyushu, *Japan*	16,274	42,149
Taiwan (Formosa)	13,851	35,873
Hai-nan, *Kwangtung, China*	12,962	33,572
Timor, *Indonesia*	11,883	30,777
Shikoku, *Japan*	7,261	18,806
Halmahera, *Indonesia*	6,865	17,780
Seram, *Indonesia*	6,621	17,148
Sumbawa, *Indonesia*	5,965	15,448
Flores, *Indonesia*	5,500	14,250
Oktabrskoy Revolyutsii, *Russian S.F.S.R.*	5,471	14,170
Samar, *Philippines*	5,050	13,080
Negros, *Philippines*	4,905	12,704
Palawan, *Philippines*	4,550	11,785
Kotelny, *Russian S.F.S.R.*	4,504	11,665
Yos Sudarsa, *Indonesia*	4,500	11,600
Panay, *Philippines*	4,446	11,515
Bangka, *Indonesia*	4,375	11,330
Bolshevik, *Russian S.F.S.R.*	4,368	11,312
Sumba, *Indonesia*	4,306	11,153
Mindoro, *Philippines*	3,759	9,736
Buru, *Indonesia*	3,670	9,505
Komsomolets, *Russian S.F.S.R.*	3,477	9,006
Wrangel, *Russian S.F.S.R.*	2,800	7,300
Leyte, *Philippines*	2,785	7,213
Iturup, *Russian S.F.S.R.*	2,596	6,725
Novaya Sibir, *Russian S.F.S.R.*	2,394	6,200
Bali, *Indonesia*	2,147	5,561
Lombok, *Indonesia*	2,098	5,435
Madura, *Indonesia*	2,042	5,290
Faddayevskiy, *Russian S.F.S.R.*	1,930	5,000
Billiton (Belitung), *Indonesia*	1,853	4,800
Nias, *Indonesia*	1,842	4,772
Bolshoy Lyakhovsky, *Russian S.F.S.R.*	1,776	4,600
Cebu, *Philippines*	1,703	4,411
Butung, *Indonesia*	1,620	4,200
Bohol, *Philippines*	1,492	3,864
Wetar, *Indonesia*	1,400	3,600
Socotra, *Yemen (Aden)*	1,400	3,600
Siberut, *Indonesia*	1,400	3,600
Masbate, *Philippines*	1,262	3,269
Waigeo, *Indonesia*	1,200	3,100
Yamdena, *Indonesia*	1,200	3,100
Taliabu, *Indonesia*	1,100	2,900
Europe		
Great Britain	83,698	216,777
Iceland	39,769	103,000
Ireland, *Ireland–U.K.*	32,589	84,406
Severny, *Novaya Zemlya, Russian S.F.S.R.*	18,882	48,904
West Spitsbergen, *Svalbard, Norway*	15,075	39,044
Yuzhny, *Novaya Zemlya, Russian S.F.S.R.*	12,848	33,275
Sicily, *Italy*	9,830	25,460
Sardinia, *Italy*	9,194	23,813
North East Land, *Svalbard, Norway*	5,486	14,210
Cyprus	3,572	9,251
Corsica, *France*	3,352	8,681
Crete, *Greece*	3,190	8,261
Sjaelland (Zealand), *Denmark*	2,713	7,027
Edge, *Svalbard, Norway*	1,942	5,030
Vendsyssel-Thy, *Denmark*	1,809	4,685
Euboea, *Greece*	1,412	3,657
Majorca, *Balearic Islands, Spain*	1,405	3,640
Vaygach, *Russian S.F.S.R.*	1,306	3,383
Kolguyev, *Russian S.F.S.R.*	1,240	3,200
Gotland, *Sweden*	1,212	3,140
Fyn, *Denmark*	1,152	2,984
Zemlya Georga, *Franz Josef Land, Russian S.F.S.R.*	1,120	2,900
Zemlya Aleksandry, *Franz Josef Land, Russian S.F.S.R.*	1,080	2,800
Saaremaa, *Estonian S.S.R.*	1,032	2,674
Oceania		
New Guinea, *Papua New Guinea–Indonesia*	309,000	800,000
South Island, *New Zealand*	58,676	151,971
North Island, *New Zealand*	44,204	114,489
Tasmania, *Australia*	24,868	64,409
New Britain, *Papua New Guinea*	14,100	36,500
New Caledonia, *Papua New Guinea*	6,467	16,750
Hawaii, *Hawaiian Islands*	4,021	10,414
Viti Levu, *Fiji*	4,011	10,388
Bougainville, *Papua New Guinea*	3,880	10,049
New Ireland, *Papua New Guinea*	3,340	8,651
Isabela (Albemarle), *Galápagos Islands, Ecuador*	2,249	5,825
Melville, *Northern Territory, Australia*	2,240	5,800
Vanua Levu, *Fiji*	2,137	5,535
Guadalcanal, *Solomon Islands*	2,047	5,302
Kangaroo, *South Australia*	1,680	4,351
Espíritu Santo, *Vanuatu*	1,420	3,677
Malaita, *Solomon Islands*	1,400	3,600
Santa Isabel, *Solomon Islands*	1,300	3,400
San Cristóbal (Makira), *Solomon Islands*	1,206	3,125

*Conversions for rounded figures are rounded to nearest hundred.

Norman influence in the early 1100s. Industry in the valleys did not undergo significant development until the late 1800s and early 1900s, when numerous coal mines were sunk. Celynen South and Celynen North collieries, located just north of the town of Abercarn, were sunk in 1873 and 1913 respectively, and a coal viaduct, stretching 200 ft (60 m) high and 1,500 ft long between two mountain peaks near Crumlin, was completed in 1857.

Although some of the coal mines were still operating in the second half of the 20th century, the area's dependence on the iron and coal industry has greatly diminished. The district has become well known for offering a wide range of recreational opportunities, as many of the old mining sites have been reclaimed and much of the district is now devoted to parks and open spaces. including the Ebbw forest with its numerous nature trails and scenic drives. A highway and a railroad run up the River Sirhowy valley from Risca through Crumlin, with the highway branching to the northeast at Nebridge. The town of Blackwood is the administrative seat of the district. Pop. (1982 est.) 65,100.

Isly, Thomas-Robert Bugeaud, duc d' (duke of): *see* Bugeaud, Thomas-Robert.

Ismāʿīl, in full ISMĀʿĪL IBN SHARĪF (b. 1645/46—d. March 1727, Meknès, Mor.), second ruler of the ʿAlawī dynasty of Morocco; his long reign (1672–1727) saw the consolidation of ʿAlawī power, the development of an effective army trained in European military techniques, and the introduction of French influence in Morocco.

Virtually nothing is known about Ismāʿīl's youth. In 1672, with the sudden death of his half brother, Mawlāy (Lord) ar-Rashīd, founder of the dynasty, Ismāʿīl, then acting viceroy in Fès, immediately seized the treasury and had himself proclaimed ruler. His claim was challenged by three rivals—a brother, a nephew, and al-Khiḍr Ghīlān, a tribal leader of northern Morocco. These rivals were supported by the Ottoman Turks, acting through Algiers, who hoped to weaken the ʿAlawīs by supporting internal subversion so that they could extend their rule over Morocco. As a result, relations with the Ottoman regent of Algiers were strained throughout Ismāʿīl's reign. The succession war lasted five years. Al-Khiḍr Ghīlān was defeated and killed in September 1673, but Ismāʿīl had greater difficulties with the brother and nephew. He finally included them in the Moroccan power structure by recognizing them as semi-independent governors of important provinces. He completed the internal pacification of Morocco in 1686 with the final defeat and death of his nephew Aḥmad ibn Mahraz.

In 1673 Ismāʿīl created the ʿAbid (Black) al-Bukhārī army known colloquially as *buākhar* and made up of slaves bought from their masters and enlisted into this army together with freeborn blacks. This contingent was provided with women, and the offspring of these unions were entered into special schools and given specialized military training. Toward the end of his reign he had a black army of more than 150,000 men, of whom about 70,000 were kept as a strategic reserve in and around Meknès. His army was equipped with European arms, and his officers learned to combine artillery with infantry effectively. He used these forces against the Ottomans in Algiers in the years 1679, 1682, and 1695/96 in expeditions designed to pacify his frontiers and to punish the regent of Algiers. In the end the Ottomans agreed to respect Moroccan independence.

Ismāʿīl's relations with the European powers were much more complex. He hated the Europeans as infidels, yet needed them as suppliers of arms and other finished products. Throughout his reign there was intermittent warfare with the European settlers of the Moroccan seaports: in 1681 he captured al-Maʿmūrah from the Spanish, and in 1684 he expelled the English from Tangier. In order to challenge Spain for possession of its settlements within Morocco, he became increasingly friendly with Louis XIV of France, the enemy of Spain. France was to reap great commercial benefits from this friendship. French influence became paramount in Morocco; French officers trained Moroccan artillerymen and helped in the building of public works. The palace of Meknès, styled on that of Versailles, was a massive monument to Ismāʿīl's will and determination.

Ismāʿīl was frugal in financial matters. He raised the necessary revenues for his army and his public works by holding a monopoly on foreign trade, and he was not above encouraging piracy. He maintained his authority and religious legitimacy by supporting the notion that he was a direct descendant of the prophet Muḥammad and, thus, had special spiritual gifts, which entitled him to rule. He demanded not only temporal but also spiritual allegiance and recognition from his people.

Ismāʿīl has been criticized for cruelty and capriciousness, but iron rule was necessary for the ʿAlawī dynasty to survive. He was credited with having 700 sons and countless daughters. Upon his death, supreme power became vested in his ʿAbīd troops, who became the arbitrators of the dynastic fortunes. He was succeeded by his son Mawlāy Aḥmad.

Wilfrid Blunt's *Black Sunrise: The Life and Times of Mulai Ismail, Emperor of Morocco 1646–1727* appeared in 1951.

Ismāʿīl I, also spelled ESMĀʿĪL I (b. July 17, 1487, Ardabīl?, Azerbaijan—d. May 23, 1524, Ardabīl, Ṣafavid Iran), shah of Iran (1501–24) and religious leader who founded the Ṣafavid dynasty (first native dynasty to rule the kingdom in 800 years) and converted Iran from the Sunnī to the Shīʿī sect of Islām.

According to tradition, Ismāʿīl was descended from an *īmām.* His father, leader of a Shīʿī group known as the Kizilbash (Red Heads), died in battle against the Sunnīs when Ismāʿīl was only a year old. Fearful that the Sunnīs, the majority sect, would wipe out the entire family, Shīʿī supporters kept family members hidden for a number of years.

Ismāʿīl emerged at the age of 14 to take his father's position as head of the Kizilbash. He quickly established a base of power in northwestern Iran, and in 1501 he took the city of Tabriz and proclaimed himself shah of Iran. In a succession of swift conquests he brought all of modern Iran and portions of present-day Iraq under his rule.

In 1510, Ismāʿīl moved against the Sunnī Uzbek tribes in what is now Soviet Central Asia. By skillful use of ambush Ismāʿīl was able to defeat a 28,000-man Uzbek force with only 17,000 Iranians in a battle near the city of Marv. Muḥammad Shaybānī, leader of the Uzbeks, was killed trying to escape after the battle, and Ismāʿīl had his skull made into a jewelled drinking goblet.

The Shīʿī sect of Islām was proclaimed by Ismāʿīl to be the established religion. The fact that much of the population considered him a Muslim saint as well as shah facilitated the process of conversion. Ismāʿīl's action provoked the Ottoman Turks. Religious friction grew after the Turkish ruler Sultan Selim I executed large numbers of his Shīʿī subjects as heretics and potential spies. He then wrote Ismāʿīl a series of belligerent letters. Ismāʿīl replied that he had no wish for war, adding that he thought the letters had been written under the influence of opium; he also sent Selim's royal secretary a box of the drug. Selim was an opium user, and the gesture hit home.

In 1514 the Ottomans, with highly trained professional troops armed with muskets and artillery, invaded northwest Iran. Ismāʿīl rushed from his campaigns in Central Asia to oppose the threat to his capital at Tabriz. In a hard-fought battle, Selim and a force of 120,000 troops defeated Ismāʿīl and his army of 70,000. Ismāʿīl was wounded and nearly captured as he tried to rally troops. The Ottomans then took Tabriz without opposition; a mutiny among his troops, however, forced Selim to withdraw, giving Ismāʿīl time to recover his strength.

The warfare continued as a series of border skirmishes for a number of years, but Ismāʿīl remained strong enough to prevent further inroads by the Ottomans. In 1517, Ismāʿīl moved northwest, subduing the Sunnī tribes in what is now the Soviet Socialist Republic of Georgia. The basic conflict between the Shīʿī empire Ismāʿīl had founded and the Sunnī Ottomans in the west and the Sunnī Uzbek tribes in the east continued for more than a century. Ismāʿīl died at the age of 36, but the Ṣafavid dynasty ruled Iran for two centuries, until 1722.

Ismāʿīl I ibn Aḥmad, also spelled ESMĀʿĪL EBN AḤMAD (reigned 892–907), one of the Persian Sāmānid dynasty's most famous sovereigns, who was generous, brave, just, and cultivated. Originally governor of Transoxiana at the age of 21, he extended his domains throughout Ṭabaristān and Khorāsān and, though nominally under the caliph of Baghdad, established independent rule throughout eastern Persia with his capital at Bukhara.

Ismail bin Dato' Abdul Rahman, Tun (b. Nov. 4, 1915, Johore Baharu, Straits Settlements—d. Aug. 2, 1973, Kuala Lumpur, Malaysia), Malay politician who held several ministerial portfolios.

Tun Ismail, a medical doctor trained in Singapore and Melbourne, entered Malaysian politics in 1951 when he was elected vice-president of the United Malays National Organisation, the dominant Malay political party. An active participant in the negotiations that led, in 1957, to the independence of Malaya, he served in various government offices during the last days of colonial rule before being sent as his country's first ambassador to the United States and representative to the United Nations, from 1957 to 1959.

Returning to Malaya, Tun Ismail was successively minister of external affairs, internal security, and home affairs but resigned because of ill health in 1967. He came into his own in 1969, however, when, recalled to government after the serious racial riots of that year and the consequent suspension of the parliamentary process, he did much to defuse racial tensions and to lead the country back to normalcy. He was appointed deputy prime minister in 1970 and died in office three years later.

Ismāʿīl Pasha (b. Dec. 31, 1830, Cairo—d. March 2, 1895, Istanbul), viceroy of Egypt under Ottoman suzerainty, 1863–79, whose administrative policies, notably the accumulation of an enormous foreign debt, were instrumental in leading to British occupation of Egypt in 1882.

Ismāʿīl studied in Paris and undertook various diplomatic missions in Europe before becoming viceroy in 1863. In 1867 he obtained from the Ottoman sultan the hereditary title of khedive. As viceroy he conducted important negotiations regarding completion of the Suez Canal. The canal neared completion in the summer of 1869, and Ismāʿīl turned the celebration of the canal's opening in November into a magnificent display of khedival splendour.

One of the most significant of Ismāʿīl's innovations was the establishment of an assembly of delegates in November 1866. Although this body served only in an advisory capacity, its

members eventually came to have an important influence on the course of governmental affairs. Village headmen dominated the assembly and came to exert increasing political and economic influence over the countryside and the central government. This was demonstrated in 1876, when the assembly prevailed upon Ismāʿīl to reinstate the law (promulgated by him in 1871 to raise money and later repealed) that allowed landownership and tax privileges to persons paying six years' land tax in advance.

Ismāʿīl, hoping to bring the vast areas of the Sudan under effective Egyptian control, hired Europeans and Americans to direct the military and administrative aspects of this venture, feeling that they would be more immune to the intrigues to which his own officials would have been subjected. Although some progress was made, Ismāʿīl did not realize his goal of creating a new southern province but did assert what later became an important element in nationalist thought—the political unity of the Nile valley.

Ismāʿīl's administrative policies consumed an enormous amount of money, much of it supplied by European financiers. When he assumed power, the Egyptian national debt stood at £7,000,000; by 1876 this debt had increased to almost £100,000,000. The Commission of the Public Debt was set up at the urging of Ismāʿīl's foreign creditors, but he did not cooperate fully because some of the measures he was required to take would have infringed on his domestic authority. The Ottoman sultan dismissed him in June 1879.

Ismāʿīl Shahīd, Muḥammad (b. April 29, 1779, Phulat, India—d. May 6, 1831, Balakote), Indian Muslim reformer who attempted to purge Indian Islām from idolatry and who preached holy war against the Sikhs and the British.

As a preacher in Delhi, Ismāʿīl Shahīd attracted attention as a young man for his forceful preaching against such popular superstitions as grave worship, the veneration of saints, and other practices regarded as heretical. Returning from a pilgrimage to Mecca in 1823, he began to preach holy war (jihad) against the Sikhs who had been oppressing their Muslim subjects. In 1824–26 Ismāʿīl accompanied a voluntary force of Muslim warriors led by Sayyid Aḥmad to fight a holy war against the Sikhs in the Punjab. Ismāʿīl assumed leadership of the *mujāhidīn* (holy warriors) in 1830, when they were driven out of their stronghold of Peshāwar. The Muslims went down to death before a superior Sikh force at the battle of Balakote, on May 6, 1831, where Ismāʿīl lost his life.

Ismailia, also transliterated AL-ISMĀʿĪLĪYAH, capital of Al-Ismāʿīlīyah *muḥāfaẓah* (governorate), northeastern Egypt. The city is about at the midpoint of the Suez Canal, on the northwestern shore of Lake At-Timsāḥ. The lake, in a natural depression, was connected to the Gulf of Suez of the Red Sea in pharaonic times.

The city was founded in 1863 by the French engineer Ferdinand de Lesseps, builder of the Suez Canal, as a base camp. It was named for the ruling Egyptian khedive (viceroy) Ismāʿīl Pasha, whose elaborate palace built for the gala opening of the canal in 1869 has fallen into ruin. Laid out in contemporary 19th-century style, with broad avenues, tree-lined squares, parks, and gardens, it has a gridiron street plan.

Ismailia played an important role in modern Egyptian history: British suppression of an uprising by rebellious Egyptian police there in January 1952 was a key event leading to the overthrow of King Farouk I later that year and the Egyptian Revolution that followed. During the period that the canal was open to traffic (1869–1956; 1957–67), Ismailia prospered. The operating headquarters of the Suez Canal Company and the Central Movement Office, which regulated canal traffic, were there. When the canal was closed for eight years following the Six-Day War of June 1967, the city's economic base was undermined; much of the population was resettled elsewhere in Egypt.

With the cease-fire and peace following the 1973 war with Israel, especially after the Suez Canal reopened in 1975, Ismailia returned to prosperity. The refugees were returned, new housing was built by the government, and a tax-free industrial zone was created as part of President Anwar el-Sādāt's "Open Door" policy. Industries that have been established include food processing, tractor and engine construction, and shipyard work. In the early 1980s a power plant was built in the city. The Suez Canal University opened in 1975.

The city is linked to the national rail network of Egypt via Banhā in Al-Qalyūbīyah governorate. Another railway along the Suez Canal serves Ismailia. The city has a ferry service across the canal. Pop. (1986 prelim.) 212,567.

Ismāʿīlīte, a sect of the Shīʿites (one of the major branches of Islām) that was most active as a religio-political movement in the 9th–13th century through its subsects, the Fāṭimids, the Qarāmiṭah (Qarmatians), and the Assassins.

The Ismāʿīlītes came into being after the death of Jaʿfar ibn Muḥammad (765), the sixth imam, or spiritual successor to the Prophet, who was recognized by the Shīʿites. Jaʿfar's eldest son, Ismāʿīl, was accepted as his successor only by a minority, who became known as the Ismāʿīlītes. Those who accepted Jaʿfar's younger son, Mūsā al-Kāẓim, as the seventh imam and acknowledged his successors through the 12th imam became known as the Ithnā ʿAsharīyah, or Twelvers, the largest and most conservative of the Shīʿite sects. Certain of the Ismāʿīlītes (known as Wāqifīyah, or Stoppers) believed Ismāʿīl to have been the seventh and last imam and were designated as Seveners (Sabʿīyah), while the majority of Ismāʿīlītes believed the imamate continued in the line of the Fāṭimid caliphs. The Seveners later claimed that Ismāʿīl's son Muḥammad at-Tamm was expected to return at the end of the world as the mahdi ("divinely guided one").

Ismāʿīlīte doctrine, formulated during the late 8th and early 9th centuries, stressed the dual nature of Qurʾanic interpretation, exoteric and esoteric, and, like Manichaeism, made a corresponding distinction between the ordinary Muslim and the initiated Ismāʿīlīte. The secret wisdom of the Ismāʿīlītes was accessible only through a hierarchical organization headed by the imam and was disseminated by *dāʿīs* (missionaries), who introduced believers into the elite through carefully graded levels. The *Rasāʾil ikhwān aṣ-ṣafāʾ wa khillān al-wafāʾ* ("Epistles of the Brethren of Purity and Loyal Friends"), a 10th-century philosophical and religious encyclopaedia influenced by Neoplatonism, was said to have been composed by a secret confraternity connected with the Ismāʿīlītes.

The Ismāʿīlītes became active in the second half of the 9th century in southern Iraq under the leadership of Ḥamdān Qarmaṭ. This branch of the sect, which came to be known as the Qarāmiṭah, established itself in Iraq, Yemen, and especially Bahrain, in the 9th–11th century.

In Tunis, ʿUbayd Allāh established himself as the first Fāṭimid caliph in 909, claiming descent—through a line of "hidden imams"—from Muḥammad, son of Ismāʿīl, and through him from Fāṭimah, daughter of the Prophet, whence the dynastic name. The Fāṭimids conquered Egypt in 969; while they did not succeed in converting the bulk of their subjects during their brilliant rule of two centuries, they did create a widespread Ismāʿīlīte missionary network with followers all over the Islāmic world.

A fatal schism split the movement over the succession to the Fāṭimid caliph al-Mustanṣir (d. 1094). The Egyptian Ismāʿīlītes recognized his son al-Mustaʿlī, but the Ismāʿīlītes of Iran and Syria upheld the claims of his older son, Nizār; hence, there are two branches of Fāṭimids, the Mustaʿlīs and the Nizārīs.

When Ismāʿīlīyah came to an end in Egypt with the deposition of the last Fāṭimid caliph by Saladin in 1171, the Mustaʿlī Ismāʿīlītes survived in Yemen. They had not recognized any Fāṭimid after al-Āmir, al-Mustaʿlī's son, and believed that al-Āmir's infant son aṭ-Ṭayyib remained alive and that the line of the imams was hidden until a future time. In the interim they are governed by the chief *dāʿī*. In the 16th century the *dāʿī* of a major branch of the Mustaʿlis relocated in India and now resides in Surat, in Gujarāt district. His followers in India are usually known as Bohrās.

The Nizārīs, led by Ḥasan-e Ṣabbāḥ, gained control of a number of fortresses in Iran and Syria, the chief being Alamūt (1090). Known as Assassins, they remained in political power through the 13th century until displaced by the Mongols and the Mamlūks. The Nizārīs survived, though in two rival lines. The minor line died out by the 18th century, while the major line, led by an imam called the Aga Khan, moved from Iran to India in 1840. The Aga Khan has a following, estimated in the millions, in India and Pakistan and in parts of Iran, Africa, and Syria.

The Druze, a hill people living in modern southern Lebanon, neighbouring Syria, and Israel, separated from the main body of the Ismāʿīlītes early in the 11th century. They then formed a special closed religion of their own, which acknowledged the imams as incarnations of the godhead.

Ismāʿīlīyah, Al-, *muḥāfaẓah* (governorate), northeastern Nile delta, Lower Egypt. It is a square-shaped territory with a long, narrow extension northward along the Suez Canal, ending just south of Port Said. Its eastern boundary is the Suez Canal, including Lake Murrah al-Kubrā, a shallow, marshy salt lake forming part of the Suez Canal. The governorate's total area is 557 square miles (1,442 square km), mainly desert except in the northern part.

It is traversed east–west by the Al-Ismāʿīlīyah Canal, formerly called the Sweet Water Canal, built 1858–63 from the Būlāq quarter of Cairo on the Nile to the city of Ismailia on Lake At-Timsāḥ to provide fresh water for the thousands of workmen building the Suez Canal. A branch, commencing just west of the city, runs south along the waterway to Suez city. There is extensive irrigation along the main (east–west) section, and the area, otherwise waterless desert, produces fine truck crops. Cattle raising and fish farming have been introduced. Poor, sandy soils have hindered agricultural development on the Suez Canal branch. In the northern areas of the governorate, fruit and vegetables are raised on land receiving winter rains.

Just outside Ismailia to the west is a military base, established by the British in World War I. Enlarged and improved over the years, it was evacuated by the British in 1956 under the terms of the treaty of 1954 and is now occupied by Egyptian armed forces.

Ancient ruins have been discovered at Tall al-Maskhūtah, about 10 miles (16 km) west of Ismailia on the Al-Ismāʿīlīyah Canal. Some scholars identify them with biblical Pithom, a site of pharaonic storehouses built by the Hebrews under Egyptian bondage (Exodus 1:11). Other scholars identify the site with biblical Succoth, the Israelites' first halt in the exodus

from Egypt (Ex. 12:37). The canal itself follows the course of an ancient Red Sea–Nile canal, first built by the Saite pharaoh Necho II (610–595 BC). Pop. (1983 est.) 447,000.

Ismay (of Wormington), Hastings Lionel Ismay, Baron (b. June 21, 1887, Naini Tāl, India—d. Dec. 17, 1965, Broadway, Worcestershire, Eng.), British soldier who became Prime Minister Winston Churchill's closest military adviser during World War II and participated in most major policy decisions of the Allied powers.



Ismay
Karsh of Ottawa—Camera Press

Commissioned in 1905, Ismay served in India and Africa. After World War I he became assistant secretary (1926–30) and secretary (1938– 40) of the Committee of Imperial Defense but exercised his greatest influence after his appointment, in May 1940, as chief of staff to Churchill in his capacity as minister of defense and his personal representative to the Chiefs of Staff's Committee, positions he retained until 1946. He actively participated in most major inter-Allied conferences throughout World War II, playing a major role in the decision to make Germany the Allies' first-priority target and in the planning for the invasion of France in 1944. He was raised to the peerage in 1947. After renewed service in India (1947), he became secretary of state for Commonwealth relations (1951–52) and secretary general of the North Atlantic Treaty Organization from 1952 until his retirement in 1957. He had daughters but no sons, and his barony lapsed upon his death.

isnād (from Arabic *sanad*, "support"), in Islām, a list of authorities who have transmitted a report (*ḥadīth*) of a statement, action, or approbation of Muḥammad, one of his Companions (Ṣaḥābah), or of a later authority (*tabī*); its reliability determines the validity of a *ḥadīth*. The *isnād* precedes the actual text (*matn*) and takes the form, "It has been related to me by A on the authority of B on the authority of C on the authority of D (usually a Companion of the Prophet) that Muḥammad said. . . ."

During Muḥammad's lifetime and after his death, *ḥadīth*s were usually quoted by his Companions and contemporaries and were not prefaced by *isnād*s; only after a generation or two (*c.* AD 700) did the *isnād* appear to enhance the weight of its text. In the 2nd century AH (after AD 720), when the example of the Prophet as embodied in *ḥadīth*—rather than local custom as developed in Muslim communities—was established as the norm (*sunnah*) for an Islāmic way of life, a wholesale creation of *ḥadīth*s, all "substantiated" by elaborate *isnād*s, resulted. Since *ḥadīth*s were the basis of virtually all Islāmic scholarship, especially Qur'ānic exegesis (*tafsīr*) and legal theory (*fiqh*), Muslim scholars had to determine scientifically which of them were authentic. This was done by a careful scrutiny of the *isnād*s, rating each *ḥadīth* according to the completeness of its chain of transmitters and the reliability and orthodoxy of its authorities (*see* 'ilm al-ḥadīth).

Early compilations of the most reliable *ḥadīth*s (known as *musnad*s) were even arranged by *isnād*; that is, classified according to the Companion of Muḥammad to whom they were attributed. Most notable of these was the *Musnad* of Aḥmad ibn Ḥanbal (d. 855), incorporating about 29,000 traditions. *Musnad*s proved difficult to use efficiently, however, and later compilations, known as *muṣannaf*, grouped *ḥadīth*s according to subject matter.

Iso-Hollo, Volmari (b. May 1, 1907, Ylöjärvi, Fin.—d. June 23, 1969, Heinola), Finnish runner who won two successive gold medals in the Olympic Games (1932, 1936) for the 3,000-metre steeplechase. He also won a silver medal for the 10,000-metre race in the 1932 Olympic Games at Los Angeles and a bronze medal in the same event during the 1936 games at Munich. During the 1932 Olympic steeplechase, an official's error forced the competitors to run an extra lap.

isoamyl nitrite: *see* isopentyl nitrite.

isobar, line on a weather map of constant barometric pressure drawn on a given reference surface. The isobaric pattern on a constant-height surface is extremely useful in weather forecasting because of the close association between pressure and weather. Regions of low pressure at sea level tend to be areas of bad weather, especially in winter. At higher elevations the wind blows approximately parallel to the isobars, with low pressure to the left in the Northern Hemisphere and to the right in the Southern Hemisphere; the closer together the isobars are, the stronger is the wind speed. Only sea-level pressure patterns are routinely used in meteorology. At higher elevations pressure itself is used to define the reference surface upon which contours of the height above sea level are drawn; dynamically, the height contours of a constant pressure surface are completely analogous to the isobars of a constant-height surface.

isobar, in nuclear physics, any member of a group of atomic or nuclear species all of which have the same mass number—that is, the same total number of protons and neutrons. Thus, chlorine-37 and argon-37 are isobars. Chlorine-37 has 17 protons and 20 neutrons in its nucleus, whereas argon-37 has a nucleus comprising 18 protons and 19 neutrons. In beta decay, mother and daughter nuclei are always isobars, because either a neutron is converted to a proton or a proton is converted to a neutron in the process.

isobaric spin (particle physics): *see* isospin.

isobutane (chemistry): *see* butane.

isocarboxazid, antidepressant drug of the monoamine-oxidase inhibitor type, introduced into medicine about 1960 and used to treat moderate to severe mental depression. Like other monoamine-oxidase inhibitor drugs, it prevents the enzymatic breakdown of norepinephrine, the brain-neurotransmitter substance concerned with emotional stimulation. Isocarboxazid is administered orally and is readily absorbed from the stomach. The onset of action is delayed, the effects of the drug developing slowly over the first two weeks of therapy. As with other monoamine-oxidase inhibitor drugs, liver damage is a possible side effect.

Isocrates (b. 436 BC, Athens—d. 338, Athens), ancient Athenian orator, rhetorician, and teacher whose writings are an important historical source on the intellectual and political life of the Athens of his day. The school he founded differed markedly in its aims from the Academy of Plato and numbered among its pupils men of eminence from all over the Greek world.

Early life and influences. Isocrates was born into a prosperous family shortly before the outbreak of the Peloponnesian War (431–404 BC). He passed his youth in a gloomy period following the death of Pericles, the great Athenian leader and statesman, a period in which wealth—both public and private—was dissipated, and political decisions were ill-conceived and violent. He would have been 14 years old when the democracy voted to put to death all male citizens of the small Thracian city of Scione. Isocrates was deeply moved by a desire to see Greece united and at peace and was influenced by, among others, the Sicilian sophist Gorgias, who not only inspired his pupil with a taste for Gorgianic prose but also put before him as the cure for Greece's ills the Panhellenist program; that is, union of Greeks in an attack on the Persian Empire and the settlement therein of the impoverished, thus securing peace between and within cities. This became and remained Isocrates' political creed.

In the closing years of the Peloponnesian War, Isocrates lost his inherited wealth and began to earn money by writing speeches for others to use in the courts. A few of these speeches survive. This was, in fact, the conventional start to a career as an orator, but since he lacked both the voice and the self-confidence necessary for a public speaker he turned his attention to education, and for more than 40 years his main effort was to prepare for successful public life those who could afford to pay his heavy fees.

Of his hundred pupils the most notable were Timotheus, the Athenian general, prominent in Athens' history between 378 and 355; Nicocles, the ruler of Salamis in Cyprus; and the two greatest Greek historians of the 4th century, Ephorus—who wrote a universal history—and Theopompus—who wrote the history of Philip II of Macedon. In this way his influence permeated both politics and literature.

At the same time he continued to publish a series of speeches on the state of Athens and of Greece. How far these influenced his contemporaries has been fruitlessly debated. Their importance for historians is that they provide an index of Panhellenist, conservative Greek opinion, and whoever reads with attention the "Panegyric" (380), "On Peace" (355), "On the Areopagus" (354?), "To Philip" (346), and the "Panathenaic" oration (begun 342, completed 339) will have gained considerably in understanding of the larger issues of the age.

Isocrates as rhetorician. Isocrates, however, was a man of no great intellectual power, and it is not surprising to find him contemptuous of the philosophical subtleties of the Platonic circle. He cared above all for polished expression; he is said to have taken 10 years in the composition of the "Panegyric," and a man who could expend effort on such showpieces of oratory as the "Encomium of Helen" (390) clearly had little of real intellectual importance to say. His defects and his preferences showed themselves in the system of education that he developed. Unfortunately, his discussion in the speeches "Against the Sophists" and in "On the Exchange" tells one more of what he objected to in other systems than of what he actually had in his own, but it can be safely asserted that, whereas the training of the Platonic Academy was essentially philosophical, that of Isocrates was almost entirely given over to rhetoric, the art of persuasion.

There is indeed a strong suspicion that Isocrates would lend his talents to any cause whatsoever, merely for the pleasure of presenting it well. The so-called Cyprian orations—"To Nicocles" (*c.* 372), the "Nicoles" (*c.* 368), and the "Evagoras" (*c.* 65)—are concerned with the laudations of monarchs, while the "Archidamus" (366) puts into the mouth of the heir to one of the Spartan kings a speech full of praise for Sparta and Spartanism. One

is correspondingly less impressed when in the "Panegyric" and "Panathenaic" orations he professed admiration for Athens. Such exaltation of style and indifference to matter is contemptible, and, insofar as his purpose in his system of education appears to have been to train others to a similar facility, he can hardly escape the censure he accorded to other rhetorical schools.

Isocrates did have beliefs, however, some of which are revealed in "On the Areopagus," composed at the end of the Social War, when Athens' fortunes were at their lowest for 50 years. In this work he commends the ancient constitution of Athens, under which the aristocratic council of the Areopagus exercised a general supervision over the conduct of citizens. Isocrates' proposals for returning to the system in operation before the days of democracy were not practical but display profoundly conservative inclinations.

His other mainstay was Panhellenism, and this is what chiefly interests historians. In the "Panegyric" he developed the theme that many, notably Gorgias and the rhetorician Lysias, had recently argued: he called on Sparta to establish concord in Greece by recognizing the fitness and right of Athens to share with Sparta hegemony in Greece and by proceeding with the national crusade against Persia. This amounted to a reassertion of the political faith of the great 5th-century opponent of Persia, Cimon. More than 30 years later, in the letter "To Philip," Isocrates appealed to the King of Macedonia to reconcile the Greeks and lead them against Persia. Since Philip was on the point of intervening in Greece to settle the Second Sacred War (355–346), many have believed that Isocrates was prepared to submit his country to an outside master.

This is unjust, for Isocrates, a political innocent, had only the vaguest idea of what the consequences of such a policy might be. He had in fact made earlier similar appeals to Agesilaus, king of Sparta, to Dionysius I, tyrant of Syracuse, and to Alexander, tyrant of Pherae in Thessaly, none of whom could conceivably have become political master of Greece. The truth is that Isocrates was seeking merely a military leader. These earlier appeals came to nothing, and in the 350s, when Greece was divided first by the Social War, precipitated by the Athenian policy of sending cleruchies (colonizing groups) to Samos, the subjection of Cos and Naxos to Athenian jurisdiction, and the arbitrary demands of Athenian generals for money, and then by the Sacred War, fought as a result of the refusal of the Phocians to pay a fine levied by the Amphictyons, and when Persia was again threatening, there could be no question of Greece uniting to attack. Isocrates thus had to confine himself to pleading for peace, notably in the speech "On Peace" at the end of the Social War.

Isocrates' disillusionment and death. The rise of Philip led him to hope that all was not lost—he had his general at last. But he never paused to ask what would happen to Greece when Macedonia had succeeded in gratifying Panhellenist dreams. And, when all hopes for peaceful relations between Athens and Philip faded, he promptly forgot about Philip, and in his last great speech, the "Panathenaic" oration, Philip has no part. After the Battle of Chaeronea, at which Greek independence was lost and as a result of which Philip indeed became master, Isocrates in despair starved himself to death (338).

Historians debate whether he was the prophet of the Hellenistic world, that great expansion of Hellenism resulting from the foundation of cities in Asia by Philip's son Alexander the Great and his successors. Certainly, he adhered to the Panhellenist idea that Asia should be colonized by the Greeks, but he appears to have envisaged no more than the colonization of Asia Minor, and the actual Macedonian settlements were far from the comfortable retreats Isocrates had dreamed of for the poor of Greece. He had, furthermore, merely thought of exporting the poor. He had no vision of the great new common market that would save Greece from misery. So perhaps the title prophet is too much. But he did see that at the heart of Greek troubles was poverty, and in his unwavering belief in colonization he showed a common sense denied in this matter to his greater contemporaries, Plato and Aristotle.

(G.L.Ca.)

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isocyanide, also called ISONITRILE or CARBYLAMINE, any of a class of organic compounds having the molecular structure $R-N^{+}\equiv C$, in which R is a combining group derived by removal of a hydrogen atom from an organic compound. The isocyanides are isomers of the nitriles; they were discovered in 1867 but have never achieved any large-scale utility. They are usually prepared from primary amines by treatment with chloroform and alkali and often are obtained as minor products in the synthesis of nitriles from metal cyanides and organic halogen compounds. They possess remarkably powerful and repulsive odours.

isodrin, chlorine-containing organic compound used as an insecticide; *see* aldrin.

Isoetes (plant genus): *see* quillwort.

Isoko, people of the northwestern part of the Niger Delta in Nigeria, speaking a language of the Kwa branch of the Niger-Congo family. The term Sobo is used by ethnographers as a cover term for both the Isoko and their neighbours the Urhobo, but the two groups remain distinct from one another.

Isoko economy is based on farming, fishing, and the production of palm oil and kernels. The main food crops are yams and cassava, supplemented by corn (maize), beans, peppers, and peanuts (groundnuts).

The family, consisting of a man, his wife or wives, and their children, lives together in a compound; one or more groups of families related through patrilineal descent occupy a ward of the village. The village itself is a compact settlement, usually containing fewer than 500 persons. Both men and women are grouped into age-grades, each with particular responsibilities. The duties of the women's grades include the ritual surrounding fertility and childbirth, and control of the market. Young boys perform simple communal tasks; adult men do major community work and are the fighting and executive unit of the village; older men form the nucleus of the village council. Membership in certain title organizations is available on payment of fees and is an important source of political authority. The Isoko never formed a single social or political unit; local communities remain autonomous.

Traditional religion includes belief in a creator god and his messengers, in spirits, and in ancestral spirits. Diviners are consulted to explain failures in any activity, on occasions of illness or death, and before economic activity. Witches are believed to be organized into groups that meet regularly in large trees. Many Isoko, however, are now Christians.

isolating language, a language in which each word form consists typically of a single morpheme. Examples are Classical Chinese (to a far greater extent than the modern Chinese languages) and Vietnamese. An isolating language tends also to be an analytic language (*q.v.*), so that the terms isolating and analytic are often used interchangeably in linguistics.

isolation, in medicine, separation of an infected individual (human or animal) from the healthy until that individual is no longer able to transmit the disease. In its strictest sense, the practice of isolation differs from that of quarantine, which is the detention of an individual who may have been exposed to a communicable disease until it is deemed certain that he has escaped infection. *See* quarantine.

Isolation is also a technique used in medicine and in biological research to maintain a germfree environment. *See* germfree life.

Isolde, also spelled ISOLT (in medieval romance): *see* Tristan and Iseult.

isoleucine, an amino acid present in most common proteins, sometimes comprising 2 to 10 percent by weight. First isolated in 1904 from fibrin, a protein involved in blood-clot formation, isoleucine is one of several so-called essential amino acids for chicks, rats, and other higher animals, including man; *i.e.,* they cannot synthesize it and require dietary sources. In microorganisms and plants, isoleucine is synthesized from the amino acid threonine.

isomer, in nuclear physics, any of two or more nuclides (species of atomic nuclei) that consist of the same number of protons and the same number of neutrons but differ in energy and manner of radioactive decay, and that exist for a measurable interval of time. The half-life of the more energetic isomer may be as short as about 10^{-11} second but, in some extreme cases, as long as several years. Two nuclear isomers of cobalt-58, for example, are known: the lower energy isomer, ^{58}Co, of 71-day half-life (which decays by electron capture and positron emission); and the high-energy isomer, ^{58m}Co (*m* for metastable), of 9-hour half-life (which undergoes gamma decay, forming ^{58}Co).

Nuclear isomers are formed as a direct result of reactions such as bombardment of nuclei by subatomic particles or as intermediate decay products of radioactive nuclei. Extremely unstable nuclei that decay as soon as they are formed in nuclear reactions and intermediate decay products the half-lives of which are less than about 10^{-11} second are not generally classified as nuclear isomers.

isomer, in meteorology, line on a map connecting points having the same monthly or seasonal precipitation, expressed as a percentage or fraction of the annual total; it is similar to an isohyet, a line that connects points of the same total precipitation for a given time period or for a particular storm. Isomers and isohyets generally will not coincide. In regions with more than one rainy season isomeric analysis is useful in establishing the relative importance of each rainfall regime.

isomerase, any one of a class of enzymes that catalyze reactions involving a structural rearrangement of a molecule. Alanine racemase, for example, catalyzes the conversion of L-alanine into its isomeric (mirror-image) form, D-alanine. An isomerase called mutarotase catalyzes the conversion of α-D-glucose into β-D-glucose. *cf.* ligase, lyase.

isomerism, the existence of sets of two or more substances that have identical chemical compositions and molecular weights but different properties. The different substances that make up these sets are called isomers.

A brief treatment of isomerism follows. For full treatment, *see* MACROPAEDIA: Molecules: *Isomerism.*

It is now generally accepted that the differences in the properties of isomers result from differences in the arrangements of atoms within the molecules, but at the time (1830) that isomerism was recognized and named (by the Swedish chemist Jöns Jakob Berzelius), even the existence of molecules was not well established. The idea that atoms might unite in a given ratio but different patterns was quite novel; indeed, the investigation of isomerism contributed to the development of the concept that many substances are made up of particles whose composition is defined by not only the relative numbers of different atoms but also the absolute numbers.

For the rest of the 19th century, the study of isomerism was practically a branch of organic chemistry. In 1893, however, the Swiss chemist Alfred Werner published his findings on the structures of the inorganic coordination compounds. These structures correctly account for the complex isomerism of covalent inorganic compounds.

The two principal classes of isomers are structural isomers and stereoisomers. Substances are said to be structural isomers, or to be structurally isomeric, if they have the same elemental composition and molecular weight but different bonding patterns. On the other hand, they are called stereoisomers if they have the same composition, molecular weight, and bonding pattern but differ in the spatial arrangements that their atoms can assume without breaking any covalent bonds. (At ordinary temperatures all polyatomic molecules constantly undergo internal vibration, torsion, and flection, but the differing shapes that result are not regarded as isomers. *See also* conformation.)

A typical example of structural isomerism is provided by the two compounds ethyl alcohol and methyl ether, which both have the molecular formula C_2H_6O. At atmospheric pressure ethyl alcohol is a liquid that boils at 78° C (172° F) and is converted to ethyl iodide upon reaction with hydriodic acid; methyl ether is a gas that liquefies at −24° C (−11° F) and is converted to methyl iodide by reaction with hydriodic acid. The molecular structure of ethyl alcohol is CH_3-CH_2-OH; that of methyl ether is CH_3-O-CH_3.

Structural isomers that can be readily changed into each other are called tautomers. A typical case is that of the ester ethyl acetoacetate, which under ordinary circumstances is a mixture of the so-called keto form (about 92 percent) and the enol form (about 8 percent).

Two classes of stereoisomeric compounds are generally recognized: optical isomers and geometric isomers. Optical isomers occur in pairs that are nonsuperimposable mirror images of each other, like right- and left-handed gloves. They take their name from their effect of rotating the plane of polarization of a beam of polarized light that is directed through them: one member of each pair causes rotation in one direction, the other in the opposite direction. This phenomenon, called optical activity, arises from any of several kinds of imbalance in the three-dimensional structure of the molecule that cause it to have no point, line, or plane of symmetry.

The optical activity of these compounds is the only physical property that differentiates them. The chemical properties of optical isomers also are identical, except in their interactions with other dissymmetric compounds.

Geometric isomerism results from rigidity in the molecular structure; in organic compounds this rigidity most often is associated with a double bond or a ring of atoms. In most compounds in which two carbon atoms are linked by a double bond, each of these atoms is also linked by single bonds to two other atoms (or groups of atoms), which may differ from one another—say, *A* and *B*. The two carbon atoms and the four atoms directly bonded to them are held in a plane by the double bond. There are therefore two different arrangements: one, called *cis,* in which the two *A* atoms are on the same side of the double bond, and one, called *trans,* in which the two *A* atoms are on opposite sides. In any such pair, the *cis* isomer differs from the *trans* both physically and chemically.

The molecules of the simplest cyclic hydrocarbons consist of three or more methylene (CH_2) groups joined in a ring. In cyclopropane, for example, there are three such groups; the three carbon atoms define a plane, and the two hydrogen atoms bonded to each of them lie on different sides of this plane. If the hydrogen atoms attached to two of the carbon atoms are replaced by other atoms—say, *A*—two different structures are possible. In one (*cis*), the two *A* atoms lie on the same side of the plane; in the other (*trans*), the *A* atoms lie on opposite sides.

Cis–trans isomerism also occurs in two groups of inorganic compounds. In coordination compounds such as dichlorodiammineplatinum(II), $PtCl_2(NH_3)_2$, in which a metal atom is surrounded by two pairs of covalently bonded atoms or groups of atoms (ligands) that are situated at the vertices of a square, the ligands of one pair—say, the two chlorine atoms—occupy adjacent vertices in the *cis* isomer and diagonally opposite vertices in the *trans* isomer. If the metal atom is linked to six ligands, two of one kind and four of another, located at the vertices of an octahedron, the ligands of the pair occupy adjacent vertices in the *cis* isomer and opposite vertices in the *trans* isomer.

isomerization, the chemical process by which a compound is transformed into any of its isomeric forms, *i.e.,* forms with the same chemical composition but with different structure or configuration and, hence, generally with different physical and chemical properties. An example is the conversion of butane, a hydrocarbon with four carbon atoms joined in a straight chain, to its branched-chain isomer, isobutane, by heating the butane to 100° C or higher in the presence of a catalyst. Butane and isobutane have widely different properties. Butane boils at −0.5° C and freezes at −138.3° C, whereas isobutane boils at −11.7° C and freezes at −159.6° C. More important from the commercial standpoint, branched-chain hydrocarbons are better motor fuels than their straight-chain isomers. The isomerization of straight-chain hydrocarbons to their corresponding branched-chain isomers is an important step (called reforming) in gasoline manufacture. There are numerous other examples of isomerization reactions of great industrial importance.

isometric drawing, also called ISOMETRIC PROJECTION, method of graphic representation of three-dimensional objects, used by engineers, technical illustrators, and, occasionally, architects. The technique is intended to combine the illusion of depth, as in a perspective rendering, with the undistorted presentation of the object's principal dimensions; that is, those parallel to a chosen set of three mutually perpendicular coordinate axes.

The isometric is one class of orthographic projections. (In making an orthographic projection, any point in the object is mapped onto the drawing by dropping a perpendicular from that point to the plane of the drawing.) An isometric projection results if the plane is oriented so that it makes equal angles (hence, "isometric," or "equal measure") with the three principal planes of the object. Thus, in an isometric drawing of a cube, the three visible faces appear as equilateral parallelograms; that is, the parallel edges of the cube are projected as parallel lines, and the lengths of the edges, which are parallel to the principal axes, appear in their true proportions.

isometric system, also called CUBIC SYSTEM, one of the crystal systems to which a given crystalline solid can be assigned. Crystals in this system are referred to three mutually perpendicular axes of equal lengths. If the atoms or atom groups in the solid are represented by points and the points are connected, the resulting lattice will consist of an orderly stacking of blocks, or unit cells. The isometric unit cell is distinguished by four lines, called axes of 3-fold symmetry, about which the cell can be rotated by 120° without changing its appearance. This characteristic requires that the cell be a perfect cube; the 3-fold axes are the diagonals of the cube.

A cube has six square faces, but many of the crystal forms in the isometric system display more complex configurations; among the most symmetrical forms of the isometric or cubic system are the octahedron (8 faces), trisoctahedron (24 faces), and hexoctahedron (48 faces).

Only a small fraction of the thousands of recognized crystalline solids are included in the isometric or cubic system. Some of these are sodium chloride (table salt), copper, gold, silver, platinum, iron, fluorite, leucite, diamond, garnet, spinel, pyrite, galena, and magnetite.

isoniazid, also called ISONICOTINIC ACID HYDRAZIDE (INH), drug used in the chemotherapy of tuberculosis in combination with other drugs, such as para-aminosalicylic acid (PAS) or the antibiotic streptomycin; these drugs are used with isoniazid in order to prevent, or at least delay, the development of isoniazid-resistant strains of the infective agents, tuberculin bacilli. Treatment usually is continued for many months. The most important drug in the therapy of tuberculosis, isoniazid was introduced into medicine in 1952; it usually is administered orally, but it can be given by injection. It may cause dizziness or headache, but side effects are not common.

isonipecaine (drug): *see* meperidine.

Isonzo, Battles of the (1915–17), 12 battles along the Isonzo River on the Italian Eastern Front in World War I.

The deep Isonzo River is flanked by rugged peaks, and the Austrians had fortified the mountains prior to Italy's entry into the war on May 23, 1915, giving them a great advantage over the Italians. Gen. Luigi Cadorna launched his first attack against the Austrians on June 23. For 14 days the Italian Army attempted to cross the river and scale the heights beyond, but were beaten back. Again during July 18–August 3, October 18–November 4, and November 10–December 2, the Italians attacked, but only in the Caporetto region did they succeed in crossing the river and gaining several bridgeheads, and the Austrians remained in control. From March 11 to 19, 1916, Cardona tried again—and again failed. Then the Italians began drilling and blasting tunnels and trenches in the solid rock up to the heights opposite and behind the enemy lines. In the sixth battle, August 6–17, 1916, Gorizia was captured, the first real victory. In the next three battles, September 14–17, October 10–12, and November 1–4, the Italians concentrated on the Carso Plateau, but the exhausted army could not penetrate the formidable natural barriers protected by Austrian artillery. In the tenth battle, May 12–June 8, 1917, Cardona struck in two places,

capturing the peak of Kuk and destroying advanced defenses in the south. During August 18–September 12 the Italians struck for the 11th time and slowly pushed forward, dislodging the Austrians as they advanced. The Germans feared that the Austrian front might collapse and sent reinforcements. On October 24 the Austrian-German forces took the offensive, beginning with a heavy bombardment. By afternoon the Italian Army was in a rout. War-weary and demoralized territorial troops threw down their arms, the Austrians poured over the Isonzo, and Caporetto fell, though many Italian units continued to fight as they retreated toward the Piave River, where they held the line on November 7, after one of the worst defeats in Italian history.

Consult the INDEX *first*

isopentyl nitrite, also called ISOAMYL NITRITE, one of the oldest and most important vasodilators (*i.e.,* agents that expand blood vessels). It is used in medicine to provide relief from attacks of angina pectoris (chest pain precipitated by oxygen deficiency in the heart muscles) and to treat ischemia (insufficient arterial blood flow) of smooth muscle. Isopentyl nitrite is administered by inhalation and is very rapidly absorbed from the lungs. Its action is nonspecific; *i.e.,* it affects all smooth muscles, causing them to relax.

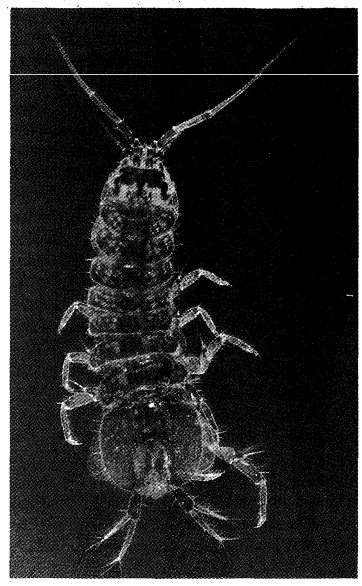
Isopentyl nitrite is a clear, pale yellow liquid with a characteristic penetrating odour.

isoperimetric problem, in mathematics, the determination of the shape of the closed plane curve having a given length and enclosing the maximum area (the curve is a circle). The calculus of variations evolved from attempts to solve this problem and the brachistochrone (*q.v.*) problem. Isoperimetrics was made the subject of an investigation by 17th- and 18th-century Swiss mathematicians, the Bernoullis, who found and classified many curves having maximum or minimum properties. A major step in generalization was taken by the Swiss mathematician Leonhard Euler, who published the rule (1744) later known as Euler's differential equation, useful in the determination of a minimizing arc between two points on a curve having continuous second derivatives and second partial derivatives. His work was soon supplemented by that of Joseph-Louis Lagrange, Adrien-Marie Legendre, and others.

Techniques of the calculus of variations are frequently applied in seeking a particular arc from some given class for which some parameter (length or other quantity dependent upon the entire arc) is minimal or maximal. Surfaces or functions of several variables may be involved. A problem in three-dimensional Euclidean space (that of finding a surface of minimal area having a given boundary) has received much attention and is called Plateau's problem. As a physical example, consider the shapes of soap bubbles and raindrops, which are determined by the surface tension and cohesive forces tending to maintain the fixed volume while decreasing the area to a minimum. Other examples may be found in mechanics, electricity, relativity, and thermodynamics.

isopod, any member of the order Isopoda (class Crustacea), a group of diverse, widely occurring forms including marine, freshwater, and terrestrial species. Most are free-living, but a number of marine species are parasitic on other animals. They are usually inconspicuous. Most of the 4,000 species, which include the pill bug, the sow bug, and the gribble (*qq.v.*), are from 0.7–35 millimetres (0.28–1.4 inches) long; however, *Bathynomus giganteus,* a marine species of the Caribbean Sea, grows to 35 centimetres (14 inches).

The body is elongated, rather flat, and somewhat arched. The back is covered by a series of wide, armour-like plates; the thorax, or midsection, has seven segments, the abdomen six. There are usually six pairs of limbs, but sometimes as few as two or as many as eight are found.



Isopod (*Asellus*)
E.R. Degginger

Sow bugs and pill bugs are often found in leaf litter. Aquatic forms are abundant among water plants near the shore. Parasitic forms live in the internal organs of fishes and prawns.

isoprene, also called 2-METHYL-1,3-BUTADIENE, a colourless, volatile liquid hydrocarbon obtained in processing petroleum or coal tar and used as a chemical raw material. The formula is C_5H_8.

Isoprene, either alone or in combination with other unsaturated compounds (those containing double and triple bonds), is used principally to make polymeric materials (giant molecules consisting of many small, similar molecules bonded together) with properties dependent upon the proportions of the ingredients as well as the initiator (substance that starts the polymerizing reaction) employed. Polymerization of isoprene using Ziegler catalysts yields synthetic rubber that closely resembles the natural product. Butyl rubber, made from isobutene with a small amount of isoprene, using aluminum chloride initiator, has outstanding impermeability to gases and is used in inner tubes.

Many plant substances have formulas that are small multiples of C_5H_8. Formation of isoprene upon thermal decomposition of these materials led to the proposal by the German chemist Otto Wallach in 1887 that they are built up from isoprene units. This "isoprene rule" was verified in numerous cases and has proved useful in studies of the structures of terpenes and terpenoids.

isoprenoid, any of a class of organic compounds composed of two or more units consisting of five carbon atoms in a specific pattern. Isoprenoids play widely varying roles in the physiological processes of plants and animals. They also have a number of commercial uses.

A brief treatment of isoprenoids follows. For full treatment, *see* MACROPAEDIA: Chemical Compounds.

Isoprenoids in living organisms range in function from pigments and fragrances to vitamins and precursors of sex hormones. One of the most familiar natural substances, rubber, is a polyisoprene. Other commercially valuable isoprenoids are those used as flavourings, solvents, and raw materials for chemicals.

The five-carbon unit that comprises the basic building-block of isoprenoids is a hydrocarbon called isoprene. Isoprene (2-methyl-1,3-butadiene) is a branched-chain, unsaturated hydrocarbon, unsaturated meaning it contains one or more double bonds between carbon atoms. Isoprene has, in fact, two carbon–carbon double bonds. Isoprenoids contain from two to many thousands of isoprene units. Most of the natural isoprenoids are composed of two, three, four, six, or eight isoprenes. Those containing two to four isoprenes are formed by simple addition of the five-carbon units. The six- and eight-unit molecules are made by linking together two three-unit and four-unit molecules, respectively. The carbon backbone can have one or more functional chemical groups, such as hydroxyl and carbonyl, attached to it. These help to give isoprenoids their diversity.

The isoprenoids are also known as terpenes. The smallest terpene molecules—those containing 10 carbon atoms—are called monoterpenes. The larger molecules, which increase by five-carbon units at a time, are called sesquiterpenes, diterpenes, triterpenes, and tetraterpenes, respectively. The monoterpenes are mostly volatile, which accounts for their fragrances. Terpenes of higher molecular weight are less volatile, although sesquiterpenes contribute to the flavours of some foods. Adding water molecules to a pyrophosphate group connected to a monoterpene produces geraniol, a component of geranium oil and an important contributor to rose perfumes. Related molecules are menthol from peppermint oil; citral from lemongrass oil; and limonene from lemon and orange oils. Other monoterpenes include pinene, from turpentine, and camphor.

Many of the larger terpenes are cyclic—*i.e.,* they contain ring structures. However, the diterpene called phytol, an important precursor of the plant pigment chlorophyll, is acyclic. A related diterpene that contains one ring of six carbon atoms is vitamin A.

One of the most important triterpenes is squalene. Although acyclic, it is a precursor of the four-ring steroids that play a key role in controlling many biological activities. Squalene is found widely in nature, notably in fish-liver oils. Five-ring triterpenes, which are derived from squalene, like steroids, are found in many plants. They are often linked chemically to sugars to form compounds called saponins.

The tetraterpenes include many plant pigments such as lycopene, which accounts for the red of tomatoes, and β-carotene, which accounts for the yellow in carrots. β-carotene is a symmetrical molecule that the digestive process splits to produce vitamin A.

Polyterpenes are polymers containing large numbers of isoprene units. The best known is natural rubber, in which 4,000 to 5,000 five-carbon units are linked together. Another polymeric isoprene is gutta-percha, a tough plastic substance employed in insulation and in dentistry.

isopropyl alcohol, one of the commonest members of the alcohol family of organic compounds; *see* propyl alcohol.

isorhythm, in music, the organizing principle of much of 14th-century French polyphony, characterized by the extension of the rhythmic texture (*talea*) of an initial section to the entire composition, despite the variation of corresponding melodic features (*color*); the term was coined around 1900 by the German musicologist F. Ludwig.

A logical outgrowth of the rhythmic modes (fixed patterns of triple rhythms) that governed most late medieval polyphony, isorhythm first appeared in 13th-century motets, primarily in cantus firmus or tenor parts but occasionally in other voices as well. Abandoning

all modal limitations, the isorhythmic motet of the 14th century managed to derive decisive structural benefit from the systematic application of given rhythmic patterns without the inescapable dance associations of its 13th-century predecessor. The first great master of the isorhythmic motet was Guillaume de Machaut (*c.* 1300–77), but instances of isorhythm occurred as late as the early work of the 15th-century Burgundian composer Guillaume Dufay (*c.* 1400–74). As an analytical concept, isorhythm has proved valuable in connection with musical practices quite unrelated to those of the European Middle Ages, for example, peyote cult songs of certain North American Indian groups.

isospin, also called ISOBARIC SPIN, or ISOTOPIC SPIN, property that is characteristic of families of related subatomic particles differing principally in the values of their electric charge. The families of similar particles are known as isospin multiplets: two-particle families are called doublets, three-particle families are called triplets, and so on.

The component particles of atomic nuclei, the neutron and proton, form an isospin doublet, since they appear to differ in nothing but electric charge and subsidiary properties. They are commonly thought of as different versions, or charge states, of the same object, called a nucleon. The isospin of a nucleon has a value of one-half. Isospin values are found by subtracting one from the number of members in its multiplet and then dividing by two.

The main importance of isospin in physics is that, when particles collide or decay under the influence of the process known as the strong interaction, their isospin is conserved. That is to say, even as the particles rearrange themselves or change into new particles, their total isospin value, computed in a specified way from the individual values, remains constant. Rules like this and others applicable to isospin (known as isospin selection rules) help physicists to consolidate their understanding of fundamental laws.

Isospora, genus of parasitic protozoans of the sporozoan subclass Coccidia. *Isospora* causes the disease known as coccidiosis (*q.v.*) in man, dogs, and cats. The species that attack man, *I. hominis* and *I. belli*, inhabit the digestive tract of man and are endemic in many areas of southern Europe, Asia, Africa, Latin America, and Oceania. Symptoms of human infection include weight loss, digestive disturbances, and fever. Dogs and cats are infected by the species *I. bigemina, I. rivolta,* and *I. felis.* The genus is recognized by spore cases containing two spores, each of which contains four infective parasites (sporozoites).

isostasy, theoretical balance of all large portions of the Earth's crust as though they were floating on a denser underlying layer, about 110 kilometres (70 miles) below the surface. Imaginary columns of equal cross-sectional area that rise from this layer to the surface are assumed to have equal weights everywhere on Earth, even though their constituents and the elevations of their upper surfaces are significantly different. This means that an excess of mass seen as material above sea level, as in a mountain system, is due to a deficit of mass, or low-density roots, below sea level.

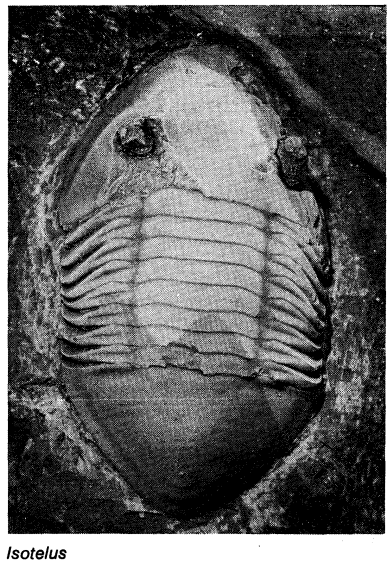
In the theory of isostasy a mass above sea level is supported below sea level, and thus there is a certain depth at which the total weight per unit area is equal all around the world; this is known as the depth of compensation. The depth of compensation was taken to be 112.7 kilometres (70 miles) according to the Hayford–Bowie concept, which was used for preparing geodetic maps for the United States.

The Airy hypothesis says that the Earth's crust is a more rigid shell floating on a more liquid substratum of greater density. Airy assumed that the crust has a uniform density throughout. The thickness of the crustal layer is not uniform, however, and so this theory supposes that the thicker parts of the crust sink deeper into the substratum, while the thinner parts are buoyed up by it. According to this hypothesis, mountains have roots below the surface that are much larger than their surface expression. This is analogous to an iceberg floating on water, in which the greater part of the iceberg is under water.

The Pratt hypothesis supposes that the Earth's crust has a uniform thickness below sea level with its base everywhere supporting an equal weight per unit area at a depth of compensation. In essence this says that areas of the Earth of lesser density, such as mountain ranges, project higher above sea level than do those of greater density. The explanation for this was that the mountains resulted from the upward expansion of locally heated crustal material, which had a larger volume but a lower density after it had cooled.

The Heiskanen hypothesis is an intermediate or compromise hypothesis between Airy's and Pratt's. This hypothesis says that approximately two-thirds of the topography is compensated by the root formation (Airy model) and one-third by the Earth's crust above the boundary between the crust and substratum (Pratt model).

Isotelus, genus of trilobites (extinct arthropods) restricted to the Ordovician Period in Europe and North America (the Ordovician Period began 500,000,000 years ago and lasted 70,000,000 years). *Isotelus* was relatively large for a trilobite and is characterized by its distinctive flat shape. The head and the tail were



Isotelus

By courtesy of the trustees of the British Museum (Natural History); photograph, Imitor

well developed and large relative to the whole animal. The number of thoracic segments was small, and the eyes were large and crescentic in shape.

isotherm, line drawn on a map or chart joining points with the same temperature; sometimes the prefix choro- (space) or chrono- (time) is added. Isotherms are very commonly used in meteorology to show the distribution of temperature at the Earth's surface or on a constant level or constant pressure chart. They are also used to show the time variation of temperature with height in the atmosphere or with depth in soil or water; the characteristics of heat flow into soil, for example, are easily visualized from a graph showing temperature as a function of depth and time. In climatology, a convenient way to compare thermal climates is to plot for each location temperature as a function of time of day (vertical axis) and time of year (horizontal axis); the resulting isotherms are sometimes called thermoisopleths.

isotone, any of two or more species of atoms or nuclei that have the same number of neutrons. Thus, chlorine-37 and potassium-39 are isotones, because the nucleus of this species of chlorine consists of 17 protons and 20 neutrons, whereas the nucleus of this species of potassium contains 19 protons and 20 neutrons.

isotope, one of two or more species of atoms of a chemical element with the same atomic number and position in the periodic table and nearly identical chemical behaviour but with different atomic masses and physical properties.

A brief treatment of isotopes follows. For full treatment, *see* MACROPAEDIA: Atoms: Their Structure, Properties, and Component Particles.

The majority of elements, as found in the Earth's crust and atmosphere, are mixtures of several isotopes. Such mixtures are in almost unvarying proportions. In its natural form tin, for example, has 10 isotopes whose atomic masses range from values approximating 112 to 124, but any given sample of the element has an average value of 118.69. In effect, ordinary tin is nature's standardized blend of these 10 atomic species.

In most cases, only the stable isotopes of elements can be found in nature. The unstable, or radioactive, forms decay (break down) spontaneously into entirely different elements at characteristic rates because their ratio of neutrons to protons is either too low or too high for stability. Isotopes of all the elements heavier than bismuth are radioactive. Some of these, such as uranium, do occur naturally because their isotopes have long half-lives.

Before the early 1900s it was generally assumed that the mass of a standard number of atoms of any given element was a fundamental characteristic of the element. It was also thought that all the atoms of an element were the same and, in particular, had the same mass. The first evidence that two substances possessing the same chemical properties did not have to be physically identical came from the study of the radioactivity of the heavy elements. Between 1906 and 1907 several investigators showed that ionium (a decay product of uranium) and radiothorium (a decay product of thorium), when mixed with thorium, could not be separated from it by any chemical means. The two substances had radioactive properties quite different from those of thorium and could be shown to have atomic masses differing by several units from that of thorium. The term isotope was introduced in 1913 by the English chemist Frederick Soddy to cover such situations. Not long after the acceptance of these ideas as applied to the heavy elements, there came indications that isotopy might exist in the main group of naturally occurring stable elements. In 1919 F.W. Aston of England demonstrated conclusively that neon consisted chiefly of two atomic species. The success with neon was followed by the discovery that chlorine had two isotopes. It soon became clear that most elements consisted of a mixture of isotopes, each with an atomic mass close to an integer on the atomic mass scale.

isotope, radioactive: *see* radioactive isotope.

isotope dilution, radiochemical method of analysis for measuring the mass and quantity of an element in a substance. The procedure involves adding to a substance a known quantity of a radioisotope of the element to be measured and mixing it with the stable isotope of the element. A sample is then taken from

the mixture and analyzed. By measuring the amount of radioactive isotope and the amount of stable isotope present and determining the ratio of these amounts, both the quantity and mass of the element can be ascertained.

Isotope dilution is employed chiefly in analytical chemistry in situations in which precise quantitative analysis by conventional means is difficult. Certain kinds of geophysical investigations also require its use, as in determining the occurrence and distribution of trace elements in rock samples and meteorites.

isotopic fractionation, enrichment of one isotope relative to another in a chemical or physical process. Two isotopes of an element are different in weight but not in gross chemical properties, which are determined by the number of electrons. It can be predicted theoretically and demonstrated experimentally, however, that subtle chemical effects do result from the difference in mass of isotopes. Isotopes of an element may have slightly different equilibrium constants for a particular chemical reaction, so that fractionation of the isotopes results from that reaction. The extent of isotopic fractionation can be expressed by a fractionation factor, alpha (α), also known as a separation factor, or enrichment factor, that is the ratio of the concentrations of the two isotopes in one compound or phase divided by the ratio in the other compound or phase. If N_l and N_h stand for the relative abundances of the light and heavy isotopes, respectively, in the one compound and if n_l and n_h are the corresponding abundances in the other compound, then $\alpha = (N_l/N_h)/(n_l/n_h)$. The fractionation factor is the factor by which the abundance ratio of two isotopes will change during a chemical reaction or a physical process.

The precipitation of calcium carbonate from water is an example of an equilibrium fractionation process. Oxygen-18 is enriched by a factor of 2.5 percent during this precipitation; the fractionation factor depends upon the temperature and, consequently, can be used as a means of determining the temperature of the water in which the precipitation occurred. This is the basis of the so-called oxygen isotope geothermometer.

During the process of photosynthesis, carbon-12, the light isotope of carbon, is enriched relative to the heavier isotope, carbon-13; the cellulose and lignin in wood from trees is enriched by a factor of about 2.5 percent during this process. The fractionation in this case is not an equilibrium process but rather a kinetic effect: the lighter isotope proceeds faster through the photosynthetic process and, consequently, is enriched.

Physical processes, such as evaporation and condensation and thermal diffusion, may also result in significant fractionation. For example, the light isotope of oxygen, oxygen-16, is enriched in water evaporating from the sea. On the other hand, precipitation is enriched in the heavy isotope, resulting in a further concentration of the light isotope in atmospheric water vapour. Because of the process of evaporation and condensation between the equatorial regions and polar regions, water in the polar regions may be enriched in the light isotope by as much as 5 percent.

The fissile isotope uranium-235 has been separated from the more abundant, nonfissile isotope uranium-238 by exploiting the slight difference in the rates at which the gaseous hexafluorides of the two isotopes pass through a porous barrier.

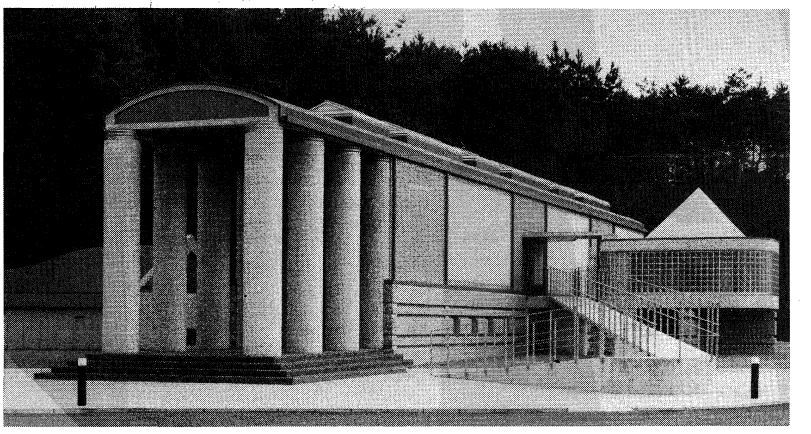
isotopic spin (particle physics): *see* isospin.

isotopic tracer, any radioactive atom detectable in a material in a chemical, biological, or physical system and used to mark that material for study, to observe its progress through the system, or to determine its distribution. An isotopic tracer must behave as does the material being studied, but, in addition, it must have some distinguishing property by which it can be detected in the presence of the other material.

The movement of a chemical element under study may be traced by adding a radioactive isotope (or radioisotope) of the same element. The radiations emitted by such a radioisotope can be tracked by means of radiation detection devices, such as Geiger-Müller counters or scintillation detectors. Radioisotopes can be detected in quantities as small as a few atoms. Radioactive tracers are widely used in science, engineering, and medicine in virtually any situation in which it is necessary to determine the distribution pattern or the rate of material transport.

Isotope dilution, in which radioisotopes are introduced into stable isotopes of the same element and mixed, is a widely used technique for determining the volume of a system. To measure the contents of the human blood system or of an industrial tank, a minute quantity of radioactive tracer is added and allowed to mix uniformly throughout the system; then a sample of known volume is removed from the system and measured for the amount of radioactive tracer it contains. The ratio of this content to the amount originally introduced is proportional to the volume of the entire system.

Isozaki Arata (b. July 23, 1931, Ōita, Kyushu, Japan), one of the best-known of a group of avant-garde Japanese architects of the late 20th century.



Okanoyama Graphic Art Museum, Nishiwaki City, Japan, designed by Isozaki Arata, 1982–84
Taisuke Ogawa/Shinkenchiku

Isozaki was born to an upper-class family, and he studied architecture at the University of Tokyo. Upon graduation, he became an apprentice for nine years to Tange Kenzō, a leading Japanese architect of the postwar period. During that period Isozaki also worked with a design team known as Urtec (Urbanists and Architects). He was somewhat influenced by the Metabolist movement, a brutalist group that combined a concern for modern technology and utilitarianism. In 1963 Isozaki formed his own design studio. He was a visiting professor at a number of universities throughout the United States.

The first building for which he is noted is the Ōita Prefectural Library (1966), a Metabolist-influenced structure. After working as chief architect for Japan's "Expo '70," Isozaki moved away from his more orthodox modernist structures and began to examine a variety of non-Oriental solutions to architectural problems. Among his innovative structures of this period are the Kita-Kyūshū City Museum of Art (1974), the Fujimi Country Clubhouse in Ōita (1974), the Okanoyama Graphic Art Museum (1982–84), and the Civic Centre for Tsukuba (1983). He also designed the Los Angeles Museum of Contemporary Art (1986). He wrote many books on architecture.

Isparta, also spelled ISPARTA, formerly HAMİD-ABAD, or HAMİDELI, city, western Turkey. Known as Baris under the Byzantine Empire, it was taken by the Seljuq Turks in 1203–04. Later it belonged to the Turkmen Hamid principality, the last ruler of which sold it to the Ottoman sultan about 1381. The city's monuments include a ruined medieval fortress and several mosques, of which Firdevs Paşa Cami is a work of the 16th-century master court architect Sinan. Isparta is known for its roses and attar (fragrant oil) of roses and for its carpets. A branch line connects it with the main Anatolian railway. Pop. (1985) 101,215.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Isrā', in Islām, the Prophet Muḥammad's night journey from Mecca to Jerusalem. As alluded to in the Qur'ān (17:1), a journey was made by a servant of God, in a single night, from the "sacred place of worship" (*al-masjid al-ḥarām*) to the "further place of worship" (*al-masjid al-aqṣā*).

Traditionally, there was general agreement that the servant of God was Muḥammad and that the "sacred place of worship" was Mecca. Early commentators, however, interpreted the "further place of worship" as heaven, and the entire verse was considered a reference to the Prophet's ascension into heaven (Miʿrāj), an ascension which also originated in Mecca. In the period of the Umayyad caliphate (661–750), the "further place of worship" was read as Jerusalem. The two versions were eventually reconciled by regarding the Isrā' simply as the night journey and relocating the point of Muḥammad's ascension from Mecca to Jerusalem to avoid confusion. Some commentators also suggested that the Isrā' was a vision sent to Muḥammad in his sleep and not an actual journey at all; but orthodox sentiment has emphatically preserved the physical, thus miraculous, nature of the trip.

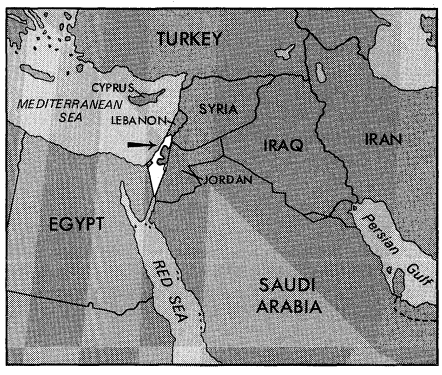
The Isrā' story, greatly elaborated by tradition, relates that Muḥammad made the journey astride Burāq (*q.v.*), a mythical winged creature, in the company of the archangel Gabriel. Muḥammad meets Abraham, Moses, and Jesus in Jerusalem; he then officiates as leader (*imām*) of the ritual prayer (*ṣalāt*) for all the prophets assembled and establishes his primacy among God's messengers. *See also* Miʿrāj.

Israel (Jewish patriarch): *see* Jacob.

Israel, either of two political units in the Old Testament: the united kingdom of Israel under the kings Saul, David, and Solomon

that lasted from about 1020 to 922 BC; or the northern kingdom of Israel, including the territories of the 10 northern tribes (*i.e.,* all except Judah and part of Benjamin), that was established in 922 BC as the result of a revolt led by Jeroboam I. The southern kingdom, ruled by the Davidic dynasty, was thereafter referred to as Judah. The later kingdom's history was one of dynastic instability, with only two prolonged periods of stable government, under Omri (reigned 876–869 or *c.* 884–*c.* 872 BC) and Ahab (*c.* 876–*c.* 853 BC) and the Jehu dynasty (*c.* 842–746 BC). In the 8th century BC the northern kingdom was overrun by the Neo-Assyrian Empire, with Samaria, the capital, falling in 722/721.

Israel, officially STATE OF ISRAEL, Hebrew MEDINAT YISRA'EL, Arabic DAWLAT ISRĀ'ĪL, Middle Eastern republic at the eastern end of the Mediterranean Sea, covering an area of 7,992 square miles (20,700 square km), not including more than 7,000 square miles of Israeli-occupied territory in Syria's Golan Heights (in the north), in the West Bank and



Israel

East Jerusalem (in the east), and in the Gaza Strip (in the southwest, formerly administered by Egypt). These territories were taken by Israel in the 1967 war and are disputed, as is the de facto capital, Jerusalem, which was formerly divided between Jordan and Israel. Bounded by latitudes 33°15′ and 29°30′ N (about 250 miles [400 km] from north to south) and by longitudes 34°15′ and 35°45′ E (about 75 miles [121 km] across at its widest extent from east to west), Israel is bordered on the north by Lebanon, on the northeast by Syria, on the east and southeast by Jordan, on the southwest by Egypt, and on the west by the Mediterranean Sea. The population was estimated to be 4,614,000 in 1990.

A brief treatment of Israel follows. For full treatment, *see* MACROPAEDIA: Israel.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. Israel may be divided, from west to east, into four physiographic regions: the Mediterranean coastal plain, a narrow 115-mile (185-kilometre) strip along the western edge of the country that is only 20 miles (32 km) across at its widest point, in the south; a hill region extending from the northern border, through the Israeli-occupied West Bank, into central Israel; the Great Rift Valley, part of a great fissure extending the length of the country's eastern boundary to the Gulf of Aqaba, which contains the Dead Sea, the lowest point (1,312 feet [400 m] below sea level) on the Earth's surface; and the Negev, the country's largest region, occupying nearly the entire southern half of Israel.

Israel's major drainage system is the interior basin formed as the Jordan River flows southward; it empties first into the Ḥula Basin (at approximately sea level) and then into the freshwater Sea of Galilee (686 feet [209 m] below sea level). Then it proceeds to the Dead Sea, one of the most saline bodies of water in the world. The Sea of Galilee is connected, through a complex of pumping stations and reservoirs, to Israel's aquifers in the west, providing water to almost half of the country's agricultural land.

The climate in Israel varies from north to south. Winter temperatures (January and February) range from about 46° F (8° C) in Jerusalem to 61° F (16° C) in Elat (Eilat), on the Gulf of Aqaba in the southern Negev; summer temperatures (July and August) for the same locations are 74° F (23° C) and 90° F (32° C). The northern highlands and the northern coastal areas receive more than 16 inches (400 mm) of rainfall annually, the extreme northern highlands receiving more than 40 inches (1,016 mm). Practically all precipitation in the north comes between October and April. More than half of the country receives less than 8 inches (203 mm) of rainfall; the Negev receives less than 4 inches (102 mm), and less than 1 inch (25 mm) falls along the 'Arava Valley south of the Dead Sea.

Cultivation is concentrated in areas north of latitude 31°30′ N, where annual rainfall exceeds 12 inches (305 mm). Most of the original evergreen forests have disappeared, but there are continuing reforestation efforts. The hills are mostly covered by maquis (wild shrub vegetation) and, in the Negev, only desert scrub grows wild. Animal life varies from such mammals as wild boars, wildcats, and gazelles to reptiles like the agama and gecko lizards.

Israel is not particularly rich in natural resources. It has limited reserves of copper and only meagre supplies of oil and natural gas.

The people. Jews constitute more than four-fifths of the total population, and Arabs about one-sixth. The two main Jewish religious groups are formed by followers of the Ashkenazic rite (of Jews from central and eastern Europe and their descendants in other parts of the world) and followers of the Sephardic and Oriental rites (of Jews from the Mediterranean region and from the Middle and Far East). Muslims, who constitute more than two-thirds of the Arab population, are the largest minority. Practically all of the Muslims adhere to the Sunnite rite.

Most Christians live in towns, and most speak Arabic. The Greek Orthodox and Greek Catholic (Melkite) churches are the largest Christian communities, but there are smaller numbers of Roman Catholics and Uniates. Jerusalem is the seat of two Russian Orthodox missions. The small Evangelical, Episcopal, and Lutheran churches are primarily Arabic-speaking. The Druzes have constituted a separate Arabic-speaking community since 1957. Most Druzes are agriculturists and preserve their traditional way of life.

The Circassians, who are Sunnite Muslims, number a few thousand and live in the Galilee region, preserving their language and traditions. They have traditionally spoken Arabic, but the younger generation speaks Hebrew. There is also a tiny minority of Samaritans in Israel.

About three-fifths of the Jewish community was born in Israel, about one-fifth in Europe and the United States, and about one-sixth in Asia or Africa. The Jewish birth rate is about one-third lower than the Arab birth rate, and the Jewish death rate is about twice that of the Arab death rate. The infant mortality rate for Jews, however, is about half that for Arabs. Although the population growth of Israel has been primarily due to immigration, future growth will depend more on natural increase, with the largest rate of increase occurring among the Arabs. About one-third of the country's total population is less than 15 years of age. Israel's population is nine-tenths urban and heavily concentrated in the Mediterranean coastal plain.

The economy. Israel has a mixed economy largely based on services and manufacturing industries. Although the gross national product (GNP) is increasing more rapidly than the population, the GNP per capita is on the lower end as compared with those of the developed countries.

Approximately one-fifth of the land is arable; irrigation is concentrated in Galilee and the Negev Desert. Agriculture produces approximately 4 percent of the GNP and employs about one-twentieth of the population. More than three-fourths of the arable land is cultivated by *kibbutzim* (collectives) or *moshavim* (cooperatives). Citrus fruits are the main crops, and Israel is one of the world's largest producers of oranges and grapefruit. Other crops produced in quantity include seed cotton, apples, avocados, potatoes, grapes, tomatoes, bananas, wheat, peaches, olives, and sugar beets. Vegetables are grown as an early season crop for European markets.

Pastures occupy two-fifths of the land and support cattle, sheep, and goats. Israel is one of the world's largest producers of turkeys.

Landings of fish are about evenly divided between freshwater, from the Sea of Galilee and fish ponds, and marine, from the Mediterranean and Black seas and the Atlantic Ocean. Annual landings are dominated by carp and cape hake.

Israel is among the world's largest producers of potash. Other minerals extracted include phosphates, bromide and magnesium compounds from the Dead Sea, lime, salt, glass sands, gypsum, and clay.

Manufacturing is well-diversified, accounts for about 17 percent of the GNP, employs more than one-fifth of the total labour force, and centres on processing raw and semi-finished materials. Principal manufactures include electronics, weapons, cement, potassic and other fertilizers, sulfuric acid, cotton textiles and clothing, tinned and bottled fruits and fruit juices, wheat flour, polished diamonds, metal products, machinery, motor vehicles, aircraft, precision instruments, plastics, and home appliances. Electricity is generated by thermal power plants.

Although the construction industry accounts for only about 3 percent of the GNP, it is of major importance to the economy in conjunction with the manufacturing industries that produce the building materials used. Residential buildings make up the largest share of construction.

The largest sector of the economy is public and community services, which account for 34 percent of the GNP and employ more than one-fourth of the work force. Tourism is an important source of foreign exchange, and income from tourism ordinarily exceeds expenditures by Israelis abroad.

The Israeli government owns mining and drilling enterprises, some industrial plants, and the national railway system. The government also aids industrial development and protects existing industry through import tariffs. Large sums in aid come from Jewish communities in Europe and the Americas. The United States provides development aid in addition to military assistance and loans. The sharp rise of oil prices in the 1970s, coupled with heavy government spending and a fall in investment aid, drove the inflation rate upward. By the mid-1980s Israel had one of the highest rates of inflation in the world, despite government-sponsored economic-austerity policies. Unemployment, however, remained relatively low, and Israel had a shortage of skilled workers.

The General Federation of Labour (Histadrut; founded in 1920) is the principal labour federation and voluntary organization to which all trade unions belong. Membership is open to all workers and members of *kibbutzim* and *moshavim,* as well as to professionals. Histadrut negotiates collective-bargaining agreements, linked to the retail

price index, and it administers employee-benefit programs, pension programs, and a number of social services. It owns about 5 percent of all industrial enterprises and is represented on labour-management boards and in the National Productivity Institute. It also supports pay-incentive programs for higher productivity and improved efficiency and other economic-development projects.

Budgetary revenue originates primarily from income and property taxes and value-added taxes. The development budget comes principally from foreign loans and grants. Expenditures are largely allocated to debt repayment, defense, interest on loans, and health and welfare. The major financial institution is the Central Bank of Israel.

There are about 330 miles (530 km) of standard-gauge rail routes in Israel. The road network is fully paved and includes highways with four or more lanes. Ashdod and Haifa, on the Mediterranean, and Elat, on the Red Sea, are the principal ports. An international airport is located at Lod (Tel Aviv-Yafo), and there are four domestic airports. El Al Israel Airlines Ltd. provides international service, and Arka Israeli Airlines handles domestic service.

Exports consist mainly of machinery and electronics, cut or mounted diamonds, fruits and vegetables, and textiles and clothing. Major importers of Israeli products are the United States, the United Kingdom, and Japan. Imports, which significantly exceed exports in value, are dominated by rough diamonds, investment goods, fuel and lubricants, consumer goods, and foodstuffs. The main sources of imports are the United States, Belgium and Luxembourg, Germany, and the United Kingdom.

Government and social conditions. Israel is a democratic republic with a parliamentary system of government. The country does not have a written constitution, and government is based on legislation, administrative acts, and parliamentary practice. Supreme authority rests with the Knesset, whose 120 members are elected to four-year terms by universal adult suffrage. A unicameral body, it assumes all legislative duties and elects the president (chief of state) to a five-year term. The president, whose duties are largely ceremonial, appoints a prime minister to head the government. The prime minister usually comes from the party having the plurality of seats in the Knesset, and the membership of the cabinet is negotiated among the parties forming the Knesset's majority coalition. Many parties compete for parliamentary seats, but the dominant political organizations have been the Israel Labour Party (Mapai) and the Likud (Unity) Party. Israel's judicial system is headed by a Supreme Court whose members are appointed by the president. The Israel Defense Forces consists mostly of army personnel and can mobilize to about five times its ordinary strength within 48–72 hours.

Israel has an advanced system of social welfare that provides old-age pensions, industrial-injury and maternity benefits, and family allowances. The government also offers general assistance, relief grants, and unemployment benefits. Kupot Holim, the health insurance fund of the Histadrut, covers most workers, providing both sickness benefits and medical care. Health conditions in Israel are generally good, and life expectancy is 75 years.

Education is compulsory and free for children between the ages of 5 and 15. Primary education lasts for eight years; postprimary education covers four years, although the last two years are not compulsory. There are three types of schools in Israel: national state schools, religious state schools, and the Agudat Israel religious schools. Institutions of higher education include the Hebrew University of Jerusalem (inaugurated in 1925), Tel-Aviv University (inaugurated in 1956), and Technion (Israel Institute of Technology; inaugurated in 1924). Israel has an adult literacy rate of more than 90 percent.

Israel's news media are relatively free to criticize government policy and express divergent political or religious views. Because of the country's recurrent state of national emergency, however, military censors review press and broadcasting materials concerning national security. Radio and television broadcasting stations are owned and operated by the government.

Cultural life. Jews arriving from many parts of the world have brought with them both their own Jewish cultural inheritances and aspects of diverse individual cultures absorbed over the centuries. Different folk traditions, such as folk songs, musical instruments, and other expressions of popular culture, have been preserved mainly among Sephardic Jewish communities and among the rural Arab population. In literature and drama an early concentration on themes of the Diaspora is giving way to an interest in national themes. Israel's most distinguished writer is considered to be Shmuel Yosef Agnon (1888–1970), winner of the Nobel Prize for Literature in 1966.

History. The record of human habitation in Israel (Palestine) is at least 100,000 years old. Evidence of the domestication of plants and animals can be dated to about 10,000 BC. The most notable achievement of the ancient Palestinians was the development of a linear alphabet, which was originated by the Canaanites in the 2nd millennium BC and picked up by the Phoenicians and Israelites about 1000 BC.

The occupation of Palestine by the Israelites (Hebrews), to whom the area was known as Canaan, was probably completed by the end of the 13th century BC. Palestine was under Egyptian control from about 1550 to 1200 BC. The appearance of the Sea Peoples weakened Egypt's hold on its Asian vassals, and from among them the Philistines emerged as a significant power in Palestine. They were subdued by the expanding Israelites under the kings David and Solomon. Solomon's reign in the mid-10th century BC was a golden age for Israel, marked by prosperity and the building of the First Temple of Jerusalem, but his death brought division of the kingdom into a northern component known as Israel and a southern one known as Judah. Israel was overrun and destroyed by the Assyrians in 722 BC, but Judah existed as an Assyrian vassal until 625 BC. The Babylonians destroyed Judah in 587 BC and transported many of its inhabitants to exile in Babylon.

The Persians, under Cyrus II (*c.* 550–529 BC), allowed the Jews to return to Jerusalem and rebuild the Temple (Second Temple). After the invasion by Alexander the Great, Palestine passed to the Ptolemies, then to the Seleucids. The Hellenizing efforts of the Seleucids and the desecration of the Temple by Antiochus IV (175–164 BC) led to the revolt by Judas Maccabeus that, by 141 BC, brought independence to Israel under the Hasmoneans. Internal dissension among the ruling family led to civil war and Roman intervention in 65 BC. Jesus taught in Jerusalem, and he was tried and crucified there in about AD 30. Under the Romans, two Jewish revolts were crushed. After the final revolt in AD 135, the Jewish population of Palestine was reduced to a tiny fraction of the former total, and Israel ceased to exist as a political entity.

The Byzantines brought some prosperity to Palestine largely through patronage of Christian shrines. In the 7th century Palestine fell to the Muslims, who built the Dome of the Rock in Jerusalem in 691. Jerusalem thus became a holy city for three major religions.

From 1100 to 1291 control of Palestine alternated between the Muslims and invading crusaders. By 1517 it had fallen to the Ottomans. A brief incursion by Napoleon brought back Egyptian control under Muḥammad ʿAlī, who opened Palestine to Western influences. It was returned to the Ottomans in 1840.

The first Zionist settlement was established in 1882. The Balfour Declaration of 1917 stated Britain's support of a national Jewish homeland in Palestine; the British occupied Palestine in 1918.

Adolf Hitler's persecution of Jews increased Jewish migration to Palestine during the 1930s and early 1940s, and relations between Jews and Arabs deteriorated. Partition into Jewish and Arab sectors was proposed but rejected. After World War II, the United States threw its support behind a Zionist state, and the United Nations voted in 1947 to partition Palestine. On May 14, 1948, the State of Israel was proclaimed and war broke out between Israel and Egypt, Transjordan (later Jordan), Syria, Lebanon, and Iraq. Israel was victorious, as it was again in 1967 and 1973, but the Middle East has continued to be unstable. Peace with Egypt was achieved in 1979, but the question of a Palestinian state and Jewish settlement in territories occupied by Israel in and after the 1967 war hampered relations with Arab states. In 1982 Israel invaded Lebanon in an effort to expel guerrillas belonging to the Palestine Liberation Organization. In late 1987 Israel faced the first disorders and riots that were to characterize the *intifadeh,* or "uprising," of the Palestinian Arabs of the West Bank and the Gaza Strip, which Israel had occupied ever since winning the 1967 war.

Israel, Ten Lost Tribes of: *see* Ten Lost Tribes of Israel.

Israel, Twelve Tribes of: *see* Twelve Tribes of Israel.

Israel Labour Party, Hebrew MIFLEGET HA-ʿAVODA HA-YISRAʾELIT, Israeli political party founded in January 1968 in the union of three socialist-labour parties. It and its major component, Mapai, dominated Israel's government from independence (1948) until 1977, when the rival Likud coalition came to power. From 1984 to 1990, however, Labour again had a strong voice in the government through a power-sharing agreement with Likud.

The major partner in the labour alliance and (by its antecedents) the oldest party in Palestine-Israel is Mapai (an acronym for Mifleget Poʿale Eretz Yisraʾel ["Party of the Workers of the Land of Israel"]). It was formed in 1930 in a merger of two older labour parties, Aḥdut ha-ʿAvoda ("Unity of Workers"), founded in 1919, and ha-Poʿel ha-Tzaʿir ("Young Worker"), founded in 1905, the latter being the first party of David Ben-Gurion. Mapai quickly became the dominant party in the Jewish community in Palestine in the 1930s; and, after the independence of Israel (1948), it controlled the government for 29 years (from 1968 as part of the Israel Labour Party). Mapai was the party of Ben-Gurion, Levi Eshkol, Abba Eban, Golda Meir, Itzhak Rabin, and Shimon Peres.

The second partner in the Israel Labour Party is Aḥdut ha-ʿAvoda–Poʿale Tziyyon ("Unity of Labour–Workers of Zion"), which was founded in 1944 by a group of Mapai members who broke away in protest against Mapai's alleged reformist tendencies. Its constituency lies largely in the kibbutzim. It rejoined Mapai in a "Labour Alignment" in 1965 and then joined in the founding of the Israel Labour Party three years later.

The third partner was Rafi (an acronym for Reshimat Poʿale Yisraʾel ["Israel Workers List"]), formed in 1965 when Ben-Gurion, after a political fight and personal feud with Levi Eshkol, withdrew with his supporters to form a new party. When most Rafi members joined the new Israel Labour Party in 1968,

Ben-Gurion and a few followers stayed out to form their own tiny party, the State List.

Since its founding, the Israel Labour Party has usually formed a Labour Alignment (Ma'arach) with Mapam (*q.v.*), a left-wing Zionist and socialist party. The Ma'arach has also included two Arab lists, Progress and Development and the Arab Bedouin List. The Labour Party's share of the popular vote slowly declined from the 1970s as the Israeli electorate moved steadily to the right on foreign-policy and security issues.

Israel Museum, Hebrew MUSE'ON YISRA'EL, in Jerusalem, museum opened in 1965, comprising separate sections: the Bezalel National Art Museum, the Samuel Bronfman Biblical and Archaeological Museum, a Youth Wing, the Shrine of the Book, and The Billy Rose Art Garden. The Shrine of the Book houses the Dead Sea Scrolls in a building whose pagoda-like dome is reminiscent of the shape of the ancient jars in which the scrolls were found in 1947. The Archaeological Museum is actually 15 connected pavilions showing finds from excavations in Israel. The gates to the ancient city of Ḥaẓor are reconstructed in one pavilion, and another shows some fine Palestinian ceramics. The Bezalel Museum is devoted to various religious and ethnographic objects such as Ḥannukka lamps and costumes. There is also an 18th-century synagogue from Vittorio Veneto, near Venice. The display in the Billy Rose garden is of modern and abstract sculpture.

Israeli, Isaac ben Solomon, Arabic ABŪ YA-'QŪB ISḤAQ IBN SULAYMĀN AL-ISRĀ'ĪLĪ, also called ISAAC ISRAELI, or ISAAC THE ELDER (b. 832/855, Egypt—d. 932/955, Al-Qayrawān, Tunisia), Jewish physician and philosopher, widely reputed in the Middle Ages for his scientific writings and regarded as the father of medieval Jewish Neoplatonism. While there is considerable disagreement about his birth and death dates, he is known to have lived more than 100 years and never to have married or to have had children.

Israeli first gained note as an oculist, maintaining a practice near Cairo until about 904, when he became court physician in Al-Qayrawān to the last Aghlabid prince, Ziyādat Allāh. He also studied medicine there under Isḥāq ibn 'Amrān al-Baghdādī, with whom he sometimes has been confused.

Some five years after his arrival, Israeli entered into the service of al-Mahdī, the founder of the North African Fāṭimid dynasty (909–1171), whose capital was Al-Qayrawān. At the request of the caliph, Israeli wrote eight medical works in Arabic. All were translated into Latin in 1087 by the monk Constantine, who claimed to have written them himself. Not until 1515 was their true authorship uncovered, and the works were republished in Lyon under the title *Omnia Isaac Opera;* the editor, however, mistakenly included the writings of other medical scholars as well. Israeli's scientific works include standard treatises on fevers, urine, pharmacology, ophthalmology, and ailments and treatments. He wrote also on logic and psychology, showing particular insight in the field of perception.

Of his philosophical writings, *Kitāb al-ḥudūd* (Hebrew: *Sefer ha-gevulim,* "The Book of Definitions") is best known. Beginning with a discussion of Aristotle's four types of inquiry, Israeli goes on to present 56 definitions, including definitions of wisdom, intellect, soul, nature, reason, love, locomotion, and time. Others of his philosophical works include *Sefer ha-ru'aḥ ve-ha-nefesh* ("Treatise on Spirit and Soul"), probably part of a larger exegetical effort, and *Kitāb al-jawāhir* ("Book of Substances"), of which only fragments have been found.

Israeli's thought was influenced heavily by two major sources: the great 9th-century Islāmic philosopher al-Kindī and a lost pseudo-Aristotelian treatise on such matters as the source of being, the nature of the intellect, and the course of the soul. Israeli's interpretation of eschatological matters in the light of Neoplatonic mysticism was to influence Solomon ibn Gabriol in the 10th century and other later Jewish philosophers.

Israeli law, the legal practices and institutions of modern Israel. In ancient times, when the people of Israel lived in their homeland, they created their own law: the law of the Torah and the law of the Mishna and the Talmud (*see* Torah; Mishna). Then came the separation of land and people for more than 1,800 years. The law left the land together with those who had created it, and the land acquired other laws, changing from time to time with the change of consecutive conquerors. The Jews took their law with them wherever they went, continued to develop it, and submitted to it wherever their communities enjoyed any measure of autonomy. When the Jews thus eventually returned to their ancient land in the 20th century, they brought back with them a dual legal heritage: that of the historic Jewish law and that of the laws of the countries in which they had been living.

When Israel's independence was proclaimed in 1948, some of the Ottoman enactments and much law of English origin continued to be applied, but English ceased to be the predominant legal language and was immediately replaced by Hebrew. The law was thenceforth made by the democratic authorities of the autonomous state of Israel, which, in spite of an Arab minority, became Jewish in conception, way of thinking, and purpose.

Israeli courts are composed of professional judges only, the jury being unknown. Secular courts are organized on three levels: magistrate's courts, dealing with certain civil matters and offenses punishable with imprisonment up to three years; district courts in the four principal cities, with general jurisdiction in civil and criminal matters; and the supreme court in Jerusalem, deciding appeals from inferior courts and exercising, as court of first and only instance, jurisdiction as high court of justice. Religious courts continue to be competent in matters of personal status, with some minor changes in the scope of jurisdiction of the rabbinical courts.

In administrative law, legislation covers most subjects with which the legislature of a modern welfare state is concerned, including education, compulsory military service (for men and women), and national insurance. Particularly important for the economy of the country are the water law and the law on the encouragement of capital investments, both of 1959. Laws dealing with collective bargaining, labour exchanges, protection of wages, safety regulations, severance payment, and so on, are the nucleus of a code of labour law.

Developments in criminal law, torts, and evidence have been confined to piecemeal amendments of the pre-1948 law. Significant among these are the abolition of the death penalty for murder and the introduction of suspended prison sentences; a new way of taking evidence of minors in trials of sexual offenses; and liability of the state in torts. The rules of criminal procedure were consolidated in 1965: among other changes, preliminary inquiry was abolished; the civil procedure rules, mainly derived from their English counterpart, were also redrafted and revised.

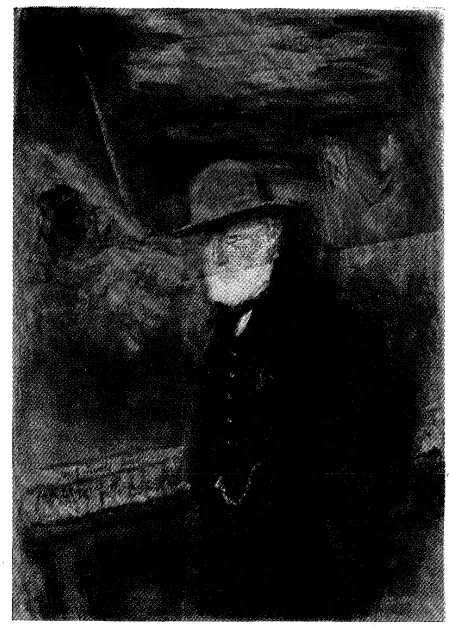
In private law Israeli legislation includes a law on women's equal rights; laws dealing with capacity and guardianship, adoption, and duties of maintenance between relatives; a law on the tenure of cooperative houses with separate ownership of flats; a standard contracts law; a comprehensive law of succession; laws on agency, guarantee, mortgage, and bailment; a defamation law and a patents law.

Jewish law as such continues to be applied by the rabbinical courts within their jurisdiction in matters of personal status; it is applied also by the civil courts when called upon to deal with such matters concerning Jews. In other fields of law it is not applied as the law of the land. It serves, however, as an important source for the shaping of new rules of law, both by the Knesset (parliament) and in the creative decisions of the courts. At the same time, modern laws of various other nations are consulted and used for comparison, and decisions of foreign tribunals, not necessarily of English courts, are frequently cited as persuasive authorities.

Israelite, in the broadest sense, a Jew, or a descendant of the Jewish patriarch Jacob, whose name was changed to Israel after an all-night fight at Penuel near the stream of Jabbok (Genesis 32:28). In early Jewish history, Israelites were simply members of the 12 tribes of Israel. After 930 BC and the establishment of two independent Jewish kingdoms in Palestine, the ten northern tribes comprising the Kingdom of Israel were known as Israelites to distinguish them from Jews in the southern Kingdom of Judah. The northern kingdom was conquered by the Assyrians in 721 BC, and its population was eventually absorbed by other peoples. Thereafter, Israelite referred to those who were still distinctively Jewish, namely, descendants of the Kingdom of Judah.

In liturgical usage, an Israelite is a Jew who is neither a cohen (descendant of Aaron, the first high priest) nor a Levite (descendant of early religious functionaries). The distinction is significant, for if a cohen is present for synagogue service, he must be called up first for the reading of the Law; he is then followed by a Levite. Normally, therefore, an Israelite is not called up until the third reading.

Israëls, Jozef (b. Jan. 27, 1824, Groningen, Neth.—d. Aug. 12, 1911, The Hague), painter and etcher, often called the Dutch Millet. Israëls was the leader of the Hague school of peasant genre painting, which flourished in The Netherlands between 1870 and 1890. He began his studies in Amsterdam and from 1845 to 1847 worked in Paris under the academic painters Horace Vernet and Paul Delaroche.



Self-portrait, watercolour on paper by Jozef Israëls, 1908; in the Toledo Museum of Art, Ohio

By courtesy of the Toledo Museum of Art, Ohio, gift of Edward Drummond Libbey

He first tried to establish himself as a painter of Romantic portraits and conventional historical pictures but had achieved little success when in 1855 ill-health compelled him to leave Amsterdam for the fishing village of Zandvoort, near Haarlem. That change revolutionized Israëls' art; he turned to realistic and compassionate portrayals of the Dutch peasantry and fisherfolk (*e.g.,* "Waiting for the Herring Boats," 1875). In 1871 he moved to The Hague, often working in nearby Scheveningen.

Besides oils, Israëls worked in watercolours and was an etcher of the first rank. His later works in all media express a tragic sense of life and are generally treated in broad masses of light and shade. His painting style was influenced by Rembrandt's later works, and, like Rembrandt, Israëls often painted the poor Jews of the Dutch ghettos (*e.g.,* "A Son of the Chosen People," 1889; Stedelijk, Amsterdam). His son Isaac (1865–1934), also a painter, adopted the Impressionist technique and subject matter and had some influence on his father's later work.

Isrāfīl, in Islām, the archangel who will blow the trumpet from a holy rock in Jerusalem to announce the Day of Resurrection; the trumpet is constantly poised at his lips, ready to be blown when God so orders. In biblical literature, Raphael is the counterpart of Isrāfil.



The archangel Isrāfīl, miniature from the *'Ajā'ib al-makhlūqāt* ("The Wonders of Creation") of Qazvīnī, Iraq, *c.* 1370–80; in the Freer Gallery of Art, Washington, D.C.

By courtesy of the Smithsonian Institution, Freer Gallery of Art, Washington, D.C.

Isrāfīl is usually conceived as having a huge, hairy body that is covered with mouths and tongues and that reaches from the seventh heaven to the throne of God. One wing protects his body, another shields him from God, while the other two extend east and west. He is overcome by sorrow and tears three times every day and every night at the sight of hell. It is said that Isrāfīl tutored Muḥammad for three years in the duties of a prophet before he could receive the Qur'ān.

Issa, a branch of the Somali (*q.v.*) people living in the Republic of Djibouti (formerly the French Territory of the Afars and Issas) on the east coast of Africa.

Issa, also called KOBAYASHI YATARŌ, original name KOBAYASHI ISSA (b. June 15, 1763, Kashiwabara, Shinano province, Japan—d. Jan. 5, 1828, Kashiwabara), Japanese poet whose works in simple, unadorned language captured the spiritual loneliness of the common man. Out of a life of tragic adversity he created a poetry of sentimental simplicity that endeared him to the Japanese people.

As a boy Issa found relations with his stepmother so difficult that in 1777 he was sent by his father to Edo (present-day Tokyo), where he studied haiku under the poet Chikua Nirokuan. He took the pen name Issa in 1793 and traveled extensively through southwestern Japan, afterward publishing his first collection of verse, *Tabishūi* (1795; "Travel Gleanings"). An inheritance feud erupted between Issa and his stepmother upon the death of his father in 1802; this was not concluded until 1814, after which he settled in his native town and married for the first time. Four children died in infancy, and his wife died in childbirth. A second marriage was unsuccessful, and Issa died before his third wife gave birth to a girl, who survived.

In Issa's poetry everyday subjects are treated with ordinary language but take on a lyrical quality through his sharp critical eye and sympathetic tone. His other important works are *Chichi no shūen nikki* (1803; "Diary of My Father's Last Days") and *Oraga Haru* (1819; *The Year of My Life*).

Issachar, one of the 12 tribes of Israel that in biblical times constituted the people of Israel who later became the Jewish people. The tribe was named after the fifth son born to Jacob and his first wife, Leah. After the death of Moses, Joshua led the Israelites into the Promised Land and apportioned the territory among the 12 tribes. The tribe of Issachar settled on land lying west of the Jordan River and southeast of the southern tip of the Sea of Galilee. After the death of King Solomon (922 BC), Issachar was one of the 10 northern tribes that established the independent Kingdom of Israel that survived until the Assyrian conquest of 721 BC. These 10 tribes, partially dispersed to other regions, eventually lost their identity and became known as the Ten Lost Tribes of Israel.

Isserles, Moses ben Israel, also called (by acronym) REMA (b. *c.* 1525, Kraców, Pol.—d. May 1, 1572, Kraców), Polish-Jewish rabbi and codifier who, by adding notes on Ashkenazic customs to the great legal digest *Shulḥan 'arukh* of the Sephardic codifier Joseph Karo, made it an authoritative guide for Orthodox Jews down to the present day.

A precocious scholar, Isserles became the head of the great yeshiva (institution of Jewish learning) in Kraców while he was still a young man. Until his time, most of the great codifications of Jewish law had been written by Sephardim, *i.e.,* Jews of Spanish and Portuguese descent. Therefore many eastern European customs (*minhagim*) had been ignored, making the Sephardic codes increasingly unacceptable to the Ashkenazim, the Jews of German-Polish descent. When Joseph Karo published *Shulḥan 'arukh* (1565; "The Well-Laid Table"), its Sephardic bias provoked Isserles to write a commentary entitled *Mappa* ("The Tablecloth"), first published in Kraców in 1571 as notes to an edition of *Shulḥan 'arukh.* This commentary, which extensively utilized Ashkenazic customs, made the *Shulḥan 'arukh* acceptable all over the Jewish world. A man of unusual intellectual breadth, Isserles was greatly interested in philosophy, history, and astronomy, as well as in Kabbalistic studies. He considered philosophy and the Kabbala, the influential body of Jewish mystical writings, to be different expressions of the same religious truth.

Issigonis, Sir Alec, in full SIR ALEXANDER ARNOLD CONSTANTINE ISSIGONIS (b. Nov. 18, 1906, Smyrna [now İzmir], Tur.—d. Oct. 2, 1988, Birmingham, Eng.), British automobile designer who created the best-selling, economical Mini and the perennially popular Morris Minor.

The son of a Greek merchant, Issigonis immigrated to London in 1922 during the war between Greece and Turkey. After studying engineering, he joined Morris Motors in 1936 as a suspension designer. There he developed the Morris Minor, which remained in production from 1948 to 1971. A reliable car with excellent steering and cornering qualities, it was the first all-British car to pass the one million mark in sales; surviving models are still cherished by owners and collectors.

After briefly working elsewhere in the early 1950s, Issigonis returned to what had become the British Motor Corp., where in 1959, in response to the Suez energy crisis (1956) and the popularity of Germany's Volkswagen Beetle, he introduced the Mini. The boxy, inexpensive, fuel-efficient Mini used a transverse engine to power its front wheels—a radical design at the time—and thus could comfortably seat four passengers despite being only 10 feet (3 m) long. Its practicality and affordability made it immediately popular; by the late 1980s more than 5 million had been sold.

Issigonis became a fellow of the Royal Society in 1967 and was knighted in 1969.

Issus, Battle of (333 BC), conflict early in Alexander the Great's invasion of Asia in which he defeated a Persian army under King Darius III. This was one of the decisive victories by which Alexander conquered the Achaemenian Empire. Issus is a plain on the coast of the Gulf of İskenderun, in modern Turkey. The Macedonian forces, with an infantry phalanx in the centre and cavalry on the sides, approached the army of Darius, which was drawn up on the opposite bank of the Pinarus (either modern Payaz or Deli) River. Alexander led the charge across the river, shattering the Persian left wing before turning against the Greek mercenaries who formed the Persian centre. His army in confusion, Darius escaped, but his family was captured. Arrian, Alexander's biographer (2nd century AD), claimed the Macedonians lost only 450 men, with Alexander himself being wounded.

Issy-les-Moulineaux, town, suburb of Paris, in Hauts-de-Seine *département,* Île-de-France *région,* north-central France. It is bounded to the northeast by the city limits of Paris. The town has aeronautics and metallurgical industries, and it manufactures chemicals, electrical equipment, and cigarettes. Its airport (on land actually belonging to the city of Paris) was established in 1907 and is the French terminus for the Paris–Brussels helicopter service. It was at Issy that Bishop Jacques-Bénigne Bossuet and other churchmen gathered (1694–95) in an unsuccessful attempt to settle the doctrine of Quietism (perfection in passivity of the soul). Pop. (1982) 45,702.

Issyk-Kul, *oblast* (province), northeastern Kirgiz Soviet Socialist Republic, with an area of 16,800 square miles (43,500 square km). In the northwest is Lake Issyk-Kul at an elevation of 5,276 feet (1,608 m) and surrounded by ranges rising to 17,100 feet (5,200 m), while in the southeast, on the frontier with China, are the highest peaks of the Tien Shan (mountains), culminating in Victory Peak at 24,406 feet (7,439 m). The climate around Lake Issyk-Kul is relatively mild, but in the mountain valleys of the southeast even the summers are cool. Fine-fleeced sheep and pedigree horses are reared on the extensive pastures, and grain and potatoes are grown in the eastern part of the Issyk-Kul Basin. The oblast is the main Soviet producer of raw opium. Industry is found mainly in Przhevalsk, the administrative centre, and Rybachye in the west. Most of the population live around the lake, which is also a summer resort area, the town of Cholpon-Ata on the north shore of the lake being especially popular. Nearly three-fifths of

the population is Kirgiz and about one-third Russian. Pop. (1989 prelim.) 482,000.

Issyk-Kul, Lake, Russian OZERO ISSYK-KUL, a drainless lake in Issyk-Kul *oblast* (province) of the Kirgiz Soviet Socialist Republic. Situated in the northern Tien Shan (mountains), it is one of the largest mountain lakes in the world and is famous for its magnificent scenery and unique scientific interest. It is situated within the bottom edges of the Issyk-Kul Basin, which is bordered on the north by the Kungey-Alatau Range (Khrebet) and on the south by the Terskey-Alatau Range. The lake has a length of 113 miles (182 km), a width of up to 38 miles (61 km), and a surface area of 2,408 square miles (6,236 square km). It reaches 2,303 feet (702 m) in depth and has a volume of 416 cubic miles (1,738 cubic km). The lake's name, which derives from a Kirgiz word for "hot lake," alludes to the fact that it does not freeze over during the winter, even though the lake is situated at an elevation of 5,276 feet (1,608 m). Evidence suggests that Issyk-Kul has existed at least since the Miocene (23.7 to 5.3 million years ago) or Pliocene (5.3 to 1.6 million years ago) epochs.

The Issyk-Kul Basin in which the lake is set is up to 150 miles (241 km) long and 45 miles (72 km) wide, and its surface area is estimated at between 8,500 and 9,000 square miles (22,015 and 23,310 square km). The plain is composed of lake deposits of the Quaternary period (1.6 million years ago to the present). The Kungey-Alatau Range, with elevations up to 15,653 feet (4,771 km), and the Terskey-Alatau (up to 17,113 feet [5,216 km]) frame the basin with steep slopes and rocky crests.

The climate is warm, dry, and temperate. Air temperatures in July on the shore average about 62° F (17° C), while in January, on the western edge of the basin, the temperatures average about 28° F (−2° C). The annual amount of precipitation increases sharply from west to east, from 4 inches (100 mm) to a maximum of 16–20 inches (410–510 mm) in summer. A continuous snow cover exists in the eastern part of the basin, and strong winds blow frequently toward the lake with velocities in the west averaging about 90 miles (145 km) per hour.

More than 50 rivers can be counted in the basin. The largest, the Dzhergalan and the Tyup, are nearly 60 miles (97 km) long and are located in eastern Priissykkulye. The Chu River flows along the basin's western outskirts.

Lake Issyk-Kul's shores open out gently, with coves on the eastern and southeastern sides. Sandy soils predominate. Lake terraces stretch along the shores, indicating a higher water level in the past, and the presence of underwater ruins of buildings at depths of up to 23 feet (7 m) testifies to the fact that in the European Middle Ages the level of the lake was lower than it now is.

The greater part of the lake bottom is made of clay and silt. The water temperature in July on the surface is 68° to 73° F (20° to 23° C), and in January it is 36° to 37° F (2° to 3° C). The water of the Issyk-Kul is sky blue in colour, very clear (visibility up to 65 feet [20 m]), and salty. Unsuitable for drinking and irrigation because of its high mineral content, it is used at times without freshening for watering cattle.

Rocky deserts with sparse, saline, semibushy vegetation lie in the western part of the basin. Toward the east are steppes and meadows and a type of elm that grows in the chestnut soils and black earth. Higher up in the mountains, sub-Alpine and Alpine meadows occur.

More than 20 kinds of fish live in Lake Issyk-Kul. The basic commercial fish are the naked osman, the chebak, the little chebak, the common carp, and the marinka.

The lake's western and eastern shores serve as a wintering place for waterfowl. Pochard, mallard, bald coot, and teal are the main varieties. To conserve the wildlife, the Issyk-Kul Preserve was founded in 1948, encompassing a lake waterfront and a 1-mile (1.6-kilometre) shore zone in which hunting is forbidden. Hare, fox, and muskrat live in the thickets. In all there are some 40 kinds of mammals and 200 types of birds.

Kirgiz and Russians predominate in the population of the basin; but there are also many Ukrainians, Tatars, Uzbeks, and Dungans. There are two large cities—Przhevalsk and Rybachye—and hundreds of villages. Most of the population is concentrated in eastern Priissykkulye. The main occupation is farming: wheat, potatoes, vegetables, and the medicinal poppy are grown, and stock are raised.

Regular boat trips are made across the lake carrying freight and passengers, and the area is joined with other regions by highways, railways, and air transportation. The shores of the lake are noted for their health resorts.

Istanbul, Turkish ISTANBUL, formerly CONSTANTINOPLE, ancient BYZANTIUM, largest city and seaport in Turkey. Strategically situated on a hilly triangular peninsula at the entrance to the Black Sea, the city lies on either side of the Bosporus (Bosphorus) Strait and thus is located in both Europe and Asia.

A brief treatment of Istanbul follows. For full treatment (including a map), *see* MACROPAEDIA: Istanbul.

Byzantium, founded as a colony by Greeks at about the end of the 8th century BC, passed to the Persian Empire in 512 BC and later to Alexander the Great. A free city under the Roman Republic, it came under direct Roman rule during Vespasian's reign (AD 69–79). In 324 Constantine I made the city his capital (renamed New Rome), and in 330 he made it the seat of the empire, later naming it Constantinople. Under Constantine it was decreed a Christian city, and it became the ecclesiastical centre of Christendom. In the 6th–13th century, the city was frequently besieged by the Persians, Arabs, Bulgars, and Russians. It was captured in 1203 by the armies of the Fourth Crusade, who sacked it and turned it over to Latin Christian rule. The city was returned to Byzantine rule in 1261 but fell to the Ottoman ruler Mehmed II, under whom it became popularly known as Istanbul and was made capital of the Ottoman Empire in 1453. A period of peaceful growth followed, lasting until 1922. The Turkish Republic moved the capital to Ankara in 1923, and Constantinople was officially renamed Istanbul in 1930.

The European section of the city, with some three-fourths of the total population, is the site of major businesses and hotel and office complexes. Within the old walled city (Stamboul) lie seven hills, with flat summits and steep slopes, where an essentially medieval appearance is still preserved; lying across the Golden Horn, Beyoğlu, with theatres and many Turkish government offices, is the modern section of Istanbul. The climate of the city is subtropical and Mediterranean, with annual average temperatures of 58° F (14° C) and annual precipitation of 30 to 35 inches (760 to 900 mm).

About one-third of Turkey's manufacturing plants are located in Istanbul. The major industries are the manufacture of textiles, cement, glass, and leather goods; the processing of tobacco; and automobile and truck assembly, printing, and shipbuilding and ship repairing. Many large Turkish banks and foreign insurance companies are located in the city, and tourism is an important source of income.

Istanbul is a city of great historical interest, and many reminders of its past remain. Yerebstan Sarayı (Underground Palace) and Constantine's Palace (Tekfur Sarayı; built a thousand years after Constantine) are among its well-preserved monuments. Many of the ancient Christian churches are still in use, some as mosques; the largest of these is the Hagia Sophia, which in 1453 was converted into a mosque and in 1935 into a museum. The walled Topkapı Palace (Seraglio) houses important Turkish collections of manuscripts, china, armour, and textiles.

The city has been the cultural centre of Turkey for centuries. Among its newer facilities is the Atatürk Palace of Culture, opened in 1969, as a centre for the arts. There are several learned societies, research institutes, museums, and libraries. The University of Istanbul is the oldest and largest institution of higher learning in the country. Other important cultural institutions are the Istanbul Technical University, Marmara University, the University of the Bosporus, Mimar Sinan University, and Yildiz University.

The city is connected by railroads with eastern and western Europe and the Middle East (Syria and Iraq). The Bosporus bridges, linking the European and the Asian sections of Istanbul, are among the longest highway suspension bridges in the world. Yeşilköy International Airport is about 17 miles (27 km) to the west of the city. The port of Istanbul handles a large part of the country's imports and exports. Area city, 98 square miles (254 square km). Pop (1985) 5,475,982.

İstanköy (Greece): *see* Cos.

Isthmian Games, in ancient Greece, a festival of athletic and musical competitions in honour of the sea god Poseidon, held in the spring of the second and fourth years of each Olympiad at his sanctuary on the Isthmus of Corinth. Legend attributed their origin either to Sisyphus, king of Corinth, or to Theseus. Open to all Greeks, the Isthmian Games were especially popular with Athenians. The victors' prize, originally a crown of dry wild celery, was changed to a pine wreath in Roman times, the pine being sacred to Poseidon. Celebration of the festival died out when Christianity became dominant in the 4th century AD.



Blue Mosque (Mosque of Ahmed I) and, beyond, the Sea of Marmara, Istanbul, Tur.

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isthmus, narrow strip of land connecting two large land areas otherwise separated by the sea. Unquestionably the two most famous are the Isthmus of Panama, connecting North and South America, and the Isthmus of Suez, connecting Africa and Asia. Historically the Isthmus of Corinth was of major importance because it connected what otherwise would be the island of the Peloponnese with the rest of the Greek peninsula. Isthmuses are of great importance in plant and animal geography because they offer a path for the migration of land plants and animals between the two land masses they connect.

istiḥsān (Arabic: "to approve," "to sanction"), among Muslim theologians, the use of one's own judgment to determine the best solution to a religious problem that cannot be solved by citing sacred texts. This approach to religious problems found special application as Islām spread to new lands and encountered new environments. Proponents of *istiḥsān* believe Muḥammad sanctioned this procedure when he said: "Whatever true Muslims prefer, is preferable in the eyes of God." Most religious authorities restrict the use of *istiḥsān* to cases that cannot be satisfactorily solved by applying such other well-established norms as, for example, analogy (*qiyās*) and consensus of opinion (*ijmāʿ*). Certain prominent theologians, however, among them ash-Shāfiʿī (d. 820), forbade the use of *istiḥsān* altogether, fearful that true knowledge and correct interpretation of religious obligations would suffer from arbitrary judgments infused with error. The followers of Abū Ḥanīfah (d. 767) held the modified view that *istiḥsān* is in fact a form of analogy because any judgment about what is best necessarily follows careful consideration of all alternative solutions.

istiṣlāḥ (Arabic: "to deem proper"), a norm employed by Muslim jurists to solve perplexing problems that find no clear answer in sacred religious texts. In such a situation, the judge reaches a decision by determining first what is materially most beneficial to the community as a whole, then what benefits the local community, and, finally, what benefits the individual. Almost all Muslim schools of theology acknowledge the usefulness and legitimacy of *istiṣlāḥ,* for they accept the premise that whatever is materially beneficial for humanity in general is almost certainly beneficial to individuals. *Istiṣlāḥ* may not be used when the material advantage to an individual or community directly conflicts with explicit teachings of Islām. Certain Sunnī Muslims, however, regard all material considerations as unworthy of true believers unless such decisions coincide with the spiritual needs of the community.

Istiwāʾīyah al-Gharbīyah,al-, English WESTERN EQUATORIA, *mudīrīyah* (province), Southern Region, southern Sudan, covering an area of 30,399 sq mi (78,732 sq km). Bounded by Zaire on the south, the Central African Republic on the west, and by the provinces of Baḥr al-Ghazāl and al-Buḥayrah on the north, and al-Istīwaʾīyah ash-Sharqīyah on the east, it was created from former al-Istiwāʾīyah province in 1975. The Marra and Abū Gatta hills dominate the western half of the province. The northward-flowing Wāw, Numatinna, Sue and Ibba rivers drain the province. Woodlands of broadleafed trees and thick forest in the valleys are the dominant vegetation.

The region was part of the Egyptian conquest of the Sudan in 1821. The slave and ivory trade flourished, the former until suppressed by Sir Charles Gordon, the governor general of the Sudan, in the early 1870s. Attempts were made to spread Christianity (including mission schools) and Islām among the local peoples. A revolt against the Egyptians begun in 1881 by al-Mahdī, a religious reformer and Sudanese political leader, led to an unsuccessful Mahdist attack on the province in 1888. The area was seized along with the rest of the Sudan by Anglo-Egyptian forces in 1898. The Toposo and Didinga peoples periodically revolted until 1922. Government efforts to localize administration created an Equatoria army corps (limited to southern Sudanese troops) and closed the province to non-Sudanese trade, a policy not reversed until a 1947 conference on unity between north and south. After a short revolt by the Equatoria army corps, the province was incorporated into The Sudan when it became independent in 1956. In the interest of north–south harmony, the government moved to advance Islāmization by opening an Islām institute at Marīdī and expelling the Christian missionaries. Many southerners fled. After a military coup in 1969, the new government granted more autonomy to the south, and refugees who had fled returned and were resettled at Wāw and Tambura.

Agriculture is the principal occupation, and sedentary and shifting cultivation of cereals, root crops, wheat, hemp, jute, coffee, tobacco, and corn (maize) is practiced. Forest products include gum, firewood, charcoal, agricultural implements, rope fibres, and tanning materials. Industries produce leather goods, wood and wood products, milled flour, and processed foods. Yambio, the provincial capital, is linked by road with Marīdī and Tambura. The majority of the population is Nilo-Hamitic including the Murle, Didinga, Boya, Toposa, and Latuka peoples. The Zande scheme, aimed at resettling the Azandes, is located in the province and has its headquarters at Nzura. Pop. (1976 est.) 268,000.

Istiwāʾīyah ash-Sharqīyah, al-, English EASTERN EQUATORIA, *mudīrīyah* (province), Southern Region, southern Sudan, bounded by Zaire, Uganda, and Kenya on the south; Ethiopia on the east; the provinces of Junqalī and al-Buḥayrah on the north, and al-Istiwāʾīyah al-Gharbīyah on the west. It covers an area of 46,038 sq mi (119,237 sq km), and was formed in 1975 from the eastern part of former al-Istiwāʾīyah province. The Imatong and Dongotona mountains, flanked by the lower Didinga Hills to the east, dominate the physiography of the province. The Imatongs are the highest mountains in The Sudan, with Kinyeti the country's highest peak at a height of 10,456 ft (3,187 m). Both the Imatong and the lower Dongatona mountains are covered with lush rain forests and their drainage forms extensive swamps in the north. The Baḥr al-Jābal (Mountain Nile) flows northward through the province.

The region, inhabited by a number of Nilo-Hamitic peoples, was conquered by Egypt in 1821. In 1881 several local tribes joined with al-Mahdī, a religious reformer and Sudanese political leader, in his revolt against Egyptian rule. The Mahdists were defeated by an Anglo-Egyptian force in 1898 and the area was incorporated into the Anglo-Egyptian Condominium the next year. Christian missionaries began founding churches and schools in the province in 1903. Government attempts to localize administration led to the division of the Sudan into north and south. The partition was ended in 1947. Many Arabic schools were started in the province before Sudan's independence in 1956. A rebellion by southern troops at Jūbā in 1958 led to a civil war that continued until 1969.

Agriculture is the principal occupation in the province and shifting cultivation produces *durra* (sorghum), sesame, cotton, castor-oil seeds, cereals, pulses, tobacco, and root crops. There is a developing timber industry and forest produce comprises gum, firewood, charcoal, railway ties, telegraph poles, rope fibres, and tanning materials. Boats and agricultural implements are manufactured. Jūbā, the provincial capital, is connected by road with Yei, Torit, and Kapoeta. The majority of the population is of Nilo-Hamitic stock, including the Murle, Didinga, Boya, Toposa, and Latuka. Pop. (1976 est.) 542,000.

istoriato style, style of pottery decoration, originating *c.* 1500 in Faenza, Italy, and popular throughout the 16th century, in which paintings comparable in seriousness to Italian Renaissance easel paintings were applied to maiolica ware. The subjects—biblical, historical, and mythological scenes—are executed with a realism (including the use of perspective) quite unlike any previous pottery decoration. Some examples are almost exact copies, others are free interpretations of the paintings and graphic work of such contemporary artists as Raphael and Albrecht Dürer. *Istoriato* painting sometimes occupies only the centre of the dish, with a border of formal ornament surrounding it; but often, notably in wares from Urbino, the painting covers the entire surface.



Faenza maiolica *istoriato* dish with a depiction of the judgment of Paris painted within a border of grotesques, 1527; in the Victoria and Albert Museum, London

By courtesy of the Victoria and Albert Museum, London

The greatest *istoriato* painter was Nicola Pellipario, who decorated Castel Durante and Urbino wares. His palette is soft and harmonious, and his subjects, drawn chiefly from Ovid and Lucian, are lyrically rendered. Many pieces of a service produced for Isabella d'Este, and another for the Ridolfis, survive in museums. The *istoriato* style was widely imitated in pottery centres outside of Italy, especially in France.

Istria, Serbo-Croatian ISTRA, triangular peninsula in Yugoslavia, 1,220 sq mi (3,160 sq km) in area, extending into the northern Adriatic Sea between the Gulf of Venice (west) and the Kvarner (east). Istria is divided administratively between Slovenia (north) and Croatia (south). A highly indented shoreline 267 mi (430 km) in length exhibits numerous drowned valleys. The west coast has a score of small offshore island groups, the most notable being Brioni. The peninsula is a limestone plateau, lacking in water in the north due to its karst topography. There are thick forests, however, and places suffering from the ravages of timber cutting are being reforested. In the waterless areas a scrub vegetation prevails. Maximum elevation, 4,580 ft (1,396 m), is reached at Mt. Učka. A Mediterranean climate brings predominantly hot, dry summers and warm, wet winters.

The population, about two-thirds of which is Croatian, engages mostly in agriculture. There has been an increase in viticulture; fishing, cattle breeding, and forestry are other activities. Locally, salt is obtained from seawater at Piran and Portorož; Raša is an important site for the mining of high quality anthracite

coal; and bauxite, building stone, and quartz are extracted. The major cities are Pula and Opatija. The beautiful Istria was subdued by Rome in 177 BC after two wars. It was under the control of diverse Mediterranean powers until 1797, when the entire peninsula came under the rule of Austria, which lost it to Italy (1919). Most of Istria passed to Yugoslavia in 1947; the northwestern section, around Trieste, was divided between Italy and Yugoslavia in 1954. Pop. (1982 est.) Yugoslavian part, about 300,000.

Istrie, Jean-Baptiste Bessières, duc d' (duke of): *see* Bessières, Jean-Baptiste.

István (Hungarian personal name): *see under* Stephen.

Īśvara (Sanskrit: "Lord"), in Hinduism, the personal, or immanent, god, as distinct from the absolute, or transcendent, supreme being (Brahman). Īśvara refers to the personified aspect of the divine, of whom the various sectarian divinities are particular manifestations. The title is particularly favoured by devotees of the god Śiva, though its meaning transcends all sectarian differences; the comparable term Bhagavat (also meaning "Lord") is more commonly used among the Vaiṣṇava (followers of the god Vishnu).

Itabuna, city, southeastern Bahia state, northeastern Brazil, just west of Ilhéus on the Rio Cachoeira at 174 feet (53 m) above sea level. Itabuna, which was elevated to city status in 1910, is the trade centre for a rich zone yielding cacao, livestock, and other agricultural products. It was used as a setting by Jorge Amado in his novels dealing with the cacao culture. A chemical factory is located there. Goods are transported to Salvador, the state capital (150 miles [240 km] north-northwest), and to other urban centres in Bahia by highway, air, and ocean (via Ilhéus). Pop. (1980 prelim.) 129,938.

Itacoatiara, city, northeastern Amazonas state, northwestern Brazil. Formerly known as Serpa, the settlement lies on the left (north) bank of the Amazon River, downstream from the junction of the Madeira and approximately 110 miles (180 km) east of Manaus, the state capital. River steamers and hydroplanes utilize the facilities at Itacoatiara, which ships principally rubber, Brazil nuts, cacao, hardwood, and fish. The town is of archaeological importance as the site at which tinted petroglyphs were discovered. Pop. (1980 prelim.) 26,737.

Itagaki Taisuke, HAKUSHAKU (Count) (b. April 17, 1837, Kōchi, Japan—d. July 11, 1919, Tokyo), founder of Japan's first political party, the Jiyūtō, or Liberal Party.

Born into a middle-ranking samurai family, Itagaki entered the service of his feudal lord in 1860 and emerged from subsequent factional struggles to become the military commander in Tosa, the large feudal domain controlled by his clansmen. Under Itagaki's command the troops of Tosa participated in the Meiji Restoration in 1868, which overthrew the Tokugawa shogunate and restored national authority to the emperor. Afterward, he was one of a dozen powerful young leaders on the national scene and served from 1868 to 1873 as an official in the new government. When the majority of the Cabinet thwarted his plans for a war against Korea, he resigned and founded a political club (political parties were then unknown in Japan). He denounced the government's arbitrary stand and called for the formation of a "council chamber chosen by the people," to advise the government.

In 1875 he served in the Cabinet for a brief period but then once again left. This time he founded the first nationwide organization with a mass following, the Society of Patriots, but he resisted the desire of radical members of the group to join in the rebellion that was raised in 1877 by dissatisfied samurai. In 1878 Itagaki tried to further his movement by establishing a school devoted to teaching the principles of democratic government. For this action he became known as the Rousseau of Japan. The peak of his fame came shortly after, when he organized Japan's first political party. He was a charismatic leader and a popular speaker. In April 1882, campaigning for the Jiyūtō, he was stabbed by an attacker and is reputed to have declared: "Itagaki may die, but liberty, never."

With the beginning of parliamentary government in 1890, Itagaki, who had been made a count in 1887, served as the symbolic head of his party, which frequently cooperated with Itō Hirobumi, Japan's first prime minister and one of the more liberal of the government oligarchs. He and his party felt a responsibility to demonstrate to the West that the Japanese were capable of parliamentary government. After retirement in 1900 he wrote position papers and agitated for social reform.

Itagüí, city, Antioquia department, northern Colombia, on the Río Porce between the Andean Cordilleras (mountains) Occidental and Central, at 5,148 feet (1,569 m) above sea level. Formerly a resort and a local commercial and manufacturing centre, Itagüí has become part of the industrial complex centring on Medellín, 5 miles (8 km) northeast by highway and railroad. The principal industrial activity in Itagüí is textile milling. Pop. (1973) 90,828.

Itaipú Dam, hollow gravity dam on the Upper Paraná River at the Brazil–Paraguay border, north of the town of Puerto Presidente Stroessner, Paraguay. It is the world's largest hydroelectric project, with 18 massive turbine generators located in the powerhouse at the base of the dam; the turbines are capable of generating 12,600 megawatts of electricity. Built as a joint venture by Paraguay and Brazil, the whole Itaipú complex of dams and spillways curves across almost 5 miles (8 km) of the Upper Paraná River. The dam itself, built between 1975 and 1982, is 643 feet (196 m) high and consists of large concrete segments joined to form a hollow chamber. The upstream face is supported by two buttresses, and the downstream face is a simple concrete slab. It is the highest and largest hollow gravity dam in the world. Its reservoir stretches northward for about 100 miles, and it has totally submerged the formerly spectacular Guaíra Falls (*q.v.*).

Itajaí, city, eastern Santa Catarina state, southern Brazil, at the mouth of the Rio Itajaí, at 20 feet (6 m) above sea level. Founded in the mid-19th century by German and Italian colonists, Itajaí is now the commercial centre and port for an agricultural region drained by the Rio Itajaí and its tributaries. Wrapping paper and cotton textiles are the principal goods manufactured in the city, which also exports lumber, starch, cassava, sassafras, vegetable oil, and tobacco. In the late 1970s a fishing terminal was installed there. Itajaí is connected to Florianópolis, the state capital (50 miles [80 km] south), and to other communities in Santa Catarina by highway and air. Pop. (1980 prelim.) 78,867.

Itajubá, city, southern Minas Gerais state, Brazil, on the Rio Sapucaí, in the Serra da Mantiquiera, at 2,769 feet (844 m) above sea level. It was made the seat of a municipality in 1848 and given city status in 1862. Although basically a textile centre, it has other industries and serves a region of agriculture (coffee, rice, corn [maize], and sugarcane) and cattle ranching. Goods are transported by rail or road to Belo Horizonte, the state capital, 389 miles (626 km) northeast, and to other cities in Minas Gerais, São Paulo, and Rio de Janeiro states. Pop. (1980 prelim.) 53,506.

Italia: *see* Italy.

Italian Communist Party, Italian PARTITO COMUNISTA ITALIANO (PCI), second largest of Italy's two major political parties and western Europe's largest Communist party.

Dissidents of the Italian Socialist Party's extreme left wing founded the PCI in January 1921. The new party matured quickly, sending deputies to parliament before Benito Mussolini's Fascists outlawed all political parties in 1926. After that year, the PCI went underground to establish an organization that later proved important to the Italian Resistance.

After World War II, the PCI joined five other anti-Fascist parties in coalition governments until May 1947, when the Christian Democrat premier Alcide De Gasperi excluded both the PCI and the Italian Socialist Party from a new government. The PCI's consistent success at the polls ensured that it would continue to influence Italy's political life. In particular, the Communists' ability to win votes away from the Socialists' left wing affected the policies of that important party.

In 1956, when the revelation of Joseph Stalin's crimes was followed by the Soviet Union's suppression of the Hungarian revolt, Communist leader Palmiro Togliatti helped dissociate the party from the Soviet Union by proposing the concept of "polycentrism," a form of limited independence among Communist parties. After Togliatti's death in 1964, the PCI nearly split into "Russian" and "Italian" wings over this concept. Despite this conflict and other splits to the left, the PCI won 26.9 percent of the vote in the 1968 parliamentary elections. This victory, together with the PCI's apparent acceptance of democratic processes in 1969, raised the question of Communist participation in government—a question that bitterly divided the governing coalitions thereafter.

Enrico Berlinguer, who led the party from 1972 until his death in 1984, became one of Europe's leading proponents of "Eurocommunism," or "national Communism," which advocated the flexible adjustment of Communist principles to national or local needs and conditions. In the 1980s, with the decline of the Communist parties of Spain and France, the concept of Eurocommunism faded and the PCI looked increasingly toward alliance with the Italian Socialist Party.

Italian Democratic Socialist Party, Italian PARTITO SOCIALISTA DEMOCRATICO ITALIANO (PSDI), anti-Communist reform party advocating economic planning and nationalization of some industries. As a centre party, it was able to join many Italian governments in the decades after World War II.

In early 1947, Socialists who opposed the Italian Socialist Party (PSI) for its cooperation with the Italian Communist Party (PCI), seceded to form the Socialist Party of Italian Workers (Partito Socialista dei Lavoratori Italiani; PSLI). After the Christian Democrat premier Alcide De Gasperi excluded the PCI and the PSI from his government in May 1947, the PSLI's parliamentary support and participation in government added stability to the government's majority. In 1952 the PSLI and other anti-Communist Socialist factions merged and were renamed the PSDI, which participated in centre governments after 1954.

As the PSI moved away from its Communist ally during the 1950s, its platform came to resemble that of the PSDI. In 1963 the PSI took part in government, and in October 1966 the PSDI rejoined under PSI's name. The reunion lasted only a short time; after the PCI's share of the vote increased to 26.9 percent in the 1968 parliamentary election, the question of a government including Communists arose. The former Social Democrats who opposed Communist participation left the PSI in July 1969

and formed the Unitary Socialist Party (PSU), whose disagreement with the PSI constituted a major stumbling block to forming governments in the late 1960s. The PSU took the name of Social Democrat again in the spring of 1970. It has continued to add support to the Christian Democratic governments.

Italian East Africa, Italian AFRICA ORIENTALE ITALIANA, group of Italian possessions in East Africa in 1936–41. It comprised Ethiopia (annexed by Italy on May 9, 1936, and proclaimed a part of Italian East Africa that June 1) together with the Italian colonies of Eritrea, now part of Ethiopia, and Italian Somaliland, now part of the Somali Democratic Republic. Italy's king, Victor Emmanuel III, was named emperor. British forces overran the area between January and November 1941.

Italian language, Italian ITALIANO, Romance language spoken by nearly 66,000,000 persons in Italy (including Sicily and Sardinia), France (including Corsica), Switzerland, and other countries. It is spoken by large numbers of emigrants and their descendants in the Americas, especially in the United States, Argentina, and Canada. Written materials in Italian date from the 10th century (a set of court records with the testimony of the witnesses in the Italian vernacular), and the first literary work of length is the *Ritmo Laurenziano* ("Laurentian Rhythm") of the late 12th century.

Although Italian has a standard literary form, based on the dialect of Florence, the common speech is dialectal or a local variant of standard Italian. The less formal the occasion and the less educated the speaker, the greater the deviation from standard speech; many Italians cannot speak the standard language at all. The following dialect groups are distinguished: Northern Italian, or Gallo-Italian; Venetan, spoken in northeastern Italy; Tuscan (including Corsican); and three related groups from southern and eastern Italy—(1) the dialects of the Marche, Umbria, and Rome, (2) those of Abruzzi, Puglia (Apulia), Naples, Campania, and Lucania, and (3) those of Calabria, Otranto, and Sicily.

The sound system of Italian is quite similar to that of Latin or Spanish. Its grammar is also similar to that of the other modern Romance languages, showing agreement of adjectives and nouns, the use of definite and indefinite articles, loss of noun declension for case, two genders (masculine and feminine), and an elaborate system of perfect and progressive tenses for the verb. The most notable difference between Italian and French or Spanish is that it does not use *-s* or *-es* to form the plural of nouns but instead uses *-e* for most feminine words and *-i* for masculine words (and some feminine words).

Italian Liberal Party, Italian PARTITO LIBERALE ITALIANO (PLI), conservative Italian political party founded about 1942 (clandestinely during the Fascist period), with its first congress being held in 1944. It has remained a minority party, never garnering more than 6 percent of the vote.

Before the Fascist era (and the consequent dissolution of opposition parties), there was no "Liberal Party" in Italy, but only various parties and parliamentary groups that could be called "liberal" in the 19th-century sense. Such factions and the party that was formed in 1942 have their roots in the 19th-century liberalism promoted by Count Camillo di Cavour, who favoured Italian unity and free enterprise. This tradition was continued in the 20th century by such liberal theorists as Benedetto Croce and Luigi Einaudi.

The modern Italian Liberal Party favours capitalism, laicism, and support for NATO and draws its chief support from small businessmen. Since 1944 it has been a minor partner in most of the Christian Democratic coalition governments.

Italian literature, the body of written works produced in the Italian language that had its beginnings in the 13th century.

A brief account of Italian literature follows. For full treatment, *see* MACROPAEDIA: Italian Literature.

Lacking political and administrative cohesion, Italy had a variety of vulgar tongues, ranging from Provençal to Sicilian, that might have replaced Latin as the lingua franca. It was largely due to the genius of Dante Alighieri (1265–1321), author of *La divina commedia* (*c.* 1310–21; *The Divine Comedy*), that the new literary medium became Tuscan. Thereafter, Giovanni Boccaccio (1313–75), worldly and traveled, broadened the language's secular appeal, and Francesco Petrarch (1304–74), with his intellectual gifts, contributed much in refining and elaborating Dante's *dolce stil novo* ("sweet new style"). Figures such as the humanist Leon Battista Alberti (1404–72), who insisted that Tuscan was in no way inferior to Latin, helped to sustain Florence's intellectual leadership, while the Venetian Pietro Bembo (1470–1547), credited with producing the first proper Italian grammar, himself championed Tuscan not so much for its intrinsic merits as for the excellence of its literary achievements.

With Ludovico Ariosto (1474–1533), Niccolò Machiavelli (1469–1527), and Francesco Guicciardini (1483–1540), humanistic writings reached a high point. Ariosto is remembered above all for *Orlando furioso* (1516), the epic poem on which he laboured for 30 years, while Machiavelli and Guicciardini, among many others, reaffirmed the role of Tuscan by employing the vernacular for their celebrated historical and political writings. From the period of the Counter-Reformation the only major work to have stood the test of time is Torquato Tasso's (1544–95) *Gerusalemme liberata* (1581; "Jerusalem Delivered"), a narrative poem inspired by the First Crusade.

The Age of Enlightenment saw a crisis in the written language, which as the vehicle of a restricted elite had tended over the years to petrify, while the Italian public, using dialect as their first tongue but with an increasing access to education, required an up-to-date literary medium more in tune with the spoken word. The poet Giuseppe Parini and the dramatist Vittorio Alfieri used conventional literary styles, but there were those, such as the philosopher and economist Cesare Bonesana Beccaria (1738–94) or the journalist Pietro Giordani (1774–1848), who were giving thought to the creation of a standard vernacular better adapted to modern needs. Yet others such as the Milanese poet Carlo Porta (1775–1821) and, to a lesser degree, the Venetian dramatist Carlo Goldoni (1707–93), were resorting to regional dialect in the quest for a popular, true-to-life linguistic tool. It was the Romantic Alessandro Manzoni (1785–1873), with his novel *I promessi sposi*, 3 vol. (1825–27; *The Betrothed*), who did more than anyone to forge a new literary idiom, basing it, despite his Milanese birth, on everyday, middle-class Florentine speech.

Italian Romanticism inevitably became involved with the patriotic myths of the Risorgimento ("Rising Again"), and much of the literature produced at this time reflects the political fervour of the age. With the notable exception of Manzoni's poetry and fiction and Giacomo Leopardi's poetry, the bulk of writing is more important for its good intentions and didactic vigour than its literary merit. The sentimental poetry of the "Second Romanticism" especially helped spark a number of reactive movements. *Verismo* ("realism"), for example, was a literary movement inspired by the French Naturalists, and it reflected Positivist and determinist ideas. The *veristi* tried to present life—usually that of the lower classes—objectively and without adornment and to achieve documentary, "real-life" effects. The greatest exponent of *verismo,* Giovanni Verga (1840–1922), in his two masterpieces, *I malavoglia* (1881; *The House by the Medlar Tree*) and *Mastro-don Gesualdo* (1889), portrays the victims of social and economic change. Luigi Capuana (1839–1915), the founder of *verismo,* is best remembered for his dramatic psychological study *Il marchese di Roccaverdina* (1901; "The Marquis of Roccaverdina").

In sharp contrast to the *veristi* stands the flamboyant nationalist and literary virtuoso Gabriele D'Annunzio (1863–1938), who answered his contemporaries' need for a new myth in the prosaic atmosphere of the post-unification era. D'Annunzio is best known for his autobiographical novel *Il piacere* (1889; *The Child of Pleasure*), his mature poetry, and his late memoirs.

The end of World War I witnessed a need to return to traditional stylistic values. Yet this understandable need for order not only produced a sterile preoccupation with form but also blended in readily with the stifling of free expression under Fascism. A notable exception to this trend was Luigi Pirandello (1867–1936), who achieved international recognition with his innovative, experimental drama. In his masterworks *Sei personaggi in cerca d'autore* (1921; *Six Characters in Search of an Author*) and *Enrico IV* (1922; *Henry IV*) he probes the fluctuating boundaries between reality and appearances, art and life, and sanity and insanity. Italo Svevo (1861–1928) in *La coscienza di Zeno* (1923; *The Confessions of Zeno*) creates a gem of psychological observation and Jewish humour. Of enduring readability are works by Corrado Alvaro, Dino Buzzati, Carlo Emilio Gadda, and Ignazio Silone. The poets of the earlier part of the 20th century, influenced by the French Symbolists, wrote in an involuted manner, employing unorthodox structures and a highly subjective language that enabled them to voice their distress obscurely. Known by the name of *ermetismo* (Hermeticism), the movement included such names as Eugenio Montale and Giuseppe Ungaretti.

Post-World War II literature, imprecisely labeled Neorealist, reflects the influences of *verismo,* Marxist ideas, and American literature. For their subject matter writers relied heavily on the unusual experiences of contemporary history. Thus there are Carlo Levi's poetic evocation of Lucania, an impoverished town in the south to which he was exiled by the Fascist regime (*Cristo si è fermato a Eboli* [1945; *Christ Stopped at Eboli*]); Francesco Jovine's *Terre del Sacramento* (1950; *The Estate in Abruzzi*); and Vasco Pratolini's pictures of the Florentine working classes (*Il quartiere* [1945; *The Naked Streets*] and *Metello* [1955]).

Because the literary spectrum has become more heterogeneous, it is easiest to view contemporary writers in terms of individual domain. Giorgio Bassani's milieu, for example, is the nostalgic world of Ferrara, with particular emphasis on its Jewish community; Italo Calvino has spun fantastic philosophical tales; Leonardo Sciascia evokes his native Sicily with concerned and scholarly understanding; Natalia Ginzburg's territory is the family, be it her own, an imagined, or a historical one. This list of authors can readily be lengthened to hold such names as Carlo Cassola, Alberto Moravia, Mario Soldati, Giovanni Arpino, Elsa Morante, and Umberto Eco.

Italian Peninsula, one of the three great peninsulas of southern Europe, the other two being the Balkan (to the east) and the Iberian (to the west). The Italian Peninsula extends from the region of the Po River southward for some 600 mi (960 km); it has a maximum width of 150 mi. To the east lies the Adriatic Sea, to the south the Ionian Sea, and to the

west the Tyrrhenian and Ligurian seas. The Apennines, a volcanic mountain chain subject to frequent earthquakes, extends the length of the peninsula; lowlands are mostly along the coasts. The peninsula comprises much of Italy and includes the independent republic of San Marino as well as Vatican City.

Italian Republican Party, Italian PARTITO REPUBBLICANO ITALIANO (PRI), anticlerical social reform party. Although it had only a small following in the years after World War II, its position in the centre of the Italian political spectrum enabled it to take part in many coalition governments.

The party traces to the 19th century when radicals fought for a unified Italy under a republican form of government; the PRI was formally founded in 1895. Suppressed during the Mussolini era, it reemerged in 1943. After World War II, the PRI refused to participate in government until Italians had voted against monarchical government. From 1947 to 1953, the PRI participated in the four-party "centre" governments. It withdrew from government in 1953 and did not return until February 1963, when the dominant centre party, Christian Democracy (Democrazia Cristiana), joined Italy's two Socialist parties and the PRI in a centre-left coalition. The PRI usually remained in government thereafter, and a PRI leader, Giovanni Spadolini, was premier in 1981 and 1982.

Italian Social Movement, Italian MOVIMENTO SOCIALE ITALIANO (MSI), extreme right-wing anti-Communist party of Italy, many of whose members have been persecuted for neo-Fascist actions.

The MSI was formed in 1948 from elements of the defunct Uomo Qualunque (Average Man) Party that had appeared in 1945. In the early 1950s MSI's electoral success worried moderates until they saw that the right-wing party was not gaining a substantial number of votes. The moderates' occasional need for MSI votes, however, proved embarrassing; in 1960, when the MSI formed a necessary part of a parliamentary majority, protest riots led to the fall of the Christian Democratic government. In the 1972 general elections MSI joined with another right-wing party, the Italian Democratic Party of Monarchical Unity, to form an alliance known as the National Right (Destro Nazionale; DN). In January 1973 they formally merged as the MSI-DN; but, in the 1976 elections, extremist members engaged in so many public acts of violence that 26 more moderate MSI-DN parliamentarians subsequently bolted from the party and formed a right-wing but anti-Fascist party known as the National Democracy (Democrazia Nazionale; DN). This splinter party, however, won no seats in subsequent elections, whereas the surviving MSI continued to win seats.

Italian Socialist Party, Italian PARTITO SOCIALISTA ITALIANA (PSI), one of the first Italian parties with a national scope and a modern democratic organization, founded in 1892 in Genoa as the Italian Workers' Party (Partito dei Lavoratori Italiani) and taking its present name in 1893.

The original basis of the party lay among trade unions, socialist circles, and cooperative organizations and contained an Anarchist and a Marxist wing. Throughout the first decades of the 20th century the party's left wing (or maximalists) and its reformists (led by Filippo Turati) fought for control. One of the leaders of the maximalists was Benito Mussolini, but he was expelled in 1914 because he favoured Italy's entrance into World War I. During that war the PSI took a neutral and pacifist position that reflected the intense struggle between the reformists and the left wing. In 1919 at the Bologna Congress the left took leadership of the party, joined the Communist International (Comintern), and attempted revolutionary conquest and the establishment of a Socialist Republic. After an enormous wave of strikes, demonstrations, and factory occupations in 1920, a reaction set in. While the majority of the party retreated, the left broke away to join the Italian Communist Party.

The PSI was driven underground in 1926, and in 1934 it formed an alliance with the Communists that lasted until the mid-1950s, when the Soviet invasion of Hungary and Khrushchev's secret speech led the PSI to denounce the Soviet Union. The party remained torn over the question of whether to collaborate with the Christian Democrats or the Communists.

After much hesitation the party joined a Christian Democratic government in 1963. Thereafter the PSI was part of or supported many centre-left governments, and in 1983 Bettino Craxi became the first Socialist premier. His government lasted longer than any other since World War II.

Italian State Railways: *see* Ferrovie dello Stato Italia.

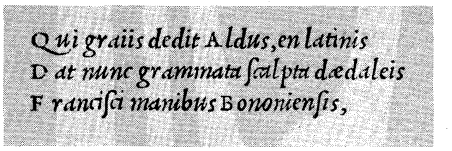
Italianate painters, group of 17th-century painters, principally Dutch, who traveled in Italy and, consciously adopting the style of landscape painting that they found there, incorporated Italian models and motifs into their own works. Chief among the Italianates were Bartholomeus Breenbergh, Andries and Jan Both, Nicolaes Berchem, and Jan Asselijn. The Both brothers, of Utrecht, were to some degree rivals of the Haarlem-born Berchem. Andries painted the figures that populated Jan's landscapes. Berchem's own compositions were largely derived from the Arcadian landscapes of Claude Lorrain (1600–82); a typical scene would contain shepherds grazing their flocks among classical ruins, bathed in a golden haze. Upon his return to Holland, Berchem occasionally worked in cooperation with the local painters and is said to have supplied figures in works of both Jacob van Ruisdael and Meindert Hobbema.



"Figures in the Roman Forum," oil painting by Andries and Jan Both, Dutch painters belonging to a group of artists known as the Italianate painters; in the Rijksmuseum, Amsterdam

By courtesy of the Rijksmuseum, Amsterdam

italic, in printing, a sloping, light-bodied, compact, and almost cursive letter form, which, with roman and black letter shapes, has been one of the three major typefaces in the history of Western printing. Used today almost exclusively as a special function adjunct of roman letters, italic types were used first as body texts in small volumes in which their space-saving, humanistic characteristics were desirable. Though first designed in 1500



Italic type from the dedication to Virgil's *Opera*, the first book to use italic type, printed by Aldus Manutius in Venice, 1501

Courtesy of The Newberry Library, Chicago

or earlier, the first notable use of italic was in an edition of Virgil (the "Aldine Virgil"), created in 1501 by Francesco Griffo, typecutter to the printer Aldus Manutius, in Venice. He designed his type on models of an informal, handwritten letter used in the papal chanceries of the time, and he cut his new face in lowercase letters only. He combined these with a suitable roman capital. Still later, a simple, sloping uppercase face was introduced, as an intermediate between roman and a fully developed uppercase italic letter shape.

Italic languages, Indo-European languages spoken in the Apennine Peninsula (now Italy) in the 1st millennium BC. The only survivor after that period was Latin, the language of the Roman Empire and, later, western Christendom.

A brief treatment of the Italic languages follows. For full treatment, *see* MACROPAEDIA: Languages of the World.

No longer thought to be a subfamily of Indo-European like Celtic, Germanic, or Slavic, the Italic languages seem to be distinguishable into three independent members of the Indo-European family: Latin (perhaps with Faliscan), Osco-Umbrian, and Venetic. Data on them comes from Greek and Roman sources, especially from inscriptions. Latin is the language of Latium and of Rome; its earliest known documents date from the 6th century BC. From the 3rd century BC, Latin began to emerge as the predominant language of Italy, and by AD 100 it had effaced all the other dialects between Sicily and the Alps, with the exception of Greek in the colonies of Magna Graecia.

Before the spread of Latin, Oscan was the most widely spoken group of dialects of the Apennine Peninsula. It was used by the Samnites, by the inhabitants of Lucania and Bruttium, and by smaller tribes between Latium and the Adriatic Coast. The most important

Oscan texts come from Campanian cities; the most extensive Oscan inscription, the Tabula Bantina, is preserved in Lucania. The Umbrian idiom, closely related to Oscan, is known principally from the Tabulae Iguvinae (Iguvine Tables), which constitute one of the largest and most important epigraphical documents of antiquity. Faliscan inscriptions appear around Falerii, in the Etruscan area of central Italy. Venetic, once used in the region surrounding present-day Venice, is known principally by inscriptions from sanctuaries at Este and Lagole di Calalzo.

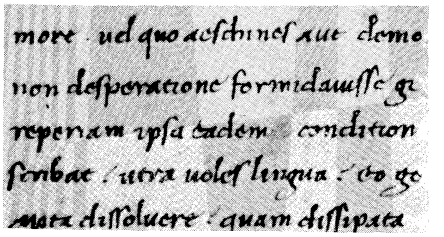
The alphabets used for writing these languages include Greek, Latin, and derivations of the Etruscan alphabet. Four national "scripts" include Oscan, Umbrian, Faliscan, and Venetic.

The Italic languages must have been brought from the original area of the Indo-European languages, probably east central Europe. A stratum of very old place-names of non-Indo-European origin, a stratum ascribed to a "Mediterranean" language, attests to this immigration. Phonetic differences between the reconstructed hypothetical Indo-European parent language and the attested Italic languages seem to have occurred late in time. Only one can confidently be placed before the migration over the Alps: the change to *ss* of the combinations of the dental occlusive (stop) plus *t*. This feature is common to Celtic, Germanic, and Latin—for example, Latin *visus*, "seen," High German *gi-wiss*, "surely known," and the Indo-European term with $d + t$, $*widto$-*s* (an asterisk [*] means a word is reconstructed). Features that developed in Italy itself include the voiceless dental spirant *f*, which replaced the Indo-European voiced aspirates *bh, dh, $g^{w}h$,* in initial position—for example, Latin *frater*, "brother" equals Umbrian *frater* and equals Indo-European $*bhrāter$.

In contrast to the many phonological correlations among the Italic languages, there are few definite connections between these tongues in their grammars. Many of the morphological features common to Osco-Umbrian and Latin are shared by other Indo-European languages—for instance, the passive ending in *-r* in the Oscan *vincter* and Latin *vincitur*, "He is conquered," are found in Celtic, Hittite, and Tocharian as well. More important are the discrepancies. For example, the genitive singular of *o*-stems shows *-i* in Latin and Faliscan (perhaps also in Venetic) and in the Celtic languages, but *-eis* in Osco-Umbrian.

Lexical comparison leads to more specific data about the history of the Italic languages. An old difference between Latin and Osco-Umbrian is found in Latin *ignis*, "fire," equals Sanskrit *agni*, but Umbrian *pir* "fire" equals Greek *pȳr* and Old English *fyr*. Certain forms, reflecting the acquisition of Mediterranean culture, suggest that Latin and Osco-Umbrian speakers were not in contact with each other when they began to build cities. On the other hand, they adopted the same terms for "write" and "read." Both the Latin and Osco-Umbrian alphabets are derived from the Etruscan one, and Etruscan features are obvious in archaic Italic religion. Osco-Umbrians and Veneti adopted even the Etruscan word for "god"—*ais*. The Etruscan supremacy ended about 500 BC with the founding of local republics in Rome and in other cities of Italy. Early republican terminology developed independently in each of the Italic languages. The last period of Italic language history shows an increasing influence of Roman models.

italic script, in calligraphy, script developed by the Italian Humanists *c.* 1400 from antique Latin texts and inscriptions. The Humanists called the Carolingian minuscule of most of these sources *lettera antica,* mistakenly regarding it as a Roman script from the time of Cicero. Florentine scribe Niccolò Niccoli (died 1437) combined the rhythm and fluidity of the familiar black-letter current hand with the narrow, inclined strokes of the *lettera antica* in his *antica corsiva,* which became the model for italic printing types. As in modern italic fonts, the form of *a* is distinctive, and *f, g, k,* and ſ (long *s*) are more or less reminiscent of black-letter cursive. For his headings Niccoli preferred Roman capitals "italicized" by a slight inclination to the right.



Antica corsiva, from *Cicero*, italic script developed by Niccolò Niccoli, 1423 (Florence, Biblioteca Nazionale Centrale, Conv. Suppr. J.1.14, c. 32r)
By courtesy of the Biblioteca Nazionale Centrale, Florence

Italic War (ancient Rome): *see* Social War.

Italicus, Silius: *see* Silius Italicus.

Italiysky, Aleksandr Vasilyevich Suvorov, Knyaz (Prince): *see* Suvorov, Aleksandr Vasilyevich.

Italo-Albanian Church, also called ITALO-GREEK CHURCH, or ITALO-GREEK-ALBANIAN CHURCH, an Eastern rite member of the Roman Catholic communion, comprising the descendants of ancient Greek colonists in southern Italy and Sicily and 15th-century Albanian refugees from Ottoman rule. The Italo-Greeks were Byzantine-rite Catholics; but, after the Norman invasion of the 11th century, most of them were forcibly Latinized. Byzantine practices were partially restored with the coming of the Eastern-rite Albanian refugees, but the monasteries continued to decline, and by the 17th century the bishops were all Latin.

Pope Benedict XIV's pronouncements of 1742 (*Esti Pastoralis*) recognized the validity of the ancient Italo-Greek-Albanian rites and customs and allowed that members of the rite should be free from Latin coercion or interference in their traditional affairs. The Italo-Albanians, however, were not organized under their own bishops until 1919, in the diocese of Lungro (Calabria), Italy, and 1937, in the Sicilian diocese of Paina degli Albanesi. Although heavily influenced by Latin usages in their churches, calendar, and feast days, they have made some attempt to restore the purity of the Byzantine liturgical rites.

Italo-Ethiopian War (1935–36), an armed conflict that resulted in Ethiopia's subjection to Italian rule. Often seen as one of the episodes that prepared the way for World War II, the war demonstrated the ineffectiveness of the League of Nations when League decisions were not supported by the great powers.

Ethiopia (Abyssinia), which Italy had unsuccessfully tried to conquer in the 1890s, was in 1934 one of the few independent states in a European-dominated Africa. A border incident between Ethiopia and Italian Somaliland that December gave Benito Mussolini an excuse to intervene. Rejecting all arbitration offers, the Italians invaded Ethiopia on Oct. 3, 1935.

Under Generals Rodolfo Graziani and Pietro Badoglio, the invading forces steadily pushed back the ill-armed and poorly trained Ethiopian Army, winning a major victory near Lake Ascianghi (Ashangi) on April 9, 1936, and taking the capital, Addis Ababa, on May 5. The nation's leader, Emperor Haile Selassie, went into exile. In Rome, Mussolini proclaimed Italy's king Victor Emmanuel III emperor of Ethiopia and appointed Badoglio to rule as viceroy.

In response to Ethiopian appeals, the League of Nations condemned the Italian invasion in 1935 and voted to impose economic sanctions on the aggressor. The sanctions remained ineffective because of general lack of support. Although Mussolini's action was viewed with disfavour by the British, who had a stake in East Africa, the other major powers had no real interest in opposing him. The war, by giving substance to Italian imperialist claims, contributed to international tension.

Italo-Turkish War (1911–12), war undertaken by Italy to gain colonies in North Africa by conquering the Turkish provinces of Tripolitana and Cyrenaica (modern Libya). The conflict upset the precarious international balance of power just prior to World War I by revealing the weakness of Turkey and, within Italy, unleashed the nationalist–expansionist sentiment that guided government policy in the following decades.

Italy took advantage of a period of international uncertainty following the Moroccan crisis of 1911 to achieve its long desired goal of establishing a colony in North Africa. Using the pretext of the infringement of Italian interests in the two provinces, the Italian government issued an ultimatum to Turkey on Sept. 28, 1911, and on the next day declared war. Italian forces quickly occupied the towns of Tripoli, Darnah (Derna) and Banghāzī (Benghazi), but unexpected resistance on the part of the Muslim population forced the Italian commander Gen. Carlo Caneva to confine operations to the coastal areas. In May 1912 Italian naval forces occupied Rhodes and some of the Dodecanese islands off the Turkish coast, but the war remained at a stalemate until a successful Italian offensive in North Africa from July to October 1912. Turkey, now menaced by the Balkan states, sought peace. By the terms of the Treaty of Lausanne (also called Treaty of Ouchy; Oct. 18, 1912), Turkey conceded its rights over Tripoli and Cyrenaica to Italy. Although Italy agreed to evacuate the Dodecanese, its forces continued to occupy the islands.

Italus, John (fl. 11th century), Byzantine philosopher, skilled dialectician, and imputed heretic who, at the imperial court, established a school of Platonism that advanced the work of integrating Christian with pagan Greek thought. Italus exerted a lasting influence on the Byzantine mind.

Of Calabrian origin, Italus, after a period of court favour under the emperor Michael VII Ducas (1071–78), was suspected of treason while on a diplomatic mission to Italy but was later exonerated. With the exile of his tutor, Michael Psellus, he succeeded to the title first philosopher of Constantinople. In a synod of 1082 he was charged with rationalizing the Christian mysteries, particularly the ineffable manner of the God–man union in Christ, and with reviving the doctrines of the pre-existence and transmigration of souls, as enunciated by pre-Christian philosophers. Confined to a monastery, he publicly retracted any neo-pagan implications in his teaching and was consequently pardoned.

Italus' distinction derives from his attempt, in 93 short tracts, to synthesize Platonic metaphysics with Aristotelian logic. His eclecticism greatly influenced the later theories of 14th- and 15th-century Italian Humanism.

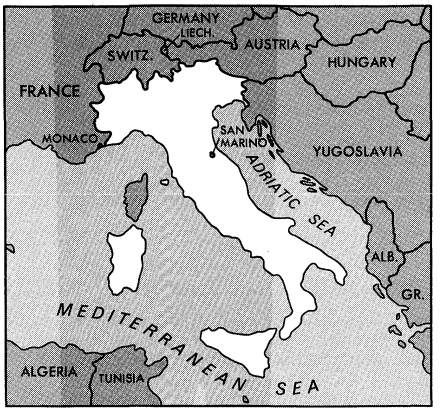
Italy, Latin ITALIA, in Roman antiquity, the Italian Peninsula from the Apennines in the north to the "boot" in the south. In 42 BC Cisalpine Gaul, north of the Apennines, was added; and in the late 3rd century AD Italy came to include the islands of Sicily, Corsica, and Sardinia, as well as Raetia and part of Pannonia to the north.

The first major power in the peninsula was the Etruscans. From Etruria, Etruscan power spread northward to the Po Valley and southward to Campania, but it later collapsed to Etruria itself. Where the Etruscans failed, the people of Rome gradually succeeded in the task of unifying the various Italian peoples into a political whole. By 264 BC all Italy south of Cisalpine Gaul was united under the leadership of Rome in a confederacy; its members were either incorporated in or allied with the Roman state. The status of the allies gradually changed until after the Italian, or Social, War (*i.e.*, the war of the *socii*, or allies) of 90 BC, when Roman citizenship was extended to all Italy. But political unification was achieved more quickly than was sentimental unity: Romans and Italici did not immediately coalesce into a nation. Cicero might talk of *tota Italia*, but Italy was not finally united in spirit until the time of Augustus, and Romanization was still slower in superseding local differences. In the meantime Cisalpine Gaul, which had received Roman citizenship in stages, was incorporated into Italy in 42 BC.

For administrative purposes the emperor Augustus divided Italy into 11 regions: (1) Latium and Campania, including the Volsci, Hernici, Aurunci, and Picentini, from the mouth of the Tiber to that of the Silarus (Sele) River; (2) Apulia and Calabria, including the Hirpini (the "heel" of Italy); (3) Lucania and Bruttium, bounded on the west coast by the Silarus, on the east by the Bradanus (Bradano) River (the "toe" of Italy); (4) Samnium, including the Samnites, Frentani, Marrucini, Marsi, Paeligni, Aequiculi, Vestini, and Sabini, bounded on the south by the Tifernus (Biferno), on the north probably by the Matrinus (Piomba) River; (5) Picenum, between the Aesis (Esino) and Matrinus rivers; (6) Umbria, including the *ager Gallicus*, bounded by the upper Tiber, Crustumius (Conca), and Aesis rivers; (7) Etruria, bounded by the Macra (Magra) and Tiber rivers; (8) Gallia Cispadana, limited by the Po, from Placentia (Piacenza) to its mouth, and by the Crustumius, which was substituted for the Rubicon; (9) Liguria, bounded by the Varus (Var), Po, and Macra; (10) Venetia and Istria, including the Cenomani around Lake Garda in the west; and (11) Gallia Transpadana, bounded by the Alps, the Po, and the Addua (Adda) River. This arrangement was retained almost unchanged until the emperor Diocletian's reorganization (*c.* AD 290–300), when the diocese of Italy included the islands of Sicily, Corsica, and Sardinia, as well as Raetia and part of Pannonia to the north. In practice this diocese was divided into two areas, each under a *vicarius:* that of Italy with the four northern regions and that of Rome with the seven southern areas and the islands.

Italy, officially ITALIAN REPUBLIC, Italian ITALIA, or REPUBBLICA ITALIANA, mountainous country of south central Europe, extending southeastward into the Mediterranean Sea, covering an area of 116,324 sq mi (301,277 sq km). The capital is Rome. Its neighbours to the north are France, Switzerland, Austria, and Yugoslavia. It is separated from Albania and Greece, to the southeast, by the Adriatic Sea, and from Tunisia, to the southwest, by the Mediterranean Sea. The population in 1990 was estimated to be 57,512,000.

The article that follows is a summary of significant detail about Italy. Fuller treatment is provided in the following MACROPAEDIA articles. For geography and history, *see* Italy; for information about the country in its regional setting, *see* Europe; Mediterranean Sea. For information about its major cities, *see* Florence; Milan; Rome. For information about its literary history, *see* Italian Literature.



Italy

For current history and for statistics on Italian society and economy, *see* the article "World Affairs" and BRITANNICA WORLD DATA, respectively, in the *Britannica Book of the Year.*

The land. Italy is a country of mountains and highlands; the Alps, among the world's highest and most rugged mountains, loop from east to west along its northern boundary, joining the Apennine Mountains in a narrow strip near the Ligurian (Riviera) Coast in the northwest. The highest ranges lie in the western Alps along the Swiss border, rising to 15,203 ft (4,634 m) at Monte Rosa (Italy's highest peak). The Apennine mountain system stretches southward the length of the country (for about 745 mi [1,220 km]), widening in the central region (near Rome) to about 120 mi, narrowing again in the south as its southern ranges continue westward into Sicily. The country's plains (or lowlands) occupy less than one-fourth of the total land area; nearly two-thirds of these lie in the Po River Valley (a region about the size of Denmark). The Po Valley, facing eastward toward the Adriatic Sea, is bounded on the north by the Alps and on the south by the northernmost extent of the Apennines. Most of the remaining lowlands are scattered along the coasts. Three major tectonic plates, converging from the south, the west, and the northeast, create geologically unstable conditions throughout southern Italy and Sicily. An earthquake southeast of Naples destroyed several villages and took more than 3,000 lives in November 1980. The most famous of southern Italy's four active volcanoes is Mt. Vesuvius, whose eruption in the first century AD destroyed Pompeii. In March 1981, Sicily's Mt. Etna erupted for the third time in the 20th century.

Italy's major river, the Po, is joined by several large tributaries from the north as it flows eastward, forming a catchment area of more than 27,000 sq mi. The country's major Alpine lakes, including Lago Maggiore, Lugano, and Como, drain southward to the Po Valley. Rivers discharging into the Tyrrhenian Sea to the southwest (including the Arno [Florence to Pisa] and the Tiber rivers) generally run parallel to the coast and are longer than those that discharge along the northeastern Adriatic and the southeastern Ionian coasts.

The country's major islands, Sicily and Sardinia, are generally drier and warmer than the mainland; winters are mild (temperatures range between 48° and 52° F [9° and 11° C]) and summers are hot and dry (July temperatures average almost 80° F [26° C] and rainfall for June, July, and August averages less than 1 in. [25 mm]). The mainland climate varies generally from north (northwest) to south (southeast); summer temperatures are relatively uniform throughout the country. July temperatures range between 72° and 75° F (22° and 24° C), while winter temperatures range from cold (32° to 35° F [0° to 2° C]) in the Alps and the Po Valley in the north to relatively mild (41° to 46° F [5° to 8° C]) in the south. Annual average rainfall generally exceeds 40 in. (1,000 mm) in the highlands and remains below 30 in. in the lowlands (including a large part of the Po Valley). The dry season occurs during the winter in the north and during the summer in the south; in neither area is it as marked as on the islands.

In the early 1980s, more than 40 percent of Italy's land area was considered arable; more than one-quarter of it was planted to wheat (the country's major crop) and another 15 percent devoted to corn (maize), barley, and oats. The Po Valley is the principal agricultural region and has little of its original forest vegetation remaining. Natural vegetation is determined largely by elevation; the lower Alpine lake regions support cork oak, European olive, and cypress, replaced by beech slightly higher up, which finally gives way to deciduous larch and Norway spruce. The country's wildlife includes the marmot, ermine, and the Alpine rabbit among the smaller mammals; among the larger mammals are two protected species, the brown bear and the ibex. Birds include the golden eagle and the rarer capercaillie (wood grouse).

Italy's mineral reserves include modest commercial deposits of antimony, iron, magnesium, manganese, mercury, lead, zinc, and copper. In the early 1980s the country's estimated reserves of petroleum and natural gas were placed at more than 90,000,000 metric tons (625,000,000 bbl) and more than 3,650,000,000,000 cu ft (100,000,000,000 cu m), respectively.

The people. There is some anthropological variation from one region to another, and this has been slow to change, despite internal migration. The inhabitants of the south tend to be both darker and shorter in stature than those of the northern regions. The people are generally dark complected, but there are fair types in northern Italy. The country is linguistically homogeneous, with nearly all the population speaking Italian save for a small German-speaking minority in the north, where even smaller minorities of other groups are also found, among them Greeks and Albanians. In the early 1980s some 85 percent of the populace professed Roman Catholicism; most of the remainder professed no religion except for some 500,000 evangelical Protestants and a scattering of other Protestant and non-Christian groups, all small. Italy's population density was about 485 persons per sq mi (187 per sq km) in the early 1980s. The birth rate was 13 per 1,000 population and the death rate 10 per 1,000, with an annual rate of growth of 0.4 percent.

The economy. Italy has a developed mixed private and publicly owned economy. The gross national product (GNP) in 1981 was U.S. $350,231,000,000, about $6,227 per capita. Average annual growth of the real GNP (1975–80) was 3.8 percent. Services in the private sector and mining, manufacturing, and utilities contribute the largest shares of the GNP.

Agriculture accounts for 6 percent of the GNP and employs about 12 percent of the labour force. About one-fourth of Italy's arable land requires irrigation. In addition to cereal grains, sugar beets, tomatoes, potatoes, and olives are produced. Orchard fruits and nuts and grapes are important, and Italy is one of Europe's largest producers of garden vegetables and fruits. It ranks high in olive oil and wine production.

Pastures occupy 17 percent of Italy's land area but are often rocky, marginal land, and although sheep, cattle, pigs, goats, and chickens are raised, Italy is a net importer of meat and dairy products. Dairy cattle as well as sheep, goats, and water buffalo supply milk. Cattle hides sustain Italy's renowned leather industry.

Forests occupy about one-fifth of the land area, but Italy must import more than two-

fifths of its lumber needs as well as cork. Most indigenous lumber is used for industrial purposes, and sawn wood, panelling, veneer sheets, and plywood are also important products.

Fishing in the Mediterranean has declined because of over-fishing and pollution, but Italy managed to increase its catch in the early 1980s through Atlantic Ocean operations; marine fishing, especially sardines and anchovies, accounts for 92 percent of the catch. Fish must also be imported to satisfy domestic needs.

Mineral resources are inadequate for domestic manufacturing needs. Some natural gas, petroleum, and lignite is produced. Among metals there is limited mining of iron ore, zinc, antimony, cadmium, and silver. Only in stone is Italy well endowed; marble, pozzolan and pumice, gypsum, salt, potash, pyrites, feldspar, and bentonite and refractory clays are produced in quantity.

Industry is well diversified and includes petroleum refining, cement, steel and iron, and ferroalloys; among manufactures are motor vehicles and bicycles, domestic electrical appliances, typewriters and business machines, various electronic products, railway equipment, ships, various textiles and clothing, and bricks, glass, ceramics, and china wares. Electrical energy production (1980) was 186,305,000,000 kW-hr, mostly thermal, with one-quarter of it hydroelectric, 2 percent geothermal, and only 1 percent nuclear. Construction generates about 8 percent of the GNP and employs 9 percent of the labour force. Major projects in the early 1980s included a gas pipeline from Algeria, reconstruction in the south after the earthquake of 1980, nuclear and coal fired electrical generating plants, and port construction in northern Italy.

Tourism is well developed, centring on winter sports in the north, historic sites, museums, cultural events, and a mild winter climate in the south. More than 40,000,000 tourists visited Italy annually in the early 1980s, generating about $8,000,000,000 income.

The labour force is about two-fifths of the population, and the largest sectors of employment are industry, services, and trade and commerce. Each of Italy's three major labour federations is closely allied to a political party; there are the Communists, Christian Democrats, and Social Democrats. Strikes occur frequently, often hindering industrial production.

Italy's government owns and operates a number of industries through a system of financial holding companies. The producing companies thus held are also open to private investment. Industrial development has been channelled through this structure and through five-year economic plans. There is also a development plan for southern Italy. Budgetary and trade deficits and uneven European economic growth in the 1970s helped cause high inflation and economic slowdown. The government responded by introducing credit limits and austerity budgets, and devalued its currency, the lira, in 1980.

Budgetary revenue is obtained mainly from property and income taxes, business taxes and duties, and value-added taxes on manufacturing and consumption. Expenditures are primarily for social security and welfare, health, economic services, public services, interest on the public debt, and education.

The Banca d' Italia is the central bank of issue and oversees the operation of government owned and private banks. Special government sponsored credit banks finance development projects. Italy is a member of the European Economic Community.

Railways are state owned and administered by the Ferrovie dello Stato. More than half of its 10,000-mi network is electrified. There are more than 180,000 mi of roads, nearly nine-tenths paved. Some 1,500 mi of internal waterways include rivers, canals, and lakes. The principal ports by volume of traffic are Genoa, Augusta, Trieste, Venice, and Taranto. Ferry service links the mainland to Sicily, Sardinia, and the smaller islands. Italy's merchant fleet had (1982) 1,663 vessels larger than 100 gross tons. Rome and Milan are the principal international airports. Alitalia is the government-owned international airline, and two of its subsidiaries and a third, private company, provide domestic services to most cities.

Italy's trade deficits peaked in 1980 and improved in 1981. The principal exports are machinery and manufactured products; textiles, clothing, and shoes; chemicals; and transport equipment; and these are sent mainly to Germany, France, the United Kingdom, and the United States. Imports consist mainly of crude petroleum, chemicals, and food, drink, and tobacco, arriving principally from Germany, France, the United States, and Saudi Arabia.

Administrative and social conditions. Italy is a multi-party parliamentary republic. Supreme authority rests with the Parliament, which consists of two bodies of equal legislative power: a 322-member Senate and a 630-member Chamber of Deputies. Except for seven senators appointed for life, all legislators are elected to five-year terms by universal adult suffrage. According to the country's constitution of 1948, the two bodies may be dissolved by the president before the end of their normal term. The president, who is elected by an electoral college comprising the Parliament and 58 regional representatives, serves as head of state. He appoints a prime minister who directs the country's executive affairs and who names a Council of Ministers (cabinet) to assist him. All ministers are responsible to the Parliament. The judicial system in Italy is headed by a 15-member Constitutional Court. The nation's political system usually produces short-lived coalition governments dominated by the centrist Christian Democratic Party. The second largest political party has been the Italian Communist Party, which has sought to gain political power by parliamentary means and has frequently distanced itself from the Soviet Communist Party line. The Communists have elected mayors of many Italian cities. Italy belongs to the North Atlantic Treaty Organization (NATO) and allows the United States to maintain military bases on Italian soil.

The country's social welfare system offers benefits for work injury, disability, maternity, unemployment, and retirement. In addition, the national health service provides low-cost medical care to all residents.

Health conditions in Italy are roughly comparable to those found in other Western European countries. The principal causes of death are cardiovascular and cerebrovascular diseases and cancer—health problems that are usually associated with the most highly industrialized nations. Italy has a high number of doctors and hospital beds per 10,000 population, and an infant mortality rate of 15 per 1,000 live births. Life expectancy at birth stands at 70 years for men and 76 years for women.

Education in Italy is free and compulsory for children between the ages of 6 and 14 years. This eight-year span consists of five years of primary and three of lower secondary school. Higher secondary education is provided by classical, artistic, and scientific *lycées,* training schools for elementary teachers, and technical and vocational institutes. Students who receive a higher secondary certificate are eligible for automatic entry into any Italian university. One of Italy's most historic institutions of higher learning is the Universita degli Studi in Rome, which was founded in 1303 by Pope Boniface VIII.

Italy's press is free from government censorship. News articles are usually highly politicized, with many newspapers leaning strongly to the political right-of-centre. The broadcast media are owned and operated by the state through Radiotelevisione Italiana.

Cultural life. Italy's contributions to the arts are legendary. Through Dante, Petrarch, and Boccaccio, Italian literature blossomed to greatness early; after Ariosto and Tasso in the later Renaissance it declined somewhat into formalism but renewed some of its fire through the Romantics, Vittorio Alfieri, Ugo Foscolo, Alessandro Manzoni, and Giacomo Leopardi; and then, in the 20th century, Gabriele D'Annunzio represented the last flowering of Romanticism. The great names in Italian visual arts and architecture through the centuries make a long catalog: those of Giotto, Donatello, Brunelleschi, Michelangelo, Leonardo da Vinci, Titian, Bernini, and Tiepolo call up a host of others. Italian music has been one of the supreme expressions of that art in Europe: Gregorian chant, troubadour song, the madrigal, and work of Palestrina and Monteverdi and of composers such as Vivaldi, Alessandro and Domenico Scarlatti, and Cimarosa. Italy's most significant contribution to contemporary art on an international scale has probably been in cinema. Important directors include Roberto Rossellini, Vittorio de Sica, Michelangelo Antonioni, Federico Fellini, Cesare Zavatini, Pier Paolo Pasolini, and Luchino Visconti. The trenchantly laconic statement of many of these directors' films and their affinity with the attitudes of Existentialist thinking marked a development in cinematic imagination that had a cross-fertilizing influence, in particular, on the young French filmmakers of the "New Wave."

History. Italy supported life during Paleolithic times, and traces of Neanderthal Man have been found. The migrations of Indo-European peoples into Italy probably began around 2000 BC and continued down to 1000 BC. From about 900 BC, the Etruscan civilization, under heavy Greco–Oriental influence, flourished between the Arno and Tiber rivers. Sometime in the 6th century BC, the Romans overthrew the Etruscans and established the Roman Republic. By 264 BC, all Italy south of Cisalpine Gaul was under the leadership of Rome. The Romans continued to expand their influence, and when the republic fell in 44 BC, an empire was launched that by AD 180 extended from Britain to Africa to the Euphrates River. The imprint of Roman civilization on the Western world is immense. From its alphabet, to its laws, to its roads, to its arts, the heritage of Roman civilization has lasted well into the 20th century.

The barbarian invasions of the 4th and 5th centuries finally destroyed the western Roman Empire. Part of Italy fell to the Byzantines, but the rest was invaded first by the Lombards, then the Franks, then the Saracens, and finally the Germans. For a time, the pope was the only real authority in Rome, and he came to rule over an area known as the Papal States. The Normans invaded southern Italy in the 11th century and established a kingdom there. City-states, whose political and commercial rivalries were intense, eventually emerged in the north.

Though Italy remained politically fragmented for centuries, it became the cultural centre of the Western world from the 13th to the 16th century. The Italian Renaissance remains one of the highest artistic achievements in history.

In the late 15th century, Italy was invaded by France and later by Emperor Charles V, who subjugated most of the country by 1550. Through Charles, Italy passed to the Spanish Habsburgs, who held sway until the Austrians gained control of much of northern Italy in the first half of the 18th century. Certain areas, however, clung to or gained independence during this century. When the Napoleonic

invasion of 1796 was brought to an end in 1815, Italy was again a grouping of major and minor independent states.

The Risorgimento is the name given to the Italian unification movement that took place in the 19th century largely through the efforts of the House of Savoy, the monarchs of the liberal northern Italian state of Piedmont. With French help, the Piedmontese had united most of Italy under the rule of their king, Victor Emmanuel II, by 1861. The annexation of Venetia in 1866 and papal Rome in 1870 marked the complete unification of peninsular Italy into one nation.

Fascism developed in Italy after World War I under Benito Mussolini. Italy invaded Ethiopia and formed the Rome–Berlin Axis in 1936. When the Allied powers invaded Italy in 1943, Mussolini fled and Italy surrendered to the Allies and joined the war against Germany.

In 1946 a republic was proclaimed, and coalition governments became the rule as Italy recovered from the ravages of the war. Economic growth thereafter was slow but steady, and Italy became an integral member of both the European Economic Community and the North Atlantic Treaty Organization. A prolonged outbreak of terrorist activities by the left-wing Red Brigades threatened domestic stability in the 1970s, but by the late 1980s the terrorist groups had been suppressed by skillful police investigations and prosecutions. By that time Italy's economy had become one of the more dynamic ones in Europe.

Itami, city, Hyōgo *ken* (prefecture), Honshu, Japan. It lies along the Fukuchigama railway line, northwest of Ōsaka. The site was settled in prehistoric times. The opening of the railway and the construction of company-owned housing complexes made Itami a residential suburb of the Ōsaka–Kōbe Metropolitan Area. The city's industrial district was founded in the 1930s and has expanded since World War II. Itami contains most of Ōsaka International Airport. Pop. (1988 est.) 186,734.

Itapetininga, city, in the highlands of east-central São Paulo *estado* ("state"), Brazil, lying at 2,200 feet (670 m) above sea level, near the Itapetininga River. Formerly called Nossa Senhora dos Prazeres de Itapetininga, it was given town status in 1770 and was made the seat of a municipality in 1771. Agriculture and industry both contribute to Itapetininga's economy. Principal crops in the region are corn (maize), rice, *feijão* (beans), and cotton. Cotton textiles, furniture, and ceramics are manufactured in the city. Goods travel by road or rail to the state capital, São Paulo, 90 miles (145 km) east, and to other urban centres in São Paulo and Paraná states. Itapetininga also has an airfield. Pop. (1980) 61,298.

Itapicuru River, river, Maranhão *estado* ("state"), northeastern Brazil, rising in several headstreams in the Itapicuru mountain range. It arches northeastward to Caxias and thence northwestward, emptying into the Atlantic Ocean through São José Bay, southeast of São Luís Island. The river's total length is approximately 750 miles (1,200 km), of which about 400 miles (640 km) are navigable.

Itard, Jean-Marc-Gaspard (b. 1775, Oraison, Fr.—d. July 5, 1838, Paris), French military surgeon who later became an outstanding specialist in ear diseases and malfunctions and who, from 1800, devoted much of his time and private fortune to the education of deaf mutes. He was also one of the first to attempt the instruction of mentally retarded children on a scientific basis. In *Rapports sur le sauvage de l'Aveyron* (1801; *Reports on the Savage of Aveyron*), he explained the methods he used (1801–05) in trying to train and educate an 11-year-old boy who had been found running naked and wild in a forest. His work indirectly influenced the educational methods of the Italian pediatrician Maria Montessori.

Itārsi, town, central Madhya Pradesh state, central India. A major rail junction connected with Bhopāl, Gwalior, and Indore, Itārsi has extensive railway workshops. The town is also a trade centre for forest products from the Sātpura Range to the south. A large weekly cattle market is held in the town. Itārsi has a college affiliated with the University of Saugar. Pop. (1981) town, 62,499; metropolitan area, 69,619.

Itasca, Lake, lake regarded as the main source of the Mississippi River, in Clearwater county, northwestern Minnesota, U.S. Of glacial origin, it covers an area of 1.8 square miles (4.7 square km) and has an average depth of 20–35 feet (6–11 m). From the lake's surface, which is 1,475 feet (450 m) above sea level, the Mississippi flows southward 2,348 miles (3,779 km) to the Gulf of Mexico.

The fur trader William Morrison was reputedly the first white man to visit the lake in 1803. It was Henry Rowe Schoolcraft, the U.S. superintendent of Indian affairs for Michigan Territory, however, who proposed Lake Itasca as the true source of the Mississippi in 1832. The French explorer Joseph Nicollet surveyed the area in 1836 and confirmed Schoolcraft's claim. Many geologists, however, believe that other glacial lakes in the region also supply the headwaters of the river.

Schoolcraft is generally credited with originating the name Itasca from the Latin words *veritas* ("truth") and *caput* ("head," or "source"). Indian legend, however, mentions I-tesk-ka, the daughter of Hiawatha, whose tears of anguish at being spirited away to the netherworld reputedly formed the source of the Mississippi.

The Itasca basin was made a state park in 1891. The lake is stocked with muskie and other prize fish and is popular with boaters. The University of Minnesota maintains a school of forestry and a biological station nearby.

Itata and Baltimore incidents (1891), two serious occurrences involving the United States and Chile, the first during and the second shortly after the Chilean civil war of 1891. The civil war was precipitated by a conflict between the Chilean Congress and President José Manuel Balmaceda, in which the navy supported the insurgent Congress and the army backed the president. The U.S. government openly favoured Balmaceda. The rebels, faced with a shortage of arms, purchased some in San Diego, Calif., and loaded them on the Chilean ship *Itata*. U.S. officials, claiming that the purchase violated their country's neutrality, attempted unsuccessfully to prevent the ship from sailing. On the *Itata's* arrival in Chile the revolutionaries were forced to hand the ship over to U.S. naval custody. The *Itata* was escorted back to the United States, where a court ruled that there had been no violation of U.S. neutrality and that the detention of the ship had been improper. The incident aroused the intense anger of the Chilean insurgents, and, after they had gained control of the government, U.S.–Chilean relations entered a long period of tension that was further aggravated by the incident involving the cruiser USS *Baltimore*.

In August 1891 Balmaceda resigned and gained asylum in the Argentine legation, after forces loyal to him had suffered two defeats near Valparaíso. The U.S. minister to Chile then gave political asylum to some of Balmaceda's supporters. Animosity toward North Americans boiled over on Oct. 16, 1891, when the captain of the *Baltimore* injudiciously allowed his men shore leave at Valparaíso. Some of the crew members were attacked by a mob; two were killed and several wounded seriously. War was averted when the Chilean government, while maintaining that the seamen were to blame, offered to pay an indemnity of $75,000 to their families.

Itaya Hazan (b. 1872, Shimodate, Japan—d. 1963, Shimodate), Japanese potter known for his depiction of noble figures and his skill as a colourist.

After studying sculpture at the Tokyo Fine Arts School, Itaya graduated in 1894 and then studied ceramics, building a kiln in Tokyo in 1904. In 1953 he received the Bunka Kunshō ("Order of Cultural Merit"). His most famous works include a pot decorated with flowers in bright glaze (1935) and a coloured ceramic vase decorated with auspicious flowers and a phoenix (1927).

Itbāy, also called 'ATBĀY, mountainous region of southeastern Egypt and the northeastern part of The Sudan, paralleling the Red Sea. It lies largely south of Egypt's administrative boundary with The Sudan and separates the coastal lowland of the Red Sea from the Nile River valley. Itbāy north–south-trending mountain chains are called the Red Sea Hills.

itching, also called PRURITUS, a stimulation of free nerve endings, usually at the junction of the dermis and epidermis of the skin, that evokes a desire to scratch. It has been suggested that an itch is a subthreshold sensation of pain; however, although both itch and pain sensations share common nerve pathways, they are generally considered to be distinct sensory types. Itching evokes a range of sensations, from a tickling feeling that is easily relieved, to pathological itching, which generally indicates a dermatologic or systemic disease.

The release of histamine from cells in the epidermis is usually considered to incite most sensations of itching. Scratching may temporarily relieve itching by interrupting the rhythm of nerve impulses or by inflicting transitory damage to the nerves. Persistent scratching produces redness, papules, and crusting of the skin.

Itching associated with skin lesions (such as vesicles and papules) generally indicates a dermatologic disease. Generalized itching without skin lesions can occur in systemic diseases such as those that occur in metabolic and endocrine conditions, malignant cancers, drug reactions, and renal, blood, and liver diseases. Excessive drying of the skin caused by old age or weather often produces itching, as does pregnancy. A psychological cause for itching is considered only after all other possibilities have been sufficiently excluded.

No generally accepted therapy exists for the relief of itching, although many have been suggested. Topical anesthetics and other drugs usually have temporary or minor effects. Emollients, applied and blotted dry, may be helpful when applied to wet skin. At present the choice of therapy usually depends on the underlying cause of the itching, and the focus is primarily on curing the underlying disease rather than the symptom.

Itchō (Japanese painter): *see* Hanabusa Itchō.

Itelmen (people): *see* Kamchadal.

Iténez River (South America): *see* Guaporé River.

Iteso (people): *see* Teso.

Ithaca, Modern Greek ITHÁKI, the second smallest of the seven main Ionian Islands (*q.v.*), in the *nomós* (department) of Cephalonia, Greece. (The smallest is Paxos.)

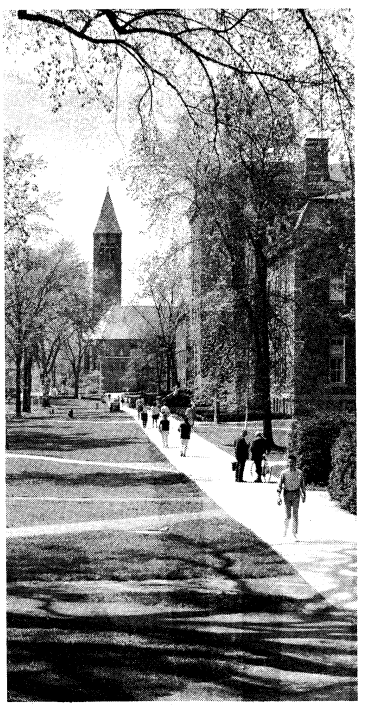
With an area of 37 square miles (96 square km), it consists of two limestone masses connected by a narrow, hilly peninsula that curves to form the head of a gulf facing the Greek mainland. The island is separated on the west by the Ithákis Channel, approximately 2.5 miles (4 km) in width. With little arable land,

Ithaca must import grain, but some olive oil, wine, and currants are produced. The island was devastated by the earthquake of 1953 but was rebuilt. Ithákī (Vathý), the chief place and port of the island, is well protected at the head of a narrow, deep, horseshoe-shaped inlet of the gulf.

The island owes its fame almost solely to its classical associations, almost no mention of it appearing in writings of the Middle Ages. As late as AD 1504 it was almost uninhabited following depredations by corsairs, and the Venetians had to grant incentives to settlers from neighbouring islands and the mainland to repopulate it. Although its identity with the Ithaca of the legendary hero Odysseus has been disputed by scholars, the island appears to be described in the *Odyssey* with considerable coincidence of topographic detail. The Homeric "Fountain of Arethusa" has been identified with a copious spring rising at the foot of a sea cliff at the island's southeastern extremity, and counterparts have been sought for such Homeric locales as Mt. Neritos, Mt. Neion, the harbour of Phorcys, the town and palace of Odysseus, and the cave of the Naiads. Some authorities have placed the Homeric town on an inlet on the northwestern coast of the island, others at Aëtós on the isthmus.

No amount of ingenuity, however, can fully reconcile the descriptions in the *Odyssey* with the present topography. It has been suggested that the Homeric Ithaca should be identified with Leucas (*q.v.*) and that the name may have been transferred through a migration of the inhabitants. Excavations by the British School at Athens at Polis, Aëtós, and elsewhere have confirmed occupation during the appropriate period, the Mycenaean, but nothing can be identified positively with Homeric localities. These same excavations revealed traces also of a Corinthian colony (*c.* 800 BC) at Aëtós. Pop. (1981) island, 3,646; port, 2,037.

Ithaca, city, seat (1817) of Tompkins County, central New York, U.S., at the southern end of Cayuga Lake, 55 mi (89 km) southwest of Syracuse. Within the city are picturesque gorges cut by several creeks. Founded in 1789 by Simeon DeWitt, surveyor general of New York, it had formerly been a part of the military tract granted in 1782 to veterans of the American Revolution. Named Ithaca (for the ancient Greek island) in 1795, it developed as an agricultural and lumber centre. Its growth was stimulated by the establishment there of Cornell University (founded by Ezra Cornell in 1865) and Ithaca College (1892). Located at the southern terminus of the New York State Barge Canal system, it has acquired some industry, including salt production and the manufacture of chain drives and belting, adding machines, and textiles. Ithaca is a southern gateway to the Finger Lakes recreational area, and tourism enhances the economy. Inc. village, 1821; city, 1888. Pop. (1980) 28,732.



The Arts Quadrangle at Cornell University, Ithaca, N.Y.

By courtesy of Cornell University, Ithaca, N.Y.

Ithnā ʿAsharīyah, also called IMĀMĪS, English TWELVERS, an important sect of the Shīʿah (one of the major branches of Islām), believing in a succession of 12 *imāms*, leaders of the faith after the death of Muḥammad, beginning with ʿAlī ibn Abī Ṭālib, fourth caliph and the Prophet's son-in-law.

Each of the *imāms*—ʿAlī, his sons Ḥasan and Ḥusayn, ʿAlī Zayn al-ʿĀbidīn, Muḥammad al-Bāqir, Jaʿfar aṣ-Ṣādiq, Mūsā al-Kāẓim, ʿAlī ar-Riḍā, Muḥammad al-Jawād, ʿAlī al-Hādī, Ḥasan al-ʿAskarī, and Muḥammad al-Mahdī al-Ḥujjah—was chosen from the family of his predecessor, not necessarily the eldest son but a descendant deemed spiritually pure. The last *imām* recognized by the Ithnā ʿAsharīyah disappeared in 878 and is thought to be alive and in hiding, ready to return at the Last Judgment. As the 12 *imāms* are viewed as preservers of the faith and the only interpreters of the esoteric meanings of law and theology, a cult has grown around them, in which they are thought to influence the world's future. Pilgrimages to their tombs secure special rewards and are legitimate substitutes for pilgrimages to Mecca. In the period from the disappearance of the *imām* to the Mongol invasion (*c.* 1050), a body of literature known as Ḥadīth (reports of Muḥammad's activities and sayings and the sayings of ʿAlī) was collected in support of Twelver beliefs.

Ithnā ʿAsharīyah became the state religion of Iran under the Ṣafavīd dynasty (1501–1736), which claimed descent from the 7th *imām* and added the words "I testify that ʿAlī is the *walī* (friend) of God" to the Muslim profession of faith (*shahādah*). The sect also has followings in India, Iraq, and Syria. *See also* imām.

itinerarium, plural ITINERARIA, road manual or route map of the ancient Roman Empire. They were constructed according to basic concepts formulated by Greek cartographers such as Agrippa and Ptolemy, and they were frequently used by private and official travellers.

The only surviving map is the Peutinger Table, a 13th-century copy of a Roman world map. The 4th-century "Antonine Itinerary," one of the few remaining manuals, provides lists of several thousand geographic names of the entire empire, with estimates of the intervening distances. The "Ravenna Cosmography," probably of the 7th century, itemizes islands of the Atlantic and places and rivers of Asia, Africa, and Europe.

Itō, city, Shizuoka Prefecture (*ken*), Honshu, Japan, on the east coast of the Izu-hantō (Izu Peninsula). Although its hot springs were discovered in the late 16th century, the city did not develop as a resort until the arrival of a railway line from Atami in 1938. Itō is now the second largest spa on the peninsula (after Atami), with almost 400 hot springs. It is also an important fishing port and market for the mandarin oranges grown to the west. Historic monuments include the Otonashi Shrine to which the shogun Minamoto Yoritomo was banished in 1160. Pop. (1980) 69,638.

Itō Hirobumi, KŌSHAKU (Duke, or Prince), original name TOSHISUKE (b. Oct. 14, 1841, Suō Province, Japan—d. Oct. 26, 1909, Harbin, Manchuria, China), Japanese elder statesman (genrō) and premier (1885–88, 1892–96, 1898, 1900–01), who played a crucial role in the building of modern Japan. He helped draft the Meiji constitution (1889) and brought about the establishment of a bicameral national Diet (1890). He was created a marquess in 1884 and a duke (or prince) in 1907.

Early career. Itō's father was an adopted son of a modest samurai (warrior) family, and Itō grew up amid convulsive political conditions resulting from the decline of the Tokugawa shogunate—which had governed Japan since 1603—and the rise of Western influence in the country. He played a minor role in the events leading to the Meiji Restoration, a movement that overthrew the shogunate and restored power to the emperor (1868). This brought him into contact with men like Kido Takayoshi, who was to become one of the great leaders of early Meiji Japan and who was Itō's most important mentor in these years.

Itō's talents were apparent even before the restoration, and he was sent to England by the leaders of Chōshū to study Western naval science (1863). His connections with Kido and Ōkubo Toshimichi, the other giant of early Meiji Japan, enabled him to undertake government assignments to the United States and the Iwakura Mission to Europe (1870, 1871–73) to study and work on matters as diverse as taxation and budgetary systems and treaty revision.

Rise to power. His political career changed decisively when Ōkubo, the most powerful man in the government, was assassinated in 1878, and Itō succeeded him as minister of home affairs. His advancement brought him into conflict with the equally talented and ambitious statesman Ōkuma Shigenobu. In a series of masterful political strokes, Itō forced Ōkuma and his supporters out of the government in 1881 and persuaded the government to adopt a constitution; by 1889 the Emperor proclaimed it and in 1890 the national Diet was established.

Preparations for constitutional government were made with utmost seriousness. Itō, then the most important person in the Meiji government, and other officials spent nearly one and a half years (1882–83) in Europe, notably in Germany, studying under leading constitutional scholars. The Meiji constitution, Itō's greatest handiwork, has been criticized for perpetuating authoritarian rule because the guarantees of civil rights and the Diet's powers were hedged by restrictions. Actually, given the Meiji leaders' samurai background and the tense domestic and foreign problems they faced, the unprecedented acknowledgment in writing of basic rights and the establishment of the Diet were progressive and enlightened acts. It should also be noted that neither Itō nor any of the Meiji leaders ever pointed to these tensions and difficulties as an excuse for reverting to tight authoritarian control.

Itō's preeminence continued in the 1890s. In mid-decade, as prime minister, he helped Japan attain two important successes. The first was an agreement with Great Britain signed in 1894 for doing away with extraterritoriality by 1899. Under the agreement British nationals in Japan would thereafter be subject to Japanese law. This agreement was followed by others with other major Western nations. The second achievement was Japan's victory over China in 1895, and both achievements were among the first clear signs that Japan, alone among non-Western nations, had achieved success in modernization and a weightier role in East Asian affairs.

Domestically, Itō did not fare as well. He had felt, along with other genrō, that party politicians were incapable of dealing dispassionately with Japan's welfare and destiny; and, indeed, the powers guaranteed by the

Meiji constitution enabled the political parties to impede government programs in the Diet. Itō unhappily, but with characteristic flexibility, continually worked out compromises with the parties, until by 1900 no Cabinet could be formed without their tacit consent. From the start the parties had been cooperating with the government in return for Cabinet positions and laws favouring party growth. Itō made one last move to salvage the situation by leaving the government and forming the Seiyūkai, which he based on an older anti-government party, the Kenseitō. The Seiyūkai became the first party to control an absolute majority in the House of Representatives during a Diet session, leading Itō to believe that he had finally created the right condition for smooth passage of government programs. He did not count on the obstructive tactics of the House of Peers, however, whose conservative members were unhappy with Itō's alliance with the parties. Ironically, Itō had originally created the House of Peers to balance what he considered the less than responsible House of Representatives. Finally, embittered with the knowledge that dealing with party members, each with his own constituency to answer to, was infinitely more difficult and distasteful than working with a handful of genrō, all of the same background and inspiration, he resigned as president of the Seiyūkai in 1903. But Itō paid for having broken genrō ranks; soon afterward Yamagata Aritomo, founder of the modern Japanese Army, became the leading power among the powerful genrō.

Itō's legacy, however, cannot be denied, for he made cooperation between high-ranking bureaucrats and party politicians respectable, which provided an alternative to the unremitting and unproductive polarization of these two groups. Moreover, the continued commitment of the other genrō to the Meiji constitution made party growth inevitable.

Assassination. Itō's term as resident general in Korea proved to be a failure, for he was unable to gain the trust and confidence of the Koreans in spite of his moderate and sympathetic approach. Nor could he prevent the thrust toward annexation of Korea favoured by other leaders in Japan. In October 1909 he was shot in Harbin in North China by An Chung-gŭn, a member of the Korean independence movement. His last words on being told that he was the victim of a political assassination were: "Baka na yatsu ja!" ("He is a fool!"). Itō probably meant that the Korean had killed the one Japanese leader who had supported, and would have continued to support, an even-handed Korea policy.

Itō was honoured with a state funeral. Despite his unquestioned contributions to the modernization of Japan, he has never been first in the hearts of his countrymen. The Japanese more often favour their romantic heroes, usually losers of great military causes. His private life also prevented his enshrinement in ethics textbooks as a paradigm for young Japanese. He is remembered instead for his boast: "Drunk, I (relax) with my head on a beauty's lap; awaken (refreshed), I grip the reins of power." His violent death was also ironic: he was never the strong-willed statesman that Ōkubo, Ōkuma, and Yamagata were. He sought the compromiser's role, the harmonious solution. His enduring monument was the creation of a viable constitutional system. It enabled the Japanese to effect orderly, evolutionary, peaceful political change accompanied by an ever-widening scope for meaningful popular participation. (G.Ak.)

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Itō Jakuchū, also called JOKIN (b. March 2, 1716, Kyōto—d. Oct. 27, 1800, Kyōto), Japanese painter of the mid-Edo period (1603–1867) who excelled in drawing flowers, fish, and birds, especially fowl, which he used to keep at his home in order to observe them closely.

The son of a greengrocer, he first studied drawing with a painter of the Kanō school (stressing Chinese subject matter and techniques). He also made copies of old Chinese masters. He developed an amazingly realistic style and added to it decorative touches that he learned in part from the works of Ogata Kōrin (1658–1716). He made a set of 30 pictures for the Shōkoku-ji, entitled "Dōshokusai-e" (coloured pictures of animals and plants), which, along with "Gunkei zu fusumae" (screen painting of fowl), are his most famous works. He later became a recluse and assumed the name Tobeian, or the Bushel Monk. It is said that those who got his paintings gave him one *to* (approximately two bushels) of rice in return.



"Cocks and Hens," painting by Itō Jakuchū, mid-18th century; in the Imperial Collection, Japan

By courtesy of the Imperial Household Agency, Japan

Itō Jinsai (b. Aug. 30, 1627, Kyōto—d. April 4, 1705, Kyōto), sinologist, philosopher, and educator who helped found the Kogaku (Study of Antiquity), which opposed the official Neo-Confucianism of Tokugawa Japan (derived essentially from the writings of the Chinese thinker Chu Hsi). He advocated a return to classical Confucian teaching. Through his hundreds of students, he exerted a powerful influence that tended to counteract the monolithic thought patterns imposed upon the nation by the Tokugawa rulers (1603–1867).

The son of a Kyōto lumberman, Itō turned his hereditary business over to his younger brother in order to devote himself to teaching and scholarship. He became known for his gentle manner and his dedication to humanistic ideals. Refusing all offers of employment from the powerful feudal rulers, he and his son Itō Tōgai (1670–1736) founded the Kogidō ("School for Study of Ancient Meaning") in Kyōto. It was run by his descendants until 1904, when it was absorbed into the public school system.

The outline of Itō's thought, which is believed to be unrivalled in Tokugawa Japan for its level of moral elevation, can be found in a small work called *Gōmōjigi* (1683), a commentary on the analects of the Chinese philosophers Confucius and Mencius. Itō was concerned with what he saw as the underlying truths of Confucian thought. He tried to develop a rational, as against an authoritarian, basis for human morality and the pursuit of happiness.

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Itsekiri, also called JEKRI, ISHEKIRI, or OWERRI, ethnic group inhabiting the westernmost part of the Niger Delta of Nigeria. The Itsekiri make up an appreciable proportion of the modern towns of Sapele, Warri, Burutu, and Forcados. They speak a dialect of Yoruba, and share elements of culture with the Yoruba, Edo, Urhobo, and Ijaw through a variety of contacts.

The Itsekiri are a coastal people, primarily fishermen, and have employed traps, fences, and nets, as well as rod and line techniques. Women make mats and baskets from reeds and palm materials. Silversmithing has died out, and blacksmithing has declined.

Myths of origin establish that Ginuwa, the Itsekiri founder and first *olu* (king), came from Benin, so that subsequent kings are descendants of the Oba of Benin. Lesser chiefs once met as a council and advised the *olu*. Chieftaincy is being redefined in conformity with modern government, and some settlements do not participate in chieftaincy at all.

Within settlements adult males trace patrilineal descent from settlement founders. In broader context, the Itsekiri claim affiliation to groups of kin by descent in both male and female lines. Itsekiri men often take wives from neighbouring peoples, where girls unrelated to prospective husbands can more easily be found. The Itsekiri are considered to be especially well groomed and dressed, and indigenous wrappers are often combined with imported European clothing items.

As a coastal people, the Itsekiri came into contact wth Europeans before groups farther inland did. The Portuguese, during the 19th century, were the first Europeans to come into contact with them, and the Itsekiri established a reputation as great traders partly through supplying European manufactured goods to inland peoples. British administration, however, eventually aggravated relations between the Itsekiri and their Urhobo neighbours, which led to civil disturbances around the city of Warri in the 1950s.

In traditional Itsekiri religion, Oritse is the supreme deity and creator of the world. Among the other deities are Umale Okun, god of the sea, and Ogun, god of iron and war. Divination may be accomplished by men skilled in consulting the Ifa oracle, and ceremonies are performed to the ancestors on various occasions.

In the 1980s, the Niger Delta area inhabited by the Itsekiri was noted for oil production.

Itsuku-shima, also called MIYA-SHIMA, or MIYA-JIMA, English SHRINE ISLAND, offshore island, Hiroshima Prefecture (*ken*), Japan, in the Inland Sea. The small island, one of Japan's most scenic spots, is 19 mi (31 km) in circumference and occupies an area of 12 sq mi (31 sq km). It is best known for its 6th-century Itsuku-shima-jinja (*jinja*, "shrine"), which was built on tidal land and has the appearance of floating on the sea during high tide. It was named after one of the daughters



Stone lanterns and the great gateway at the Itsuku island-shrine in Hiroshima Bay, Japan

Bob Glaze—Artstreet

of Susanowo, the Shintō storm god. Other religious buildings include the 9th-century temple that crowns Mount Mi, which rises to the island's highest elevation, 1,739 feet (530 m).

Because of its religious significance, births and burials were long prohibited on Itsuku Island. This ban was lifted after the Meiji Restoration (1868), but the dead are still transported to Ōno, on Honshu, for burial.

The town of Miyajima is a popular summer resort, with beaches, cherry trees, and tame deer.

ITT Corporation, formerly (until 1983) INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, diversified American corporation that was known for more than 60 years chiefly for its manufacture of telecommunications, electronic, and defense equipment. ITT is headquartered in New York City.

ITT was incorporated in 1920 from several Caribbean telephone and telegraph companies, choosing its name in imitation of the American Telephone and Telegraph Company (AT&T). In 1925 it purchased AT&T's large foreign manufacturing subsidiary, International Western Electric, and renamed it ITT Standard Electric Corporation; this move made ITT a major telecommunications manufacturer in 11 countries.

Under the guidance of Harold Sydney Geneen, who ran the company from 1959 to 1978, ITT acquired 275 other companies and increased its annual sales nearly 20-fold. In the 1960s and '70s, ITT developed and manufactured defense and surveillance systems for the U.S. military. In 1987, however, the corporation divested its telecommunications businesses—including the manufacture and operation of public and private telephone, switching, cable, radio, data transmission, and defense systems throughout much of the world—by forming a joint venture, Alcatel N.V., with France's Cie. Générale d'Electricité, which held controlling interest in the venture. ITT retained its bread, snacks, and frozen-foods businesses (under the trade names Wonder, Hostess, and Morton); the Sheraton hotel group; a book-publishing company; and a number of other companies, including The Hartford Fire Insurance Company.

ITU: *see* International Telecommunication Union.

Ituiutaba, city, western Minas Gerais state, Brazil, at 1,981 feet (604 m) above sea level, in the highlands between the Tijuco and da Prata rivers. It was made the seat of a municipality in 1901. Ituiutaba is the commercial centre for the surrounding agricultural and pastoral region and processes local crops (rice, corn [maize], cotton, cassava, oranges), cottonseed oil, and livestock products. The city is accessible by highway and air from Belo Horizonte, the state capital, 493 miles (793 km) east-southeast, and from São Paulo. Pop. (1980 prelim.) 65,178.

Iturbide, Agustín de, also called (1822–23) AGUSTÍN I (b. Sept. 27, 1783, Valladolid [now Morelia], Mex.—d. July 19, 1824, Padilla), Mexican caudillo (military chieftain) who became the leader of the conservative factions in the Mexican independence movement and, as Agustín I, briefly emperor of Mexico.

Like many young men of the upper classes in Spanish America, Iturbide entered the army, becoming an officer in the provincial regiment of his native city in 1797. In 1810 Miguel Hidalgo y Costilla offered him a post with his revolutionary army, but Iturbide refused and joined the royalists instead. His defense of Valladolid against the revolutionary forces of José María Morelos dealt a crushing blow to the insurgents, and for this victory Iturbide was given command of the military district of Guanajuato and Michoacán. In 1816, however, grave charges of extortion and violence caused his removal.



Iturbide, detail of a portrait by an unknown artist, 19th century; in the Museo Nacional de Historia, Mexico City

By courtesy of the Instituto Nacional de Antropologia e Historia, Mexico City

By 1820 the radical independence movement was almost entirely extinguished. Both Hidalgo and Morelos had been captured and executed; only guerrilla bands (under the command of General Vicente Guerrero) prevented the complete victory of the royalists. The Mexican independence movement then performed a curious about-face. In reaction to a liberal coup d'état in Spain, the conservatives in Mexico (formerly staunch royalists) advocated immediate independence. Iturbide assumed command of the army and, at Iguala, allied his reactionary force with Guerrero's radical insurgents. Iturbide's Plan de Iguala, published on Feb. 24, 1821, proclaimed three guarantees: (1) immediate independence from Spain, (2) equality for Spaniards and Creoles, and (3) the supremacy of Roman Catholicism and a ban on all other religions. The Army of the Three Guarantees quickly subjugated the country; on Aug. 24, 1821, Juan O'Donojú, the new representative of the Spanish king, signed the Treaty of Córdoba, recognizing the independence of Mexico.

The revolutionary coalition quickly fell apart as Iturbide removed Guerrero and his insurgent following from influence. On May 19, 1822, Iturbide placed the crown upon his own head and became Agustín I, emperor of Mexico. An arbitrary and extravagant ruler, he proved unable to bring order and stability to his country, and all parties soon turned against him. Opposition solidified behind Antonio López de Santa Anna, whose own plan called for Iturbide's exile. On March 19, 1823, Iturbide abdicated and went first to Italy and then to England. In 1824, however, he returned to Mexico, unaware that the congress had decreed his death. Captured on July 15, he was executed four days later. Although regarded by most scholars as a self-serving military adventurer, he has remained for the Roman Catholic Church and for the conservative classes the great hero of Mexican independence.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Ituri Forest, forest in Central Africa, an ecological zone of deep equatorial forest that forms the northeastern section of the huge tropical forest covering about two-fifths of Zaire.

A brief treatment of the Ituri Forest follows. For full treatment, *see* MACROPAEDIA: Africa.

The area of the Ituri is variously estimated at between 13,000 and 21,000 square miles (34,000 and 54,000 square km). The northern and eastern limits of the Ituri Forest are well-known, but its boundaries to the south and west remain undefined. The forest is oppressive, heavy with permanent humidity and silence, and swarming with life. The trees range in height from 20 to 160 feet (6 to 50 m), and their crowns are so close together that they intertwine to obscure the sky and the sun. Countless epiphytes (plants that grow on other plants and draw moisture and nutrients from the air and rain) serve to darken the undergrowth. The forest is relatively flat in its northwestern reaches, whereas toward the south and southeast its contours are much more rugged. It is watered by the broad Ituri River and its tributary, the Epulu, whose wide basin forms the heart of the forest. The rivers are fed by frequent rainfall, the annual precipitation being about 80 inches (2,000 mm) annually. The forest soil is both rich and friable, the vegetation itself providing the thick layer of humus necessary for its survival. Animal life characteristic of deep equatorial forest is abundant. The two most notable species are the okapi (a mammal related to the giraffe) and the mountain gorilla. Elephant and forest buffalo are plentiful.

The forest is inhabited by two entirely different ethnic groups, Bantu and Pygmies, who maintain a symbiotic relationship with some mutual suspicion and contempt. They meet at regular intervals, mainly to trade, and then often celebrate ritual ceremonies in common. The forest plays a very small part in the Zairian national economy, its inhabitants being virtually self-sufficient.

Itzamná (Mayan: "Iguana House"), principal pre-Columbian Mayan deity. The ruler of heaven, day, and night, he frequently appeared as four gods called Itzamnás, who encased the world; like some of the other Meso-American deities, the Itzamnás were associated with the points of the compass and their colours (east, red; north, white; west, black; and south, yellow).

Itzamná was sometimes identified with the remote creator deity Hunab Ku and occasionally with Kinich Ahau, the sun god. The moon goddess Ixchel, patroness of womanly crafts, was possibly a female manifestation of the god. Itzamná was also a culture hero who gave mankind writing and the calendar and was patron deity of medicine. *See also* Bacab.

Iuba I (Numidian king): *see* Juba I.

IUD, abbreviation of INTRAUTERINE DEVICE, plastic or metal object that is implanted in the uterus to prevent conception. *See* contraception.

Iunu (ancient city): *see* Heliopolis.

Iuzhno-Sakhalinsk (Russian S.F.S.R.): *see* Yuzhno-Sakhalinsk.

Iuzhnyi Bug (Ukrainian S.S.R.): *see* Yuzhny Bug.

Ivan (Russian personal name): *see under* John, except as below.

Ivan, English JOHN, name of six grand princes of Moscow and tsars of Russia, grouped below chronologically and indicated by the symbol •.

• **Ivan I,** in full IVAN DANILOVICH, byname IVAN MONEYBAG, Russian IVAN KALITA (b. 1304?—d. March 31, 1340, Moscow), grand prince of Moscow (1328–40) and grand prince of Vladimir (1331–40) whose policies increased Moscow's power and made it the richest principality in northeastern Russia.

The son of Prince Daniel of Moscow, Ivan succeeded his brother Yury as prince (1325) and then as grand prince (1328) of Moscow. Determined to persuade the Khan of the Golden Horde, the overlord of all the Russian princes, to make him grand prince of Vladimir, he cooperated with the Khan in an expedition against his chief rival, Grand Prince Alexander of Tver (now Kalinin), whose subjects had revolted against the Khanate (1327). Despite his efforts, when Alexander was deposed as grand prince, Ivan was not chosen to replace him until 1331; and he was never given authority over the major principalities of Tver, Suzdal, and Ryazan.

Nevertheless, Ivan maintained cordial relations with the Khan; and, while collecting tribute for the Tatars throughout his domain, he acquired a reputation for thrift and financial shrewdness that earned him the nickname Kalita ("Moneybag"). Preferring to expand his realm by purchasing territory rather than conquering it, Ivan enlarged Moscow; he also increased its influence over the neighbouring principalities, and, by forming a close alliance with the metropolitan of the Russian Orthodox Church, whose seat was transferred to Moscow in 1326, he made Moscow the spiritual centre of the Russian lands.

• **Ivan II,** in full IVAN IVANOVICH, byname IVAN THE RED, Russian IVAN KRASNY (b. March 30, 1326—d. Nov. 13, 1359), grand prince of Moscow and Vladimir.

The son of Ivan I, he succeeded his brother Semen on the throne of Moscow in 1353 and was granted the patent to that principality by the Khan of the Golden Horde in spite of the vigorous claim laid by Konstantin Vasilyevich of Suzdal. At first the principalities of Suzdal, Ryazan, and the republic of Novgorod refused to recognize Ivan as grand duke, and they waged war against him until 1354. Ivan was dominated by his aristocratic advisors (boyars), prominent among whom was the military commander in Moscow, Aleksey Khvost, and the metropolitan Aleksei. As grand prince Ivan continued the policies of his father, which were aimed at uniting the Russian lands. His son was Dmitri Donskoy, to whom the principates of Moscow and Vladimir passed upon Ivan's death.

• **Ivan III,** Russian in full IVAN VASILYEVICH, byname IVAN THE GREAT, Russian IVAN VELIKY (b. Jan. 22, 1440, Moscow—d. Oct. 27, 1505, Moscow), grand prince of Moscow (1462–1505), who subdued most of the Great Russian lands by conquest or by the voluntary allegiance of princes, rewon parts of the Ukraine from Poland–Lithuania, and repudiated the old subservience to the Mongol-derived Tatars. He also laid the administrative foundations of a centralized Russian state.



Ivan III, portrait from A. Thenet, *La Cosmographie universelle,* Paris, 1575

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

Early life and reign. Ivan was born at the height of the civil war that raged between supporters of his father, Grand Prince Vasily II of Muscovy, and those of his rebellious uncles. His early life was dramatic and tumultuous: when his father was arrested and blinded by his cousin in 1446, Ivan was first hidden in a monastery and then smuggled to safety, only to be treacherously handed over to his father's captors later in the year; shortly after his father's release in the same year Ivan was solemnly affianced—for purely political reasons—to the daughter of the Grand Prince of Tver, whom he married in 1452. During the last years of his father's reign, he gained experience in the arts of war and government. At the age of 12 he was placed nominally in command of a military expedition dispatched to deal with the remnants of his father's internal enemies in the far north; and at 18 he led a successful campaign against the Tatars in the south. Vasily II died on March 27, 1462, and was succeeded by Ivan as grand prince of Moscow.

Little is known of Ivan's activities during the early part of his reign. Apart from a series of sporadic and largely successful campaigns against his eastern neighbours, the Tatars of Kazan, there was evidently not much beyond the routine business of ruling to occupy him. But his private life soon changed radically. In 1467 his childhood bride died (perhaps poisoned), leaving him with only one son. In view of the primitive state of Muscovite medicine and the demonstrable reluctance of Ivan's brothers to see the royal line continued longer than was necessary, the likelihood of the son predeceasing his father and thus robbing him of an heir appeared only too real, and another wife had to be sought. Curiously, the initiative seems to have come from outside; in 1469 Cardinal Bessarion wrote from Rome offering Ivan the hand of his ward and pupil, Zoë Palaeologus, niece of the last emperor of Byzantium. It took three years before the fat and unattractive Zoë, who, on entering Moscow, changed her name to Sofia (and perhaps her faith to Orthodoxy), was married to Ivan in the Kremlin.

Middle reign. At Ivan's accession many Great Russian lands were not yet under Muscovite control; the entire Ukraine and the upper Oka districts were part of the Polish–Lithuanian union and Ivan himself, in name at least, was a tributary of the Khan of the Golden Horde. He set himself the task of reconquering from Poland–Lithuania the Ukrainian possessions of his forefathers. But first the independent Great Russian lands had to be annexed or subdued and subservience to the Tatars had to be repudiated.

After rendering the Kazan Horde on his eastern flank temporarily impotent by a series of campaigns (1467–69), Ivan attempted to subdue Novgorod and its huge northern empire. He repeatedly, invaded Novgorod, formally forced it to accept his sovereignty (1478), stripped it of the last vestiges of political freedom, secularized large tracts of its church lands, annexed its colonies, and replaced many of its citizens with reliable elements from his own domains. By 1489 Novgorod could offer no more resistance to Ivan. Of the remaining Russian lands still technically independent in 1462, Yaroslavl and Rostov were annexed by treaty (1463 and 1474, respectively). Tver offered little resistance and meekly yielded to Moscow in 1485. Ryazan and Pskov alone retained their independence at the cost of abject subservience to their virtual suzerain.

Freedom from subjection to Khan Ahmed of the Golden Horde came in 1480. To counterbalance Ahmed's friendship with Poland–Lithuania, Ivan concluded an invaluable alliance with Khan Mengli Girei of Crimea. After a victorius campaign by Ivan in 1480, Ahmed withdrew his forces from Ivan's dominions, and although Ahmed's sons continued to worry Moscow and Crimea until their final defeat in 1502, Ivan from 1480 no longer considered himself a vassal of the Khan and entered the field of European diplomacy as an independent sovereign. By tact and diplomacy he managed to maintain his friendship with Mengli and to avoid serious trouble in Kazan for the rest of his reign.

In 1480 Ivan also had to cope with the danger of rebellion by his two brothers Andrey and Boris, who had been incensed by his high-handed appropriation of their deceased elder brother's estates. They defected with their armies to the western frontiers but eventually returned and acknowledged Ivan's territorial acquisitions and primacy.

Late reign. In 1490 Ivan's eldest son by his first wife died of gout. He had been ineptly treated by a Jewish doctor who had been brought to Russia by Sofia's brother, and Ivan suspected foul play. He now had to solve the problem of who was to be his heir—his eldest son's son Dmitry (born 1483) or his eldest son by Sofia, Vasily (born 1479). For seven years he vacillated. Then, in 1497, he nominated Dmitry as heir. Sofia, anxious to see her son assured of the throne, planned rebellion against her husband, but the plot was uncovered. Ivan disgraced Sofia and Vasily and had Dmitry crowned grand prince (1498).

However, in 1500 Vasily rebelled again and defected to the Lithuanians. Ivan was forced to compromise. At that stage of his war with Lithuania he could not risk the total alienation of his son and wife. And so, in 1502, he gave the title to Vasily and imprisoned Dmitry and his mother, Yelena.

At home Ivan's policy was to centralize the administration by stripping the appanage princes of land and authority. As for the boyars, they were stripped of much of their authority and swiftly executed or imprisoned if suspected of treason. Ivan's reign saw the beginning of the *pomestie* system, whereby the servants of the grand prince were granted estates on a basis of life tenure and on condition of loyal service.

Ivan's last years were years of disappointment. The war against Lithuania had not ended as conclusively and satisfactorily as he had expected—much of the Ukraine was still in the hands of a strangely buoyant enemy; his ecclesiastical plans for secularizing church lands had been thwarted at the Council of 1503, and the Khanate of Kazan, which had been so carefully neutralized during Ivan's reign, was beginning to rid itself of Muscovite tutelage. Ivan died in the autumn of 1505.

Assessment. In spite of his great achievements, he died unmourned and seemingly unloved. Singularly little is known about him as a man. He was tall and thin and had a slight stoop. It is said that women fainted in his presence, so frightened were they by his awesome gaze. His only known pleasures were those of the bed and the table. His contemporaries are silent about his virtues. Yet few scholars have underestimated the role of Ivan in the creation of the Russian state, and none dispute the significance of his diplomatic and military successes. It may be that the excessive cautiousness of his character, the lack of élan and glamour, and the very dullness of the man have prevented historians from universally recognizing the appellation of "the Great," first attributed to him by the Austrian ambassador to his son's court.

(J.L.I.F./Ed.)

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• Ivan IV, Russian in full IVAN VASILYEVICH, byname IVAN THE TERRIBLE, Russian IVAN GROZNY (b. Aug. 25, 1530, Kolomenskoye, near Moscow—d. March 18, 1584, Moscow), grand prince of Moscow (1533–84) and the first formally proclaimed tsar of Russia (from 1547). He engaged in prolonged and largely unsuccessful wars against Sweden and Livonia; and, in seeking to impose military discipline and a centralized administration, he instituted a reign of terror against the boyars and other high nobility.



Ivan IV, icon, late 16th century; in the Nationalmuseet, Copenhagen

By courtesy of the Nationalmuseet, Copenhagen

Early life. Ivan was the first child of Grand Prince Vasily III and his second wife, Princess Yelena Glinskaya. Through his father he was directly descended from Prince Alexander Nevsky, whose younger son Daniel had received the appanage of Moscow in 1263 and had been the first of a long line of hereditary grand princes of Moscow and the founder of the Danilovich dynasty, of which Ivan was the penultimate representative. On his mother's side, Ivan was connected with the Orthodox Russian nobility that had emigrated to Muscovite territory from Lithuania in the beginning of the 16th century. The theory later formulated by Ivan IV that his dynasty was directly descended from the Roman emperor Augustus was a fantasy with political undertones that allowed the Tsar a certain latitude in international dynastic arguments. On Dec. 4, 1533, immediately after his father's death, Ivan was proclaimed grand prince by the metropolitan Daniel in the Cathedral of the Dormition (Assumption). His mother, the Grand Princess Yelena, aided by her favourite, Ivan Ovchina-Telepnev-Obolensky (thus arousing the unsubstantiated rumour that Ivan was his son), ruled in Ivan's name until her death (allegedly by poison) on April 3, 1538. Although subsequently Ivan never accused anyone of this crime, her favourite was thrown into prison, and his sister, who had been Ivan's nurse, was forced to become a nun. Ivan had taken a formal part in the affairs of state from the age of five onward, and he was actually the centre of a furious struggle for power among the prominent members of the nobility. His first independent action took place at the age of 13, when he ordered the seizure in his presence of the leader of one of the court factions, Prince Andrey Shuysky, who was then murdered by Ivan's kennel men. But actual power remained in the hands of Ivan's relatives, the Glinsky princes. The young ruler passed his time visiting monasteries and hunting. From 1545 onward Ivan undertook long trips to various parts of his territories. In this same year he ordered a nobleman's tongue cut out "for uttering rude words." Ivan evidently resented any criticism, which in the spirit of the age he construed as lese majesty. Courtiers were often disgraced, and the metropolitan Makary frequently intervened on their behalf. Right up to his death in 1563, Makary appears to have had a restraining influence on Ivan. Nevertheless, several executions took place in June 1546, including that of one of his former favourites, Fyodor Vorontsov. In December Ivan officially sought Makary's advice on his marriage and on his coronation—at which he was to be crowned tsar (a shortened form of Caesar) rather than grand prince.

The young tsar. The coronation took place on Jan. 16, 1547, and on February 3 he married Anastasya Zakharina-Yureva, a member of the ancient family of Andrey Kobyla-Koshkin (the family from which the next dynasty, the Romanovs, would come). The marriage, while it lasted (Anastasya died on Aug. 7, 1560), was apparently a very happy one; six children were born, although only two survived infancy. Historians consider that Anastasya exerted a beneficial influence on the Tsar and, like Makary, frequently acted as a peacemaker. It would appear that it was Makary who encouraged the young tsar in his desire to establish a Christian state based on the principles of justice. Reforms were proposed, starting with the systematization of church affairs, and these were approved at the church assemblies of 1547 and 1549. According to a subsequent defector, Prince Andrey Kurbsky, at this juncture the Tsar sought general guidance from a group of advisers informally known as the "Chosen Council." Most prominent among them was the Tsar's then favourite, the priest Silvestr, and a talented young statesman (who was later to suffer disgrace), Aleksey Adashev. A new legal code was compiled in 1550, and administrative practice and the conditions of military service were improved, the government meanwhile providing extensive local self-government.

Campaigns against the Tatars. In 1549 a national assembly (*zemsky sobor*) met in an advisory capacity. Muscovite rulers had long feared the Tatar incursions, and Ivan was equally conscious of this danger. But, as a result of campaigns in 1547, 1549, and 1552 in which Ivan himself participated, having left Makary as regent in Moscow, the Tatar Khanate of Kazan on the Volga was annexed, and in 1556 the Khanate of Astrakhan acknowledged Muscovite supremacy without a fight.

Internal struggles continued, complicated by Russian rules of precedence, which were so complex that quarrels unavoidably arose, and meanwhile the nobility was growing in number and in power. In March 1553 Ivan fell seriously ill and summoned his boyars to swear allegiance to his heir, the infant prince Dmitry. The privy council and the Council of Boyars were split in their views, since many feared a return, if an infant were to succeed the Tsar, of the internecine struggles of Ivan's minority.

The candidate favoured by the boyars was the Tsar's first cousin, Prince Vladimir of Staritsky. Nevertheless, the Tsar, despite the disaffection of many of those on whose loyalty he had hitherto relied, succeeded in obtaining general recognition of the validity of his son's succession rights. No one suffered disgrace for their part in this episode, and Prince Vladimir himself was made a member of the Council of Regency. But the Tsar obviously drew the conclusion that Vladimir could be a danger to the legitimate succession; when, over the course of the next 15 years, Vladimir and his ambitious mother had succeeded in further arousing the Tsar's suspicion, Ivan did away with them (probably in 1569).

The Livonian War. With both banks of the Volga now assured, Ivan prepared for a campaign to force an exit to the sea, a traditional concern of landlocked Russia. Although the English merchants led by Richard Chancellor had made contact by reaching Moscow via the northern sea route, Ivan still felt that the greatly desired trade with Europe depended on free access to the Baltic and decided to turn his attention westward rather than southward. The Livonian War began in January 1558 and was not ended until 24 years later, on Jan. 15, 1582, when an armistice was concluded after the Russian government had requested the intervention of Pope Gregory XIII, who sent his nuncio Antonio Possevino to mediate.

The war was fruitless for Russia, and the country was exhausted by the long struggle. Ivan found the collapse of his hopes and plans hard to bear and quarrelled in 1581 with his much loved heir, Ivan, whom he mortally wounded in the heat of the moment. His son was not the only one to suffer the ruler's wrath, for Ivan later sent to various monasteries memorials (*sinodiki*) containing the names of more than 3,000 victims whom he had executed, together with large sums of money, with orders to the monks to pray for the souls of the dead.

Most of these executions, including many whose names the Tsar did not include in his memorials, occurred during the period when Ivan formed his *oprichnina.* Ivan divided his territories into two parts, one to be ruled in the traditional manner, and the other—referred to as the widow's part (*oprich*)—he proposed to rule personally, aided by a carefully chosen bodyguard of 1,000–6,000 men.

Since nearly all the documents relating to this epoch were destroyed in one of Moscow's periodic fires, historians tend to give differing explanations for Ivan's actions during this part of his reign: the majority tend to the view that the struggle was between the autocrat and the old nobility, which was jealous of surrendering its privileges and power, but a further aspect should also be taken into consideration. This was Ivan's dissatisfaction with his military commanders. The formation of the *oprichnina,* for example, took place shortly after the defection to the King of Poland of one of Ivan's outstanding commanders in the field (and also a distant relation), Kurbsky. The *oprichnina* lasted only seven years, from 1565 to 1572, when it was abolished as a result of the failure of the *oprichnina* regiments to defend Moscow from an attack by the Crimean Tatars. Nevertheless, the *oprichnina* leaves a bloody imprint on Ivan's reign, causing some doubts as to his mental stability.

Ivan's methods and achievements. Many of his acts shocked his contemporaries, particularly the brutality of his public executions; his methods of disposing of those churchmen who displeased him were extremely cruel, as was his decimation of the city of Novgorod the Great. But, when Ivan's cruelty is judged within the context of his day, compared, for example, with the Massacre of St. Bartholomew's Day or the methods of the Inquisition, it would seem that his methods were not necessarily more extreme than elsewhere.

The majority of historians agree that Ivan was a calculating politician and that, after the death of his first wife, he was prepared to attain his political aims by marriage. Eleven days after Anastasya's death, the Tsar issued instructions for negotiations to be opened with Sigismund II Augustus, the king of Poland; after due deliberation he announced that he wished to marry the latter's sister Catherine. These negotiations were unsuccessful, although the Tsar was to try again later and even concluded an armistice in 1567 with Sweden so as to obtain Catherine (who meanwhile had been the wife of John III, the brother of Eric XIV). The Tsar hoped thus to form a Polish-Muscovite political union, an idea shared by many of his contemporaries on both sides of the Polish frontier; and in 1572, when the last Jagiellon king died, Ivan was keen to advance his candidature to the Polish throne.

Ivan was undoubtedly a passionate man, and, since he did not sanction extramarital relationships for a ruler, his wives were changed with great frequency: he had six wives (a seventh union not being recognized by the church); of these, three died, one survived him, and two were divorced and forced to enter nunneries. Ivan also discussed with the English ambassador the possibility of marrying one of Queen Elizabeth's ladies-in-waiting, Mary Hastings; he had been anxious to cement relationships with England ever since 1553, and in 1566 he even toyed with the idea of abdicating and living in England. But he remained on the Russian throne until his death in 1584.

Ivan's achievements were many. In foreign policy all his actions were directed toward forcing Russia into Europe—a line that Peter I the Great was to continue; this policy caused much annoyance among his European neighbours, who did not relish the idea of a strong and prosperous competitor in commerce. He also strove to arrest Tatar and Turkish incursions into Russian territory. Ivan encouraged cultural development, especially printing. He was widely read, and he wrote well; although his surviving writings are mainly of a political nature, his command of words and his biting sarcasm are very evident. He was a devout son of the Orthodox church, a loyalty that frequently interfered with his political aims, and he even composed prayers and church music. His arguments on religious questions are striking in their power and conviction, but Ivan placed most emphasis on defending the divine right of the ruler to unlimited power under God—a view with which most other contemporary monarchs would have been in complete agreement. (N.An.)

BIBLIOGRAPHY. E. Donnert, *Der livländische Ordens ritterstaat und Rusand,* pp. 299–310 (1963), provides an excellent summary dealing mainly with the period of the Livonian War and Ivan's foreign policy. George Vernadsky, *A History of Russia,* vol. 4–5 (1959–69), includes a comprehensive list of Russian source material on this period and a bibliography on Ivan's internal policies.

• **Ivan V,** in full IVAN ALEKSEYEVICH (b. Sept. 6 [Aug. 27, Old Style], 1666, Moscow, Russia—d. Feb. 8 [Jan. 29], 1696, Moscow), nominal tsar of Russia from 1682 to 1696.

The younger son of Tsar Alexis (reigned 1645–76) by his first wife, Mariya Ilinichna Miloslavskaya, Ivan was a chronic invalid, deficient mentally and physically, who suffered from scurvy and poor eyesight and in his later years was partially paralyzed. When his elder brother Tsar Fyodor III died in 1682, Ivan's half brother Peter, the son of Alexis and his second wife, Natalya Kirillovna Naryshkina, was named tsar. But Ivan's sister Sophia, determined to maintain the Miloslavsky family in power, encouraged the *streltsy* (sovereign's bodyguard) to riot and to demand that Ivan become tsar (June 2 [May 23, Old Style], 1682). Consequently, three days later the boyar duma (or council) proclaimed Ivan and Peter corulers with Ivan as the senior tsar. On July 5 (June 25) both boys were crowned, and Sophia became regent.

Although the Naryshkins overthrew Sophia in 1689, Ivan, who had adopted a conciliatory attitude toward Peter, was allowed to retain his official position until his death. He never participated in governmental affairs, however, and devoted the bulk of his time to prayer, fasting, and pilgrimages.

• **Ivan VI,** in full IVAN ANTONOVICH (b. Aug. 23 [Aug. 12, Old Style], 1740, St. Petersburg, Russia [now Leningrad]—d. July 16 [July 5], 1764, Shlisselburg Fortress, near St. Petersburg), infant emperor of Russia in 1740–41.

The son of Prince Anton Ulrich of Braunschweig-Bevern-Lüneburg and Anna Leopoldovna, the niece of Empress Anna (reigned in Russia 1730–40), Ivan Antonovich was named heir to the throne by the empress on Oct. 27 (Oct. 16, Old Style), 1740, and proclaimed emperor the following day. The empress' favourite, Ernst Johann Biron, the Duke of Courland, became regent for him. Although Biron was overthrown by the vice-chancellor, Andrey Osterman, and Field Marshal Burkhard Christoph, Count von Münnich, three weeks later, Ivan remained the nominal ruler of Russia, and his mother was installed as regent.

On Dec. 6 (Nov. 25, Old Style), 1741, however, Elizabeth, the daughter of Emperor Peter I the Great (reigned in Russia 1682–1725), organized a group that opposed Anna Leopoldovna's foreign policy and her German advisers and deposed the regent, the ruling German clique, and Ivan VI. For the next 20 years Ivan remained in solitary confinement in various prisons. Although his mental and emotional development were thereby retarded, a second lieutenant of the Shlisselburg garrison, Vasily Yakovlevich Mirovich, tried in 1764 to free Ivan in order to remove Catherine II the Great, who had recently seized the throne (1762), and to restore him to power. In the course of Mirovich's mutiny, however, Ivan was assassinated by his jailers.

Ivan THE RED: *see* Ivan II.

Ivan Asen I, also called ASEN I (d. 1196), tsar of the Second Bulgarian empire from 1186 to 1196, during one of the most brilliant periods of the restored Bulgarian nation. He and his brother Peter II were founders of the Asen dynasty, which survived until the latter half of the 13th century.

Asen was a descendant of landowners and boyars from Tŭrnovo whose family name was Belgun. In 1186 after a violent dispute with the Byzantine emperor Isaac II Angelus, Asen and Peter led a popular rising of Vlachs and Bulgars and proclaimed their independence from Constantinople (modern Istanbul). Asen was crowned tsar as Ivan Asen I at Tŭrnovo, and Peter became ruler of the eastern half of the kingdom, with his residence at Preslav. The brothers invaded Thrace but were defeated, withdrew to the north, and, in alliance with the Kumans, conquered northern Bulgaria. In 1187 they checked the Byzantine army in Thrace; and, in the armistice that followed, their younger brother Kaloyan was sent as hostage to Constantinople. He escaped, however, and war broke out, to continue intermittently until the Byzantine forces were thoroughly defeated in 1196. Later in that year Ivan Asen was killed by one of his boyars, Ivanko, who seized power at Tŭrnovo but soon had to seek refuge in Constantinople. Asen's brother Peter ascended the throne as Peter II but was killed by the boyars in 1197. Kaloyan was then crowned tsar, reigning from 1197 to 1207.

Ivan Asen II (d. 1241), tsar of the Second Bulgarian empire from 1218 to 1241, son of Ivan Asen I.

Ivan Asen overthrew his cousin Tsar Boril (reigned 1207–18) and blinded him, proclaiming himself tsar. A good soldier and administrator, he restored law and order, controlled the boyars, and, after defeating Theodore Ducas, despot of Epirus, in 1230, acquired large parts of Albania, Serbia, Macedonia, and Epirus. The record of his achievements, dated 1230, can still be seen in the old Church of the Forty Martyrs at Tŭrnovo.

One of Ivan's daughters was married to the Serbian prince Vladislav, whom Ivan was able to establish as king of Serbia; another was married to Manuel Angelus, ruler of Salonika; and his third daughter, Helen, was betrothed in 1228 to the 11-year-old Latin emperor Baldwin II. The regency of the empire was then offered to Ivan, who agreed in return to give back his conquests in Epirus, western Macedonia, and Albania. The Latins, however, afraid of Bulgaria's growing power, repudiated the treaty, and Baldwin was betrothed to the daughter of John of Brienne, king of Jerusalem, who was elected emperor. Ivan Asen thereafter separated the Bulgarian church from Rome.

Consult the INDEX *first*

Ivano-Frankovsk, formerly (1945–62) STANISLAV, *oblast* (province), Ukrainian Soviet Socialist Republic, with an area of 5,367 square miles (13,900 square km) in the western Ukraine, extending from the crestline of the Carpathian Mountains across the northern foothills to the Dnestr River.

The oblast is one of the most densely settled parts of the European Soviet Union. About two-thirds of the population, mostly Ukrainians or related Hutsuls, are rural. Along the Dnestr is intensive cultivation of wheat, rye, corn (maize), sugar beets, flax, hemp, sunflowers, and tobacco. In the valleys and on the high pastures, many cattle and sheep are kept. There is moderate exploitation of petroleum (refined at Nadvornaya), natural gas, and some lignite. Potassium sulfate mining at Kalush is of national significance, for, although there are larger potash fertilizer deposits in the Soviet Union, they are chlorides, which many crops do not tolerate. The potash also supports chemical works. Apart from the capital, Ivano-Frankovsk, the cities are mostly small local centres. Pop. (1989 prelim.) 1,424,000.

Ivano-Frankovsk, formerly (1945–62) STANISLAWÓW, or STANISLAV, city and administrative centre of Ivano-Frankovsk *oblast* (province), Ukrainian Soviet Socialist Republic, on the Bystritsa River just above its confluence with the Dnestr. Founded in 1661 as the Polish town of Stanisławów, it occupied an important position on the northern approach to the Yablonitsa Pass over the Carpathians. From 1772 to 1919 it was held by Austria; in 1945 it was ceded to the Soviet Union and named Stanislav; and in 1962 it was renamed Ivano-Frankovsk. The modern city has light-engineering, timber-working, furniture-making, and food-processing industries. There are medical and teacher-training institutes and schools for training in the oil and gas industries. Pop. (1989 prelim.) 214,000.

Ivanov, Ilya Ivanovich (b. Aug. 1, 1870, Shigry, Kursk *guberniya*, Russia—d. March 20, 1932, Alma-Ata, Kazakh S.S.R), Soviet biologist who developed a method for artificially inseminating domestic mammals and poultry.

In 1898 Ivanov established in Moscow several zoological laboratories where he studied the structure and vital processes of sex organs of farm animals, including the secretions of accessory sex glands during impregnation. From his observations he concluded that the single condition necessary for impregnation was the union of spermatozoon and egg and that spermatozoa retain their motility and potency for a certain length of time if properly preserved. Ivanov succeeded in developing techniques for obtaining, preserving, and disinfecting semen, in addition to devising a procedure for artificial insemination that could be used for all types of livestock.

In 1901 Ivanov founded the world's first centre for artificially impregnating horses at Dolgoe Village, Orlovskaya *guberniya*. He proceeded to experiment with interspecies hybridization, crossbreeding domestic animals with wild varieties by means of artificial insemination. His object was to produce commercially usable hybrids and to develop new breeds more resistant to illness and more adaptable to the harsh Russian winters. He produced, for example, a hybrid of domestic horse by crossbreeding a zebra and Przewalski's horse (*Equus przewalski*), the only true wild horse still in existence. He also sought to preserve certain endangered species of wild animals, such as aurochs and wisent (European bison).

Ivanov, Lev (Ivanovich) (b. Feb. 18 [Feb. 6, old style], 1834, Moscow—d. Dec. 24 [Dec. 11, O.S.], 1901, St. Petersburg, Russia), Russian ballet dancer who was choreographic assistant to Marius Petipa, the director and chief choreographer of the Imperial Russian Ballet.

Ivanov joined the Imperial Ballet in St. Petersburg after graduating (1852) from its school. He specialized in character roles and was promoted to premier danseur (1869); regisseur, or stage manager (1882); and assistant ballet master (1885). He staged nearly 20 new or revived works for the Imperial Ballet but received little recognition during his lifetime because the name of Petipa was always placed first on the program. Nonetheless, Ivanov became recognized as an important and innovative choreographer, for he was among the first of that era to base his work on the structure and emotional content of the musical score, rather than giving precedence to creating solos, pas de deux, or divertissements designed to display a ballerina's virtuoso technique.

Ivanov excelled in creating visual illusions through patterns of ensemble movement, as in his snowflake dance in *The Nutcracker*, and is often considered a forerunner of Michel Fokine in utilizing the corps de ballet to develop the plot or theme of a ballet. In addition to *The Nutcracker* (1892), Ivanov choreographed portions of *Swan Lake* (1895) and Act II of *Cinderella* (1893). With Petipa he revived the 18th-century *La Fille mal gardée* (1882), and with the well-known ballet teacher Enrico Cecchetti re-choreographed *Coppélia*, creating the version upon which most 20th-century productions of this ballet are based.

Ivanov, Vsevolod Vyacheslavovich (b. Feb. 24 [Feb. 12, old style], 1895, Lebyazhye, Russia—d. Aug. 15, 1963, Moscow), Soviet prose writer noted for his vivid naturalistic realism, one of the most original writers of the 1920s.

Born into a poor family on the border of Siberia and Turkistan, Ivanov ran away from home to become a clown in a travelling circus. He later was a wanderer, labourer, and itinerant entertainer. He served in the Red Army during the civil war that followed the 1917 Revolution.

In 1920 Ivanov went to Petrograd (now Leningrad), where he became associated with the Serapion Brothers, a literary group whose members admired and imitated the Romanticism of the early 19th-century German writer E.T.A. Hoffmann. He also came under the influence of Maksim Gorky. His graphic stories of the civil war—*Partizany* (1921; "Partisans"), *Bronepoezd 14-69* (1922; *Armoured Train 14-69*), *Tsvetnyye vetra* (1922; "Coloured Winds")—quickly established his reputation as a writer. Set in Asiatic Russia, the stories have a distinctive regional flavour.

A change in official literary policies in the late 1920s required Ivanov to revise his works to harmonize with the new principles. In 1927 he reworked *Armoured Train 14-69*— which had been severely criticized for neglecting the role of the Communist Party in the partisan movement—into a play, correcting this flaw. The drama enjoyed immediate success and has become one of the classics of the Soviet repertory. In his works composed at this time Ivanov had to temper much of the naturalism, which was considered a negative quality, that had produced such powerful effects in his earlier work. Moreover, his own attitude had changed; he turned from the affirmation of physical and instinctual life to psychological analysis. His major later works include a collection of tales, *Taynoye taynykh* (1927; "The Secret of Secrets"), and an autobiographical novel, *Pokhozhdeniya fakira* (1934–35; *The Adventures of a Fakir*).

During World War II Ivanov worked as a war correspondent for the newspaper *Izvestiya*. His wartime experiences provided material for a new collection of stories and a novel, neither favourably received by Soviet critics. His subsequent work is generally regarded as inferior to the early, unrevised stories.

Ivanov, Vyacheslav Ivanovich (b. Feb. 28 [Feb. 16, old style], 1866, Moscow—d. July 16, 1949, Rome), philosopher, classical scholar, and leading poet of the Russian Symbolist movement.

After studying philosophy at Moscow University and Roman history in Berlin (1886–91), Ivanov resided abroad almost continuously from 1891 to 1905, primarily in Italy, continuing his research and composing poetry. Under the influence of Nietzsche, Novalis, Dostoyevsky, and Vladimir Solovyov, Ivanov evolved a highly personal religious philosophy based on a synthesis of Dionysus and Christ and strongly coloured by aesthetic mysticism. His first volume of lyric poetry, *Kormchiye zvozdy* ("Pilot Stars"), appeared in 1903, immediately establishing him as a key figure among the Russian Symbolists. Further volumes—*Prozrachnost* (1904; "Translucency"), *Eros* (1907), and *Cor Ardens* (1911), the latter his most important poetical achievement—strengthened his position as high priest of the movement. From 1905 to 1910 his "Wednesdays" in his St. Petersburg "tower" became an important gathering place of Russian literati. In 1912 he published another important collection of poems, *Nezhnaya tayna* ("The Sweet Secret").

After further sojourns in Europe, Ivanov returned to Moscow in 1913, remaining in Russia through World War I and the Revolution and taking employment in the theatrical section of the People's Commissariat of Education in 1918. In 1921 his *Zimniye sonety* ("Winter Sonnets") was published by Ilya Ehrenburg in Berlin. In 1924 Ivanov left Russia for Rome, where he became a convert to the Roman Catholic Church in 1926. His sonnet sequence, *Rimskiye sonety* (1926; "Roman Sonnets") is a poetic account of this religious experience. Ivanov's later poetic works include the lyrical-philosophical cycle *Chelovek* (1939; "Man") and *Svet vecherniy* (1944; "Evening Light"). In addition to his lyrical works, Ivanov also wrote two poetic dramas, several collections of essays, and a critical study on Lermontov. His translations include works by Sappho, Aeschylus, and Dante.

Ivanovo, *oblast* (administrative region), western Russian Soviet Federated Socialist Republic, occupying an area of 9,225 sq mi (23,900 sq km), northeast of Moscow astride the middle Volga River and centred on Ivanovo city. The surface is a rolling morainic plain, with forests of spruce, pine, and fir and much swamp; most soils are infertile, though the southwest, with better soils, is largely plowed. The climate is continental, with long, cold winters and warm summers; precipitation is about 24 in. (600 mm) a year. The *oblast*, whose population is heavily urban, is part of the central industrial region; its textile industry, which has flourished since the 18th century, supplies nearly one-third of all Soviet cotton; linen and clothing also are produced. The engineering and chemical industries supply the needs of the textile mills. Agriculture is dominated by dairying, livestock raising, and flax cultivation, with some oats, rye, potatoes, and vegetables. The large peat reserves are much used for fuel. Pop. (1983 est.) 1,316,000.

Ivanovo, city and administrative centre of Ivanovo *oblast* (region), western Russian Soviet Federated Socialist Republic, on both banks of the Uvod River. It was created from two villages, Ivanovo and Voznesensk, in 1871; until 1932 it was known as Ivanovo-Voznesensk. The first linen mills in Russia were founded near Ivanovo by order of Peter I the Great in 1710. A large number of weaving mills and textile-printing factories were subsequently opened there, so that by the middle of the 19th century the town was known as "the Russian Manchester." In 1918 the city was the temporary capital of the revolutionary government. Ivanovo remains one of the major textile cities of the Soviet Union, producing cotton, worsted, and silk goods and clothing. Other industries produce machinery and dyes for the textile industry. Still other manufactures include peat-working machines, cranes, leather goods, lumber, and foodstuffs. A number of satellite towns produce cotton and linen. Rail and road links run to Moscow, Yaroslavl, and Vladimir. Ivanovo has a number of institutions of higher education, including textile, chemical technology, power, agricultural, medical, and teacher-training institutes. Pop. (1983 est.) 474,000.

Ivanovsky, Dmitry Iosifovich (b. Nov. 9 [Oct. 28, old style], 1864, Nizy, Russia—d. June 20, 1920, Rostov-na-Donu, Russian S.S.R.), Russian microbiologist who, from his study of mosaic disease in tobacco, first detailed many of the characteristics of the organisms that came to be known as viruses. Although he is generally credited as the discoverer of viruses, they were also independently discovered and named by the Dutch botanist M.W. Beijerinck only a few years later.

While a student at St. Petersburg University, Ivanovsky was asked in 1887 to investigate "wildfire," a disease that was infecting tobacco plantations of the Ukraine and Bessarabia. In 1890 he was commissioned to study a different disease that was destroying tobacco plants in the Crimea. He determined that the infection was mosaic disease, which was believed at the time to be caused by bacteria. Using a filtering method for the isolation of bacteria, Ivanovsky discovered that filtered sap from diseased plants could transfer the infection to healthy plants. Further researches led Ivanovsky to conclude that the causal agent was an exceedingly small parasitic microorganism that was invisible even under great magnification and that could permeate porce-

lain filters designed to trap ordinary bacteria. He differed from later researchers of viruses only in his supposition that the pathogenic agent in question was a miniscule bacterium, rather than an entirely new and different type of organism. He published his findings in an article, "On Two Diseases of Tobacco" (1892), and a dissertation, *Mosaic Disease in Tobacco* (1902).

He continued his formal education in botany and taught plant anatomy and physiology (1896–1901) but did no further work in virology. In 1908 he went to teach at Warsaw University, where he studied the process of photosynthesis, with particular attention to chloroplasts (chlorophyll-bearing structures) and to the role of pigments in plant leaves.

Ivashchenkovo (Russian S.F.S.R.): *see* Chapayevsk.

Ives, Charles (Edward) (b. Oct. 20, 1874, Danbury, Conn., U.S.—d. May 19, 1954, New York City), significant American composer who is known for a number of innovations that anticipated most of the later musical developments of the 20th century.

Ives received his earliest musical instruction from his father, who was a bandleader, music teacher, and acoustician who experimented with the sound of quarter tones. At 12 Charles played organ in a local church, and two years later his first composition was played by the town band. In 1893 or 1894 he composed "Song for the Harvest Season," in which the four parts—for voice, trumpet, violin, and organ—were in different keys. That year he began studying at Yale University under Horatio Parker, then the foremost academic composer in the United States. His unconventionality disconcerted Parker, for whom Ives eventually turned out a series of "correct" compositions.

After graduation in 1898, Ives became an insurance clerk and part-time organist in New



Charles Ives
Clara E. Sipprell

York City. In 1907 he founded the highly successful insurance partnership of Ives & Myrick, which he headed from 1916 to 1930. He devised the insurance concept of estate planning and considered his years in business a valuable human experience that contributed to the substance of his music. Nearly all his works were written before 1915; many lay unpublished until his death. Chronic diabetes and a hand tremor eventually forced him to give up composing and to retire from business. His music became widely known only in the last years of his life. In 1947 he received the Pulitzer Prize for his *Third Symphony* (*The Camp Meeting*; composed 1904–11). His *Second Symphony* (1897–1902) was first performed in its entirety 50 years after its composition.

Ives's music is intimately related to American culture and experience, especially that of New England. His compositions—with integrated quotations from popular tunes, revival hymns, barn dances, and classical European music—are frequently works of enormous complexity that freely employ sharp dissonance, polytonal harmonies, and polymetric constructions. He drew from European music what techniques he wished while experimenting with tone clusters, microtonal intervals, and elements of chance in music (in one bassoon part he directs the player to play whatever he wants beyond a specific point). Believing that all sound is potential music, he was somewhat of an iconoclast and occasionally a parodist.

In *The Unanswered Question* (composed before 1908), a string quartet or string orchestra repeats simple harmonies; placed apart from them, a trumpet reiterates a question-like theme that is dissonantly and confusedly commented upon by flutes (optionally with an oboe or a clarinet). In the second movement of *Three Places in New England* (also titled *First Orchestral Set* and *A New England Symphony;* 1903–14), the music gives the effect of two bands approaching and passing each other, each playing its own melody in its own key, tempo, and rhythm. His monumental *Second Piano Sonata* (subtitled *Concord, Mass., 1840–60*), which was written from 1909 to 1915 and first performed in 1938, echoes the spirit of the New England Transcendentalists in its four sections, "Emerson," "Hawthorne," "The Alcotts," and "Thoreau." It contains tone clusters, quotes Beethoven, and includes a flute obbligato honouring Thoreau's wish to hear a flute over Walden. The mood of the sonata ranges from wild and dissonant to idyllic and mystical. It was published in 1920, together with Ives's pamphlet *Essays Before a Sonata.*

Ives conceived his *Second String Quartet* (1911–13; composition on second movement begun 1907) as a conversation, political argument, and reconciliation among four men; it is full of quotations from hymns, marches, and Beethoven, Brahms, and Tchaikovsky. His *Variations on America* (1891; additions before 1894) is the earliest polytonal piece known. In one of his piano and violin sonatas, he adds a passage for trumpet. His *114 Songs* (1919–24) for voice and piano vary from ballads to satire, hymns, protest songs, and romantic songs. In technique they range from highly complex (*e.g.*, with tone clusters, polytonality, and atonality) to straightforward and simple.

Other compositions include *Central Park in the Dark* (1906), for chamber orchestra; *General William Booth Enters into Heaven* (1914; to Vachel Lindsay's poem), for soloist or choir and band but also performed in arrangements for chamber orchestra and for voice and piano; and the four-part symphony *A Symphony: New England Holidays* ("Washington's Birthday," 1909, rescored 1913; "Decoration Day," 1912; "Fourth of July," 1912–13; and "Thanksgiving and Forefathers' Day," 1904). The Ives manuscripts were given to the Library of the Yale School of Music by his wife, Harmony Ives, in 1955, and a temporary mimeographed catalog was compiled from 1954 to 1960 by pianist John Kirkpatrick.

The standard biography of Ives is *Charles Ives and His Music* (1955), by Henry and Sidney Cowell. *Charles Ives Remembered,* by Vivian Perlis, was published in 1974.

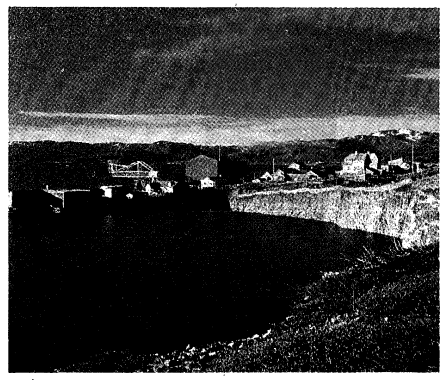
Ives, Frederic Eugene (b. Feb. 17, 1856, Litchfield, Conn., U.S.—d. May 27, 1937, Philadelphia), American photographer and inventor.

As a boy, Ives was apprenticed to a printer at the *Litchfield Enquirer,* where he became interested in photography. By the time he was 18 years old, he was in charge of the Cornell University photographic laboratory. While there, he developed an early halftone process using a gelatin relief. He continued to improve this process, and in 1881 he worked on the first commercial production of halftone printing plates using his method; in 1885 he introduced an improved halftone screen.

Among Ives's 70 patents were those for halftone photogravure (anticipating rotogravure); the modern short-tube, single-objective binocular microscope; and the photochromoscope (also called kromskop) camera and the chromogram (also spelled kromogram). The latter, a viewing instrument that accurately combined and projected the three-separation colour negative produced by the former, was of particular importance in the development of full-colour projection. Some of his early prints are preserved in the Smithsonian Institution, Washington, D.C.

Ives, James Merritt: *see* Currier, Nathaniel; and Ives, James Merritt.

Ivittuut, also spelled IVIGTÛT, town in southwestern Greenland, on the 20-mi- (32-km-) long Arsuk Fjord, southeast of Frederikshåb. Nearby is a large open-pit cryolite mine (deposit discovered in 1794) of major economic importance to Greenland. Although the mine was closed in 1963, the stockpiled cryolite is still being exported. The community, founded in 1864 with the opening of the mine, has a radio station. During World War II a U.S. military naval base was built at the head of



Ivittuut on Arsuk Fjord, Greenland
Mats Wibe Lund Jr.

Arsuk Fjord; it is now the headquarters of Grønnedal, the Greenland Command. Pop. (1982) 40.

Iviza, also called IVICA (island, Spain): *see* Ibiza.

Ivo OF CHARTRES, SAINT, French SAINT YVES DE CHARTRES (b. *c.* 1040, near Beauvais, Fr.—d. Dec. 23, 1116, Chartres; canonization date unknown; feast day May 23), bishop of Chartres who was regarded as the most learned canonist of his age.

Of noble birth, Ivo became prior of the canons regular of St. Quentin, Beauvais (*c.* 1078), and in 1090 Pope Urban II confirmed his election as bishop of Chartres. He was imprisoned in 1092 for opposing the plan of King Philip I of France to leave his wife, Bertha, and marry Countess Bertrade of Anjou. Ivo was released because of public pressure and the influence of Urban, who excommunicated Philip. At the Council of Beaugency (1104), Ivo recommended absolution for Philip, thus reconciling him with the Holy See. A moderate, Ivo served as mediator in the Investiture Conflict, a 12th-century dispute between the emperor and the papacy regarding the right to grant clerical office.

His importance as a canonist is displayed in his influential *Decretum* and his *Panormia* (17 and 8 books, respectively). His 288 letters reveal contemporary political, religious, and liturgical questions.

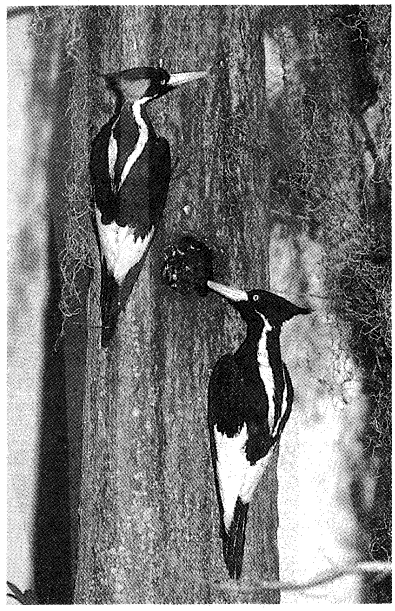
ivory, variety of dentin of which the tusk of the elephant is composed, prized for its beauty, durability, and suitability for carving. The tusk is the upper incisor and continues

to grow throughout the lifetime of the male and female African elephant and of the male Indian elephant; the female Indian elephant has no tusks or small ones. The teeth of the hippopotamus, walrus, narwhal, sperm whale, and some types of wild boar and warthog are recognized as ivory but have little commercial value because of their small size. Elephant tusks from Africa average about 6 feet (2 m) in length and weigh about 50 pounds (23 kg) each; tusks from Asian elephants are somewhat smaller. The elephant's tusk grows in layers, the inside layer being the last produced. About a third of the tusk is embedded in the bone sockets of the animal's skull. The head end of the tusk has a hollow cavity that runs for some distance along its interior, but the tusk gradually becomes entirely solid, with only a narrow nerve channel running through its centre to the tip of the tusk.

There are two main types of elephant ivory, hard and soft. Hard ivory generally comes from elephants in the western half of Africa, soft ivory from those in the eastern half. A hard ivory tusk is darker in colour and is more slender and straighter in form than a soft tusk. Internally, a hard tusk has more colour and is more brittle than a soft tusk, which is an opaque white and has a somewhat fibrous texture.

Ivory is a very durable material and is not easily damaged or destroyed; it will not burn and is very little affected by immersion in water. Ivory is similar to a hard wood in some of its properties. It is quite dense, it polishes beautifully, and it is easily worked with woodworking tools. Most of the ivory used commercially comes from Africa, but commercial sales of ivory have declined since the 19th and the early 20th centuries because of the shrinking numbers of African elephants. The once-flourishing ivory markets of Europe have largely shifted to South and East Asia, where skilled artisans still carve ivory into figurines and other aesthetic objects. The white tops of piano keys ("ivories") and white billiard balls were formerly made of ivory, but these objects are now made of plastics or other synthetic materials. *See also* ivory carving.

ivory-billed woodpecker (*Campephilus principalis*), a 45-centimetre (18-inch) black-and-white bird with a flaring crest (red in the male) and a long whitish bill. It belongs to the family Picidae (order Piciformes). By the 1980s the species was extinct or nearly so on the North American mainland; a few may yet survive in the southern United States (Florida, Louisiana, and eastern Texas). Its decline has coincided with the logging of virgin forest, where it subsisted on deadwood insects. A subspecies, the Cuban ivory-billed woodpecker (*C.p. bairdii*), still exists in small numbers in the pine forests of eastern Cuba. A related species, the imperial woodpecker (*C. imperialis*) of Mexico, is possibly extinct. All these birds appear to require large trees and isolation from disturbance.



Ivory-billed woodpeckers (*Campephilus principalis*)
Kenneth W. Fink from Root Resources—EB Inc.

Ivory Coast: *see* Côte d'Ivoire.

ivory carving, the carving or shaping of ivory into sculptures, ornaments, and decorative or utilitarian articles. Elephant tusks have been the main source of ivory used for such carvings, although the tusks of walrus and other ivory-bearing mammals have also been worked.

From ancient times ivory has been considered an article of luxury because of its qualities of fine grain, creamy light colour, smooth texture, and soft lustre. Ivory has been carved in such widely varied cultures as those of ancient Egypt, China, Japan, and India. In the West the use of ivory can be traced almost continuously from prehistoric times through the Roman, Carolingian, Byzantine, Gothic, Renaissance, and Baroque periods up until modern times.

Until about 1900 all ivory carvers used much the same tools: an ax, adz, or chisel for removing the outer bark, or rind, from the tusk; a bucksaw or bow saw for cutting the trunk of the tusk into sections; a special tool called a float for paring the surface; and hand chisels, fretsaws, and gauges for actually carving the piece. The great change came with power-driven rotary saws for cutting and peeling the ivory and with dental drills for carving it easily and quickly. These machine tools spread from Europe to Asia in the mid-20th century and are now in universal use for carving ivory.

Ancient Western carvings. Carvings made of ivory, bone, and horn are numerous from certain periods of the Stone Age. Most of the carvings have been found in southern France, particularly in the Dordogne region. The earlier examples take the form of small nude female figures, mostly of scant aesthetic worth. The carvings of animals belong to the succeeding Magdalenian period, and many of these have great merit. The material used is reindeer horn, with the ivory of mammoth tusks also occasionally used. The incising, or engraving, of ivory probably developed later than carving in the round. The prehistoric engravings on ivory usually represent animals, often rendered in a masterly manner and combined to form scenes.

Elephant tusks and hippopotamus teeth were carved from a very early period in ancient Egypt. Many combs, hairpins, and other utensils dating from the predynastic and early dynastic periods have been found at various sites, and to the same period probably belong some crudely carved nude female figures that were likely worn as amulets to ward off evil or harm. Among the masterpieces of early Egyptian carving are two statuettes, both found at Abydos; one represents a king of the 1st dynasty, while the other depicts the 4th-dynasty king Khufu, the builder of the Great Pyramid at Giza. The Egyptians also incised pictures on flat slabs of ivory, and sometime after 3000 BC they introduced the technique of relief carving. Later Egyptian ivory work, much of it of fine quality, is mostly decorative in intention, being used for handles, spoons, and inlays for caskets and furniture.

The ancient Phoenicians used ivory from Syria and Africa, and they seem to have specialized in ivory inlays for woodwork, often overpainted or encrusted with lapis lazuli or glass. Among the earliest preclassical Aegean ivory carvings are small figures of acrobats found at Knossos in Crete and dating from the 16th century BC. Many ivory gaming boxes, mirror handles, and plaques carved in low relief with hunting or combat scenes have been found at Cyprus and at Sparta and Mycenae; they show a strong Asian stylistic influence and were probably made in Syria or on the south coast of Asia Minor.

No ivories of importance belonging to the early Classical period of Greece have survived, though it is known from ancient writers that they existed. The high point of Classical ivory carving was most certainly the colossal chryselephantine statues (*i.e.,* ones partly made of ivory and gold) sculpted by Phidias in the 5th century BC; the statue depicting a seated Zeus was in the temple at Olympia, and a statue of a standing Athena was in the Parthenon at Athens. In the last centuries of the Roman Empire, ivory diptychs (*i.e.,* a relief carved on two tablets connected by a hinge) were issued by the Roman emperors, by consuls upon their taking office each year, and by patrician families to celebrate a marriage.

Post-Classical Western carving. The most important surviving ivory carving from the Early Christian period is the Brescia casket (4th century AD); this is a small casket bearing relief carvings of scenes from the Old and New Testaments. Several reliefs on diptychs and panels having Christian subjects date from this period, and indeed depictions of Christ, the Virgin Mary, and the Apostles form the main subject matter of European figurative ivory carvings for many centuries thereafter. No Byzantine ivory from the 7th to the 9th century survives, but there do exist several magnificent carved ivory reliefs from the 10th and 11th centuries. The figures are treated in a strongly classicizing, frozen, and monumental style. Byzantine statuettes from the late 11th and the 12th centuries show a more relaxed and fluid treatment of draperies, and their figures have elongated forms.

Northern European ivory carving revived during the Carolingian Renaissance, using walrus instead of elephant tusks. The Carolingians carved ivory into reliquaries, crucifixes, relief panels, and the book covers of psalters. New Testament scenes and figures were the almost invariable subject matter. These traditions continued during the Ottonian period of the 10th century, with several impressive situlae (holy-water buckets) carved with scenes from Christ's life having survived. Romanesque ivory carvings of reliquaries, tau crosses, and bishops' pastoral staffs display a multiplicity of styles, depending on the country of origin. During the Romanesque and the succeeding Gothic period, the West's artistic emphasis shifted from the decoration and embellishment of sacred objects to the building of cathedrals, monumental paintings, and stained glass. Thus, from about the 12th century on, ivory carving ceased to be a major art or an important adjunct to religious or imperial liturgies. Nevertheless, ivory diptychs and triptychs carved with religious scenes continued to be produced in the Gothic style by many workshops. Ivory was also carved into caskets, combs, mirror cases, writing tablets, cups, dagger handles, and Chess pieces. Sometimes scenes of courtly love or extracts from romances were carved onto the surface of these utilitarian objects.

Renaissance ivory carving marked a notable change from that of the Middle Ages in its technical sophistication and sensitivity. By this time ivory was rarely used except for domestic articles and inlay work, but there was a revival of interest in ivory carving in 17th-century Germany and Flanders, and many elaborate and sumptuously carved objects such as candelabra, plaques, statuettes, and drinking tankards were made by highly skilled artists. By the late 18th century, ivory

carvings were regarded in Europe merely as curious and quaint decorative objects. In the 19th century, ivory came into prominence once more, chiefly for making forgeries of older, more valuable ivory objects. It was also used to make caskets, clock cases, and batons,



"An Elopement" (sometimes called "Lancelot and Guinevere"), ivory mirror case, French Gothic, 14th century

By courtesy of the Liverpool Museum, England

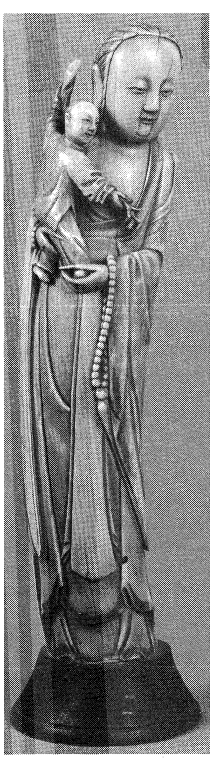
as well as humbler objects such as snuffboxes, fan handles, and scent bottles. By the 20th century, with the use of machine-driven tools to cut ivory and the decay of unified stylistic traditions of decoration, ivory carving in the West had degenerated into a craft still possessed of technical sophistication but almost utterly lacking in aesthetic worth.

Far Eastern carving. Ivory carving is one of China's oldest arts, and examples of skillfully carved ivory have been found in the tombs of the Shang dynasty (18th–12th century BC) kings; these pieces are so well designed and executed that they suggest a long previous development, probably going back to prehistoric times. In ancient China elephants still roamed the forests of the Huang Ho (Yellow River) region, so that the supply of ivory was close at hand. At the court of the Chou dynasty (12th–3rd century BC) it became fashionable for princes and high officials to carry narrow memorandum tablets of ivory. Called *hu,* these were generally worn as girdle pendants. In the Han dynasty (206 BC–AD 220) these ivory tablets came to be considered as marks of rank and were required for formal dress. Later, during the T'ang dynasty (618–907) and the Sung period (960–1279), these tablets were greatly elongated and were carried by court officials as a kind of sceptre as well as a writing surface for memoranda. The tablets continued to be carried as a mark of high court rank until the fall of the Ming dynasty in the 17th century. Some ivory figurines have also survived from these periods in Chinese history. Other carvings consist of flat ivory pieces that were painted or stained a dark colour and then carved to form intricate patterns of birds and animals or geometric figures, the carvings finally being stained with other colours or left plain.

By Sung dynasty times the elephants had been driven far into the wilderness areas of southwest China (modern Yunnan), which then belonged to another nation, the kingdom of Nanchao. Accordingly, new sources of ivory were sought overseas, and at this time the first African elephant tusks were brought from Zanzibar to China by Arab traders. The new nationalistic-minded Ming dynasty, after overthrowing the Mongol Yüan dynasty, proceeded in the 14th century to revive the art of ivory carving, and a renaissance of fine craftsmanship resulted. The Ming ivory carvings that have survived are mostly handsomely carved figures, not stained or painted but having the natural colouring of ivory. The tradition of fine Ming carving seems to have carried over into the first half of the Ch'ing dynasty (1644–1912). The art of colouring ivory was revived at this time, and both stains and lacquers were used to enhance the delicately carved figures that many connoisseurs have considered the finest productions of the Chinese carvers' art. Workshops in Peking and Canton were the main centres of ivory carving, producing figures, singly or in groups; cylindrical brush boxes, table screens, and armrests and other desk fittings carved in low and high relief; sceptres; snuff bottles, snuff dishes, and accessories for opium smoking; stands for fine porcelains; and perfume boxes, mirror cases, and other toilet articles for court ladies. Shanghai workshops produced such utilitarian objects as chopsticks, Mah-Jongg sets, combs, and seals.

Peking and Canton continued to be centres for the finest Chinese ivory carving until after the fall of the Ch'ing dynasty in 1912. In subsequent years the output declined, resulting from the lack of Imperial patronage. From that time on, the industry was devoted chiefly to supplying foreign residents and tourists with ivory canes, card cases, and other objects. Because these buyers were not discriminating, the quality, which had been declining after the mid-19th century, deteriorated at an accelerating pace.

It is not possible to claim any great antiquity for ivory carving in Japan. Although they learned the art rather late, the Japanese ivory carvers of the Tokugawa period (1603–1867) quickly developed an astonishing mastery of this medium and created many miniature works of art that still excite admiration. Ivory was used in Japan to produce such objects as the plectrum for plucking the strings of the samisen and the ends of the rollers for traditional scroll paintings. Its major artistic use, however, was for the togglelike pieces called netsukes, which formed an indispensable item of men's costumes in the Tokugawa period. Netsukes were used to fasten the medicine box (inro) and pipe and tobacco pouches to a man's sash. They were often delicate and exquisitely carved miniature figures, landscapes, or animals. With the end of the Tokugawa regime in 1867, new customs of dress, and the introduction of the cigarette shortly after, netsukes became obsolete. Their former carvers, like the Chinese, gradually turned to making things for foreign residents and tourists, producing jewel boxes, chests, card cases, Chess pieces, buttons, brooches, and other objects to appeal to Victorian tastes. By about 1900, endless repetition and the use of machine tools for mass production had destroyed the remaining elements of the art. From that time on, most Japanese ivory carving has been directed toward the copying of old netsukes, complete with signatures of dead artists, and the forging of Chinese ivory antiquities.



Ivory figure from the late Ming or Ch'ing period, North China, 16th or 17th century; in the Victoria and Albert Museum, London

By courtesy of the board of trustees of the Victoria and Albert Museum, London

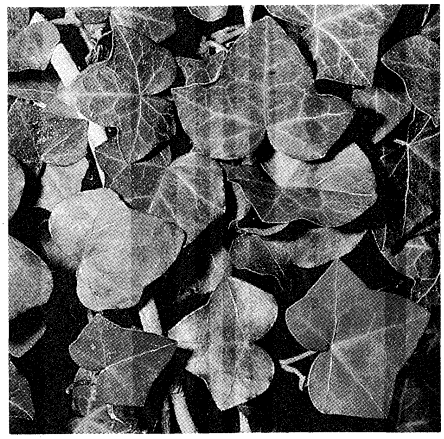
Other carving traditions. From the time of Muhammad or before, ivory was used extensively in the Middle East and in Muslim-ruled Spain to decorate furniture, doors, caskets, and minbars (pulpits). The decoration consisted of geometric and plant-form arabesques, sometimes inhabited by birds and animals. Ivory was always plentiful in India, but few carved ivory pieces have survived to illustrate the art during most of the 4,000 years it has been practiced there. Some Hindu and Buddhist figures carved in the round are extant, along with little boxes and some reliefs.

The early Inuit, or Eskimo, of North America lacked most useful metals, and so they fashioned the ivory from walrus tusks and buried mammoth tusks into a variety of utilitarian objects, such as bucket handles, bow drills, pipes, harpoon shafts, and needle cases. They etched these objects with geometric or gracefully curving patterns of fine lines. Another type of ivory carving is that of scrimshaw (*q.v.*), which is the decoration of whales' teeth or walrus tusks with various designs and images, carried out by whale fishermen in the United States during the 19th century.

Ivrea, Latin EPOREDIA, town and episcopal see, Torino province, Piemonte (Piedmont) region, northwestern Italy, on the Dora Baltea River, north of Turin. The importance of its gold mines led the Romans to seize the district from the Salassi in 143 BC. Ivrea was a Lombard duchy and, from the 9th century, a marquessate, and two of its rulers, Berengar II (950) and Arduin (1002), became kings of Italy. It passed to Monferrato in 1266 and to the House of Savoy in 1313. Served by rail and road, Ivrea manufactures office equipment (it is the headquarters of Olivetti) and textiles. Tourism is important, and the town's annual historical carnival in February is well known. Pop. (1984 est.) mun., 27,577.

Ivry-sur-Seine, industrial suburb southeast of Paris, in Val-de-Marne *département,* Paris region, France. It is bounded on the northwest by the city limits of Paris and on the northeast by the Seine River, and it is served by the Paris subway. Its port on the Seine makes it an entrepôt for foodstuffs, fuel, and timber. A hospital for incurable diseases was moved there in 1870 from Paris. During the occupation of Paris in World War II, 860 French patriots were shot by the Germans and are buried at Ivry cemetery. The suburb's manufacturing industries include electrical and nonelectrical machinery, food processing, chemicals, and wood and paper. Pop. (1982) 55,682.

ivy, any plant of the genus *Hedera,* with about five species of evergreen woody vines (rarely shrubs), in the ginseng family (Araliaceae). The name ivy especially denotes the commonly grown English ivy (*H. helix*), which climbs by aerial roots with adhering disks that develop on the stems. English ivy is frequently planted



English ivy (*Hedera helix*)
Sven Samelius

to clothe brick walls. The stems bear leaves with three to five lobes; as the stems reach the top of their support, they become horizontal or hang, sometimes developing unlobed (entire) leaves and small greenish flowers. Numerous cultivated and geographical varieties of *H. helix* exist, including many with variegated leaves. Native to Europe and much of Asia, this genus has been introduced into many parts of the world.

Many varieties of ivy are cultivated in gardens. Growing these is an extremely simple matter, as they will thrive in a poor soil and endure a considerable depth of shade, so that they may with advantage be planted under trees. For example, the common Irish ivy (a variety of *H. helix*) is often used as a ground cover beneath large trees where grass has difficulty in thriving. A strong light is detrimental to the growth of ivy, but there are few hardy plants that may be compared with it for variety and beauty that will endure shade equally well. Ivies, in their many forms, are also popular houseplants.

A question of practical importance is the relation of the ivy plant to its means of support. A moderate growth of ivy is not injurious to trees; still, the tendency is from the first unfavourable to the prosperity of the tree, and at a certain stage it becomes deadly. Therefore the growth of ivy on trees should be kept within reasonable bounds. In regard to buildings clothed with ivy, there is nothing to be feared as long as the plant does not penetrate the substance of the wall by means of any fissure. Should it thrust its way in, its natural and continous expansion hastens the decay of the structure. For unrelated plants called ivies, *see* Boston ivy; poison ivy.

Ivy League, a group of colleges and universities in the northeastern United States that are widely regarded as high in academic and social prestige: Harvard (established 1636), Yale (1701), Pennsylvania (1740), Princeton (1746), Columbia (1754), Brown (1764), Dartmouth (1769), and Cornell (1853). They are members of an athletic conference for intercollegiate football and other sports known as the Ivy League. Formally organized only in 1956, competition between the colleges dates back to football meetings in the 1870s. The Ivy League was dominant in the early years of football in the United States until 1913, as attested by the All-America teams, but faded in the 1920s.

Iwaki, city, Fukushima Prefecture (*ken*), Honshu, Japan, facing the Pacific Ocean. The city is divided into several sections that are located on the Abukuma Plateau and the alluvial plains of the Natsui and Same rivers. The northern section, which is known as Taira, was a castle town during the Tokugawa period (1603–1867); the Nakoso, Jōban, and Shikura sections were post towns. Since the first exploitation of the Jōban coal mines in the late 19th century, the entire city was dominated by the mining industry. Output declined after 1951, however, and after the 1970s only the mines in the west remained in operation. Chemical and petrochemical industries have developed, especially around Onahama. Tobacco is grown in the rural areas, and there is a lumber industry. Pop. (1985) 350,566.

Iwakuni, city, Yamaguchi Prefecture (*ken*), Honshu, Japan, in the delta of the Nishikigawa (Nishiki River), facing Hiroshima-wan (Hiroshima Bay). A castle town founded in 1603 by the Kikkawa daimyo family, Iwakuni has grown into a major industrial city and is the centre of a petrochemical-producing region that extends northward to Ōtake, Hiroshima Prefecture. Iwakuni is noted for its Kintai-bashi (Kintai Bridge) over the Nishikigawa, which has five gracefully arched spans. The bridge was originally built in 1673 to afford residents an escape from floods of the Nishiki-gawa. It was destroyed in a flood in 1950 but was rebuilt as before. Its shape leads local inhabitants to call it Soroban-bashi (Abacus Bridge). The former army and naval base contains a base for U.S. forces and Iwakuni International Airport. Pop. (1985) 111,831.

Iwakura Tomomi (b. Oct. 26, 1825, Kyōto—d. July 20, 1883, Tokyo), one of Japan's most influential statesmen of the 19th century.

He was born to the family of a court noble of relatively low rank. Adopted as son and heir of the more powerful Iwakura family, he gained an important place in court circles after the U.S. naval officer Commodore Matthew C. Perry in 1853 succeeded in forcing Japan to allow foreigners to enter the country.

In 1858 Iwakura was influential in the emperor's refusal to ratify the U.S.–Japanese treaty of commerce, thereby establishing a precedent for increased Imperial participation in affairs that had long been conducted exclusively by the shogun (feudal military dictator). When the emperor's refusal angered the shogun, Iwakura retreated and advocated a reconciliation between the two factions, symbolized by the marriage of the emperor's sister to the young shogun. Iwakura, reviled by Imperial loyalists for his retrenchment, was deprived of his court office, and from 1863 to 1867 he lived in obscurity near Kyōto.



Iwakura Tomomi
BBC Hulton Picture Library

As the shogunate lost influence, Iwakura was able to gain favour with the militarily powerful loyalists of the feudal domains of Satsuma and Chōshū. After his return to favour at court he was a member of the small group of conspirators that brought about the Meiji Restoration (1868), thus ending the power of the last shogun. In the new administration, which used the Meiji emperor's prestige as a force for modernizing Japan, Iwakura was one of the most powerful leaders. In 1871 he was appointed to head a group of about 50 leading government figures on a mission to Western countries. Ostensibly devoted to the task of treaty revision, the embassy became a great "learning mission," with its members divided into teams to study Western systems of education, administration, finance, and law. Upon his return Iwakura helped thwart plans made in his absence for war with Korea, as he was convinced that internal reforms were vitally needed. In the late 1870s he was the unchallenged de facto head of the government. A foe of the movement for democratic rights, he ended his career by supervising the early stages of the preparation of a constitution safeguarding the Imperial prerogative.

Iwamizawa, city, Hokkaido, Japan, on the levee of the Ikushunbetsu-gawa (Ikushunbetsu River), northeast of Sapporo. It developed around the railway station built on the levee in 1882. With the opening of three other railway lines by 1914, Iwamizawa became an important transportation centre connected with the nearby Ishikari Coalfield. Despite the decline in the coal-mining industry in the 1960s and 1970s, the city continues to be a prosperous local administrative and commercial centre. During the 1970s it became a suburb of Sapporo. Pop. (1980) 78,311.

Iwasaki Yatarō (b. Jan. 9, 1835, Tosa Province, Japan—d. Feb. 7, 1885, Tokyo), industrial entrepreneur who founded the Mitsubishi *zaibatsu,* the second largest of the family-owned industrial–financial combines that dominated the economic life of Japan in the late 19th and early 20th centuries.

Of petty samurai (warrior class) origin, Iwasaki began his business career as the financial manager of the feudal fief of Tosa. When the new Imperial government, established in 1868, dissolved the various feudal domains into which Japan had previously been divided, Iwasaki was able to transfer the fief's shipping interests into his own concern, which in 1873 he named the Mitsubishi Commercial Company (Mitsubishi Shōkai). Under Iwasaki's management the company flourished, and the new government administration, which desired to end Japanese dependence on foreign shipping, encouraged him, in 1884, to acquire the newly built government shipyard at Nagasaki. Under the direction of Iwasaki and his descendants, Mitsubishi branched out into numerous other industrial and commercial activities.

Iwaszkiewicz, Jarosław (b. Feb. 20, 1894, Kalnik, Ukraine, Russian Empire—d. March 2, 1980, Stawisko, near Warsaw), Polish poet, novelist, essayist, and playwright, a highly gifted and prolific man of letters.

He studied law at the University of Kiev from 1912 and at the same time attended the music conservatory. In 1918 he settled in Warsaw, where he was a cofounder of Skamander, a group of lyrical poets. For two years (1923–25) he was private secretary to Maciej Rataj, the *Sejm* (Parliament) speaker, later joining the Ministry of Foreign Affairs. From 1932 to 1936 he served as a member at the Polish legations in Copenhagen and Brussels, respectively, returning afterwards to writing. As a poet he was already well known as the author of a few collections of verse.

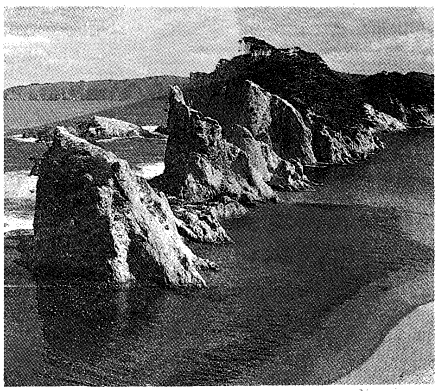
During World War II Iwaszkiewicz lived qui-

etly with his wife Anna (*née* Lilpop) at their country house in Stawisko. After the war he avoided participating in political activities. He agreed, however, in 1953 to be chairman of the Polish Committee to Defend Peace and to serve as a non-party member of the *Sejm*. He twice presided over the Polish Writers' Union (1943–49 and 1959–72). From 1955 he was editor-in-chief of *Twórczość* ("Creation"), a monthly literary periodical.

Iwaszkiewicz's poems, published in *Oktostychy* (1919), *Księga dnia i księga nocy* (1922; "The Book of Day and the Book of Night"), and *Wiersze zebrane* (1968; "Collected Poems"), among others, are frequently lyrical evocations of the Polish landscape. His prose production, which took such varied forms as essays, plays, biographies, short stories, novels, and translations, includes the short-story collection *Opowiadania* (1954; "Stories") and the novel *Sława i Chwała,* 3 vol. (1956–63; "Fame and Glory"), an examination of the turbulent Polish society from 1914 to 1945.

Iwate, prefecture (*ken*), northeastern Honshu, Japan, bordering the Pacific Ocean (east). The greater part of its 5,899 sq mi (15,278 sq km) is mountainous, and the climate is cold. The fishing port of Miyako serves as the gateway to Rikuchu-kaigan National Park, which includes the rugged, scenic coast. The western fringe of the prefecture is part of Towada-Hachimantai National Park.

Agriculture, forestry, mining, and fishing support most of the population. Rice paddies occupy more than half of the cultivated land, yielding only one crop a year. Morioka, located on the Kitakami-gawa (Kitakami River), is the prefectural capital. Iwate University (1949) is located there. A major railway hub, it produces ironware and charcoal. The first modern ironworks in Japan were in Kamaishi. Other towns—including Hanamaki, Kitakami, Mizusawa, and Ichinoseki—are situated on the Tohoku Main Line (railway). Pop. (1983 est.) 1,430,000.



Eroded seacoast cliffs in the Rikuchu-kaigan National Park, Iwate Prefecture, Japan

Cent Photos—FPG/EB Inc.

Iwo, town, Oyo State, southwestern Nigeria. It lies 6 mi (10 km) north of the Iwo station on the Lagos–Kano railway and at the intersection of roads from Ibadan, Oyo, and Ogbomosho on a low hill at the edge of savanna and forest. Founded in the 16th or 17th century by a son of the Oni (the spiritual ruler of the Yoruba people) of Ife, 28 mi east-southeast, it became the capital of the Yoruba kingdom of Iwo. In the early 19th century it received an influx of refugees both from the disintegration of the Yoruba Oyo Empire and from Iwo's generally successful campaigns in the Yoruba civil wars. The former ruler of Iwo, the *oluwo* ("king"), whose palace now incorporates a modern building and the local government offices, still retains important social and traditional functions and is an adviser to the local government. Iwo is now headquarters of a local government council. Within the town, many of the traditional Yoruba compounds with their rectangular courtyards have been replaced with single-story and multistory houses.

The cultivation and export of cocoa is the town's economic mainstay. Yams, corn (maize), cassava, and palm oil and kernels, the chief staple crops, are grown north of the town. Cotton weaving and dyeing (with locally grown indigo) are traditionally important activities.

Iwo's predominantly Muslim population is served by a central mosque and a hospital. A Baptist mission founded in 1922 operates a teacher-training college, secondary school, and leprosy settlement; Muslims, Roman Catholics, and the government operate other schools. Although the railroad built in 1906 greatly enhanced Iwo's growth, the town's traffic is now primarily road-borne. Pop. (1983 est.) 261,600.

Iwo Jima, Japanese IŌ-JIMA, island, measuring 8 sq mi (20 sq km) in area, in the Volcano Islands archipelago, Japan, in the western Pacific. According to legend it is the "island of the demons."



U.S. marines raising the American flag over Mt. Suribachi, Iwo Jima, in February 1945

Joe Rosenthal—AP/Wide World

In 1945 the island became the scene of a fierce battle between Japanese and U.S. troops. The hardest struggles were for the occupation of a height that U.S. forces labelled Meatgrinder Hill, in the north, and Mt. Suribachi, an extinct volcano in the south. A photograph of marines raising the U.S. flag over the mountain was widely reprinted; paintings, statues, and a three-cent U.S. postage stamp were based on it.

About 22,000 Japanese troops were killed or captured, and U.S. casualties totalled more than 21,000, including more than 4,500 killed. In 1951 the Volcano Islands came under U.S. administration but were returned to Japan in 1968 under the jurisdiction of the Tokyo Metropolis (*to*).

IWW: *see* Industrial Workers of the World.

Ixcatec, Middle American Indians living in a single town, Santa María Ixcatlán, in northern Oaxaca, Mex. Although there were perhaps 10,000 Ixcatec before the Spanish conquest, their numbers now remain stable at about 200. The Ixcatec language and culture are closely related to those of the neighbouring Chocho (*q.v.*). Subsistence is agricultural, with corn and beans as the staple crops. Settlements are congregated; the people live in towns or villages, from which they go out to farm the surrounding land. Houses are built in a variety of styles, from thatched huts to adobe and tile houses—the result of cultural change. The chief craft practiced is the weaving of palm-fibre hats for sale. Native dress has completely disappeared; standard Mexican peasant dress is worn.

The Ixcatec, although they are Roman Catholics, practice a faith that has intermixed some pre-Christian beliefs. The *compadrazgo,* or godparent relationship, is invoked at baptism, and godparents have obligations to their godchildren at marriage.

Ixcuina (Aztec goddess): *see* Tlazoltéotl.

Ixelles (French), Flemish ELSENE, municipality, Brabant province, central Belgium. A southeastern suburb of Brussels, it is one of the 19 communes that make up Greater Brussels. Manufactures include metals, chemicals, and textiles. The former Cistercian Abbey of La Cambre (founded 1201) now houses the National Geographic Institute and the Institute of Architecture and Decorative Art. Some of the newer buildings of the Free University of Brussels are in the southeastern part of the town near the lakes of Bas-Ixelles. Pop. (1983 est.) mun., 76,146.

Ixion, in Greek legend, son either of the god Ares or of Phlegyas, king of the Lapiths in Thessaly. He murdered his father-in-law and could find no one to purify him until Zeus did so and admitted him as a guest to Olympus. Ixion abused his pardon by trying to seduce Zeus's wife Hera. Zeus substituted for her a cloud, by which Ixion became the father of the Centaurs. Zeus, to punish him, bound him on a fiery wheel, which rolled unceas-

ingly through the air or, according to another tradition, in the underworld.

A plausible explanation of the myth connects it with the ancient practice of carrying a blazing revolving wheel through fields that needed the heat of the sun; thus the legend might possibly have been invented to explain the custom.

Ixtacalco (Mexico): *see* Iztacalco.

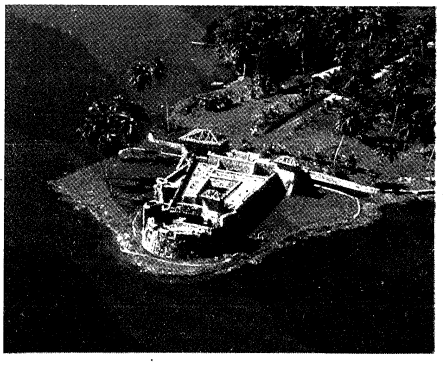
Ixtaccihuatl (volcano, Mexico): *see* Iztaccíhuatl.

Ixtapalapa (Mexico): *see* Iztapalapa.

Ixtlilxóchitl (fl. 1500–1550), Aztec chieftain, the chief of Texcoco who supported the Spanish conquistador Hernán Cortés in the conquest of rival Aztecs in Tenochtitlán.

At the time of the Spanish conquest, the cities of Texcoco and Tenochtitlán (the capital of the Aztec confederation) were engaged in an active rivalry with each other. Ixtlilxóchitl, moreover, was involved in an internal dispute with his brother over leadership of the Texcocans. When Cortés offered to support his claims and the aspirations of Texcoco, Ixtlilxóchitl allied his people with the Spanish invaders and assisted in the siege of Tenochtitlán. Although he remained an ally of Spain, he eventually lost the favour of his disillusioned subjects.

Izabal, Lake, Spanish LAGO DE IZABAL, lake in northeastern Guatemala. The nation's largest lake, Izabal occupies part of the lowlands between the Santa Cruz Mountains to the northwest and the Minas and San Isidro mountains to the southwest and southeast. It is fed by the Polochic River and is drained by the Dulce River into Amatique Bay, which is part of the Caribbean Sea. Lying only 26 feet (8 m) above sea level, Lake Izabal is approximately 30 miles (48 km) long by 15 miles (24 km) wide, with a maximum depth of 59 feet (18 m); its area is 228 square miles (590 square km).

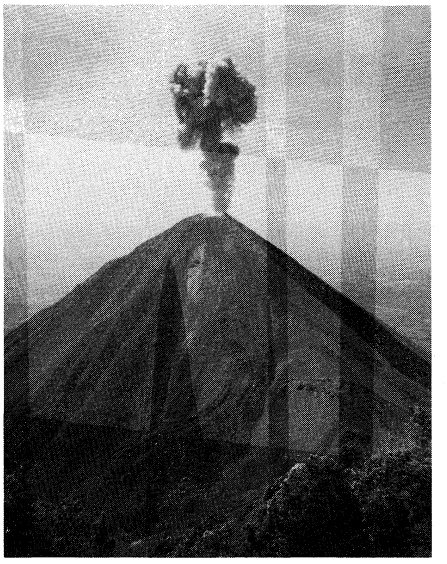


Ruins of the Spanish fort of San Felipe on Lake Izabal, Guatemala

Howard Sochurek

During the colonial period, products from the highlands were traded in the Izabal area and exported. The ruins of San Felipe fort still stand guard at the head of the Dulce. The principal settlement on the shores is El Estor, which originated as the trading outpost of the United Fruit Company and whose name is derived from the English word *store.* Nickel has been mined near the lake.

Izalco Volcano, Spanish VOLCÁN IZALCO, volcano in western El Salvador. It is the most active volcano in Central America, having erupted more than 50 times since 1700. Its black symmetrical cone, which was formed by eruptions in 1770 and 1798, is devoid of vegetation and reaches a height of 6,004 feet (1,830 m). During the 19th century, oceangoing sailors set their course by the continuous glow from Izalco's summit, nicknaming it the "Lighthouse of the Pacific." The volcano derives its name from the Izalco Indians. The

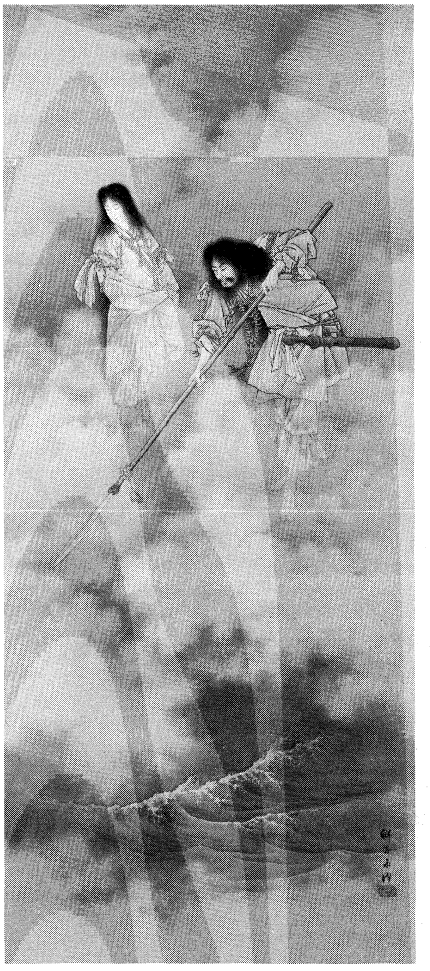


Izalco Volcano, El Salvador, during an eruption

By courtesy of the Departamento de Fomento de la Industria Turistica

town of Izalco is located at the southwestern foot of the volcano.

Izanagi and Izanami (Japanese: "He Who Invites and She Who Invites"), the central deities in the Japanese creation myth. They were the eighth pair of brother and sister gods to appear after heaven and earth separated out



Izanagi and Izanami stirring the primeval brine to form the first land mass, painting on silk, Tokugawa period (1603–1867); in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston, Bigelow Collection

of chaos. By standing on the floating bridge of heaven and stirring the primeval ocean with a heavenly jeweled spear, they created the first land mass.

Their first attempt at sexual union resulted in a deformed child, Hiruko ("Leech Child," known in later Shintō mythology as the god Ebisu), and they set him adrift in a boat. Attributing the mistake to a ritual error on the part of Izanami, who as a woman should never have spoken first, they began again and produced numerous islands and deities. In the act of giving birth to the fire god, Kagutsuchi (or Homusubi), Izanami was fatally burned and went to Yomi, the land of darkness. Izanagi followed her there, but she had eaten the food of that place and could not leave. She became angry when he lit a fire and saw her rotting and covered with maggots, and the two were divorced.

Izanagi bathed in the sea to purify himself from contact with the dead. As he bathed, a number of deities came into being. The sun goddess Amaterasu was born from his left eye, the moon god Tsukiyomi was born from his right eye, and the storm god Susanoo was born from his nose. In the Shintō religion, Izanagi's bath is regarded as the founding of *harai,* the important purification practices of Shintō.

Izdī (religious sect): *see* Yazīdī.

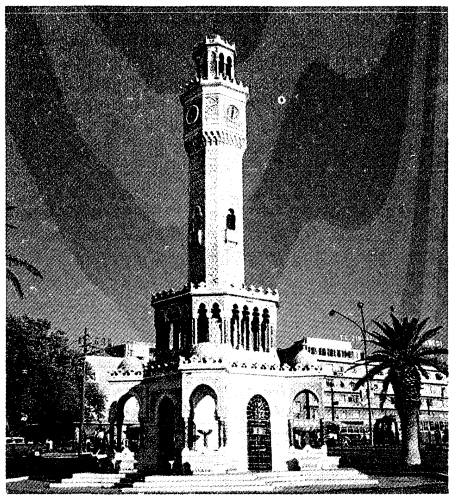
Izhevsk, also spelled IŽEVSK, city and capital of the Udmurt Autonomous Soviet Socialist Republic, west-central Russian S.F.S.R., on the Izh River. Izhevsk was founded in 1760 as an ironworking and later an armaments centre, and the city remains a major producer of steel, armaments, machine tools, building machinery, and motorcycles. There is also a large automobile plant. Other industries include large-scale sawmilling and the processing of varied foodstuffs. Izhevsk is the cultural and educational centre of the republic, with a scientific institute of the Udmurt language, literature, and history, as well as teacher-training, medical, mechanical, and agricultural institutes. Pop. (1986 est.) 620,000.

Izium (Ukrainian S.S.R.): *see* Izyum.

Izmail, city, Odessa *oblast* (province), Ukrainian Soviet Socialist Republic. It lies on the north bank of the main Danube distributary some 50 miles (80 km) from the Black Sea. The Turkish fortress established there in the 16th century was stormed by the Russians in 1790. Between World Wars I and II, Izmail, with the rest of Bessarabia, was included in Romania. It is now an important river port and transshipment point, with light industries. Pop. (1986 est.) 90,000.

İzmir, historically SMYRNA, city, western Turkey. The nation's third largest city and one of its largest ports, it lies at the head of the sheltered Gulf of İzmir on the deeply indented coast of the Aegean Sea. The modern city, with spacious avenues and modern buildings built since 1924, stands mainly on the small delta plain of the Kızılçullu (ancient Meles) River around the eastern end of the gulf and on the heights and ridges to the south. Karşıyaka (formerly Kordelia), which lies across the gulf, is nearly connected to İzmir proper by a growing chain of suburbs. Konak is the commercial centre of İzmir; the city's residential quarters are concentrated in Karantina and in Güzelyalı to the southwest and in Eşrefpaşa, north of the bazaar. South of the commercial centre lies Kadifekale (Mount Pagus; 540 feet [165 m]), on which the old citadel of İzmir was built. Alsancak to the north is the site of the recently enlarged harbour, while industry is concentrated in suburbs along the gulf to the northeast.

İzmir is one of the oldest cities of the Mediterranean world and has been of almost continuous historical importance during the last 5,000 years. Excavations indicate settlement contemporary with that of the first city



Clock tower, İzmir, Tur.
Fritz Henle—Photo Researchers/EB Inc.

of Troy, dating from the 3rd millennium BC. Greek settlement is first clearly attested by the presence of pottery dating from *c.* 1000 BC. According to the Greek historian Herodotus, the Greek city was founded by Aeolians but soon was seized by Ionians. From modest beginnings, it grew into a stately city in the 7th century, with massive fortifications and blocks of two-storied houses. Captured by Alyattes of Lydia *c.* 600 BC, it ceased to exist as a city for about 300 years until it was refounded by either Alexander the Great or his lieutenants in the 4th century BC at a new site on and around Mount Pagus. It soon emerged as one of the principal cities of Asia Minor and was later the centre of a civil diocese in the Roman province of Asia, vying with Ephesus and Pergamum for the title "first city of Asia." Roman emperors visited there, and it was celebrated for its wealth, beauty, library, school of medicine, and rhetorical tradition. The stream of Meles is associated in local tradition with Homer, who is reputed to have been born by its banks. Smyrna was one of the early seats of Christianity.

Capital of the naval theme (province) of Samos under the Byzantine emperors, Smyrna was taken by the Turkmen Aydın principality in the early 14th century AD. After being conquered in turn by the crusaders sponsored by Pope Clement and the Central Asian conqueror Timur (Tamerlane), it was annexed to the Ottoman Empire *c.* 1425. Although severely damaged by earthquakes in 1688 and 1778, it remained a prosperous Ottoman port with a large European population. In May 1919, İzmir was occupied by Greek forces. Heavily damaged in the fighting, it was recaptured by Turkish forces in September 1922.

Since World War II, İzmir has grown rapidly, partly owing to its location, for which it was selected as the site of the headquarters of the North Atlantic Treaty Organization southern command. It also has a teacher-training school and the Aegean University, founded in 1955. Second only to the Istanbul region in industry, it produces foods, cement, and cotton and woolen textiles and has petrochemical and engineering works. A large international trade fair is held annually. Exports include agricultural products from its hinterland—chiefly tobacco, figs, cotton, and vegetables—as well as manufactures, carpets, and silk.

The city's landmarks include the partly excavated remains of its agora and the ancient aqueducts of Kızılçullu. The archaeological museum has a fine collection of local antiquities. Situated near such famous ancient sites as Ephesus and Pergamum and numerous holiday resorts, İzmir has a growing tourist trade. İzmir is situated in one of Turkey's most densely populated areas. The coastal region includes the irrigated and fertile valleys and delta plains of the Küçük (small) Menderes and Gediz rivers. Pop. (1980) 530,064.

İzmit, city, northwestern Turkey. It lies near the head of İzmit Gulf of the Sea of Marmara. The city spreads across several hills and over a narrow plain that contains its commercial and industrial sections. Originally a Megarian city founded in the 8th century BC and called Astacus (or Olbia), it achieved its greatest fame as Nicomedia, built *c.* 264 BC by Nicomedes I of Bithynia to replace the destroyed old city. It served as the capital of the kingdom of Bithynia and later, under the Romans, was often the residence of emperors. It became the eastern capital of the Roman Empire under Diocletian. After a period of decline under the Byzantines, it fell to the Ottomans in 1326. Historical monuments in the city include the remains of the ancient walls and a Byzantine fortress; a 16th-century mosque was built by the renowned Ottoman court architect Sinan.

İzmit's growth in recent years has resulted mainly from its rapid industrialization and its position on the main road and rail line between Istanbul and Ankara. It is the centre of the Turkish paper industry, meeting about half of the country's requirements. It also has a large oil refinery. Other industries include cement, phosphate, textiles, petrochemicals, and tires. The port of İzmit handles both domestic and international shipping. The city is connected by road with major towns. Pop. (1980) 190,423.

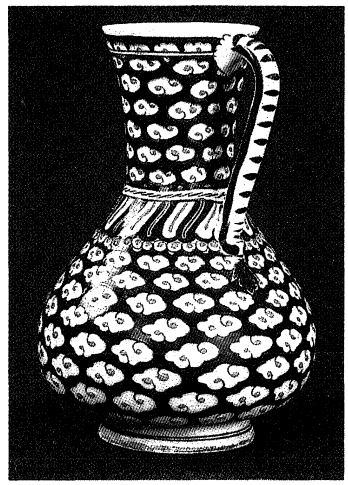
İznik, historically NICAEA, town, northwestern Turkey. It lies on the eastern shore of Lake İznik. Founded in the 4th century BC by the Macedonian king Antigonus I Monophthalmus, it was an important centre in late Roman and Byzantine times (*see* Nicaea, councils of; Nicaea, empire of). The ancient city's Roman and Byzantine ramparts, 14,520 feet (4,426 m) in circumference, remain. The town was besieged and conquered in 1331 by the Ottoman Turks, who renamed it İznik and built the Green Mosque (1378–91). İznik's prosperity, which was interrupted by the competing growth of nearby Istanbul as an Ottoman centre after 1453, revived in the 16th century with the introduction of faience pottery making. İznik subsequently became famous for its magnificent tiles, but after the workshops were transferred to Istanbul *c.* 1700, İznik began to decline. Its economy suffered a further blow with the construction of a major railway



İznik earthenware wall tiles decorated with tulips and carnations; 2nd half of the 16th century; in the Harem of the Topkapı Palace, Istanbul
Ann Hill—©Sonia Halliday Photographs

bypassing the town. Today İznik is a small market town and administrative centre for the surrounding district. Pop. (1980) 13,231.

İznik ware, in Islāmic ceramics, a school of Turkish pottery making that flowered throughout the 16th and on into the 17th century. There may have been potteries at İznik, where there were deposits of suitable clay, as early as the 12th century, but it was not until the late 15th century that pottery making came into its own in Turkey. The chief centre of production became established in the city of İznik. Early 16th-century İznik wares were influenced by the blue-and-white porcelain of Ming-dynasty China and by Persian wares. İznik ware was soft and sandy, being of grayish-white clay covered with a thin, usually white slip (a mixture of clay and water). Flat dishes were the commonest shapes, but bowls, jugs, and flower vases were also made. They were painted with stylized and symmetrical designs of flowers, leaves, and fruits, along with abstract linear motifs based on these natural forms and others



İznik earthenware jug painted in green, red, and blue on white ground under clear glaze; *c.* 1550–80; in the Victoria and Albert Museum, London
By courtesy of the Victoria and Albert Museum, London

such as fish scales. By the mid-16th century the range of colours used in the decoration had expanded from blue and white to include turquoise, several shades of green, and purple and black. Red had become a frequently used colour by the late 16th century. The quality of İznik ware declined in the 17th century, and by 1800 manufacture had ceased.

ʿIzrāʾīl, in Islām, the angel of death who separates souls from their bodies; he is one of the four archangels (with Jibrīl, Mīkāl, and Isrāfīl). ʿIzrāʾīl is of cosmic size: with his 4,000 wings and a body formed by as many eyes and tongues as there are living human beings, he stands with one foot in the fourth (or seventh) heaven, the other on the razor-sharp bridge that divides paradise and hell.

Before the creation of man, ʿIzrāʾīl proved to be the only angel brave enough to go down to Earth and face the hordes of Iblīs, the devil, in order to bring God the materials needed to make man. For this service he was made the angel of death and given a register of all mankind. While ʿIzrāʾīl can recognize the name of the blessed (circled in light) and the damned (circled in darkness), he does not know when anyone will die until the tree beneath God's throne drops a leaf bearing the man's name. He must then separate the body and soul after 40 days.

Man has several means for forestalling death. By reciting a dhikr (ritual prayer), he prevents the angel of death from entering the throat to take his spirit. When he is distributing *ṣadaqah* (alms), the angel cannot take him by the hand.

But when, after all protests, the angel returns with an apple from paradise inscribed with the *basmalah* (the invocation, "In the name of God, the merciful, the compassionate") or writes God's name in his palm, the spirit must leave. The souls of believers are then gently drawn out and carried to the seventh heaven, but the souls of unbelievers are ripped out of their bodies and hurled down to Earth before they can reach the gates of heaven.

Iztacalco, also spelled IXTACALCO, *municipio* ("municipality"), northeastern Federal District, central Mexico. It is situated at an elevation of 7,418 feet (2,261 m) in the Valley of Mexico. Iztacalco was once simply the commercial centre of an agricultural (corn [maize], beans, oats, and alfalfa) and livestock-raising region, but, with the growth of the federal capital, it has become part of Mexico City. Among the industries in the area are canneries, chemical plants, and factories producing cardboard, mattresses, furniture, and hats. It is also known for its market. Iztacalco is easily accessible by highway, railroad, and air. Pop. (1980) 570,377.

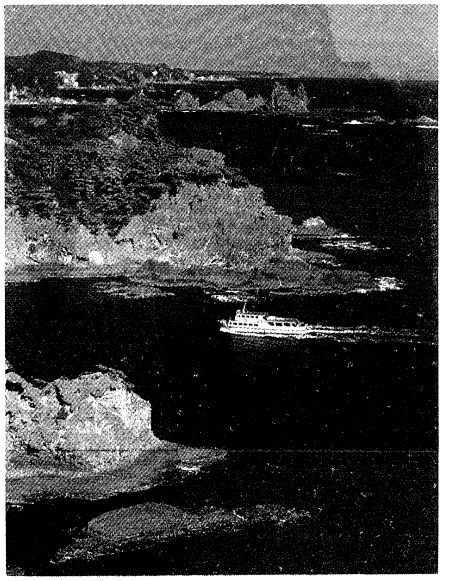
Iztaccíhuatl, also spelled IXTACCIHUATL, dormant volcano situated on the México–Puebla state line in central Mexico. It lies 10 miles (16 km) north of its twin, Popocatépetl, and 40 miles (65 km) south-southeast of Mexico City. Iztaccíhuatl (from the Nahuatl for "white woman") has three summits, the highest one reaching an elevation of 17,342 feet (5,286 m), but no crater. As seen from the federal capital, the snow-covered peaks resemble the head, breast, and feet of a recumbent woman—hence the popular designation of sleeping woman. Iztaccíhuatl last erupted in 1868.

Iztapalapa, also spelled IXTAPALAPA, *municipio* ("municipality"), northeastern Federal District, central Mexico. It is situated at 7,480 feet (2,280 m) above sea level in the Valley of Mexico. It was formerly a city built on the site of an important pre-Columbian town. Overlooking the area is Mount Estrella, where Aztecs kindled a sacred fire to initiate each cycle of their Calendar Round of 52 years.

Now an agricultural district of Mexico City, Iztapalapa produces corn (maize), alfalfa, wheat, beans, and vegetables. Industry is also becoming an important economic asset. The district's proximity to Mexico City, to the northwest, makes it easily accessible by highway, railroad, or air. Pop. (1980) 1,262,354.

Izu Islands, Japanese IZU-SHICHITŌ ("Seven Islands of Izu"), archipelago off Honshu, Japan, stretching southward into the Pacific Ocean for about 190 miles (300 km) from Tokyo Bay. Administratively part of Tokyo *to* (metropolis), the volcanic islands are (north to south) Ō, To, Nii, Shikine, Kōzu, Miyake, and Mikura. The Izu Islands form the northernmost part of the Izu Archipelago, which also includes Hachijō, Aoga, and Tori islands. Ō Island, the largest of the Seven Islands group, is 35 square miles (91 square km) in area. It was known to Western cartographers as Vries Island, after the Dutch navigator Martin Heritzoon de Vries, who reached it in 1643. The islands were used by the Japanese as convict settlements after the 12th century. They are now known for their production of camellia oil, their scenic beauty, and the volcano of Mount Mihara (2,487 feet [758 m]) on Ō Island, which is periodically active (a sizable eruption occurred in 1986).

Izu Peninsula, Japanese IZU-HANTŌ, peninsula in Shizuoka *ken* (prefecture), Honshu,



Cape Irō on Izu Peninsula, Japan
Satoshi Ohkoshi—Orion Press from FPG

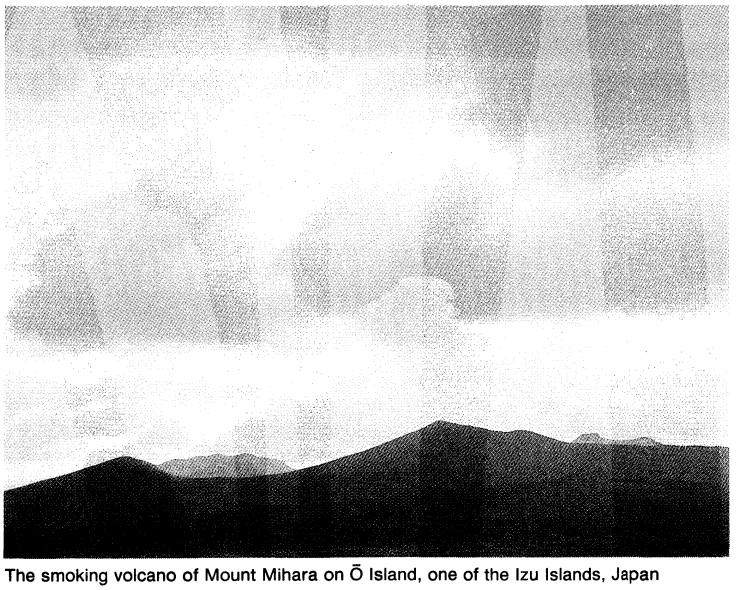
Japan. The peninsula extends 37 miles (60 km) into the Pacific Ocean between Suruga Bay on the west and Sagami Gulf on the east. The entire peninsula is included within the Fuji Volcanic Zone. Its southern part consists primarily of volcanic breccia, and its northern section is an assembly of numerous volcanoes, among which are Mount Amagi (4,613 feet [1,406 m]) and Mount Atami (2,539 feet [774 m]) in the east and Mount Daruma (3,222 feet [982 m]) in the west. The peninsula's volcanoes are highly eroded and deformed by tectonic movements; the eastern half of Mount Atami and the northern and western portions of Mount Daruma have been downfaulted into the sea. The valley of the Kano River in the north is regarded as a graben (a depressed part of the Earth's crust that is bounded by faults).

The Izu Peninsula abounds in hot springs of both volcanic and tectonic origin. Combined with the warm winter climate, they attract numerous tourists. Chief among the peninsula's spas are Atami, Itō, and Shuzenji. The port of Shimoda, northeast of Cape Irō, received the ships of Commodore Matthew C. Perry of the United States in 1854. It was subsequently the site of the first chancellery of the U.S. consulate general in Japan.

Izúcar de Matamoros (Mexico): *see* Matamoros.

Izumi Kyōka, pseudonym of IZUMI KYŌTARŌ (b. Nov. 4, 1873, Kanazawa, Japan—d. Sept. 7, 1939, Tokyo), prolific Japanese short-story writer who created his own romantic, often mystical world and peopled it with characters representing his ideal moral values.

Kyōka was born into a family of provincial artists and artisans, from whom he inherited artistic skill and a deep faith that shaded into an actual belief in mysterious forces. He went to Tokyo in 1890, hoping to be accepted as a disciple of the then leader of the literary scene, Ozaki Kōyō. A year later he was taken in, and he lived with Kōyō's other pupils until 1894. *Yakō junsa* (1895; "Police Night Patrol") and *Gekashitsu* (1895; "Surgical Room") present Kyōka's ideal values in the classic struggle between duty and human emotions. *Kōya hijiri* (1900; "The Itinerant Monk") is representative of his fascination with strange and mysterious situations. In 1899 Kyōka met a geisha, whom he later married; his stories such as *Onna keizu* (1907; "The Genealogy of Women"), *Uta andon* (1910; "The Song Lantern"), *Shirasagi* (1909; "Snowy Heron"), and *Sannin Mekura Hanashi* (1912; *A Tale of Three Who Were Blind*) are idealized images of the geisha world. At one time a very popular author, Kyōka remained aloof from contemporary changes in literary taste, choosing to go into eclipse with a small group of devoted followers rather than compromise his highly individualistic art.



The smoking volcano of Mount Mihara on Ō Island, one of the Izu Islands, Japan
Orion Press, Japan

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Izumi-Ōtsu, city, Ōsaka *fu* (urban prefecture), Honshu, Japan. It is situated facing Ōsaka Bay. An important port since the 8th century, it became a centre of cotton textile production during the Tokugawa period (1603–1867). Izumi-Ōtsu lost much of its function as a port town after the Meiji Restoration (1868). Its industry has since shifted to the production of woolen and cotton blankets. The city now produces most of Japan's cotton blankets, for both domestic use and export. Pop. (1985) 67,755.

Izumi-Sano, city, Ōsaka *fu* (urban prefecture), Honshu, Japan. The city faces Ōsaka Bay. An important transportation centre during the Heian period (794–1185), the city became a market for cotton, agricultural produce, and fish. Industry has been expanding on reclaimed coastal land, manufacturing textiles (especially towels) and machinery. Izumi-Sano

is also a trade centre for onions destined for Ōsaka and Kōbe. Pop. (1980) 90,684.

Izumo, city, Shimane Prefecture (*ken*), Honshu, Japan, on the San-in Line (railway). First formed as a market town, it has been a commercial centre for the surrounding agriculture and stock-raising area since the 18th century. The city has also served as a hub of railway and road transport since the arrival of a railway in 1910. Small-scale traditional industries include silk manufacture, woodworking, brewing, and food processing.



Entrance to the Shintō Izumo Taisha (grand shrine), Izumo, Japan
Kozo Osa—Bon

Izumo is well known as a Shintō religious centre. At Taisha, 5 mi (8 km) to the northwest, is the Izumo Taisha, the oldest Shintō shrine in Japan, attracting pilgrims throughout the year. Its present buildings, constructed largely in the late 19th century, cover an area of 40 ac (16 ha) and are approached through an avenue of pine trees. The temple complex, which contains a valuable art collection, is enclosed by hills on three sides.

There are numerous other shrines and tombs in the Izumo area. It is believed that every October all the Shintō gods meet at one of the smaller shrines. Because of this tradition, October is known as Kannazuki (Month Without Gods) everywhere else in Japan and Kamiarizuki (Month with Gods) in the Izumo area. Pop. (1980) 77,303.

Izumo Okuni, also called OKUNI (fl. early 17th century), Japanese dancer who is credited as being the founder of the Kabuki art form.

Okuni is said to have been an attendant at the Izumo Taisha (Grand Shrine of Izumo) in western Japan. She formed a troupe of female dancers who in 1603 gave a highly popular performance of dances and light sketches on a dry riverbed in Kyōto. The company's lusty and unrestrained dance dramas soon became known throughout Japan—the style acquiring the name Okuni Kabuki—and other troupes of female dancers were formed.

Okuni's company and the newer groups normally had the patronage of the nobility; but their appeal was directed toward ordinary townspeople, and the themes of their dramas and dances were taken from everyday life. The popularity of *onna* ("women's") Kabuki remained high until it was officially banned in 1629 by the shogun (military ruler), who thought that the prostitution practiced by many of the dancers was becoming too widespread.

Izvestiya, in full IZVESTIYA SOVETOV NARODNYKH DEPUTATOV SSSR (Russian: "News of the Councils of People's Deputies U.S.S.R."), daily newspaper published in Moscow by the Presidium of the Supreme Soviet of the U.S.S.R., the official national publication of the Soviet government.

It was founded in 1917 in Petrograd as an organ of the Revolution. Moving its main offices to Moscow in 1918, *Izvestiya* grew rapidly to a circulation of 354,000 in 1924 and 1,500,000 by 1932. Restrictions during World War II and under Stalin slowed its growth, but under the editorship of Khrushchev's son-in-law, Alexei Adzhubei, *Izvestiya* was transformed into a lively, readable daily by introducing more photographs, bigger headlines, and a generally high standard of design.

Izvestiya remains an instrument of the state for informing and educating the people in the light of Soviet government policies, and its extensive coverage of international relations uniformly reflects those policies. *Izvestiya* also carries many of the stories appearing in *Pravda*, the Communist Party organ, but *Izvestiya* is the principal voice for Soviet foreign policy.

Izvolsky, Aleksandr Petrovich, Graf (Count) (b. March 18 [March 6, old style], 1856, Moscow—d. Aug. 16, 1919, Paris), diplomat who was responsible for a major Russian diplomatic defeat in the Balkans (1908–09) that increased tensions between Russia and Austria-Hungary prior to World War I.

Educated at the Imperial Lyceum in St. Petersburg (now Leningrad), Izvolsky held numerous diplomatic posts throughout the world before becoming minister of foreign affairs in May 1906. In 1907 he resolved the Anglo-Russian rivalries in Iran, Tibet, and Afghanistan by concluding a treaty with Great Britain; he then directed his attention toward restoring the right of Russian warships to use the Dardanelles Strait. In attempting to achieve this goal, he reached an agreement with Austria at Buchlau, Moravia (Sept. 15, 1908). But the terms of the agreement were confused, and although Russia reluctantly supported Austria's annexation of Bosnia and Hercegovina (Oct. 7, 1908), which not only precipitated a crisis in the Balkans but also generally improved the position of Austria there at Russia's expense, Austria declined to use its influence to bring about the opening of the Strait. Izvolsky then attempted to balance Austrian influence in the Balkans by concluding an agreement with Italy (Racconigi Agreement; Oct. 24, 1909), in which the two promised to cooperate in preventing a single power from dominating the Balkans. Nevertheless, Izvolsky was dismissed in September 1910. He then served as ambassador to France until May 1917.

Izyum, also spelled IZIUM, city, Kharkov *oblast* (administrative region), eastern Ukrainian Soviet Socialist Republic. Izyum is located 75 mi (120 km) southeast of Kharkhov on the Donets River and is the centre of the Izyum *rayon* (district). The earliest historical mention of it dates as early as 1571; it has been a city since 1639. Izyum is linked with Kharkhov and Voroshilovgrad by rail and has a railroad repair shop. Other industries include a brickworks, a brewery, and optical equipment manufacture. Pop. (1983 est.) 61,000.

J. Paul Getty Museum (Malibu, Calif.): *see* Getty Museum.

J/psi particle, type of meson consisting of a charmed quark and a charmed antiquark. It has a mass of 3.1 GeV/c^2, which is about 3½ times larger than the mass of a proton. The particle was first detected in 1974 by two groups of American physicists working independently of each other at the Stanford Linear Accelerator Center in Palo Alto, Calif., and the Brookhaven National Laboratory in Upton, Long Island, N.Y. The discovery of the J/psi shed new light on quarks and their interactions. It provided support for the theory that there existed a fourth quark, called the charmed quark, in addition to those predicted by early quark models (*i.e.,* the up, down, and strange quarks). *See also* meson.

J. Walter Thompson Company, American advertising agency (1896–1980), the first international agency, and long one of the largest such enterprises in the world. In 1980 it became a subsidiary of JWT Group Inc., a Delaware-based holding company.

The company grew out of one of the first advertising agencies, Carlton & Smith, established in 1864. Four years later William Carlton hired James Walter Thompson, age 20, as a bookkeeper; Thompson later became a solicitor of advertising. After a decade Thompson purchased the company from his employer; it was incorporated as J. Walter Thompson Co. in 1896. The agency soon became the exclusive buyer of advertising space in several new women's magazines. In 1923 the company introduced the American concept of the advertising agency to Europe with the opening of a London office. Under the leadership of Stanley Resor, the agency pioneered a number of advertising innovations, including the use of testimonials and fine photography in advertisements.

Jabal Shammar, mountainous area, northwestern Saudi Arabia, bounded by the regions of Hejaz on the west and ash-Sharqīyah on the east; chief towns include the oases of Ḥā'il and Fayd. It encompasses the mountain ranges of Ajā' and Salmā as well as the immense, rolling sand-dune region of an-Nafūd. Throughout historical times the area has been inhabited by the Shammar clan. An independent principality of the Ibn Rashīd dynasty from 1834 to 1921, Jabal Shammar was involved in constant strife among the eastern Sa'ūd dynasty, the Rashīd rulers, and the *sharīf*s ("nobles") of Mecca until the Kingdom of Saudi Arabia was formed in 1932.



Characteristic desert pavement and topography in Jabal Shammar, Saudi Arabia
Walter Weiss—Ostman Agency

Jabalpur, also spelled JUBBULPORE, city, central Madhya Pradesh state, central India. Jabalpur lies just north of the Narmada River in a rocky basin surrounded by low hills that are dotted with lakes and temples. On one of the hills stands the Madan Mahal, an old Goṇḍ castle. Garha, just west, was the chief city of the four independent Goṇḍ kingdoms that arose in the 14th century. Selected as Marāṭhā headquarters in 1781, it later became the British commission headquarters of Saugor and Narmada territories. Jabalpur was constituted a municipality in 1864.

One of the largest cities in the state, it is located at a major road and rail junction. Jabalpur is a military headquarters, containing the central gun-carriage factory, an ordnance factory, and an ammunition depot. Major industries include food processing, sawmilling, and varied manufactures. The city has the state high court. It is the seat of the University of Jabalpur (1957) and Jawaharlal Nehru Agricultural University (1964).

The surrounding region includes the Haveli, an extremely fertile wheat-growing area at the western end of the Narmada valley. Rice, jowar (sorghum), gram, and oilseeds are other important crops. Iron-ore, limestone, bauxite, clay, fireclay, steatite, feldspar, manganese, and ochre deposits are extensively worked. The region also abounds in Buddhist, Hindu, and Jaina ruins. Pop. (1981) city, 614,162; metropolitan area, 757,303.

Jabavu, Davidson Don Tengo (b. Oct. 20, 1885, King William's Town, Cape Colony—d. Aug. 3, 1959, East London, S.Af.), black educator and South African political leader.

The son of John Tengo Jabavu, editor of the first Bantu-language newspaper in South Africa, Davidson Jabavu was educated in South Africa, in Wales, and at the universities of London and Birmingham and in 1916 began teaching at Fort Hare Native College (later University College) in Fort Hare, Cape Province, South Africa. In December 1935 he founded the All-African National Convention (AANC), which led the opposition to a series of bills whose purpose was to disfranchise black Africans, prevent them from owning land, and keep them from selling their labour freely. Though the convention brought together the entire spectrum of opposition to the white government, its basically moderate philosophy kept it from discovering any effective means to prevent the adoption of these measures. Nevertheless, the convention was instrumental in creating and organizing black African awareness of growing white militancy.

Jabavu became the leader of the Cape Native Voters' Association at the first non-European conference held in South Africa. During the years 1945–47, the AANC became more militant, but by 1948 its membership had declined, and it disbanded. Jabavu retired from politics to devote his time to his post as professor of Latin and Bantu languages at University College, Fort Hare. He was the author of *The Black Problem* (1920), *The Segregation Fallacy and Other Papers* (1928), *The Influence of English on Bantu Literature* (1943), many volumes of poetry in the Xhosa language, and a biography of his father.

Jabbar, Kareem Abdul: *see* Abdul-Jabbar, Kareem.

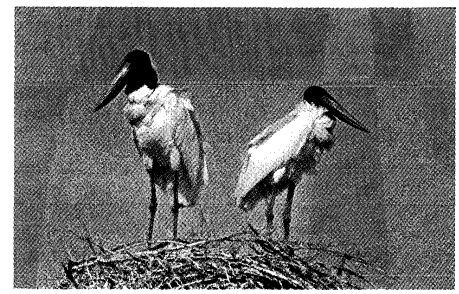
Jābir ibn Ḥayyān, Abū Mūsā (b. *c.* 721, Ṭūs, Iran—d. *c.* 815, Kūfah, Iraq), alchemist known as the "father of Arab chemistry."

Shortly after Jābir was born, his father was beheaded for the part he played in a plot by the 'Abbāsids to depose the Umayyad dynasty. Jābir was sent to Arabia, where he became a member of the Shī'ite sect. Apparently, he studied most branches of learning, including medicine. After the 'Abbāsids defeated the Umayyads, Jābir became a court physician to the 'Abbāsid caliph Hārūn ar-Rashīd. Jābir was a close friend of the sixth Shī'ite *imām,* Ja'far ibn Muḥammad, whom he gave credit for many of his scientific ideas.

More than 2,000 works are attributed to Jābir. The Muslim Ismā'īlīyah sect published a large body of alchemical and mystical works under his name. In the 14th century a Spanish alchemist placed the name Geber (the Latinized form of Jābir) on his own manuscripts, possibly to attribute them to Jābir and thus gain greater authority.

From Jābir's own works, there is no evidence of any achievements that might justify the extraordinary esteem in which he was held by later alchemists. His reputation appears to rest mainly on the appeal of his metaphysical philosophy of nature and perhaps his unique style, emphasis, and development of the theory of matter. Jābir revised the ancient Greek belief that everything is composed of fire, earth, water, and air. He believed that these four elements combined to form mercury and sulfur and that all metals are formed from these two substances when combined in various proportions. Jābir was aware that when mercury and sulfur are combined, the red compound cinnabar (mercuric sulfide) is produced; but he felt that, if the ideal proportion could be found, gold would be the product. This theory was widely adopted; altered and spread, it had a great influence on early chemistry and eventually led to the belief in phlogiston.

jabiru (*Jabiru mycteria*), a typical stork of the New World, ranging from Mexico to Argentina. The jabiru belongs to the stork family, Ciconiidae (order Ciconiiformes). It is mostly white, with the naked skin of the head and upper neck black and red. The unusually heavy bill is slightly upturned. The jabiru is one of the largest American flying birds, reaching a length of 140 cm (4.5 feet).



Jabiru (*Jabiru mycteria*)
M.P. Kahl

Another stork, *Xenorhyncus asiaticus,* which ranges from India through the islands to Australia, is also called jabiru.

Jablonec nad Nisou, German GABLONZ AN DER NEISSE, city, Severočeský *kraj* (region), Czechoslovakia, lying about 1,600 feet (500 m) above sea level in the upper valley of the Nis (Neisse) River, in the Giant Mountains. It was populated mainly by Germans between World Wars I and II, when it was known as Gablonz an der Neisse. The cradle of the famed Bohemian glass industry, it makes all types of glass products from high-quality wares to cheap imitation jewelry and plastic ornaments. Manufacture is traditionally in small units from cottage forges. Examples of glasswork are exhibited in the city's Museum of Glass and Jewelry. Pop. (1987 est.) 45,782.

Jablonski, Daniel Ernst, original name (until 1685) DANIEL ERNST FIGULUS (b. Nov. 20, 1660, Nassenhuben, near Danzig [now Gdańsk], Pol.—d. May 25, 1741, Berlin), Protestant theologian who worked for a unification of Lutherans and Calvinists.

Jablonski studied at Frankfurt am der Oder and at Oxford University and began preaching at Magdeburg in 1683. From 1686 to 1691 he headed the Moravian College at Lissa, becoming court preacher at Königsberg (1691) and

Berlin (1693). In 1699 he was consecrated a bishop of the Moravian church.

While in Berlin, Jablonski unsuccessfully worked for the union of German, English, and Swiss Lutherans and Calvinists, winning the support of court circles and of the philosopher Gottfried Wilhelm von Leibniz. He also attempted to reform the church of Prussia by introducing the episcopate and liturgy of the Church of England but again was unsuccessful. He cofounded the Berlin Academy of Sciences, which he headed in 1733. Correspondence between Jablonski and Leibniz was published in 1747 and 1799.

Jabneh (Hebrew: "God Builds"), Greek JAMNIA, modern YIBNA, also called YAVNE, ancient city of Palestine (now Israel) lying about 15 miles (24 km) south of Tel Aviv–Yafo and 4 miles (6 km) from the Mediterranean Sea. Settled by Philistines, Jabneh came into Jewish hands in the time of Uzziah in the 8th century BC. Judas Maccabeus (d. 161 BC) attacked the harbour of Jabneh in his anger at the inhabitants' hostility. On the destruction of the Temple of Jerusalem by the Romans in AD 70, the academy of Jabneh—established by Johanan ben Zakkai—became one of the most important centres of Jewish learning. At a meeting of rabbis held there about AD 100, the final canon of the Hebrew Bible was fixed. The crusaders built a fortress there in the 12th century.

Jaboatão, city, eastern Pernambuco *estado* ("state"), northeastern Brazil, on the Jaboatão River, 148 feet (45 m) above sea level and just west of Recife, the state capital. The site of two battles in the 17th-century war of the Portuguese against the Dutch, Jaboatão was elevated to city status in 1884. It is now the commercial centre of an agricultural region in which cotton, sugarcane, tobacco, and rice are cultivated. Pop. (1980 prelim.) 67,120.

jaboticaba, also called JABOTICABEIRA, any of several trees of the genus *Myrciaria,* of the myrtle family (Myrtaceae), notably *M. cauliflora* and *M. jaboticaba,* native to southeastern Brazil. The trees have been introduced to other warm regions, including western and southern North America. The name is also applied to the edible fruit of these trees. The trees do not differ greatly among the species; they are dome-shaped and grow to about 11 to 12 m (35 to 40 feet) tall. The leaves vary from 2 to 8 cm (0.75 to 3 inches) long. They are opposite and are oval or lance-shaped, and they have smooth margins and smooth surfaces. The small flowers, which grow singly or in clusters, bear four white petals. The glossy, maroon-purplish fruit is round or slightly flattened at the ends and contains one to four seeds. The pulp, which is juicy and tasty, is translucent white or tinged with rose.

Jabotinsky, Vladimir (b. 1880, Odessa, Russian Empire [now Ukrainian S.S.R.]—d. Aug. 3, 1940, near Hunter, N.Y., U.S.), Zionist leader, journalist, orator, and man of letters who founded the militant Zionist Revisionist movement that played an important role in the establishment of the State of Israel.

Jabotinsky began his career in 1898 as a foreign correspondent, but his popularity as a journalist led to his recall to Odessa in 1901 as an editorial writer. By 1903 Jabotinsky began to expound Zionist views for the restoration and creation of a Jewish national state in Palestine both in his writings and in his oratory, of which he was a master. During the next decade, he continued to work as a journalist while traveling in Europe and crystallizing his Zionist views, which tended to be uncompromising and political, rather than cultural.

During World War I, he was convinced that the Ottoman Empire, then the ruling power in Palestine, would fall and that in this vacuum the Jews could colonize Palestine if they had demonstrated service to the Allies. He thus convinced the British government to allow military participation by Jewish refugees from the Ottoman Empire.

In 1920 Jabotinsky organized and led a Jewish self-defense movement (Haganah) against the Arabs in Palestine. The British, who then ruled the country, sentenced him to 15 years at hard labour, but this action provoked such an outcry that he was soon reprieved. In the 1920s he was active in many international Zionist organizations, including the World Union of Zionist Revisionists in 1925.

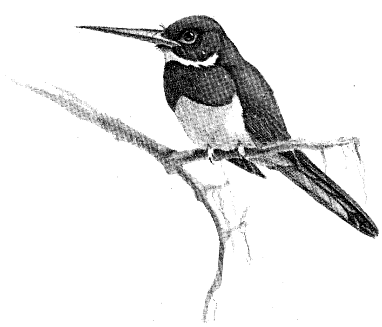
Testifying before the British Royal Commission on Palestine, Jabotinsky gave an impassioned expression of his Revisionist views. The source of Jewish suffering was not merely anti-Semitism, he said, but the Diaspora (dispersion) itself; the Jews were a stateless people. Assigning cultural Zionism a relatively low priority, he advocated the creation of a Palestinian Jewish state on both sides of the Jordan, with continued Jewish immigration to achieve a Jewish majority there, and employment of Jewish troops for self-defense as part of the permanent garrison. In 1940, while in the United States to visit Betar, the youth organization of the Zionist Revisionist Party, Jabotinsky died of a heart attack. His followers, who had already founded the Irgun Zvai Leumi terrorist group, active in Palestine in the 1940s, later founded the Israeli Ḥerut Party.

Jabrāʾīl (Muslim archangel): *see* Jibrīl.

Jac Glan-y-Gors: *see* Jones, John.

Jaca, city, Huesca *provincia,* in the *communidad autónoma* ("autonomous community") of Aragon, northeastern Spain, on the plateau on the southern bank of the Aragón River, just south of the French border. Of ancient origin, the city was captured by the Romans in 194 BC and surrounded by walls, which, with medieval additions, still partly stand. In 716 it was taken by the Moors and, under the name of Dyaka, was one of the principal cities of the province of Sarkosta (modern Zaragoza). Retaken by the Christians in 760, Jaca was declared a "city" by King Ramiro I of Aragon (1035–63) and was the first capital of Aragon. An episcopal see, Jaca has notable landmarks that include the Citadel (Ciudadela), begun in 1593 and in a state of perfect preservation; the 11th-century cathedral; and the town hall in Plateresque style (1544). Jaca's economy is based primarily on agricultural trade. Pop. (1981) 13,771.

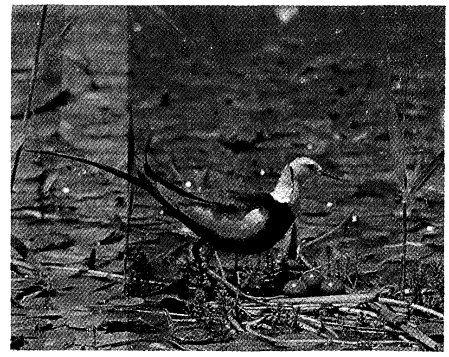
jacamar, any of 15 species of tropical American birds that constitute the family Galbulidae (order Piciformes). The jacamar has a glittering body, tapered from large head to, in most species, a long, graduated tail; some have square tails. Most are iridescently blue, green, or bronze on back and breast; males are white-throated, females brown-throated. The commonest species is the rufous-tailed jacamar (*Galbula ruficauda*), 25 cm (10 inches) long, found from southern Mexico to Argentina.



Rufous-tailed jacamar (*Galbula ruficauda*)
Painting by H. Jon Janosik

Jacamars sit, with the long, sharp bill tilted up, in trees along forest streams, then dash on whirring wings after a butterfly or dragonfly, which they catch with an audible snap of the bill and pound on the perch before eating. The egg chamber is dug into a bank or level ground.

jacana, also called LILY-TROTTER, or LOTUS BIRD, any of several species of water birds belonging to the family Jacanidae of the order Charadriiformes. Jacanas are uniquely



Pheasant-tailed jacana (*Hydrophasianus chirurgus*)
Peter Jackson—Bruce Coleman, Inc./EB Inc.

equipped with long straight claws for walking on floating vegetation. Like certain plovers, some jacanas have wing spurs.

The seven or eight species of the genus *Jacana* include the American jacana (*Jacana spinosa*), of the American tropics, variably black or reddish; the African jacana (*Actophilornis africanus*); the Australian lotus bird (*Irediparra gallinacea*) of New Guinea and the eastern Australian coast; and the pheasant-tailed jacana (*Hydrophasianus chirurgus*), of India and the Philippines, a handsome black, yellow, and white bird that acquires long tail feathers in breeding season.

Jacapo (Italian personal name): *see under* James.

jacaranda, any plant of the genus *Jacaranda* (family Bignoniaceae), especially the two ornamental trees *J. mimosifolia* and *J. cuspidifolia.* They are widely grown in warm parts of the world and in greenhouses for their showy blue or violet flowers and attractive, oppositely paired, compound leaves. The genus includes about 50 species native to Central and South America and to the West Indies.



Jacaranda acutifolia
Walter Dawn

The name jacaranda is also applied to several tree species of the genus *Machaerium* of the pea family (Leguminosae, or Fabaceae), from which some of the commercial rosewoods are obtained. Jacaranda cabinet wood

is a rosewood from the tree species *Dalbergia nigra,* also of the pea family.

Jacareí, city, southeastern São Paulo *estado* ("state"), Brazil, lying along the Paraíba do Sul River. The settlement was granted town status in 1653 and was made the seat of a municipality in 1849. The local economy depends mainly upon dairying, but coffee, rice, corn (maize), fruits, and *feijão* (beans) are also cultivated in the surrounding area. Food processing, distilling, tanning, and the manufacture of boxes are the city's main industries. Jacareí can be reached by rail or road from São Paulo city, 57 miles (92 km) southwest. It also has an airfield. Pop. (1981) 104,241.

Jáchymov, spa town, Západočeský *kraj* (region), Czechoslovakia. It lies at the foot of Mount Klínovec, the highest summit in the Ore Mountains (Krušné hory), just north of Karlovy Vary. A silver-mining centre for the Holy Roman Empire, the town reached its peak in the 16th century, when its mines were owned by the counts of Šlik (German: Schlik). The German monetary unit taler, or thaler, from which the English word dollar is derived, refers to the Joachimsthaler, a coin first minted in Jáchymov in 1517.

The town lost heavily in wealth and population during the Thirty Years' War (1610–60), and in the mid-19th century it was ravaged by fire. The local mining of uranium began in 1908 and reached its peak immediately after World War II, but has since declined. Treatments at the town's spa are based on the use of radioactive thermal baths. In the 1930s the town's Radium Palace Hotel was widely known as a deluxe hotel. Pop. (1980) 3,503.

Jacinto, António, byname of ANTÓNIO JACINTO DO AMARAL MARTINS, pseudonym ORLANDO TAVORA (b. Sept. 28, 1924, São Paulo de Luanda, Portuguese West Africa [now Luanda, Angola]), white Angolan poet, short-story writer, and minister of education in the postwar government.

Jacinto, who was long associated with militant movements against Portuguese colonialism, was sentenced to 14 years in prison at Tarrafal, Cape Verde Islands. He subsequently worked and wrote for several Angolan periodicals. Jacinto's poetry, as exemplified in "Castigo pro Comboio Malandro" ("Punishment for a Wayward Train"), addresses the pride of the Angolan peoples and their oppression at the hands of the Portuguese. The poet infuses his images with onomatopoeic sounds, realistic colours, and exotic sights. *Colectânea de Poemas* was published in 1961, and his poetry has appeared since then in virtually all anthologies dealing with Lusophone African literature.

jack, any of numerous species of fishes belonging to the family Carangidae (order Perciformes). The name jack is also applied collectively to the family. Representatives can be found in temperate and tropical portions of the Atlantic, Pacific, and Indian oceans and occasionally in fresh or brackish water. Although body size and shape vary greatly among jacks, many of the more than 150 species are characterized by laterally compressed bodies, rows of large, spiky scales along the side near the tailfin, small scales resulting in a smooth appearance, and a deeply forked tail. Many have a bluish green, silvery, or yellowish sheen on the body. Jacks are important commercially and are favoured sports fishes.

Some of the most popular marine game fishes are the amberjacks (genus *Seriola*), which are found worldwide. The greater amberjack (*S. dumerili*) of the tropical Atlantic is one of the largest members of the jack family, often attaining lengths of 1.8 m (6 feet). The genus *Caranx* includes several species of smaller but popular game fish, such as the crevalle jack (*C. hippos*) of warm Atlantic waters and the yellow jack (*C. bartholomaei*), which frequents Caribbean and other warm Atlantic waters and is noted for its golden yellow sides and fins.

Many other species in the Carangidae family are not commonly referred to as jacks. Among these are the pompano (*q.v.*), comprising the genus *Trachinotus.*

jack, in practical mechanics, portable hand-operated device for raising heavy weights through short distances, exerting great pressures, or holding assembled work firmly in position, as in jacking up a building to prevent settling or keeping it in position while replacing a foundation.

The jack's effectiveness stems from the ratio of the load, or weight of the object raised, to the amount of force applied to the handle of the jack. This ratio can be made quite high by the use of a gear or screw to regulate the upward extension of the jack. A ratchet allows a heavy weight to be raised in short successive stages, with the jack locking whenever force is not being applied to its handle. Though limited in capacity by the requirements of portability and ease of manual operation, a jack may be built to lift, or exert a force of, several tons. A familiar example of this device is the automobile jack, which is used to raise one end of a car to permit the changing of a tire.

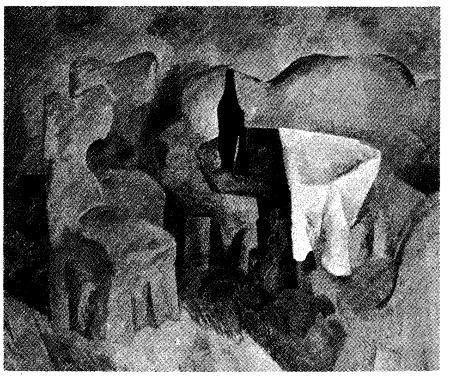
Jack THE RIPPER, pseudonymous murderer of at least seven women, all prostitutes, in or near the Whitechapel district of London's East End, from Aug. 7 to Nov. 10, 1888. One of the most famous unsolved mysteries of English crime, the case has retained its hold on the popular imagination.

All but one of Jack the Ripper's victims were killed while soliciting customers on the street. In each instance the throat was cut, and usually the body was mutilated in a manner indicating that the murderer had considerable knowledge of human anatomy. On one occasion half of a human kidney, which may have been extracted from a murder victim, was mailed to the police. The authorities also received a series of taunting notes from a person calling himself Jack the Ripper and purporting to be the murderer. Strenuous and sometimes curious efforts were made to identify and to trap the killer; the eyes of one of the murdered women were photographed in the belief (later discredited) that the assailant's image might be recorded on the retinas. A great public uproar over failure to arrest the murderer was raised against the home secretary and the London police commissioner, who resigned soon afterward.

Jack the Ripper has provided themes for numerous literary and dramatic works. Perhaps the most notable was a horror novel by Mrs. Belloc Lowndes, *The Lodger* (1913; motion picture versions, 1926, 1932, and 1944). More than 100 books about the case of Jack the Ripper have been published, with many of them offering conjectures as to the true identity of the murderer.

jack-in-the-pulpit, also called INDIAN TURNIP, BOG ONION, BROWN DRAGON, or STARCHWORT (species *Arisaema triphyllum*), a North American plant of the arum family (Araceae), noted for the unusual shape of its flower. The plant is native to wet woodlands and thickets from Nova Scotia to Minnesota and southward to Florida and Texas. It is a stoutish perennial, 1 to 2.5 feet (0.3 to 0.8 m) high, and usually bears two long-stalked, three-parted leaves that overshadow the flower. The latter consists of a conspicuous green- and purple-striped structure called a spathe, which rises on a separate stalk between the leaves. The flowering spathe curves in a hood over a club-shaped structure called a spadix, near the base of which are borne the plant's minute flowers. The plant's fruit ripens in late summer into a cluster of brilliant red berries. The jack-in-the-pulpit is one of the best-known wild flowers of the eastern United States and Canada during the late spring.

Jack of Diamonds, also called KNAVE OF DIAMONDS, Russian BUBNOVY VALET, group of artists founded in Moscow in 1909, whose members were for the next few years the leading exponents of avant-garde art in Russia. The group's first exhibition, held in December 1910, included works by the French Cubists Albert Gleizes, Henri Le Fauconnier, and André Lhote; other new tendencies in art

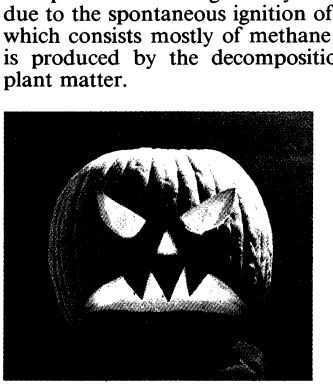


"Red Furniture," oil painting by Robert Falk; in the State Tretyakov Gallery, Moscow
Sovfoto

were seen in paintings exhibited by Wassily Kandinsky and Alexey von Jawlensky, both Russian artists then living in Germany. The Russian members of the group themselves—Robert Falk, Aristarkh Lentulov, Pyotr Konchalovsky, and Ilya Mashkov—displayed portraits and still lifes that were strongly influenced by the French artists Paul Cézanne and Henri Matisse. Other Russians participating in this first exhibition were Mikhail Larionov and Nathalie Goncharova, as well as Kazimir Malevich, who in a few years was to develop his Suprematist system.

In succeeding Jack of Diamonds exhibitions, works by the German painters Ernst Ludwig Kirchner, Erich Heckel, and Max Pechstein (all members of Die Brücke) were shown, as well as works by the French artist Fernand Léger. Also exhibiting with the group was Vladimir Tatlin, who later founded Russian Constructivism.

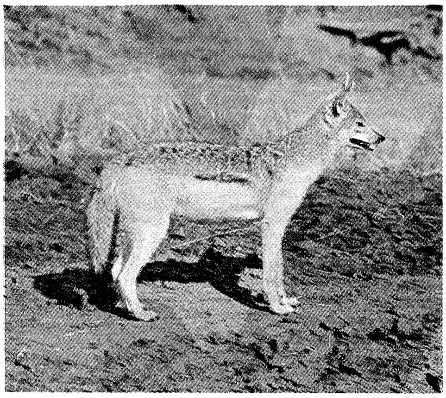
jack-o'-lantern, mysterious light seen at night flickering over marshes; when approached, it advances, always out of reach. The phenomenon is also known as will-o'-the-wisp and ignis fatuus ("foolish fire") and by many other local names. In popular legend it is considered ominous and is often purported to be the soul of one who has been rejected by hell carrying its own hell coal on its wanderings. The phenomenon is generally believed to be due to the spontaneous ignition of marsh gas, which consists mostly of methane and which is produced by the decomposition of dead plant matter.



Jack-o'-lantern
Gretchen Garner—EB Inc.

In U.S. holiday custom, jack-o'-lantern is the name given to a hollowed-out-pumpkin lantern displayed on Halloween. The surface of the pumpkin is carved to resemble a face. Light from a candle inserted inside can be seen flickering through the jack-o'-lantern's cutout eyes, nose, and usually grotesquely grinning mouth.

jackal, wolflike carnivore of the dog genus *Canis*, family Canidae, sharing with the hyena an exaggerated reputation for cowardice. Three species are usually recognized: the golden, or Asiatic, jackal (*C. aureus*), found from east-



Black-backed jackal (*Canis mesomelas*)
Leonard Lee Rue III

ern Europe and northeast Africa to Southeast Asia, and the black-backed (*C. mesomelas*) and side-striped (*C. adustus*) jackals of southern and eastern Africa. Jackals grow to a length of about 85–95 centimetres (34–37 inches), including the 30–35-cm tail, and weigh about 7–11 kilograms (15–24 pounds). The golden jackal is yellowish; the black-backed jackal is rusty red with a black back; and the side-striped jackal is grayish with a white-tipped tail and an indistinct stripe on each side.

Jackals inhabit open country. Nocturnal animals, they usually conceal themselves by day in brush or thickets and sally forth at dusk to hunt. They live alone, in pairs, or in packs and feed on whatever small animals, plant material, or carrion is available. They follow lions and other large cats in order to finish a carcass when the larger animal has eaten its fill. When hunting in packs, they are able to bring down prey as large as an antelope or sheep.

Like other members of the genus, jackals sing at evening; their cry is considered more dismaying to human ears than that of the hyena. They have an offensive odour caused by the secretion of a gland at the base of the tail. The young are born in burrows, the litters containing two to seven pups; gestation lasts 57 to 70 days. Like wolves and coyotes, jackals interbreed with domestic dogs.

The aardwolf (*q.v.*), family Hyaenidae, is sometimes called a maned, or gray, jackal. The South American fox (*q.v.*), *Dusicyon*, is sometimes referred to as a jackal.

jackdaw, also called DAW (*Corvus monedula*), crowlike black bird with gray nape and pearly eyes of the family Corvidae (*q.v.*; order Passeriformes). Jackdaws, 33 centemetres (13 inches) long, breed in colonies in tree holes, cliffs, and tall buildings: flocks fly in formation around the site. The four to six light, greenish-blue eggs are spotted and blotched. The bird's cry sounds like its name: "chak." The species ranges from the British Isles to central Asia; eastward it is replaced by the white-breasted, white-collared Daurian jackdaw (*C. dauuricus*).



Jackdaw (*Corvus monedula*)
John Markham

In the U.S. a species of grackle (*q.v.*) is sometimes called a jackdaw.

jackfruit (*Artocarpus heterophyllus*), tree native to tropical Asia and widely grown throughout the wetland tropics for its large fruits and durable wood. Like its relative the breadfruit, it belongs to the mulberry family (Moraceae). Jackfruit is 15 to 20 metres (50 to 70 feet) tall at maturity, has large stiff, glossy green leaves 15 to 20 centimetres (6 to 8 inches) long, and fruit up to 60 cm (about 2 ft) long and weighing up to 18 kilograms (about 40 pounds).

The greenish unripe fruit is cooked as a vegetable and the brown ripened fruit is eaten fresh for the sweetly acid but insipid pulp surrounding the seeds. The seeds are also cooked and eaten locally.

Jackling, Daniel Cowan (b. Aug. 14, 1869, Appleton City, Mo., U.S.—d. March 13, 1956, San Francisco), U.S. mining engineer and metallurgist who developed methods for the profitable exploitation of low-grade porphyry copper ores and thus revolutionized copper mining.

A graduate of the Missouri School of Mines, Rolla, in 1892, Jackling taught chemistry and metallurgy there (1891–93) and worked (1894–95) as a chemist and metallurgist in the Cripple Creek district of Colorado. While engaged in treating gold ores at Mercur, Utah, he was commissioned to make a report on a copper prospect at Bingham Canyon. His report led to the formation (1905) of the Utah Copper Company, for which he exploited ore yielding only 25 pounds of copper per ton (equivalent to 12.5 kilograms per 1,000 kilograms).



Jackling
By courtesy of Kennecott Copper Corporation

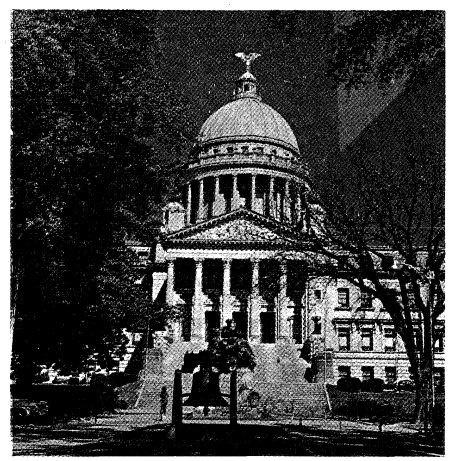
Jackling was active in operating and executive positions in the Nevada Consolidated Copper Company; the Kennecott Copper Corporation, for which he directed western operations until his retirement in 1942; and the Mesabi Iron Company. For his work in constructing and operating plants making explosives for the U.S. government (1917–19), he received the Distinguished Service Medal.

jackrabbit, common North American species of hare (*q.v.*).

jacks (game): *see* jackstones.

Jackson, city, seat (1832) of Jackson County, south central Michigan, U.S., on the Grand River, 73 mi (117 km) west of Detroit. Settled in 1829 at the meeting point of several Indian trails, it was named for Pres. Andrew Jackson and was known successively as Jacksonburgh, Jacksonopolis, and finally Jackson in 1833. The Republican Party held its first convention on July 6, 1854, in Jackson at an outdoor convention "assembled in a grove of spreading oaks" (a tablet marks the spot). The city became an early leader in the production of automobiles. With the transfer of the auto industry to other cities, Jackson acquired allied industries (auto parts and tires) and other manufactures, including steel, air-conditioning equipment, and aircraft parts. Jackson Community College was established in 1928. The Michigan Space Center, in the city, is housed in a geodesic dome. The Illuminated Cascades (man-made waterfalls) are in the Sparks Foundation County Park. Inc. village, 1843; city, 1857. Pop. (1980) 39,739.

Jackson, city, capital of Mississippi, U.S., coseat (with nearby Raymond) of Hinds County, on the Pearl River, in the west central part of the state. Settled (1792) by Louis Le Fleur, a French-Canadian trader, and known



New capitol, Jackson, Miss.
Joel Brown—Shostal/EB Inc.

as Le Fleur's Bluff, it remained a trading post until the Treaty of Doak's Stand (Oct. 18, 1820) opened the territory to white settlement. Selected as the site for the state capital and named for Gen. Andrew Jackson, it was laid out (April 1822) using Thomas Jefferson's checkerboard plan with alternate squares designated as parks. The legislature first met there Dec. 23, 1822. The first railroad arrived in 1840.

During the Vicksburg campaigns of the Civil War it was occupied four times by Federal troops, and its reduction to ashes (July 7–16, 1863) by General Sherman's forces caused it to be known as "Chimneyville." Troubled by a corrupt city government run by carpetbaggers, its recovery was slow until the arrival of new railroads in the 1880s. The Old Capitol (1833–42; scene of the Secession [1861] and Constitutional Convention [1890], and restored as a historical museum) was replaced by the New Capitol (1903) in gray stone. The Governor's Mansion (1842) served as headquarters for generals Grant and Sherman. The discovery of nearby natural gas fields in the 1930s supplied cheaper fuel and stimulated industrial growth. Jackson progressed rapidly in the 20th century, becoming an important railroad, shipping, manufacturing, and educational centre with a well diversified economy. The Pearl River Flood and Drainage Project (constructed in the 1960s and impounding Ross Barnett Reservoir) has provided industrial, agricultural, and recreational benefits.

The city is the home of Millsaps College

(1890), Belhaven College (1894), Jackson State University (1877), University of Mississippi Medical Center (1955), and the Mississippi Universities Center (embracing programs of the three state universities). The Mississippi Arts Festival, State Fair, and State Horse Show are annual events. Inc. 1823. Pop. (1980) city, 202,895; metropolitan area (SMSA), 320,425.

Jackson, city, seat (1821) of Madison County, western Tennessee, U.S., 74 mi (119 km) northeast of Memphis. It was settled in the early 1820s as a port on the Forked Deer River and developed as a cotton depot and railroad junction. First called Alexandria, the community was renamed in 1822 to honour Gen. (later Pres.) Andrew Jackson. As a supply point it was occupied by both Confederate and Federal troops during the Civil War. Jackson's growth was fostered by the establishment there of Union University (1825; controlled by the Southern Baptist Association), Lambuth College (1843; United Methodist), and Lane College (1882; Christian Methodist Episcopal Church). Jackson State Community College was opened in 1967. The city's economy is now well diversified, based on agriculture, industry, and its educational facilities. Products include textiles, power tools, batteries, offset printing plates, and aluminum foil. Food processing and soft-drink bottling are also important.

John Luther ("Casey") Jones, the railroad engineer famed for his peculiar skill with a locomotive whistle, who was killed in a wreck (1900) on the Illinois Central's "Cannonball Express," is buried in Jackson's Calvary Cemetery; his home is now a railroad museum. In Pinson Mounds Park, 11 mi (18 km) south, is a group of prehistoric Indian mounds of the so-called Temple period. Shiloh National Military Park, site of a bitter Civil War battle (April 6–7, 1862), is located 42 mi southwest, near the Mississippi border. Inc. town, 1823; city, 1845. Pop. (1980) 49,131.

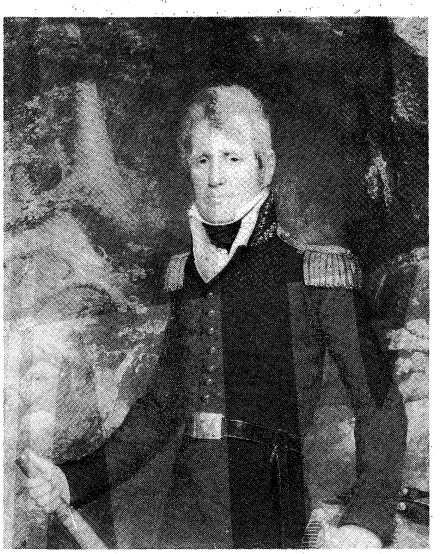
Jackson, A(braham) V(alentine) Williams (b. Feb. 9, 1862, New York City—d. Aug. 8, 1937, New York City), U.S. scholar of the Indo-Iranian languages whose grammar of Avestan, the language of the sacred literature of Zoroastrianism, and *Avesta Reader* (1893) have served generations of students.

He became an instructor at Columbia University soon after receiving his Ph.D. (1886). During a leave of absence in Europe, he continued to study Sanskrit, Prākrit, and Avestan, producing his noted work *An Avesta Grammar in Comparison with Sanskrit* (1892), modelled on the Sanskrit grammar of the U.S. scholar William Dwight Whitney.

In 1895 he began his 40 years as professor of Indo-Iranian languages at Columbia, where he became known as an authority on Iranian religion with the publication of *Zoroaster, the Prophet of Ancient Iran* (1899). In the course of four trips to India and Iran (1901–10), he scaled the cliff at Bīsitūn, Iran, to read and, for the first time (1903), to photograph the famed trilingual inscription of Darius I. His accounts of these travels, *Persia Past and Present* (1906) and *From Constantinople to the Home of Omar Khayyam* (1911), combine popular description and scholarly observation.

Jackson, Andrew, byname OLD HICKORY (b. March 15, 1767, Waxhaw, S.C.—d. June 8, 1845, the Hermitage, near Nashville, Tenn., U.S.), U.S. military hero and seventh president of the United States (1829–37), who was the first U.S. president to be elected from the area west of the Appalachians and the first to gain office by a direct appeal to the mass of voters. His political movement has since been known as Jacksonian Democracy.

Early life. Jackson was born on the western frontier of the Carolinas, an area that was in dispute between North Carolina and South Carolina, and both states have claimed him as a native son. Jackson maintained that he was born in South Carolina, and the weight of evidence supports his assertion. The area offered little opportunity for formal education, and what schooling Jackson received was interrupted by the British invasion of the western Carolinas in 1780–81. In the latter year he was captured by the British. Shortly after being imprisoned, he refused to shine the boots of a British officer and was struck across the face with a sabre. His mother and two brothers died during the closing years of the war, direct or indirect casualties of the invasion of the Carolinas. This sequence of tragic experiences fixed in Jackson's mind a lifelong hostility to Great Britain. After the end of the U.S. War of Independence, Jackson studied law in an office in Salisbury, N.C., and was admitted to the bar of that state in 1787. The next year he went to the Cumberland region as prosecuting attorney of the western district of North Carolina—the region west of the Appalachians, which was soon to become the state of Tennessee.



Andrew Jackson, detail of an oil painting by John Wesley Jarvis, *c.* 1819; in the Metropolitan Museum of Art, New York City

By courtesy of the Metropolitan Museum of Art, New York City, Harris Brisbane Dick Fund, 1964

When Jackson arrived in Nashville the community was still a frontier settlement. As prosecuting attorney, Jackson was principally occupied with suits for the collection of debts. He was so successful in these litigations that he soon had a thriving private practice and had gained the friendship of landowners and creditors. For almost 30 years Jackson was allied with this group in Tennessee politics. Jackson boarded in the home of Col. John Donelson, where he met and married the Colonel's daughter, Mrs. Rachel Robards.

Tennessee politics. Jackson's interest in public affairs and in politics had always been keen. He had gone to Nashville as a political appointee, and in 1796 he became a member of the convention that drafted a constitution for the new state of Tennessee. In the same year he was elected as the first representative from Tennessee to the national House of Representatives. He refused to seek reelection and served only until March 4, 1797. Jackson returned to Tennessee, vowing never to enter public life again, but before the end of the year he was elected to the U.S. Senate. His willingness to accept the office reflects his emergence as an acknowledged leader of one of the two political factions contending for control of the state. Jackson resigned from the Senate in 1798 after an uneventful year. Personal financial pressures were the immediate cause, but he appeared ill at ease in national politics and was unhappy in being separated from his family. Soon after his return to Nashville he was appointed a judge of the Superior Court (in effect, the supreme court) of the state, serving until 1804, when financial difficulties again forced him out of public life. In 1802 Jackson was elected major general of the Tennessee militia, a position he still held when the War of 1812 opened the door to a command in the field and a hero's role.

Military feats. In March 1812, when it appeared that war with Great Britain was imminent, Jackson issued a call for 50,000 volunteers to be ready for an invasion of Canada. After the declaration of war, in June 1812, Jackson offered his services and those of his militia to the United States. The government was slow to accept this offer, and, when Jackson finally was given a command in the field, it was to fight against the Creek Indians, who were allied with the British and who were threatening the Southern frontier. In a campaign of about five months, in 1813–14, Jackson crushed the Creeks, the final victory coming in the Battle of Tohopeka (or Horseshoe Bend) in Alabama. The victory was so decisive that the Creeks never again menaced the frontier, and Jackson was established as the hero of the West.

In August 1814, Jackson moved his army south to Mobile. Though he was without specific instructions, his real objective was the Spanish post at Pensacola. The motive was to prepare the way for U.S. occupation of Florida, then a Spanish possession. Jackson's justification for this bold move was that Spain and Great Britain were allies in the wars in Europe. At Mobile, Jackson learned that an army of British regulars had landed at Pensacola. In the first week in November, he led his army into Florida and, on November 7, he occupied that city just as the British evacuated it to go by sea to Louisiana. Jackson then marched his army overland to New Orleans, where he arrived early in December. A series of small skirmishes between detachments of the two armies culminated in a major battle on Jan. 8, 1815, in which Jackson's forces inflicted a decisive defeat upon the British army and forced it to withdraw. The news of this victory reached Washington at a time when morale was at a low point. A few days later, news of the signing of a peace treaty between the United States and Great Britain on Dec. 24, 1814, at Ghent reached the capital. The twin tidings brought joy and relief to the American people and made Jackson the hero not only of the West but of a substantial part of the country as well.

After the close of the war, Jackson was named commander of the southern district. He entrusted the command of the troops in the field to subordinates while he retired to his home at the Hermitage, near Nashville. He was ordered back to active service at the end of December 1817, when unrest along the border appeared to be reaching critical proportions. The instructions given Jackson were vague, and he ordered an invasion of Florida immediately after taking active command. He captured two Spanish posts and appointed one of his subordinates military governor of Florida. These bold actions brought an immediate and sharp protest from Spain and precipitated a Cabinet crisis in Washington. The staunch defense of Jackson by Secretary of State John Quincy Adams saved Jackson from censure and hastened the U.S. acquisition of Florida.

Presidential prospects. Jackson's military triumphs led to suggestions that he become a candidate for president, but he disavowed any interest, and political leaders in Washington assumed that the flurry of support for him would prove transitory. The campaign to make him president, however, was kept alive by his continued popularity and was carefully

nurtured by a small group of his friends in Nashville, who combined devotion to the General with a high degree of political astuteness. In 1822 these friends manoeuvred the Tennessee legislature into a formal nomination of their hero as a candidate for president. In the following year this same group persuaded the legislature to elect him to the U.S. Senate—a gesture designed to demonstrate the extent of his popularity in his home state.

In the election of 1824 four candidates received electoral votes. Jackson received the highest number, the others being John Quincy Adams, William H. Crawford, and Henry Clay. Since no one had a majority of the electoral votes, the House of Representatives was required to elect a president from the three with the highest number of votes. Crawford was critically ill and the actual choice was between Jackson and Adams. Clay, as speaker of the House, was in a strategic and perhaps decisive position to determine the outcome. Adams was elected on the first ballot. When he appointed Clay secretary of state, it seemed to admirers of Jackson to confirm rumours of a "corrupt bargain" between Adams and Clay. Jackson's friends persuaded him that the popular will had been thwarted by intrigues, and he thereupon determined to vindicate himself and his supporters by becoming a candidate again in 1828. He defeated Adams by an electoral vote of 178 to 83 after a campaign in which personalities and slander played a larger part than in any previous national election in the history of the United States. But Jackson's hour of triumph was soon overshadowed by personal tragedy—his wife died at the Hermitage on Dec. 22, 1828.

Jacksonian Democracy. The election of 1828 is commonly regarded as a turning point in the political history of the United States. Jackson was the first president from the area west of the Appalachians, but it was equally significant that the initiative in launching his candidacy and much of the leadership in the organization of his campaign also came from the West. The victory of Jackson indicated a westward movement of the centre of political power. He was also the first man to be elected president through a direct appeal to the mass of the voters rather than through the support of a recognized political organization. His victory was regarded by contemporaries and by historians as the triumph of political democracy.

Jackson was the beneficiary of a rising tide of democratic sentiment. The trend toward greater political democracy, aided by the admission of six new states to the union, five of which had manhood suffrage, along with the extension of the suffrage laws by many of the older states, weakened the power of the older political organizations and opened the way for the rise of new political leaders skilled in appealing to the mass of voters. Not the least remarkable triumph of the Jacksonian organization was its success in picturing its candidate as the embodiment of democracy, despite the fact that Jackson had been aligned with the conservative faction in Tennessee politics for 30 years and that in the financial crisis that swept the West after 1819 he had vigorously opposed legislation for the relief of debtors.

As the victory of Jackson reflected the emergence of new forces in U.S. politics, so Jackson himself brought to the presidency a new set of personal qualifications that were to become the standard by which presidential candidates would be judged for the remainder of the 19th century. He was the first president since Washington who had not served a long apprenticeship in public life and had no personal experience in the formulation or conduct of foreign policy. His brief periods of service in Congress provided no clue to his stand on the public issues of the day, except perhaps on the tariff.

Jackson approached the problems of the presidency as he had approached all other problems in life. He met each issue as it arose, and in the White House he exhibited the same vigour and determination in carrying out decisions that had characterized his conduct as commander of an army. He made it clear from the outset that he would be the master of his own administration, and, at times, he was so strong-willed and decisive that his enemies referred to him as "King Andrew I."

The first term. When Jackson was inaugurated on March 4, 1829, it was the first time in more than a quarter of a century that the advent of a new president reflected the repudiation of his predecessor. Hundreds who had worked for the election of Jackson hoped this would mean that incumbent officeholders would be replaced by friends of the new president, and within a few weeks the process of removing opponents of Jackson to make way for supporters had begun. Some years later, in the U.S. Senate, William L. Marcy of New York defended the principle of "rotation of office" with the aphorism, "To the victors belong the spoils." Rotation in office, however, did not begin with Jackson, nor did he utilize this practice as extensively as was charged. In eight years as president, Jackson removed fewer than one-fifth of all federal officeholders.

Jackson was in poor health when he became president, and few believed that he would have the strength or inclination to seek a second term. The question of the succession was, therefore, certain to attract early attention. One obvious candidate was Vice Pres. John C. Calhoun from Jackson's native state of South Carolina. Another was Martin Van Buren, Jackson's first secretary of state. The harmony of the new administration was marred from the outset by the rivalry between Calhoun and Van Buren. When Jackson learned, in 1830, that during the Cabinet debates in 1818 Calhoun had urged that he be censured for his invasion of Florida, he concluded that he could no longer trust Calhoun. From that time, Van Buren was generally recognized as the probable successor of Jackson as president.

The feud between Jackson and Calhoun assumed crucial importance in 1830 when Calhoun openly espoused the cause of South Carolina in its opposition to a high protective tariff. Feeling in South Carolina was so intense that there were covert threats that the state would attempt to prevent collection of the tariff within its borders. The issue of the tariff drifted unresolved, however, until 1832, when congressional leaders sought a compromise in the form of a moderate reduction of the tariff. South Carolina was not satisfied and in reply adopted a resolution declaring the tariffs of 1828 and 1832 null and void and prohibiting the enforcement of either within its boundaries after Feb. 1, 1833. Jackson accepted the challenge, denounced the theory of nullification, and asked Congress for authority to send troops into South Carolina to enforce the law. The President believed the tariff to be too high, however, and urged Congress to reduce the rates it had enacted a few months earlier. On March 1, 1833, Congress sent to the President two companion bills. One reduced tariff duties on many items. The other, commonly called the Force Bill, empowered the president to use the armed forces to enforce federal laws. South Carolina repealed its nullification ordinance, but at the same time it declared the Force Act null and void.

Whatever the motives, Jackson had preserved the integrity of the Union against the most serious threat it had yet faced. In contrast, he was remarkably complacent when Georgia defied the federal government. In 1829 Georgia extended its jurisdiction to about 9,000,000 acres of land that lay within its boundaries but was still occupied by Indians. The Indians' title to the land had been guaranteed by a treaty with the United States. The Indians appealed to the federal courts. In two separate cases, the Supreme Court ruled against Georgia, but Georgia ignored those decisions and continued to enforce its jurisdiction within the territory claimed by the Indians. In contrast to his strong reaction against South Carolina's defiance of federal authority, Jackson made no effort to restrain Georgia, and those close to him felt certain that he sympathized with the position taken by that state.

Reelection in 1832. In the meantime, Jackson acquiesced to the pressure of friends and sought a second term. As the election of 1832 approached, Jackson's opponents hoped to embarrass him by presenting him with a new dilemma. The charter of the Bank of the United States was due to expire in 1836. The President had not clearly defined his position, but he was increasingly uneasy about the bank as then organized. More significant in an election year was the fact that large blocs of voters who favoured Jackson were openly hostile to the bank. In the summer of 1832, Jackson's opponents rushed through Congress a bill to recharter the bank, thus forcing Jackson either to sign the measure and alienate many of his supporters or to veto it and appear as a foe of sound banking. Jackson's Cabinet was divided between friends and critics of the bank, but the obviously political motives of the recharter bill reconciled all of them to the necessity of a veto. The question before Jackson actually was whether the veto message should leave the door open to future compromise.

Few presidential vetoes have caused as much controversy in their own time or later as the one Jackson sent to Congress on July 10, 1832. The veto of the bill to recharter the bank was the prelude to a conflict over financial policy that continued through Jackson's second term. Efforts to persuade Congress to enact legislation limiting the circulation of bank notes failed, but there was one critical point at which Jackson was free to apply his theories. Nearly all purchasers of public lands paid with bank notes, many of which had to be discounted because of doubts as to the continuing solvency of the banks that issued them. Partly to protect federal revenues against loss and partly to advance his concept of a sound currency, Jackson issued the Specie Circular in July 1836, requiring payment in gold or silver for all public lands. This measure created a demand for specie that many of the banks could not meet; the effect of bank failures in the West spread to the East, and by the spring of 1837 the entire country was gripped by a financial panic. The panic did not come, however, until after Jackson had had the pleasure of seeing Van Buren inaugurated as president on March 4, 1837.

Jackson retired to his home, the Hermitage. He was virtually an invalid during the remaining eight years of his life, but he continued to have a lively interest in public affairs.

Jackson's influence. Jackson had left office more popular than when he entered. The widespread approval of his actions exercised a profound effect on the character of U.S. politics for half a century. The success of Jackson appeared to be a vindication of the new democracy. Powerful voices still questioned the wisdom and morality of democracy in 1829; there were few who would question it in 1837. Jackson had likewise established a pattern that future candidates for the presidency attempted to imitate. Birth in humble circumstances, experience on the frontier, evidence of being close to the mass of the people, a devotion to democracy, and, if possible, some military exploits were all valuable assets for any candidate.

The intensity of the political struggles from 1825 to 1837 led to the revival of the two-party system. Jackson never thought of him-

self as a master politician, but he and his associates proved themselves the most skillful political leaders of that generation. When Jackson was elected president in 1828, he was the candidate of a faction rather than of a party. When he retired from the presidency he left a vigorous and well-organized Democratic Party as a legacy. (H.W.Br./Ed.)

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Jackson, Charles Thomas (b. June 21, 1805, Plymouth, Mass., U.S.—d. Aug. 28, 1880, Somerville), Harvard-trained U.S. physician, chemist, and pioneer geologist and mineralogist. As an early experimenter in the use of ether as an anesthetic, Jackson became embroiled in one of the most bitter disputes in the history of modern medicine.

Jackson received his M.D. from Harvard Medical School in 1829. He continued his medical studies at the University of Paris, also attending lectures on geology at the Royal School of Mines. He returned to Boston in 1832 and started a private medical practice but abandoned medicine in 1836 to establish a laboratory for the teaching of analytical chemistry. One of his students was a young dental surgeon, William Thomas Green Morton, with whom Jackson worked on chemical methods for painless dentistry. From Jackson, Morton learned that ether could be applied externally as a local anesthetic.

Morton continued to experiment with ether. In September 1846 he sought Jackson's advice about ether inhalation for surgical anesthesia. Later, following Morton's successful demonstration of ether anesthesia at Massachusetts General Hospital on Oct. 16, 1846, Jackson claimed credit for the triumph. He announced that he had introduced Morton to ether, that he had first discovered its use as an anesthetic in 1842, and that, furthermore, Morton had been acting as his agent in the landmark demonstration at Massachusetts General. Jackson further denounced Morton as a swindler and a forger; years of controversy and lawsuits resulted. When Georgia physician Crawford W. Long entered the dispute, Jackson tried to persuade Long to become a party to a joint claim, naming himself, Jackson, as the discoverer of ether anesthesia and Long as its first practitioner. When Long refused, Jackson withdrew his own claim and then publicly acknowledged Long's primacy, perhaps only to discredit Morton.

Jackson's contentiousness and propensity for controversy are illustrated in other incidents. Having met Samuel Morse in 1832, Jackson later declared that he himself had told Morse the basic principles of the telegraph, and he initiated litigation that continued for years. Later, while assigned by the U.S. Geological Survey to report on the Lake Superior region, Jackson was discharged from government service; an exposé written by his colleagues on the project charged that Jackson altered data to support his own conclusions, evidently for personal financial gain. Nonetheless, his enduring scientific reputation rests primarily on his accomplishments as a geologist.

In 1873 Jackson was admitted to an asylum for the mentally ill, where he spent the remainder of his life. He has been described by some critics as a monomaniac, obsessively jealous of the accomplishments of others.

Jackson, Glenda (b. May 9, 1936, Birkenhead, Cheshire, Eng.), British stage and motion-picture actress.

From a working-class background, Jackson quit school at age 16 to begin an acting career, supporting herself with various jobs. She was discovered by Peter Brook for his Theatre of Cruelty revue, in which her career was established. In 1964 she had a stunning personal triumph when she portrayed Charlotte Corday in both the London and New York productions of *The Persecution and Assassination of Jean-Paul Marat as Performed by the Inmates of the Asylum of Charenton Under the Direction of the Marquis De Sade* (*Marat/Sade*). Her first film was the screen adaptation of that role in 1967. Her early films tended to typecast her as an extremely neurotic character, but her efforts in the 1970s showed her true versatility. Her acting in *Women in Love* (1969) and *A Touch of Class* (1973) won Oscars from the Academy of Motion Picture Arts and Sciences.

Jackson's grasp of all facets of the acting profession was revealed when she received critical acclaim and an Emmy for her television portrayal of Elizabeth I in 1972 for the BBC. She also played Elizabeth I in a 1972 film, *Mary Queen of Scots.*

To make the best use of the Britannica, consult the INDEX *first*

Jackson, Helen (Maria) Hunt, *née* FISKE (b. Oct. 15, 1830, Amherst, Mass., U.S.—d. Aug. 12, 1885, San Francisco), U.S. poet and novelist best known for her novel *Ramona.*

She lived the life of an army wife travelling from post to post, and after the deaths of her first husband, Capt. Edward Hunt, and her two sons, in 1863 she turned to writing. She married William Jackson in 1875 and moved to Colorado. A prolific writer, she is remembered primarily for her efforts on behalf of the American Indians. *A Century of Dishonor* (1881) arraigned government Indian policy; her subsequent appointment to a federal commission investigating the plight of Indians on missions provided material for *Ramona* (1884), which aroused public sentiment for improving the conditions described but has been admired chiefly for its romantic picture of old California.



Helen Hunt Jackson, wood engraving from *Century Magazine,* 1885

By courtesy of the Library of Congress, Washington, D.C.

Jackson, Henry (boxer): *see* Armstrong, Henry.

Jackson, Sir Henry Bradwardine (b. Jan. 21, 1855, Barnsley, Yorkshire, Eng.—d. Dec. 14, 1929, Hayling Island, Hampshire), British naval officer responsible for the development of radio telegraphy in the British Navy.

Jackson joined the Royal Navy at the age of 13 and was promoted to lieutenant in 1881, commander in 1890, controller in 1905, and first lord of the Admiralty in 1915.

Naval duties sparked his interest in problems of navigation, torpedo mechanisms, and communication over long distances. In 1890 he conceived that wireless waves could aid in ship-to-ship communication and by 1895 succeeded in transmitting radio signals from one end of a ship to the other. By 1900 his efforts resulted in a British government contract with Guglielmo Marconi's company to install wireless mechanisms on ships of the Royal Navy.

In 1920 Jackson was named chairman of the Radio Research Board of the Department of Scientific and Industrial Research. There he directed studies on atmospheric interference with radio transmission, direction finding, and radio-frequency measurement. He also conducted pioneering work on shortwave radio reception. Jackson was knighted in 1906.

Jackson, Howell E(dmunds) (b. April 8, 1832, Paris, Tenn., U.S.—d. Aug. 8, 1895, near Nashville, Tenn.), U.S. lawyer and associate justice of the United States Supreme Court (1893–95).

Jackson practiced law in the towns of Jackson and Memphis, Tenn., until the outbreak of the U.S. Civil War, during which he served the Confederacy as a receiver of sequestered property. He gained prominence in his practice after the war and in 1880 was elected to the legislature as a Democrat. When factional disputes prevented the legislature from agreeing on any Democratic candidate for the U.S. Senate, Jackson's name was proposed by a Republican member, and he won on the first ballot. In 1886 he was appointed by Pres. Grover Cleveland as a federal judge of the sixth circuit; and in 1891 he became the first presiding judge of the new Circuit Court of Appeals at Cincinnati, where he served with great distinction. When a vacancy occurred on the U.S. Supreme Court in 1893, Pres. Benjamin Harrison, certain that the incoming Democratic Senate would not confirm a Republican, named Jackson.

Jackson developed tuberculosis shortly after being named, and he is remembered primarily for his part in one famous case, *Pollock v. Farmers' Loan & Trust Company.* On this case the other justices were evenly divided, and Jackson, despite failing strength, took his seat in order to cast the deciding vote. Jackson cast his vote in favour, but another justice had changed his mind, and the income tax law was declared unconstitutional by a vote of five to four.

Jackson, Jesse (Louis) (b. Oct. 8, 1941, Greenville, S.C., U.S.), U.S. civil-rights leader and politician who, as the head of Operation PUSH (People United to Save Humanity), did much to focus attention on the problems of blacks and the economic disparities fostered by racial discrimination.

Born into a poor family, Jackson attended the University of Illinois (1959–60) on a scholarship and then transferred to the predominantly black Agricultural and Technical College of North Carolina (Greensboro), receiving a B.A. in sociology (1964). He did postgraduate work at the Chicago Theological Seminary and was ordained a Baptist minister (1968).

While an undergraduate, Jackson became involved in the civil-rights movement. In 1965 he went to Selma, Alabama, to march with Martin Luther King, Jr., and became a protegé of King, working with him in the Southern Christian Leadership Conference (SCLC). When Operation Breadbasket, the economic

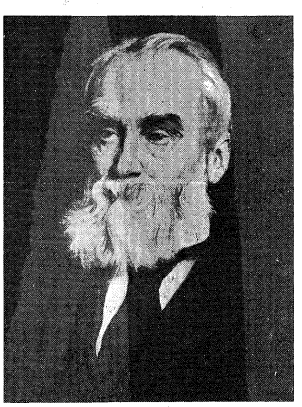
arm of the SCLC was formed, King asked Jackson to head the Chicago branch. An astute politician as well as a charismatic and articulate speaker, Jackson's organizational abilities were perceived early, and he was made national director (1967–71) of Operation Breadbasket. He successfully campaigned for companies in black neighbourhoods to hire more blacks and asked stores to feature products manufactured by black concerns. In 1971 he founded Operation PUSH, an organization that seeks to combat racism and actively promote the values of scholarship, hard work, and success among black urban youth.

Although reactions to his particular style of leadership were mixed, Jackson continued to wield much political influence. His voter-registration drive was a key factor in the election of Chicago's first black mayor, and in 1983 Jackson declared himself a Democratic candidate for president, proving a serious contender in state primaries.

Jackson, John, byname GENTLEMAN JACKSON (b. Sept. 28, 1769, London—d. Oct. 7, 1845, London), English pugilist influential in securing acceptance of prizefighting as a legitimate sport in England.

He appeared in only three public matches, the third of which, on April 15, 1795, with Daniel Mendoza, won him the championship of England, a title he held until 1803, when he retired to conduct a school of self-defense at his house in Bond Street, London. He is said to have instituted in his teaching the scientific principles of boxing: countering blows, accurate judgment of distance, and agile footwork. His school attracted many young aristocrats, including Lord Byron, a number of whom formed the Pugilistic Club there in 1814.

Jackson, John Hughlings (b. April 4, 1835, Green Hammerton, Yorkshire, Eng.—d. Oct. 7, 1911, London), English neurologist whose studies of epilepsy, speech defects, and nervous system disorders arising from injury to the brain and spinal cord remain among the most useful and highly documented in the field.



John Hughlings Jackson, oil painting by Lance Calkin; in the London Hospital Medical College

By courtesy of the London Hospital Medical College

Jackson was physician to the National Hospital for the Paralyzed and Epileptic, London (1862–1906), and the London Hospital (1859–94). In 1864 he confirmed the discovery by Paul Broca, a French surgeon, that the speech centre of right-handed persons is located in the left cerebral hemisphere, and vice versa, by finding that, in most cases, he was able to associate aphasia (a speech disorder) in right-handed persons with disease of the left cerebral hemisphere.

One of the first to state that abnormal mental states may result from structural brain damage, he discovered (1863) epileptic convulsions, now known as Jacksonian epilepsy, that progress through the body in a series of spasms and traced them (1875) to lesions of the motor region of the cerebral cortex, or outer layer of the brain. Jackson's epilepsy studies initiated the development of modern methods of clinical localization of brain lesions and the investigation of localized brain functions. His definition (1873) of epilepsy as "a sudden, excessive, and rapid discharge" of brain cells has been confirmed by electroencephalography, a method of recording electric currents generated in the brain.

Jackson, Mahalia (b. Oct. 26, 1911, New Orleans—d. Jan. 27, 1972, Chicago), U.S. singer of religious songs whose intense piety was reflected in virtually every part of her life.

Jackson sang in the choir of her clergyman father when she was five years old and, although soon familiar with such singers as Bessie Smith and Ida Cox, she remained devoted to sacred rather than profane music. At age 16 she went to Chicago, where she maintained herself by performing menial tasks; but she then began to sing in Baptist churches, investing her earnings in real estate. Her fame spread throughout the U.S. from 1945, when she began recording; her "Move On Up a Little Higher" and "Silent Night" were enormous commercial successes. She also appeared, singing gospel music, in the motion picture *Jazz on a Summer's Day.* Her career provided an example of the links between the religious and secular roots of jazz, for her singing shows the unmistakable influence of Bessie Smith and the other earthy realists of the blues as well as the deep religious fervour that was part of her heritage.

Jackson, Peter (b. July 3, 1861, St. Croix, Virgin Islands—d. July 13, 1901, Roma, Queensland, Australia), Virgin Islands-born professional boxer, one of the first outstanding black pugilists. A victim of discrimination, he was denied a chance to fight for the world heavyweight championship while in his prime.

Jackson won the Australian heavyweight championship in 1886 and the British Empire title in 1892. On May 21, 1891, in San Francisco, he fought a 61-round draw with Corbett, who had not yet won his championship. On March 22, 1898, also in San Francisco, Jackson, who was 36 years old and, except for a few exhibition matches, had not fought for six years, was knocked out in three rounds by James J. Jeffries. As a consequence of this victory and his subsequent knockout of Fitzsimmons (June 9, 1899), Jeffries is retrospectively considered by many to have been the first true world heavyweight champion under the Queensberry rules.

Jackson, Reggie, byname of REGINALD MARTINEZ JACKSON (b. May 18, 1946, Wyncote, Pa., U.S.), professional American League U.S. baseball player, whose performance as a hitter in play-off and World Series games earned him the nickname "Mr. October."

Jackson was encouraged in sports by his Spanish father and became a star athlete at Cheltenham (Pa.) High School, excelling in track and football as well as baseball, in which he was a good pitcher as well as a hitter. He batted and threw left-handed. He continued his athletic career at Arizona State University (Tempe), but after two years he became a professional baseball player. He played with Kansas City Athletics farm teams (1967–68) and joined the Athletics in 1968 when the team moved to Oakland, Calif., remaining with the team through the 1975 season. He made his mark as a home-run hitter and was also an exceptional base runner and a good outfielder, particularly on balls that were hard to play. He led the league in home runs (1973, 1975). Playing on the World Series-winning Athletics (1972–74), Jackson in the 1973 World Series batted .310, drove in all three runs as Oakland won the sixth game, and hit a two-run homer in the decisive seventh game.

In 1976 he was traded to the Baltimore Orioles, and in 1977 as a free agent he signed a five-year contract with the New York Yankees for nearly $3,000,000. He led the league in home runs in 1980. In the final game of the 1977 World Series he hit three consecutive home runs and drove in five runs as the Yankees won 8 to 4. In the 1978 World Series he hit .391 and two home runs. From 1973 he played mainly as a designated hitter (not playing in the field).

Jackson also enjoyed a career as a sports commentator.

Jackson, Robert H(oughwout) (b. Feb. 13, 1892, Spring Creek, Pa., U.S.—d. Oct. 9, 1954, Washington, D.C.), associate justice of the United States Supreme Court (1941–54).

An adept scholar, Jackson pleaded his first case by special permission while still a minor and was admitted to the bar upon becoming 21. He served as counsel for various municipal agencies in Jamestown, New York, and, after the crash of 1929, helped merge the city's three financial institutions, subsequently becoming a director of the consolidated entity. He was also an active supporter of New York Governor Franklin D. Roosevelt, who appointed him to a commission to study the state's judicial system. After Roosevelt's election to the presidency, Jackson was made general counsel to the Internal Revenue Bureau, where his notable accomplishment was the successful prosecution of Andrew Mellon for income tax evasion. Jackson also served as special counsel to the Treasury and the Securities and Exchange Commission and as assistant attorney general of the Tax, and then the Anti-Trust, Division. Pres. Roosevelt appointed him U.S. solicitor general in 1938 and attorney general in 1940. In all these assignments he was the chief legal exponent of New Deal legislation. As attorney general he drafted, at Roosevelt's request, an opinion defending the transfer to Great Britain of 50 over-age destroyers (the "destroyer-base" deal).

In 1941 Roosevelt named Jackson to the U.S. Supreme Court. His early opinions reflect his liberal nationalistic views. In *Edwards v. California* (1941), which declared unconstitutional California's "Okie" law barring indigent migrants from entering the state, Jackson maintained that freedom of movement within the United States was guaranteed by citizenship. He also strongly defended the separation between church and state. His defense of 1st Amendment guarantees were, however, balanced by concern for the maintenance of public order and security, which resulted in his concurring with court findings against the Communist Party and in favour of the relocation of Japanese persons during World War II. He is also remembered as a vigorous and clear legal stylist.

Jackson took a leave from the bench to serve as chief U.S. prosecutor in the Nürnberg trials of former German leaders. He was largely responsible for the legal basis of the International Military Tribunal as embodied in its charter and built for the prosecution a massive case from captured Nazi documents; but, having no experience as a prosecuting attorney, he conducted an undistinguished cross-examination of Hermann Göring and other defendants. In 1946 he returned to the bench.

Jackson, Sheldon (b. May 18, 1834, Minaville, N.Y., U.S.—d. May 2, 1909, Asheville, N.C.), U.S. Presbyterian minister and educator, generally regarded as the foremost apostle of Presbyterianism in America.

Jackson attended Union College and the Princeton Theological Seminary. From 1859 to 1869 he was a missionary in Wisconsin and Minnesota, organizing more than 20 churches.

In 1869 he became superintendent of missions in a number of central and western states, eventually having supervision over half the area of the United States. After 1877 he was concerned chiefly with Alaska, where he introduced Siberian reindeer as a food resource for the Eskimos. He edited the *Rocky Mountain Presbyterian* (1872–82), the *Presbyterian Home Missionary* (1882–85), and the Alaskan missionary monthly *North Star* (1887–97).

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Jackson, Shirley (Hardie) (b. Dec. 14, 1916, San Francisco, Calif., U.S.—d. Aug. 8, 1965, North Bennington, Vt.), American novelist and short-story writer best known for her story "The Lottery" (1948).

Jackson graduated from Syracuse University in 1940 and married the American literary critic Stanley Edgar Hyman. They settled in North Bennington in 1945. *Life Among the Savages* (1953) and *Raising Demons* (1957) are witty and humorous fictionalized memoirs about their life with their four children. Their light, comic tone contrasts sharply with the dark pessimism of Jackson's other works, whose general theme is the presence of evil and chaos just beneath the surface of ordinary, everyday life. "The Lottery," a chilling tale whose meaning has been much debated, provoked widespread public outrage when it was first published in *The New Yorker* in 1948. Jackson's six finished novels, especially *The Haunting of Hill House* (1959) and *We Have Always Lived in the Castle* (1962), further established her reputation as a master of gothic horror and psychological suspense.

Jackson, Thomas Jonathan, byname STONEWALL JACKSON (b. Jan. 21, 1824, Clarksburg, Va., U.S.—d. May 10, 1863, Guiney's Station, Va.), Confederate general in the American Civil War, one of its most skillful tacticians, who gained his sobriquet "Stonewall" by his stand at the First Battle of Bull Run (called First Manassas by the South) in 1861.

Early life and career. The early death of his father, who left little support for the family, and his mother's subsequent death, caused Jackson to grow up in the homes of relatives. He had little opportunity for formal education in his early years, but he received an appointment, in 1842, to the U.S. Military Academy at West Point. After a slow start, he was graduated 17th in his class and was commissioned as a second lieutenant assigned to artillery. He joined his regiment in Mexico, where the United States was then at war. In the Mexican War he first met General Robert E. Lee, who later became the commanding general of the Confederate armies, and it was here that Jackson first exhibited the qualities for which he later became famous: resourcefulness, the ability to keep his head, and bravery in the face of enemy fire. At the end of the fighting in Mexico, having been promoted to first lieutenant and to the brevet rank of major, he was assigned to the occupation forces in Mexico City.



Stonewall Jackson, 1863

By courtesy of the Library of Congress, Washington, D.C.

Finding service in the peacetime army tedious, he resigned his commission and became professor of artillery tactics and natural philosophy at the Virginia Military Institute (VMI) in 1851. Though he worked hard at his new duties, he never became a popular or highly successful teacher. A stern and shy man, he earned a reputation for eccentricity that followed him to the end of his career. His strong sense of duty and moral righteousness, coupled with great devotion to the education of cadets, earned for him the derisive title "Deacon Jackson" and comparison with Oliver Cromwell.

Upon the outbreak of the Civil War he offered his services to his state of Virginia and was ordered to bring his VMI cadets from Lexington to Richmond. Soon after, he received a commission as colonel in the state forces of Virginia and was charged with organizing volunteers into an effective Confederate army brigade, a feat that rapidly gained him fame and promotion. His untimely death only two years later cut Jackson down at the height of an increasingly successful career, leaving unanswered the question of his capacity for independent command, which his rapid rise suggests he might have achieved.

Jackson's first assignment in the Confederate cause was the small command at Harpers Ferry, Va. (now West Virginia), where the Shenandoah River flows into the Potomac. His mission was to fortify the area and hold it if possible. When General Joseph E. Johnston took over the Confederate forces in the valley, with Jackson commanding one of the brigades, Jackson withdrew to a more defensible position at Winchester.

Battle of Manassas. In July 1861 the invasion of Virginia by Federal army troops began, and Jackson's brigade moved with others of Johnston's army to unite with General P.G.T. Beauregard on the field of Bull Run in time to meet the advance of General Irvin McDowell's Federal army. It was here that he stationed his brigade in a strong line, withholding the enemy against overwhelming odds and earning the sobriquet "Stonewall." The spring of 1862 found Jackson again in the Shenandoah Valley, where his diversionary tactics prevented reinforcements being sent to Federal army general George B. McClellan, who was waging the peninsular campaign against Richmond, the Confederate capital. Jackson's strategy possibly accounted for Lee's victory later in the Seven Days' Battles. Lee, then chief military adviser to Confederate president Jefferson Davis, suggested to Jackson that he use his troops to attack Federal troops in the valley and thus threaten Washington. By rapid movement, Jackson closed separately with several Federal units and defeated them. In April he struck in the mountains of western Virginia; then on May 24–25 he turned on General Nathaniel P. Banks and drove him out of Winchester and back to the Potomac River.

He then quickly turned his attention to the southern end of the valley, defeating the Federals at Cross Keys, Va., on June 8, and at Port Republic on the next day. Lee then brought Jackson's troops by road and railroad to Richmond to envelop the right wing of McClellan's army. But Jackson arrived a day late, and his reputation lost some of its lustre, possibly because of his lack of experience in large-scale action; nevertheless, McClellan was beaten back and was ordered to evacuate the peninsula.

Lee at once joined Jackson against the Federal forces regrouping under General John Pope. He sent Jackson, by a wide encircling movement, to attack the rear of Pope's forces and bring on the Second Battle of Bull Run, in which Pope was soundly beaten. Lee next crossed the Potomac for the "liberation" of Maryland. To protect Richmond, Lee detached Jackson to capture Harpers Ferry, which he did in time (September 13–15) to rejoin Lee at Antietam. After his return to Virginia, Lee divided his army into two corps, General James Longstreet commanding the first and Jackson, now a lieutenant general, the second. At Fredericksburg, Va., in December, Jackson was in command of the Confederate right when Federal general Ambrose E. Burnside's rash attack was easily repulsed and he was crushingly defeated.

In April, General Joseph Hooker, Burnside's successor, attempted to turn the Confederate position on the Rappahannock River, south of Washington. There the seemingly invincible team of Lee and Jackson made its boldest move. Leaving a small detachment to meet Federal troops on the Rappahannock, Lee moved his main body, including Jackson's corps, to meet Hooker's threatened envelopment in the woods of Chancellorsville. He then divided his army again, keeping only 10,000 men to demonstrate against Hooker's front, and he sent Jackson to move secretly around Hooker's right with his entire corps.

Death. The maneuver was completely successful. On the evening of May 2, Jackson rolled up the flank of the unsuspecting Federal forces. Then, in the moment of victory, tragedy struck. Jackson, who had ridden forward to organize the pursuit, was accidentally shot down by his own men when he returned at dusk and was seriously, but not mortally, wounded. Although his left arm was amputated successfully, pneumonia set in and he died a week later. Lee could not replace him; for while Jackson had lost his left arm, Lee had, indeed, lost his right arm.

That Jackson was the ablest of General Robert E. Lee's generals is rarely questioned. The qualities of the two men complemented each other, and Jackson cooperated most effectively. In him were combined a deep religious fervour and a fiercely aggressive fighting spirit. He was a stern disciplinarian, but his subordinates and his men trusted him and fought well under his leadership. A master of rapid movement and surprise tactics, he kept his intentions sometimes so veiled in secrecy that often his own officers did not fully know his plans until they were ordered to strike.

(C.W.T.)

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Jackson, William (b. May 29, 1730, Exeter, Devon, Eng.—d. July 5, 1803, Exeter), English composer and writer on music, whose opera *The Lord of the Manor* (1780) held the stage for many years.

Jackson was organist and choirmaster at Exeter cathedral from 1777. His best-known other compositions are *Twelve Songs* (1755) and *Twelve Canzonets for Two Voices* (*c.* 1770). His name is also associated with an Anglican service of dubious authenticity, "Jackson in F," written in simple style for provincial singers. His writings include *Observations on the Present State of Music in London* (1791), *Thirty Letters on Various Subjects* (1782), and his autobiography, *The Four Ages* (1798; republished in *The Leisure Hour,* 1882). An

amateur painter, he was a friend of Gainsborough.

Jackson, William Henry (b. April 4, 1843, Keesville, N.Y., U.S.—d. June 30, 1942, New York City), U.S. photographer noted for his landscape photographs of the American West.

As a boy in Troy, N.Y., Jackson painted landscapes on screens and did retouching for a photographic studio. After the Civil War he went west and some time later opened a studio in Omaha, Neb. He photographed local Indian tribes and the line of the Union Pacific Railroad. From 1870 to 1878 he was the official photographer for the U.S. Geological and Geographical Survey of the Territories. His photographs of the wonders of northwestern Wyoming, taken during the survey of 1871, were instrumental in the establishment of Yellowstone National Park, in 1872. He photographed in the Grand Tetons (now the Grand Teton National Park) in 1872, and in 1874 he photographed the cliff dwellings of Colorado (now the Mesa Verde National Park). When the survey was completed in 1879, he opened a studio in Denver, Colo.

His autobiography is *Time Exposure* (1940) and a biography, *Picture Maker of the Old West: William H. Jackson,* by his son Clarence S. Jackson, was published in 1947.

Jackson Hole National Monument, fertile mountain valley and wildlife reserve mostly in Grand Teton National Park (*q.v.*), northwestern Wyoming, U.S.

jacksonian epilepsy, also called JACKSONIAN FIT, or PARTIAL EPILEPSY, localized seizure on one side of the body. It usually starts with twitching of the side of the face, the toes on one foot, or the fingers on one hand. The movements then spread to other muscles on the same side of the body. This type of seizure is associated with a lesion or defect in that part of the cerebral cortex that has to do with voluntary movement. The lesion can be caused, for example, by lung flukes that have lodged in the brain. *See also* epilepsy.

Jacksonville, city, Pulaski County, central Arkansas, U.S., just northeast of Little Rock. The locality was settled before the Civil War but did not develop until Nicholas Jackson offered land in the 1860s for a Cairo and Fulton (now Missouri Pacific) Railroad depot. The town, named for him in 1870, became a distribution point for farm produce. Since World War II, there has been diversified industrialization. After 1950 the activation of Little Rock Air Force Base and missile complexes, immediately to the north, gave considerable impetus to the city's growth. Pop. (1980) 27,589.

Jacksonville, city, Duval County, northeastern Florida, U.S., on the St. Johns River near its mouth on the Atlantic. Following a referendum, Jacksonville consolidated (1968) with most of Duval County and became one of the nation's largest cities in area (841 sq mi [2,178 sq km]).

Fort Caroline National Memorial marks the site of Florida's first European (French Huguenot) settlement (1564). The locality was known as Wacca Pilatka (meaning "cows' crossing"), interpreted as Cowford during the English period (1763–83). After U.S. acquisition the townsite was laid out (1822); it was named for Andrew Jackson and became the county seat. Its growth was impeded by the Seminole Wars, and during the Civil War it was occupied at intervals by Union troops. During Reconstruction it developed as a winter resort and progressed industrially after harbour improvements, despite a yellow-fever epidemic (1888) and widespread destruction by fire (1901).

It is now a deepwater port of entry with major shipyards and functions as the state's foremost industrial, financial, insurance, transportation, and commercial centre. Its economy is boosted by Jacksonville Naval Air Station and other naval installations. Tourist and convention facilities focus on adjacent beach communities (Atlantic Beach, Neptune Beach, Jacksonville Beach, and Ponte Vedra Beach), the Civic Auditorium, St. Johns River Park and Marina, the Zoological Park, and a sports complex (site of the Gator Bowl, Coliseum, and a ball park). Educational and cultural institutions include Jacksonville University (1934), Florida Junior College (1966), University of North Florida (1972), Jones College (1918), Cummer Gallery of Art, Jacksonville Art Museum, and Haydon Burns Library. Inc. 1832. Pop. (1980) city, 540,898; metropolitan area (SMSA), 737,519.

Jacksonville, city, Morgan County, west central Illinois, U.S. Laid out in 1825 as the county seat and named in honour of Andrew Jackson, it soon acquired a distinctive educational, institutional, and religious character, which it largely retains. Illinois College (founded there in 1829 and affiliated with the United Church of Christ) was the first in the state to graduate a college class. Other educational institutions included the Jacksonville Female Academy (1830) and the Athenaeum (1864), both later becoming part of Illinois College. The Illinois Conference Female Academy, established in 1846 as a Methodist Episcopal school, became MacMurray College for Women in 1930 (renamed to honour a benefactor, James H. MacMurray); the College for Men was added in 1955, and the institution is now MacMurray College. Jacksonville is also the home of several state institutions for the care of the handicapped: the Illinois School for the Deaf (1839), the Jacksonville Mental Health and Developmental Center (1846), and the Illinois Braille and Sight Saving School (1849). Presidential aspirants Stephen A. Douglas and William Jennings Bryan practiced law in Jacksonville, in 1834 and 1883, respectively.

A trading centre for a rich agricultural area, Jacksonville's light industries also include food processing, bookbinding, and the manufacture of ferris wheels and polyethelyne film. Inc. 1867. Pop. (1980) 20,284.

Jacksonville, city, seat of Onslow County, on the New River in southeastern North Carolina, U.S. Originally settled as Watland's Ferry (*c.* 1757), its name was changed to Courthouse and then Jacksonville (to honour Pres. Andrew Jackson). It remained a small hunting and fishing resort (1940 population 873) until 1942, when the establishment of New River Marine Base (now Camp Lejeune, 5 mi [8 km] southeast) transformed its economy. The Coastal Carolina Community College was opened there in 1965. Hofmann Forest is immediately northeast. Inc. town, 1842; city, 1955. Pop. (1980) city, 17,056; metropolitan area (SMSA), 112,784.

Jacksonville, city, Jackson County, southwestern Oregon, U.S., on Jackson Creek, just west of Medford. It began in 1851–52 as a mining camp with placer gold discoveries along the creek (named for a prospector). By the 1920s mining activities had declined together with the population, and in 1927 the city (inc. 1860) lost its county seat status (held since 1884) to Medford. Jacksonville has, however, remained Oregon's best preserved historic settlement; its Pioneer Village contains restored buildings, mining equipment, and covered wagons. Jacksonville Museum (formerly the old courthouse, completed 1884) houses pioneer and Indian relics and maintains buildings of the 1850s and '60s such as the Beekman House and Beekman Bank, the McCully House (now a doll museum), and the old Methodist and Catholic churches. The United States Hotel (1880) and the Hillside Amphitheatre are the sites of the Peter Britt Music and Arts Festival. Pop. (1980) 2,030.

jackstones, also called FIVESTONES, JACKS, or DIBS, game of great antiquity and worldwide distribution, now played with stones, bones, seeds, filled cloth bags, or metal or plastic counters (the jacks), with or without a ball. The name derives from "chackstones"—stones to be tossed. The knuckle, wrist, or ankle bones of goats, sheep, or other animals also have been used in play. Such objects have been found in prehistoric caves in Kiev, and pictures of the game are depicted on jars from ancient Greece.

In the classic game, five or more counters are thrown into the air with one hand, the object being to catch them either in the palm or on the back of that hand. Those so caught count for the player, and those missed count against him.

In contemporary games, there have been two developments: one emphasizing skill (as in the modern game of jackstones, or jacks) and the other, the accumulation of as many counters as possible.

In the U.S. and Canada, jacks is primarily a children's game, played with 6 to 12 or more six-pronged iron or plastic jacks and a small ball. After the jacks are strewn on the floor, the player tosses the ball into the air and then tries with one hand to pick up the jacks and catch the ball, usually before it bounces. If the player fails in this, the turn passes to the next player. The game becomes increasingly difficult; first, one jack has to be picked up, then two at a time, next three, and, finally, all must be grasped in the hand before the ball is caught. Increasingly complex moves are often introduced.

In Czechoslovakia, girls play the classic game using six seeds and perform each manoeuvre first with the right, then with the left hand.

In Egypt, children use no more than 10 apricot seeds, for each player. Players in turn scatter all but one of the seeds, toss that one into the air, and snatch as many as possible from those on the ground before catching the falling seed. The winner is the one who amasses the most seeds.

Jewish girls of eastern Europe traditionally played *ghop bagi* with five bones. On the first play, all were scattered on the ground or carpet, one tossed up and the other four garnered before it fell. In the second play of the set, three were on the floor and two in the air; in the third, two on the carpet and three in the air; and in the last, one on the floor and four in the air.

In Japan and in China, a similar game is played using cloth bags filled with rice, sand, or beans. The player drops the bags on a table, picks up one and tosses it aloft; while it is aloft he tries to pick up a bag from the table. He then holds this in his hand and repeats the play in an attempt to pick up and retain all the bags.

jackstraws, also called SPILLIKINS, or PICK-UP-STICKS, game of skill, played by both children and adults, with thin wooden sticks, or with straws or matches. Early 18th-century jackstraws were made of ivory or bone, later ones of wood or plastic.

To begin the game, the jackstraws (20 to 50) are bunched in one hand and set vertically on a table or other smooth, flat surface, then released suddenly so that the straws fall in a jumble. Each player in turn attempts to remove a single jackstraw without disturbing any other. If he succeeds he may try again, but if another straw moves, the player loses his turn.

The player with the most straws when the pile is totally reduced wins. Sometimes the

game is played with a retriever hook, either made as part of the set or improvised with a bent paper clip or a bent straight pin stuck in a match. Some sets have jackstraws shaped like saws, hoes, rakes, ladders, and other implements, thus making the game more difficult. The game is supposedly of great antiquity, sometimes claimed to have originated with the Chinese.

Jacob, Hebrew YA'AQOV, Arabic YA'QŪB, also called ISRAEL, Hebrew YISRA'EL, Arabic ISRĀ'ĪL, Hebrew patriarch who was the grandson of Abraham, the son of Isaac and Rebekah, and the traditional ancestor of the people of Israel. Stories about Jacob in the Bible begin at Gen. 25:19.

According to the Old Testament, Jacob was the younger twin brother of Esau, who was the ancestor of Edom and the Edomites. The two are representatives of two different grades of social order, Jacob being a pastoralist and Esau a nomadic hunter. During her pregnancy, Rebekah was told by God that she would give birth to twins; each of them would found a great nation, and Esau, the elder, would serve his younger brother. As it turned out, Jacob, by means of an elaborate double deception, managed to obtain his older brother's birthright from their father. Jacob then fled his brother's wrath and went to take refuge with the Aramaean tribe of his ancestors at Haran in Mesopotamia.

Along his journey Jacob received a special revelation from God; God promised Jacob lands and numerous offspring that would prove to be the blessing of the entire Earth. Jacob named the place where he received his vision Bethel ("House of God"). Arriving at his uncle Laban's home in Haran, Jacob fell in love with his cousin Rachel. He worked for her father, Laban, for seven years to obtain Rachel's hand in marriage, but then Laban substituted his older daughter, Leah, for Rachel at the wedding ceremony. Unwittingly married to Leah, Jacob was thus compelled to serve Laban for another seven years so that he could take his beloved Rachel as his wife as well. Jacob then served Laban for another six years, during which he amassed a large amount of property; he then set out with his wives and children to return to Palestine. On the way Jacob wrestled with a mysterious stranger, a divine being, who changed Jacob's name to Israel. Jacob then met and was reconciled with Esau and settled in Canaan.

Jacob had 13 children, 10 of whom were founders of tribes of Israel. Leah bore him his only daughter, Dinah, and six sons—Reuben, Simeon, Levi (who did not found a tribe, but was the ancestor of the Levites), Judah (from whom a tribe and the Davidic monarchy were descended), Issachar, and Zebulun. Leah's maidservant, Zilpah, bore him Gad and Asher, and Rachel's maidservant, Bilhah, bore him Dan and Naphtali. Rachel's sons were Benjamin and Joseph (who did not found a tribe, but whose sons founded the tribes of Manasseh and Ephraim).

The story of Jacob's later years more properly belongs to the story of Joseph (*q.v.*). Late in his life, a famine prompted Jacob and his sons to migrate to Egypt, where he was reunited with his son Joseph, who had disappeared some years before. Israel died in Egypt at the age of 147 years and was buried in Canaan at Hebron.

The stories about Jacob's birth and his acquisition of the birthright (Gen. 25:19–34; 27) provide a thinly veiled apology for the relation between Edom (Esau) and Israel in Davidic times. Edom, the older nation, was made subject to Israel by David (II Sam. 8:8ff.). The Jacob stories assume and emphasize that all things occur by divine design. The divine objective is of overriding significance; it is God's will that Esau (Edom) shall live in the desert and be subject to Israel.

Jacob (Congo): *see* Nkayi.

Jacob OF EDESSA (b. *c.* 640, 'En-deba, Antioch province, Syria—d. 708), distinguished Christian theologian, historian, philosopher, exegete, and grammarian, who became bishop of Edessa (*c.* 684). His strict discipline giving offense, he retired and devoted himself to study and teaching.

Jacob composed Syriac homilies in prose and verse, canons, liturgies, commentaries on the Old and New Testaments, and a chronicle, designed to continue that of Eusebius, of which only fragments remain. He revised the Peshitta (oldest and possibly the most simple version of the Bible) Old Testament on the basis of Greek and Syriac versions. He also translated from the Greek, notably the *Homiliae cathedrales* of Severus of Antioch. Jacob produced the earliest extant Syriac grammar and introduced Greek letters to represent the Syriac vowels.

Jacob OF SERUGH, Serugh also spelled SARUG (b. 451, Qurṭmān, Syria—d. November 521, Baṭnan, Osroëne), Syriac writer described for his learning and holiness as "the flute of the Holy Spirit and the harp of the believing church."

Like his father, Jacob was ordained a priest, and by 503 he was episcopal visitor of Haura in Serugh. In 519 he was made bishop of Baṭnan in Serugh. By his contemporaries and by some moderns Jacob has been regarded as orthodox, but four of his letters prove his Monophysitism, the belief in the existence of one, divine nature of Christ. His prose writings include discourses, six festal homilies, and many letters. He is the reputed author of a liturgy and order of baptism. He also wrote 760 homiletic poems, mostly in dodecasyllabic metre, treating mainly of Old and New Testament incidents and of apostles, saints, and martyrs.

Jacob, François (b. June 17, 1920, Nancy, Fr.), French biologist who, together with André Lwoff and Jacques Monod, was awarded the 1965 Nobel Prize for Physiology or Medicine for discoveries concerning regulatory activities in bacteria.

Jacob received his M.D. degree (1947) and a doctorate in science (1954) from the Faculty of Medicine and the Faculty of Science, respectively, in Paris. Most of the work of Jacob, Lwoff, and Monod was carried out at the Pasteur Institute (Paris), which Jacob had joined as a research assistant in 1950. In 1960 he became head of the department of cellular genetics at the institute, and from 1965 he was also professor of cellular genetics at the Collège de France. In 1977 he became a member of the Académie des Sciences.

With a coworker at the Pasteur Institute, Jacob discovered that the genes of a bacterium are arranged linearly in a ring and that the ring can be broken at almost any point. In 1958 Monod and Jacob began to collaborate in studies of the regulation of bacterial enzyme synthesis. One of their first major contributions was the discovery of regulator genes, so called because they control the activities of structural genes. The latter, in turn, not only transmit hereditary characteristics but also serve in the production of enzymes, other proteins, and ribonucleic acid (RNA).

Jacob and Monod also proposed the existence of an RNA messenger, a partial copy of the gene substance deoxyribonucleic acid (DNA), that carries genetic information to other parts of the cell. They also found that in a normal cell the balance between regulator and structural genes enables the cell to adapt to varying conditions. An interruption in this balance, however, can stimulate the production of new enzymes that can prove either beneficial or destructive to the cell.

Jacob, Georges (b. July 6, 1739, Cheny, Fr.—d. July 5, 1814, Paris), founder of a long line of French furniture makers. He was among the first cabinetmakers in France to use mahogany extensively and excelled at carved wood furniture, particularly chairs.

Born of a Burgundian peasant family, Jacob moved to Paris at 16 and is believed to have been apprenticed to Louis Delanois. He made chairs for Marie-Antoinette and other members of the royal household but became better known after the Revolution, which nearly ruined him. With the help of the painter David, he was commissioned to make furniture for the revolutionary Committee of Public Safety. He retired in 1796, handing over the business to his two sons, Georges and François-Honoré, but seven years later, on the death of Georges, he returned to the firm, which was renamed Jacob Desmalter. Jacob's fame is mainly attached to pieces he made for the Bonapartes, including a secretaire for the empress Joséphine.

Jacob, Max (b. July 12, 1876, Quimper, Fr.—d. March 5, 1944, Drancy), French poet who played a decisive role in the new directions of modern poetry during the early part of the 20th century. His writing is the product of a complex amalgam of Jewish, Breton, Parisian, and Catholic elements.

Jacob departed his native Brittany in 1894 to go to Paris, where he lived in extreme poverty but eventually became an important figure in Montmartre during the formative period of



Max Jacob, detail of a drawing by Pablo Picasso, 1917; in a private collection

Giraudon—Art Resource/EB Inc.

Cubism. He was a friend of the Cubist painters Pablo Picasso and Juan Gris and of the poet Guillaume Apollinaire. Jacob converted to Christianity in 1909, and he became a Roman Catholic in 1915, but he nevertheless continued to oscillate between extravagant penitence and wild bohemianism until 1921, at which time he retired into semimonastic seclusion at Saint Benoît-sur-Loire. He lived there most of the time, supporting himself by painting, until World War II, when he was interned in the concentration camp at Drancy, near Paris, where he died.

Outstanding in his voluminous production are *Le Cornet à dés* (1917; "Dice Box"), a collection of prose poems in the Surrealist manner; *Le Laboratoire central* (1921), "stoppered phials" of lyrical poetry; and his Breton *Poèmes de Morvan le Gaëlique* (1953). *La Défense de Tartufe* (1919), which with the novel *Saint Matorel* (1909) describes his religious experience; *Le Sacrifice impérial* (1929); and his *Correspondance* (edited by Garnier, vol. 1, 1953; vol. 2, 1955) show his unrelenting self-examination, his fantasy, and his verbal clowning, which concealed the profound torment of a convert, fearful of damnation and longing for heaven. His "novels," mainly epistolary, are exercises in verbal mimicry, reproducing every nuance in the conversation of the petit-bourgeois, of whom he was a sardonic but affectionate observer. Jacob was

full of paradoxes; he punned or sobbed with the same apparent ease. He charmed and influenced many of his contemporaries and toward the end of his life was surrounded by a devoted group of younger and older artists.

Jacob ben Asher (b. 1269?, Cologne?—d. 1340?, Toledo, Castile), Jewish scholar whose codification of Jewish law was considered standard until the publication in 1565 of the *Shulḥan ʿarukh* ("The Well-Laid Table") by Joseph Karo.

Little of certainty is known about Jacob's life. In 1303 he immigrated to Spain with his brothers and father, the great codifier Asher ben Jehiel, who became chief rabbi of Toledo. Although Jacob was eminently qualified, he never became a rabbi. Instead, it is likely that he eked out an existence as a moneylender.

Jacob is best known for his code *Arbaʿa ṭurim* ("Four Rows"; first published in its entirety in 1475 and also known as *Ṭur*), which systematically divided all Jewish law into four "rows," or classes, a new arrangement that became classic. He is therefore called Baʿal haṬurim (Master of the Rows). His four divisions are: (1) *Oraḥ ḥayyim* ("Path of Life"), dealing with laws governing prayer and ritual; (2) *Yore deʿa* ("Teacher of Knowledge"), setting forth the laws concerning things that are permitted or forbidden, such as dietary laws; (3) *Even haʿezer* ("Stone of Help"), containing the laws governing family relations, such as marriage and divorce; and (4) *Ḥoshen mishpaṭ* ("Breastplate of Judgment"), epitomizing civil and criminal law. Jacob eliminated all laws and customs that had been rendered obsolete by the destruction of the Second Temple (AD 70).

Revealing a marked indebtedness to his father's code, Jacob's austere digest became, after the Bible, the most popular work among 15th-century Jews and the usual basis for rabbinic decisions. It departed from his father's code and from that of Maimonides by basing the preponderance of its laws on decisions by post-Talmudic rabbinical authorities rather than on the Talmud itself.

Jacob ben Machir ibn Tibbon: *see* ibn Tibbon, Jacob ben Machir.

Jacob ben Zebi: *see* Emden, Jacob Israel.

Jacob Isaac OF PRZYSUCHA: *see* Przysucha, Jacob Isaac ben Asher.

Jacob Joseph OF POLONNOYE, in full JACOB JOSEPH BEN TZEVI HA-KOHEN KATZ OF POLONNOYE (d. *c.* 1782), rabbi and preacher, the first theoretician and literary propagandist of Jewish Ḥasidism.

Jacob Joseph was a rabbi in the large Jewish community at Shargorod, in Podolia; after he came under the influence of the Baʿal Shem Ṭov, the founder of Ḥasidism, he was expelled (*c.* 1748) from Shargorod. He was subsequently rabbi of Rashkov, Nemirov, and ultimately Polonnoye, where he remained until his death.

As a writer, he contributed significantly to the spread of Ḥasidism. His first and main work was the controversial *Toldot Yaʿaqov Yosef* (1780), which not only related the teachings of the Baʿal Shem Ṭov but also criticized traditional Jewish leadership and values. The work thus provoked anti-Ḥasidic sentiment and was burned by some opponents of the movement. Other works include homilies and commentary on books of the Bible, including *Ben Porat Yosef,* on Genesis; *Ẓefenat Paʿneʿaḥ,* on Exodus; and *Ketonet Passim,* on Leviticus and Numbers.

Jacoba OF BAVARIA, Dutch JACOBA VAN BEIEREN, French JACQUELINE DE BAVIÈRE (b. July 25, 1401, Le Quesnoy, Flanders—d. Oct. 9, 1436, Teilingen, near Leiden, Neth.), duchess of Bavaria, countess of Holland, Zeeland, and Hainaut, whose forced cession of sovereignty in the three counties to Philip the Good, duke of Burgundy, in 1428, consolidated Burgundian dominion in the Low Countries.

Jacoba, the only daughter and heiress of William, count of Zeeland, Holland, and Hainaut, was married in 1415 to John of



Jacoba, 15th-century painting by an unknown artist; in the Rijksmuseum, Amsterdam

By courtesy of the Rijksmuseum, Amsterdam

Touraine, who died two years later. Jacoba's claim to succeed her father, who also died in 1417, was not recognized by the German king Sigismund, who instead supported her paternal uncle John of Bavaria.

After marrying her cousin, John IV, duke of Brabant, in March 1418, Jacoba fought against John of Bavaria in Holland. Her uncle John the Fearless, duke of Burgundy, settled the dispute in 1419, but John of Bavaria gained control of Holland and Zeeland the following year, when the counties were mortgaged to him by John of Brabant.

Disgusted by her husband's actions, Jacoba left for Hainaut and, after repudiating her marriage in 1421, went to England, where she was welcomed by Henry V. In 1422 she married Humphrey, duke of Gloucester, whose intrusion into the Low Countries two years later destroyed the English–Burgundian alliance.

Jacoba returned to Hainaut in 1424 with Humphrey and an army, but Humphrey deserted to England in 1425. Jacoba was subsequently interned by her opponent, Philip the Good, duke of Burgundy, at Ghent.

After Philip had gained possession of Holland and Zeeland (1425), Jacoba escaped and for the next three years contested Philip's power in the Netherlands. Her hopes dimmed, however, after the Pope declared her marriage to Humphrey illegal (Jan. 9, 1428); she made a settlement with Philip on July 3, 1428, in the Treaty of Delft, which maintained Jacoba's title of countess but transferred administration of her three counties (Holland, Zeeland, and Hainaut) to Philip and stipulated that she was not to marry without his consent.

After Philip had mortgaged the revenues of Holland and Zeeland to three nobles of the Borselen family from Zeeland (1430), Jacoba secretly married one of them—Francis, lord of Zuilen and St. Maartensdijk—probably as part of a plot to overthrow Burgundian sovereignty in Holland. Philip then imprisoned Francis (October 1432) and forced Jacoba to abdicate her countship (1433). She later became duchess in Bavaria and countess of Ostrevant (in Bohemia), and was allowed to remarry Francis in 1434. She died childless.

Jacobābād, city and district, Sukkur Division, Sind Province, Pakistan. The city is the district headquarters and is a junction of the Pakistan Western Railway and main roads through Sind. It was founded in 1847 on the site of the village of Khānghar by Gen. John Jacob, the district's first deputy commissioner. Jacob, who laid out the modern city, is commemorated by monuments, and even his horse has been memorialized by a mud pyramid. The city was incorporated as a municipality in 1875. It is noted for its consistently high temperatures, with readings (May–June) sometimes exceeding 126° F (52° C) in the shade.

Manufactures include cotton carpets (*ghālīchah*), lacquered wooden toys and lamps, and embroidery. Grain markets and milling mark Jacobābād's position at the centre of a rice- and grain-cultivating region. The city has several public parks, Victoria clock tower (1887), a municipal broadcasting station, and government colleges affiliated with the University of Sind.

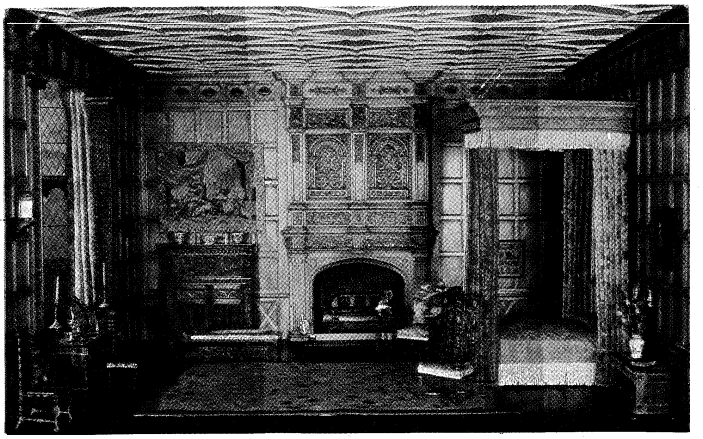
Jacobābād District (area 2,038 sq mi [5,278 sq km]), formerly the Upper Sind Frontier District, occupies an alluvial plain along the Indus River in the east, protected from flood by the Kashmor embankment, and a desolate clay desert (*pakki*) in the west; to the north are the Bugti Hills. Cultivation is by means of canal irrigation. Millet, gram (chick-pea), rice, wheat, and oilseeds are the chief crops; rice is milled locally. Pop. (1981 prelim.) town, 80,000; district, 1,013,000.

Jacobean age (from Latin Jacobus: James), period of visual and literary arts during the reign of James I of England (1603–25). The distinctions between the early Jacobean and the preceding Elizabethan styles are subtle ones, often merely a question of degree, for although the dynasty changed, there was no immediate stylistic revolution.

Jacobean builders expressed a marked preference for the rectangular "U" and "H" plans for domestic architecture and insisted that facade elevations be rigidly symmetric. They incorporated elements from Italian Mannerist architecture and also made full use of the stucco strapwork (a decorative design consisting of narrow fillets, or bands, folded, crossed, and sometimes interlaced) of the French school of Fontainebleau (a group of artists, largely Italian, who evolved a distinctive Mannerist style at the court of Francis I).

In architecture the stylistic revolution occurred in 1615, when the King appointed his former masque set designer, Inigo Jones, to the office of surveyor. Elizabeth I had preferred to be entertained at the great houses of her favourites (and at their expense), but James preferred to act as host. Jones was engaged, therefore, in the building or rebuilding of numerous royal houses and other structures in London, not only during the reign of James I but also during that of Charles I (1625–49). The gulf separating the work of Inigo Jones from the earlier architecture of James's reign is too wide to be bridged by the designation "Jacobean style," however, because the style that Jones espoused was entirely new to England, a style based on the theories and works of the Italian architect Andrea Palladio (*see* Palladianism).

During this period, painting and sculpture lagged behind architecture in accomplishments because there was no outstanding practitioner of either. For this reason, a good case can be made for a continuous, if mediocre, Jacobean style in these arts. The chief of the early Jacobean painters was the talented miniaturist Isaac Oliver. Most of the Jacobean portraitists, like the sculptors, were foreign; for example, Marcus Gheerhaerts the Younger, Paul van Somer, Cornelius Johnson, and Daniel Mytens. Their efforts were surpassed by those of the Flemish painters Peter Paul Rubens and



Model of a Jacobean "withdrawing room" or bedroom, based upon an interior in Knole House, Kent, Eng.; in the Art Institute of Chicago

By courtesy of Thorne Rooms in Miniature, the Art Institute of Chicago

Anthony Van Dyck, who worked in England during the reign of Charles I.

In literature, too, many themes and patterns were carried over from the preceding Elizabethan era. Though rich, Jacobean literature is often darkly questioning. Shakespeare's greatest tragedies were written between about 1601 (when *Hamlet* was first performed) and his death in 1616. Other Jacobean dramatic writers became preoccupied with the problem of evil: the plays of John Webster, Cyril Tourneur, Thomas Middleton, and William Rowley induce all the terror of tragedy but little of its pity. Comedy was best represented by the acid satire of Ben Jonson. Another feature of drama at this time, however, was the development of the extravagant courtly entertainment known as the masque, which reached its literary peak in the work of Jonson. Jonson's comparatively lucid and graceful verse and the writings of his Cavalier successors constituted one of the two main streams of Jacobean poetry. The other consisted of the intellectual complexity of John Donne and the Metaphysical poets. In prose, Francis Bacon, Robert Burton, and Lancelot Andrewes were some of the writers who displayed a new toughness and flexibility of style. The monumental prose achievement of the era was the great King James Version of the Bible, which first appeared in 1611; however, it was largely the fruit of work done during the Elizabethan period.

Jacobi, Abraham (b. May 6, 1830, Hartum, Westphalia—d. July 10, 1919, Bolton Landing, N.Y., U.S.), German-born physician who established the first clinic for diseases of children in the U.S. (1860) and is considered the founder of U.S. pediatrics.

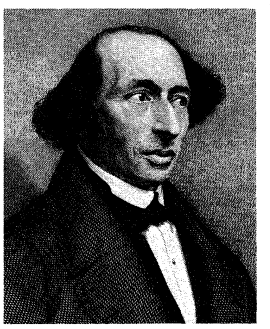
Because he took part in the German revolutionary movement (1848), Jacobi was imprisoned in Berlin and Cologne during the year of his graduation in medicine (1851). In 1853 he began his medical practice in New York City and became professor of children's diseases at the New York Medical College in 1860, holding the first chair in the subject founded in the U.S. He later held professorships at New York University (1865–70) and the College of Physicians and Surgeons of Columbia University (1870–1902).



Abraham Jacobi

By courtesy of Columbia University

Jacobi, Friedrich Heinrich (b. Jan. 25, 1743, Düsseldorf, Duchy of Berg—d. March 10, 1819, Munich), German philosopher, major exponent of the philosophy of feeling (*Gefühlsphilosophie*) and a prominent critic of Rationalism, especially as espoused by Spinoza.



Friedrich Jacobi, engraving by N. Afinger

By courtesy of the New York Public Library, Astor, Lenox and Tilden Foundations

Succeeding his father as head of a sugar factory in 1764, Jacobi joined the governing council of the duchies of Jülich and Berg (1772). With the German poet Christoph Wieland, he founded (1773) the periodical *Der Teutsche Mercur,* in which he published part of his philosophical novel *Eduard Allwills Briefsammlung* (1776; "Edward Allwill's Collected Letters") and part of another novel, *Woldemar: ein Seltenheit aus der Naturgeschichte* (1777; "Woldemar: A Rarity of Natural History"). In 1779 he became privy councillor at the Bavarian court and the following year met the German writer Gotthold Lessing.

After Lessing told him he knew only the philosophy of Spinoza, Jacobi began to study Spinozism. Finding its Rationalistic approach repulsive, he denounced it in *Über die Lehre des Spinoza, in Briefen an den Herrn Moses Mendelssohn* (1785; "On the Teachings of Spinoza, in Letters to Moses Mendelssohn"). With other Enlightenment thinkers, Mendelssohn attacked Jacobi's notion of belief as obscurantist. Jacobi replied in *David Hume über den Glauben, oder Idealismus und Realismus* (1787; "David Hume on Belief, or Idealism and Realism"), showing his concept of belief to be no different from that held by such advanced philosophers as Hume.

To Jacobi, belief meant immediate conviction, not only of the reality of sense experience but also of truths present in the heart or in the spirit of man. Specifically disclaiming any intent to construct a philosophical system that would have necessitated the strict use of reason, Jacobi maintained that felt truths would be endangered by submitting them to mental processes.

In 1794 Jacobi moved from his home in Pempelfort to Hamburg in order to avoid the French Revolutionary armies, and in 1799 he detailed his theistic views in *Jacobi an Fichte.* Three years later he strongly criticized Immanuel Kant in his *Über das Unternehmen des Kritizismus* ("On the Enterprise of Criticism"). Kant had created a dualism of sensibility and understanding that denied the possibility for the limited, sense-bound human mind to understand transcendent phenomena, but Jacobi defended an intellectual intuition that began in feeling and resulted in faith. Because he did not limit his concept of knowledge to the rational processes of the mind, he did not find it necessary to deny, as Kant did, the possibility of knowing God.

After travelling for four years, Jacobi settled in Munich (1805), where he served as president of the Bavarian Academy of Science (1807–12). A collected edition of his works, which he began, was completed by F. Koppens, 6 vol. (1812–25).

Jacobi, Karl Gustav Jacob (b. Dec. 10, 1804, Potsdam, Prussia—d. Feb. 18, 1851, Berlin), German mathematician who, with Niels Henrik Abel of Norway, founded the theory of elliptic functions.

In 1827 Jacobi became extraordinary professor and in 1829 ordinary professor of mathematics at the University of Königsberg. He first became known through his work on number theory, which gained the admiration of Carl Gauss, the greatest mathematician of his day. Unaware of similar endeavours by Abel, Jacobi formulated a theory of elliptic functions based on four theta functions. The quotients of the theta functions yield the three Jacobian elliptic functions: sn z, cn z, and dn z. His results in elliptic functions were published in *Fundamenta Nova Theoriae Functionum Ellipticarum* (1829; "New Foundations of the Theory of Elliptic Functions"). In 1832 he demonstrated that just as elliptic functions can be obtained by inverting elliptic integrals, hyperelliptic functions can be obtained by inverting hyperelliptic integrals. This success led him to the formation of the theory of Abelian functions of p variables (where p is greater than or equal to 2).

Jacobi's *De Formatione et Proprietatibus Determinantium* (1841; "Concerning the Structure and Properties of Determinants") made pioneering contributions to the theory of determinants. He invented the functional determinant (formed from the n^2 differential coefficients of n given functions with n independent variables) that bears his name and has played an important part in many analytical investigations.

Jacobi carried out important research in partial differential equations of the first order and applied them to the differential equations of dynamics. His *Vorlesungen über Dynamik* (1866; "Lectures on Dynamics") relates his work with differential equations and dynamics. The Hamilton–Jacobi equation plays a significant role in the presentation of quantum mechanics. He also made important studies of Abelian transcendents and the applications of elliptic functions to the theory of numbers.

Jacobi, Mary Putnam, née MARY CORINNA PUTNAM (b. Aug. 31, 1842, London—d. June 10, 1906, New York City), U.S. physician

considered to be the foremost woman doctor of her era.

A daughter of the publisher G.P. Putnam, she graduated from the Female (later Woman's) College of Pennsylvania in 1864. After working at the New England Hospital for Women and Children in Boston, she became in 1868 the first woman admitted to the École de Médicine in Paris. On her return to the United States in 1871 she taught at the Woman's Medical College of the New York Infirmary for Women and Children. She was one of the first women admitted to the American Medical Association, and her concern with the inferior status of women doctors led her to organize the Association for the Advancement of the Medical Education of Women in 1872. In 1873 she married Abraham Jacobi, a physician.

An ardent suffragist and reformer, Jacobi published works that range from *"Common Sense" Applied to Woman Suffrage* (1894) to *Physiological Notes on Primary Education and the Study of Language* (1899). She wrote medical textbooks and more than 100 scientific articles on various topics, including physiology, pediatrics, neurology, pathology, and medical education.

Jacobin Club, byname JACOBINS, formally (1789–92) SOCIETY OF THE FRIENDS OF THE CONSTITUTION, or (1792–94) SOCIETY OF THE JACOBINS, FRIENDS OF LIBERTY AND EQUALITY, French CLUB DES JACOBINS, or SOCIÉTÉ DES AMIS DE LA CONSTITUTION, or SOCIÉTÉ DES JACOBINS, AMIS DE LA LIBERTÉ ET DE L'ÉGALITÉ, the most famous political group of the French Revolution, which became identified with extreme equalitarianism and violence and which led the Revolutionary government from mid-1793 to mid-1794.

The Jacobins originated as the Club Breton at Versailles, where the deputies from Brittany to the Estates-General (later the National Assembly) of 1789 met with deputies from other parts of France to concert their action. The group was reconstituted, probably in December 1789, after the National Assembly moved to Paris, under the name of Society of the Friends of the Constitution, but it was commonly called the Jacobin Club because its sessions were held in a former convent of the Dominicans, who were known in Paris as Jacobins. Its purpose was to protect the gains of the Revolution against a possible aristocratic reaction. The club soon admitted nondeputies—usually prosperous bourgeois and men of letters—and acquired affiliates throughout France. By July 1790 there were about 1,200 members in the Parisian club and 152 affiliate clubs.

In July 1791 the Jacobin Club split over a petition calling for the removal of Louis XVI after his unsuccessful attempt to flee France; many of the moderate deputies left to join the rival club of the Feuillants (*see* Feuillants, Club of the). Maximilien de Robespierre was one of the few deputies who remained, and he assumed a position of prominence in the club.

After the overthrow of the monarchy, in August 1792 (in which the Jacobin Club, still reluctant to declare itself republican, did not have a direct role), the club entered a new phase as one of major groups directing the Revolution. With the proclamation of the republic in September, the club changed its name to Society of the Jacobins, Friends of Liberty and Equality. It acquired a democratic character with the admission of the leftist Montagnard deputies in the National Convention (the new legislature) and also a more popular one as it responded to the demands of the Parisian working and artisan class. Through the early phase of the Convention, the club was a meeting place for the Montagnards, and it agitated for the execution of the king (January 1793) and for the overthrow of the moderate Girondins (June 1793).

With the establishment of the Revolutionary dictatorship, beginning in the summer of 1793, the local Jacobin clubs became instruments of the Reign of Terror. (In 1793 there were probably 5,000 to 8,000 clubs throughout France, with a nominal membership of 500,000.) The clubs, as part of the administrative machinery of government, had certain duties: they raised supplies for the army and policed local markets. Often local government officials were replaced with members of clubs. As centres of public virtue, the clubs watched over people whose opinions were suspect, led the dechristianizing movement, and organized Revolutionary festivals.

The Parisian club was increasingly associated with Robespierre, who dominated the Revolutionary government through his position on the Committee of Public Safety. It supported Robespierre in his attacks on the enemies of the Revolution and helped him resist the growing demands of the discontented workers for a controlled economy. After the fall of Robespierre on 9 Thermidor, year II (July 27, 1794), the Parisian club, now a symbol of dictatorship and terror, was temporarily closed. It reopened as a centre of opposition to the Thermidorian government, but it was permanently closed on 21 Brumaire (Nov. 11, 1794).

The Club du Panthéon in 1795 and Club du Manège of 1799 briefly revived the Jacobin spirit, while some local clubs lasted until the year VIII (1799–1800) despite their having been officially banned.

The name Jacobin was also applied to radicals in England and other countries in the period of the French Revolution.

Jacobite, in British history, a supporter of the exiled Stuart king James II (Latin Jacobus) and his descendants after the Revolution of 1688. The political importance of the Jacobite movement extended from 1688 to 1745. The Jacobites, especially under William III and Queen Anne, could offer a feasible alternative title to the crown, and the exiled court in France (and later in Italy) was often frequented by disgruntled soldiers and politicians. After 1714 the Whigs' monopoly of power led many Tories into intrigues with the Jacobites.

The movement was strong in Scotland and Wales, where support was primarily dynastic, and in Ireland, where it was mainly religious. Roman Catholics and Anglican Tories were natural Jacobites. The Tory Anglicans had doubts about the legality of the events of 1688–89, whereas the Roman Catholics had more to hope for from James II and James Edward the Old Pretender, who were firm Roman Catholics, and Charles Edward, the Young Pretender, who vacillated for political reasons but was at least tolerant.

Within 60 years after the Revolution of 1688, five attempts at restoration were made in favour of the exiled Stuarts. In March 1689 James II himself landed in Ireland, and a parliament summoned to Dublin acknowledged him as king. But his Irish-French army was defeated by William III at the Battle of the Boyne (July 1, 1690), and he returned to France. A second French invasion misfired completely (1708).

The third attempt, the Fifteen Rebellion, was a serious affair. In the summer of 1715 John Erskine, 6th Earl of Mar, an embittered ex-supporter of the Revolution, raised the Jacobite clans and the Episcopal northeast for "James III and VIII" (James Edward, the Old Pretender). A hesitant leader, Mar advanced only as far as Perth and wasted a considerable amount of time before challenging the Duke of Argyll's smaller force; the result was the drawn Battle of Sheriffmuir (Nov. 13, 1715), and at the same time the hopes of a southern rising melted away at Preston. James arrived too late to do anything but lead the flight of his chief supporters to France. The fourth Jacobite effort was a west Scottish Highland rising, aided by Spain, which was quickly aborted at Glenshiel (1719).

The final rebellion, the Forty-five Rebellion, was, in retrospect, the most romanticized but also the most formidable. The outlook in 1745 seemed hopeless, for another French invasion, planned for the previous year, had miscarried and little help could be expected from that quarter. The number of Scottish Highlanders prepared to turn out was smaller than in 1715, and the lowlands were apathetic or hostile; but the charm and daring of the young prince, Charles Edward (later called the Young Pretender), and the absence of the government troops (who were fighting on the Continent) produced a more dangerous rising. Within a few weeks Charles was master of Scotland and victor of Prestonpans (September 21); though utterly disappointed as regards an English rising, he marched south as far as Derby in England (December 4) and won another battle (Falkirk, Jan. 17, 1746) before retreating to the Highlands. The end came on April 16, when William Augustus, Duke of Cumberland, crushed the Jacobite army at the Battle of Culloden, near Inverness. About 80 of the rebels were executed; many more were hunted down and wantonly killed or driven into exile; and Charles, hounded for months by government searching parties, barely escaped to the Continent (September 20).

Jacobitism thereafter declined as a serious political force but remained as a sentiment. "The king over the water" gained a certain sentimental appeal, especially in the Scottish Highlands; and a whole body of Jacobite songs came into being. By the late 18th century the name had lost many of its political overtones; and George III even gave a pension to the last pretender, Henry Stuart, Cardinal York.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Jacobs, Helen Hull (b. Aug. 6, 1908, Globe, Ariz, U.S.), American tennis player and writer, who, in the 1920s and '30s, became known for her persistence and on-court rivalry with Helen Wills Moody.

Jacobs was the national junior tennis champion in 1924–25 and attended the University of California at Berkeley from 1926 to 1929. She was defeated by Moody in the 1928 finals at Forest Hills and in the Wimbledon finals in 1929 and 1932. Her first adult major championship came in 1932, when she won the U.S. title; and Jacobs dominated Forest Hills for the next four years, winning the women's singles each year through 1935 and winning the women's doubles in 1932, 1934, and 1935 and mixed doubles in 1934. Perhaps her most memorable tournament at Forest Hills was the 1933 U.S. championship, in which she defeated Moody on a default in the third set. With Jacobs winning the set 3–0 Moody complained about back pain and conceded. Jacobs won her first Wimbledon title in 1936. She played on the U.S. Wightman Cup team for 12 years and was elected to the International Tennis Hall of Fame in 1962.

During her career in tennis she became a writer, her first books being *Modern Tennis* (1933), *Improve Your Tennis* (1936), and *Beyond the Game: An Autobiography* (1936). Later she wrote fiction (*e.g., Storm Against the Wind* [1944]) as well as nonfiction, mainly about tennis and physical fitness.

Jacobs, Jane, *née* BUTZNER (b. May 4, 1916, Scranton, Pa., U.S.), Canadian urbanologist

noted for her clear and original observations on urban life and its problems.

After graduating from high school, she became a reporter on the *Scranton Tribune,* moving to New York City about a year later. While working as a free-lance writer, she met and married an architect, Robert Hyde Jacobs. Already keenly interested in city neighbourhoods and their vitality, both as a writer and—increasingly—as a community activist, she explored urban design and planning at length with her husband. In 1952 she became an associate editor of *Architectural Forum,* where she worked for a decade. Her first full-length book, *The Death and Life of Great American Cities* (1961), is a brash and passionate reinterpretation of the multiple needs of modern urban places. Translated into Japanese and several European languages, it established her as a force to be reckoned with by planners and economists. *The Economy of Cities* (1969) discussed the importance of diversity to a city's prosperity, and it, too, challenged much of the conventional wisdom on urban planning. Jacobs moved with her husband to Canada and later became a Canadian citizen. A later work is *Cities and the Wealth of Nations* (1984).

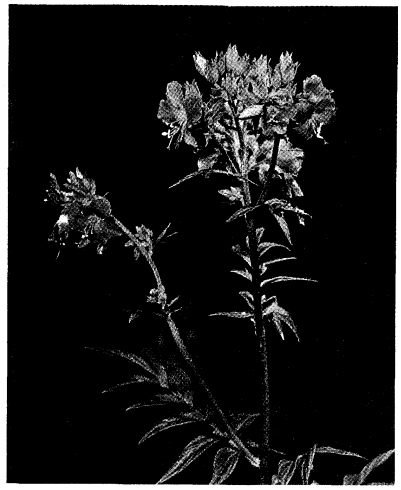
Jacobs, Joseph (b. Aug. 29, 1854, Sydney, N.S.W. [Australia]—d. Jan. 30, 1916, Yonkers, N.Y., U.S.), Australian-born English folklore scholar, one of the most popular 19th-century adapters of children's fairy tales. He was also a historian of pre-expulsion English Jewry (*The Jews of Angevin England,* 1893), a historian of Jewish culture (*Studies in Jewish Statistics,* 1891), and a literary scholar.

After attending primary school Sydney, Jacobs immigrated to England in 1872. A graduate (1876) of the University of Cambridge, Jacobs was secretary (1882–1900) of the Russo-Jewish Committee (London), formed to improve the wretched social and political conditions of Jews in Russia. He edited the journal *Folk-Lore* from 1889 to 1900. A prolific author, Jacobs is generally best known for such scholarly and popular works on folklore as *The Fables of Aesop* (1894), *English Fairy Tales* (1890), *Celtic Fairy Tales* (1892), *Indian Fairy Tales* (1892), *The Book of Wonder Voyages* (1896), and *Europa's Fairy Book* (1916). In 1900 he immigrated with his family to the United States, where he worked as revising editor of the *Jewish Encyclopedia.* He later taught literature at the Jewish Theological Seminary of America and edited the magazine *American Hebrew* (1906–16).

Jacobs, W(illiam) W(ymark) (b. Sept. 8, 1863, London—d. Sept. 1, 1943, London), English short-story writer best known for his classic horror story "The Monkey's Paw."

His early home was a house on a Thames River wharf, where his father was manager. A landsman himself, Jacobs drew on his boyhood memories of seafaring men and dockworkers to create the stories that were to establish him as a writer. His first volume, *Many Cargoes* (1896), had an immediate success and was followed by two others, *The Skipper's Wooing* (1897) and *Sea Urchins* (1898). Though his seamen are rarely at sea, their adventures or misadventures ashore provide many thrilling moments. "The Monkey's Paw" (1902), a tale of superstition and terror unfolding within a realistic, Dickensian setting of domestic warmth and coziness, is a felicitous example of Jacobs' ability to combine everyday life and gentle humour with exotic adventure and dread. Dramatized as a one-act play by Louis Napoleon Parker, it was first produced at the London Haymarket in 1903. An omnibus, *Snug Harbour,* containing some 17 volumes of Jacobs' work, was published in 1931.

Jacob's ladder, also called GREEK VALERIAN, any of about 25 species of the genus *Polemonium* of the family Polemoniaceae, native to



Jacob's ladder (*Polemonium caeruleum*)
A to Z Botanical Collection—EB Inc.

temperate areas in North and South America and Eurasia. Many are valued as garden flowers and wildflowers. They have loose, spike-like clusters of drooping blue, violet, or white, funnel-shaped, five-petaled flowers and alternate, pinnately (featherlike) compound leaves. *Polemonium caeruleum* is native to European woodlands and mountains and widely grown as a garden flower. It can grow to 90 cm (3 feet) tall and has large blue or white flowers.

Jacobsen, Arne (b. Feb. 11, 1902, Copenhagen—d. March 24, 1971, Copenhagen), Danish architect and designer of many important buildings in an austere modern style; he is known internationally for his industrial design, particularly for his three-legged stacking chair (1952) and his "egg" chair (1959), the back and seat of which were formed of cloth-covered plastic.

Jacobsen received his diploma in 1928 from the Copenhagen Academy of Arts. His first buildings date from 1930, but his first major work was the Bellavista Housing Estate (1933) at Klampenborg, near Copenhagen, where each house offers a view of the sea.

Important Jacobsen works during the 1950s include a group of houses at Søholm (1950–55), the Jesperson Building (1955) in Copenhagen, Rødovre Town Hall (1954–56), and



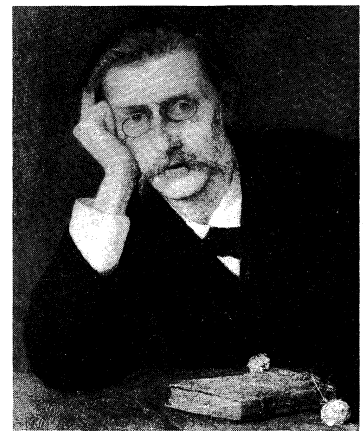
Arne Jacobsen, 1960
By courtesy of the Royal Danish Ministry for Foreign Affairs

the SAS Building (1959), Copenhagen's first skyscraper, for which he did the interior design as well as the architecture.

Like many of Jacobsen's buildings, those designed for St. Catherine's College, Oxford University (1964), recall his theory that "economy plus function equals style." The starkly modern bell tower consists mainly of two tall planes. For St. Catherine's he also designed furnishings such as silverware and china, chairs, lamps, and door handles.

Jacobsen, Jens Peter (b. April 7, 1847, Thisted, Jutland, Den.—d. April 30, 1885, Thisted), Danish novelist and poet who inaugurated the naturalist movement in Denmark and was himself its most famous representative.

A student of the natural sciences, he became a follower of Charles Darwin and translated into Danish both *On the Origin of Species,* in 1871–73, and *The Descent of Man,* in 1874. His own literary work was limited to two novels, some short stories, and a few poems.



Jens Peter Jacobsen, detail of an oil painting by E. Josephson, 1879; in the Nationalhistoriske Museum, Frederiksborg, Den.
By courtesy of the Nationalhistoriske Museum, Frederiksborg, Den.

He struggled for his last 12 years with tuberculosis until it overcame him. During those years he produced almost all of his works in slow and painful daily stints. He was a master of description, attempting to portray all facets of reality as meticulously as he had observed them in nature.

While at the University of Copenhagen, he heard the lectures of Georg Brandes, an advocate of realism, naturalism, and socially conscious art. Jacobsen's story collection *Mogens* (1872; Eng. trans., 1921) is considered the first Naturalist writing in Danish literature and was greatly admired by Brandes, who hailed him as one of "the men of the modern breakthrough." Jacobsen's first novel, *Fru Marie Grubbe* (1876; Eng. trans., 1914, 1975), is a psychological study of a 17th-century woman whose natural instincts are stronger than her social instincts and result in her descent on the social scale from a viceroy's consort to the wife of a ferryman. The book was first attacked by the conservative press for its crass realism. *Niels Lyhne* (1880; Eng. trans., 1896), his second novel, is a contemporary story of a man's vain struggle to acquire a philosophy of life. His poems were collected and published posthumously in 1886 (Eng. trans., 1920).

jacobsite, manganese iron oxide mineral, a member of the magnetite (*q.v.*) series of spinels.

Jacobson, Dan (b. March 7, 1929, Johannesburg, S.Af.), South African-born novelist and short-story writer.

Jacobson was the son of eastern European Jewish immigrants. After graduation from the University of Witwatersrand (B.A., 1949), he worked in public relations and in the family

cattle-feed-milling business. He then lived and worked in Israel before going to live in England in 1954. In 1974 he became a lecturer and in 1979 a reader in English at University College, London.

In England, distanced from the South African experience, he wrote with both humour and pathos of his troubled land of birth. His first novels—*The Trap* (1955), *A Dance in the Sun* (1956), and *The Price of Diamonds* (1957)—form a complex mosaic that provides a peculiarly incisive view of racially divided South African society. Much of his best work is in the short stories, especially in the collections *The Zulu and the Zeide* (1959) and *Beggar My Neighbor* (1964).

With *The Beginners* (1965), a long generational novel paralleling his own family history, Jacobson began to withdraw from writing about South Africa. *The Rape of Tamar* (1970) is a biblical novel, and *The Confessions of Josef Baisz* (1977) is set in a country only "something like" South Africa. His later books, however, continue to utilize both his political consciousness and his gift for irony.

Jacobson, Saul: *see* Steinberg, Saul.

Jacobson's organ, also called VOMERONASAL ORGAN, region of chemically sensitive nerve endings in the roof of the mouth of many vertebrate animals (amphibians, lizards and snakes, some mammals). It is most strongly developed in snakes, in which it is employed to supplement weak nasal chemoreceptors in evaluating airborne chemicals. Odours are sampled by flicking out the tongue and retracting it across the Jacobson's organ, where the molecules acquired by the tongue's moist surface are detected.

Jacobus DE VORAGINE, also called JACOB OF VORAGINE (b. 1228/30, Varazze, near Genoa—d. July 13/14, 1298, Genoa), archbishop of Genoa, chronicler, and author of the *Golden Legend.*

He became a Dominican in 1244. After gaining a reputation throughout northern Italy as a preacher and theologian, he was provincial of Lombardy (1267–78 and 1281–86) and archbishop of the independent city of Genoa (1292) until his death. He was beatified in 1816 for his work as a peacemaker between Guelphs (pro-papal party) and Ghibellines (pro-imperial), and his feast day in the Dominican order is July 13.

His works include sermons on Gospel readings, saints' days, and the Virgin Mary; a chronicle of Genoa; and the *Legenda aurea* (*Golden Legend,* also known as the *Lombardica historia*). This book is a collection of saints' lives, of accounts of events in the lives of Christ and of the Virgin Mary, and of information about holy days and seasons, the whole arranged as readings (Latin: *legenda*) for the church year. Immensely popular in the Middle Ages, it was translated into all western European languages and gradually much enlarged. William Caxton's translation was one of the first books printed in English (1483). Medieval artists found the *Golden Legend* a storehouse of events and persons to be illustrated. But the miraculous stories it contains and its natural lack of historical perspective rendered the book unacceptable at the Reformation and after the rise of the new learning, so it then went completely out of fashion.

Jacoby, Oswald (b. Dec. 8, 1902, Brooklyn, N.Y., U.S.—d. June 27, 1984, Dallas, Texas), U.S. Bridge player and authority, actuary, and skilled player of backgammon and of games generally.

Jacoby began to play Whist at the age of six and Poker at the age of eight. By lying about his age, he enlisted in the Army in World War I at the age of 15 but spent most of his duty playing Poker. He left Columbia College (New York City), where he played Chess, in his junior year to pass his examination as a certified public accountant. Jacoby worked for two insurance companies in the 1920s. Meanwhile, he played Bridge, winning the Goldman Trophy, the oldest major pairs competition, with George Reith, a stockbroker, in 1929. A sizable amount of money he had accumulated disappeared in the stock market crash of 1929, and he never again held a salaried position as an actuary.

He became internationally known in the Bridge world, partnered with Sidney Lenz, as a member of the Four Horsemen and Four Aces teams of the 1930s. In 1936 he became the second Bridge life master (David Bruce was the first) of the American Contract Bridge League, and in 1941 he became the all-time master-point winner as a result of his success in national tournaments.

During World War II and again during the Korean War, Jacoby served as a counter-intelligence officer in the Navy, working in both wars on enemy codes and in the latter on computer operations as well. After World War II, he wrote a syndicated Bridge column. He won the McKenney Trophy, awarded annually for the player winning the most master points (1959, 1961, 1962) and led the all-time master-point list (1962–68). In 1963 he was the first player to earn more than 1,000 points in a year, and by 1967 he surpassed the total 10,000-point figure. He retired from competition in 1983. He instituted bidding manoeuvres and wrote numerous books on Bridge, Canasta, Poker, and other card games.

Jacopo DA LENTINI (Italian poet): *see* Giacomo da Lentini.

Jacopo DA PONTE: *see* Bassano, Jacopo.

Jacopo DELLA QUERCIA (b. *c.* 1374, Siena, Republic of Siena—d. Oct. 20, 1438, Bologna, Papal States), one of the most original Italian sculptors of the early 15th century.



"The Creation of Eve," marble relief on the central portal of the facade of S. Petronio, Bologna, by Jacopo della Quercia, begun 1424

Anderson—Alinari from Art Resource/EB Inc.

In *c.* 1406 he carved the tomb of Ilaria del Carretto in the cathedral of Lucca. The effigy and sarcophagus alone survive. In 1408, at Ferrara, he made the statue of the Virgin and Child, still existing in the Museo dell'Opera del Duomo, and a year later he received the commission for the Fonte Gaia in the Piazza del Campo at Siena, now replaced by a copy; the original is in the loggia of the Palazzo Pubblico. The scheme of this celebrated and highly original fountain seems to have been repeatedly modified, the most effective work being done between 1414 and 1419. At the same time, Quercia was engaged on the statue of an Apostle for the exterior of the cathedral at Lucca, the Trenta altar for the church of S. Frediano in Lucca, and tomb slabs for Lorenzo Trenta and his wife. In 1417 he undertook to do two gilt bronze reliefs for the baptismal font in S. Giovanni in Siena. Being a dilatory artist, he completed only the "Zacharias in the Temple," the second being assigned to Donatello. His main work is the sculpture around the portal of S. Petronio at Bologna. The 10 scenes from Genesis, 5 scenes from the early life of Christ, the reliefs of prophets, and the statues of the Virgin and Child with SS. Petronius and Ambrose give the sense of depth associated with the paintings of Masaccio.

In 1435 Quercia was appointed superintending architect of the Siena cathedral, for which he was employed on the decoration (unfinished) of the Cappella Casini. Quercia is a mysterious and ambivalent artist, but he carried Sienese sculpture to its height and influenced subsequent Sienese painters.

Jacopone DA TODI, original name JACOPO DEI BENEDETTI (b. *c.* 1230, Todi, Duchy of Spoleto—d. Dec. 25, 1306, Collazzone), Italian religious poet, author of more than 100 mystical poems of great power and originality, and probable author of the Latin poem *Stabat mater dolorosa.*

Born of a noble family and trained for the law, he practiced until his wife's sudden death at a party around 1268 precipitated his total conversion to an ascetic life. He disposed of his belongings, dedicated himself to God in absolute poverty, and became (1278) a lay brother of the Franciscan order. As a member of the Spiritual faction of his order, a group espousing uncompromising poverty, Jacopone wrote violent satirical verse against Pope Boniface VIII, and then signed the manifesto (1297) that declared Boniface's election invalid. Boniface retaliated by first excommunicating and then (1298) imprisoning Jacopone for life. After Boniface died in 1303, Jacopone was released by the new pope, Benedict XI. Jacopone retired to the monastery at Collazzone, where he died three years later. His tomb is in the medieval church of S. Fortunato, Todi.

Most of Jacopone's poetic work is in the Italian vernacular. A notable exception is the Latin *Stabat mater dolorosa* that has long been attributed to him. That poem was added to the Roman liturgy in the 18th century and has been set to music by many composers, including Josquin des Prez, Palestrina, Giovanni Battista Pergolesi, Gioacchino Rossini, and Antonín Dvořák. His many *laudi spirituali* ("spiritual canticles"), some written during his imprisonment, are vivid and original outpourings of many moods, ranging from bitter anger to mystical ecstasy.

Some English translations of his work are included in Evelyn Underhill's *Jacopone da Todi, Poet and Mystic* (1919).

Jacotot, Jean-Joseph (b. March 4, 1770, Dijon, Fr.—d. July 30, 1840, Paris), French pedagogue and innovator of a universal method of education.

Jacotot began his career as a teacher and mathematician and was appointed subdirector of the École-Polytechnique in Dijon (1795), where he became, in succession, professor of the method of sciences, of Latin and Greek literature, and of Roman law. During the Napoleonic wars he entered the army and rose to the rank of captain of artillery; he then became military secretary and director of the military École Normale and was elected a member of the Chamber of Deputies. In 1818 he became lecturer on French language and literature at the University of Louvain in Belgium.

On the basis of his unusually diverse experience, Jacotot wrote *Enseignement universel* (1823; "Universal Teaching Method"), in which he advanced an egalitarian view of man in such maxims as "All human beings are equally capable of learning" and "Everybody can be proficient in anything to which he turns his attention." He also maintained that all knowledge is related, so that, knowing one thing well, one could apply it to other fields of knowledge.

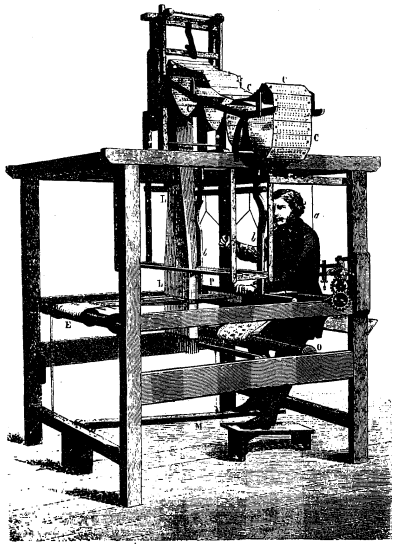
Jacquard, Joseph-Marie (b. July 7, 1752, Lyon—d. Aug. 7, 1834, Oullins, Fr.), French inventor of the so-called Jacquard loom, which served as the impetus for the technological revolution of the textile industry and is the basis of the modern automatic loom. He first formed the idea for his loom in 1790, but his work was cut short by the French Revolution, in which he fought on the side of the Revolutionaries in the defense of Lyon.

Jacquard demonstrated an improved drawloom in 1801, for which he was awarded a bronze medal. He continued his work, and in 1805 he introduced an attachment that has caused any loom that uses it to be called a Jacquard loom (*q.v.*). In 1806 the loom was declared public property, and Jacquard was rewarded with a pension and a royalty on each machine.

His machine aroused bitter hostility among the silk weavers, who feared that its introduction would deprive them of jobs. The weavers of Lyon not only burned machines that were put into production but attacked Jacquard as well.

Eventually, the advantages of the loom brought about its general acceptance, and by 1812 there were 11,000 in use in France. In 1819 Jacquard was awarded a gold medal and the Cross of the Legion of Honour. The use of his loom spread to England in the 1820s and from there virtually worldwide.

Jacquard loom, also called JACQUARD ATTACHMENT, or JACQUARD MECHANISM, in weaving, device incorporated in special looms to control individual warp yarns. It produces fabrics having intricate woven patterns such as tapestry, brocade, and damask and has also been adapted to the production of patterned knitted fabrics.



Jacquard loom, engraving, 1877
The Bettmann Archive

The Jacquard system was introduced in 1805 by Joseph-Marie Jacquard (*q.v.*) of France, but it soon spread elsewhere. Jacquard's loom utilized punched cards that controlled the weaving of the cloth so that any desired pattern could be obtained automatically. These punched cards were adopted by the noted English inventor Charles Babbage as an input–output medium for his so-called analytical engine and were used by the U.S. statistician Herman Hollerith to feed data to his census machine. They are now used as one of various means by which information is fed into digital computers.

Jacqueline OF BAVARIA (15th-century Dutch countess): *see* Jacoba of Bavaria.

Jacquerie, insurrection of peasants against the nobility in northeastern France in 1358—so named from the nobles' habit of referring contemptuously to any peasant as Jacques or Jacques Bonhomme.

The Jacquerie occurred at a critical moment of the Hundred Years' War. The Battle of Poitiers (September 1356), in which King John II the Good was captured by the English, was the latest in a series of defeats that had brought discredit on the French nobility. It was followed by an Anglo-French truce that resulted in the pillage of the countryside by the "great companies" of mercenaries from the English forces, sometimes abetted by the nobles. The peasants were further enraged by the nobles' demands for heavier payments of dues and by the order of the dauphin Charles (the future Charles V) that the peasants refortify the castles of their aristocratic oppressors.

On May 21, 1358, an uprising began near Compiègne and spread quickly throughout the countryside. The peasants destroyed numerous castles and slaughtered their inhabitants. Under their captain general, Guillaume Cale, or Carle, they joined forces with Parisian rebels under Etienne Marcel. The Parisians were defeated at Meaux on June 9 by Gaston Phoebus of Foix and Jean III de Grailly. Charles II of Navarre routed Cale at Clermont-en-Beauvaisis on June 10. A massacre of the insurgents followed their defeat.

Jacques Cartier, Mount, French MONT JACQUES-CARTIER, also called TABLETOP, mountain in Bas-Saint-Laurent–Gaspésie region, eastern Quebec province, Canada, on the north side of the Gaspé Peninsula in Gaspesian Provincial Park.

The highest peak in the well-forested Monts Chic-Choc (Shickshock Mountains), an extension of the Appalachians, is Mount Jacques Cartier, which has an elevation of 4,160 ft (1,268 m). The name Tabletop indicates its flat summit.

Jacuí River, Portuguese RIO JACUÍ, river, Rio Grande do Sul state, southern Brazil, rising in the hills east of Passo Fundo and flowing southward and eastward for 280 mi (450 km), receiving the Taquari, Caí, Sinos, and Gravataí rivers near its mouth. There, at Pôrto Alegre, the state capital, on the Atlantic coast, it forms the Rio Guaíba, a shallow estuary emptying into the north end of the Lagoa (lagoon) dos Patos.

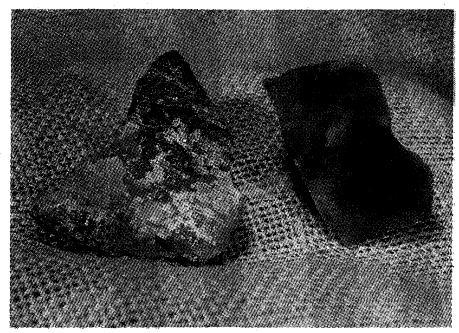
Navigable for river craft as far upstream as Cachoeira do Sul, it is one of the most heavily used river barge systems in Brazil, carrying large tonnages from the São Jerônimo coal basin to seaports and transporting rice and other crops cultivated in the rich agricultural lowland region that it drains. The Itaúba hydroelectric plant was built on the Jacuí River in the late 1970s.

jade, gemstone composed of either of two silicate minerals. The more highly prized of these is jadeite (*q.v.*); the other is nephrite (*q.v.*).

jade, Chinese: *see* Chinese jade.

Jadebusen, bay, Lower Saxony *Land* (state), northwestern Germany, broad inlet of the North Sea that covers an area of 73 square miles (190 square km). Formed for the most part by storm floods that occurred in 1219 and 1511, the generally shallow bay is fed by several small streams, including the Jade River. In springtime, the 13.5 feet (4.1 m) difference between high and low tide is the greatest on the German North Sea coast. The bay serves the port of Wilhelmshaven on its northwest coast.

jadeite, gem-quality silicate mineral in the pyroxene family; a form of jade. The more prized of the two types of jade, jadeite (imperial jade) is usually found as transparent to opaque, compact, cryptocrystalline lenses, veins, or nodules. It may be distinguished from nephrite (mutton-fat jade), jade's other form, by its granular fracture and glassy lustre; in addition, polished surfaces often show pitting caused by varying hardness. Jadeite, sodium aluminum silicate ($NaAlSi_2O_6$), may contain a number of impurities (often calcium) that give it a variety of colours: white, emerald green, apple green, red, brown, and blue. Deep-green to greenish-black varieties are called chloromelanite and are coloured by iron.



Uncut (left) and cut jadeite
Runk/Schoenberger—Grant Heilman

Jadeite occurs only in metamorphic rocks, most often in those that have been subjected to the high pressures deep below the Earth's surface. Jadeite is rare; its presence at the surface indicates great uplift of earlier buried regions and great amounts of erosion. The most important source is the large deposit near Tawmaw, Myanmar (Burma). Jadeite has also been found near Omi and Kotaki, Japan; in the Motagua River Valley of Guatemala; in San Benito County, Calif.; and in Mexico, Celebes, and New Guinea.

For detailed physical properties of jadeite, *see* gemstone (table); pyroxene (table).

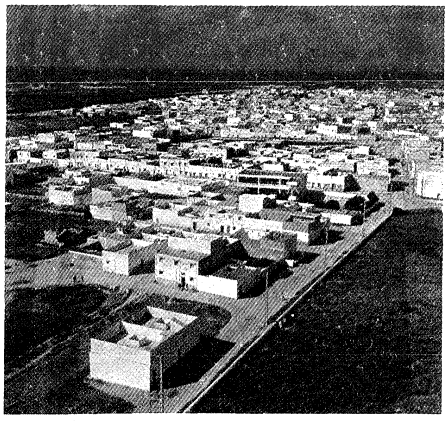
Consult the INDEX *first*

Jadida, el-, formerly (until *c.* 1960) MAZAGAN, Atlantic port city, provincial capital, and province, Centre region, Morocco. The settlement developed after 1502 around a Portuguese fort, and, as Mazagan, became the centre of Portuguese settlement and their last stronghold (1769) against the Filālī (Alaouite) sultans. As an infidel city it was deemed defiled for Muslim habitation and was finally resettled by Moroccan Jews in 1821. It was then named el-Brija el-Jadida (The New Fort). Some Portuguese town walls and churches still stand.

The port, which after 1912 was surpassed by Casablanca, is now used chiefly for coastal shipping of agricultural produce and is a seaside resort. The city is linked by road with Casablanca, Marrakech, and Safi.

El-Jadida province has an area of 2,317 sq mi (6,000 sq km) and is bounded by Settat and el-Kelaa des Srarhna provinces to the east, by Safi province to the southwest, and by the Atlantic Ocean to the northwest. The Oued (river) Oum er-Rbia, along which cereals (mainly

barley), grapes, sheep, goats, and cattle are raised, traverses the coastal plain. Pop. (1971)



El-Jadida, Morocco
Salmer—Plessner International

mun., 55,501; (1981 est.) province, 734,400.

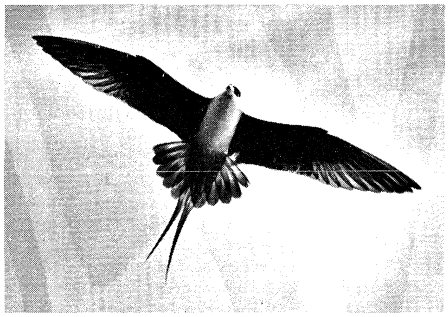
Jadotville (Zaire): *see* Likasi.

Jadwiga, original Hungarian HEDVIG, German HEDWIG (b. 1373/74—d. July 17, 1399, Kraków, Pol.), queen of Poland (1384–99), whose marriage to Jogaila, grand duke of Lithuania (Władysław II Jagiełło of Poland), founded the centuries-long union of Lithuania and Poland.

Jadwiga was the daughter of Louis I, king of both Hungary and Poland, and Elizabeth of Poland. After Louis died on Sept. 11, 1382, his elder daughter, Maria, was elected queen of Hungary; but the Poles opted to end the personal union between the two countries by choosing Jadwiga as their queen, though she was then but a child of nine years. On Oct. 15, 1384, she was crowned *rex*, "king," of Poland. The Polish magnates further promoted her marriage to Jogaila in order to produce a union of territories larger than the former one with Hungary and to open the way to the Christian conversion of the largely pagan Lithuanians. Jogaila was baptized in Kraków on Feb. 15, 1386, married to Jadwiga on February 18, and crowned on March 4.

Jadwiga was a patron of religion and scholarship, seeking to promote the religious development of the nations that she had united, founding a special college for Lithuanians in Prague, and financing the restoration of the university at Kraków, effected after her death and named the Jagiellonian University. Chiefly Jadwiga's work, the university was modelled after the University of Paris and became the centre of Polish civilization and influence.

jaeger (German and Dutch: "hunter"), any of three species of seabirds belonging to the genus *Stercorarius,* family Stercorariidae. They are rapacious birds resembling a dark gull with a forward-set black cap and projecting central tail feathers. Jaegers are called skuas in Britain, along with the great skua, a larger bird (*see* skua). Jaegers have two colour phases: all-brown or, more commonly, brown above and white below.



Long-tailed jaeger (*Stercorarius longicaudatus*)
Charlie Ott—The National Audubon Society Collections/Photo Researchers

Jaegers nest in Arctic tundra and then go to sea, many as far as Australia and New Zealand. At sea they catch fish on their own; but nesting, along coasts, they force terns and kittiwakes to disgorge their food, destroy the eggs and young of other seabirds, and capture land birds and rodents.

The largest species is the pomarine jaeger, or pomatorhine skua (*Stercorarius pomarinus*), 50 centimetres (20 inches) long. Smallest is the long-tailed jaeger (*S. longicaudatus*), 35 cm long. Intermediate in body size is the parasitic jaeger, skua (*S. parasiticus*).

Jæger, Hans Henrik (b. Sept. 2, 1854, Drammen, Nor.—d. Feb. 8, 1910, Kristiania), novelist, ultra-Naturalist, and leader of the Norwegian "Bohème," a group of urban artists and writers in revolt against conventional morality; his role in Norwegian literature is based on the police suppression of his first novel.

Jæger went to sea in his youth, and thereafter studied philosophy independently, notably Hegel, Fichte, and Kant. An advocate of sexual freedom, Jæger believed that the restrictions and frustrations of monogamy were a source of social evil. He made two unsuccessful attempts to express his ideas in a play. In 1885, however, he created a sensation with his novel *Fra Kristiania-Bohêmen* (1885; "From Bohemian Kristiania"), which was confiscated as pornography. The following year, he was sentenced to 60 days in prison for making the work public and 150 more for printing the volume in Sweden. He avoided part of the sentence by moving to Paris, where he spent most of the rest of his life. Although his novel was of no literary merit, it became a cause célèbre, dividing the Norwegian literary world between champions of freedom of speech and advocates of good taste and high standards.

Jaén, province, in the autonomous community (region) of Andalusia, south central Spain. It has an area of 5,212 sq mi (13,498 sq km) and is surrounded by the Sierra Morena (north), the Segura and Cazorla ranges (east), and Parapanda, Lucena, and Segura mountains (south). The western region is composed of plains that lead to the fertile Río Guadalquivir Valley. There are several irrigation dams and hydroelectric plants on the Guadalquivir.

The economy is based on the cultivation of olives, followed in importance by grapes and cereals, and on mining (lead at Linares, iron, copper, uranium, and salt). Industries concentrated in the provincial capital, Jaén (*q.v.*), include the manufacture of automobiles, agricultural machinery, foodstuffs, chemicals, and ceramics. The chief towns, apart from Jaén, are Linares, Andújar, Ubeda, and Martos. Pop. (1982 est.) 611,655.

Jaén, city, capital of Jaén province, in the autonomous community (region) of Andalusia, southern Spain, on the northern side of the Sierra Jabaleuz and north of Granada. Known to the Romans as Aurinx, the city was the centre of the Moorish principality of Jayyán and was reconquered by Ferdinand III of Castile and Leon in 1246. Buildings from these periods include the castle of Santa Catalina, mentioned by 12th-century Arab chroniclers, and the cathedral, begun in 1540 by Andrés de Vandelvira and completed in the 18th century. Jaén's economy is based primarily on the production of olive oil. Pop. (1982 est.) 86,660.

Jæren, lowland plain area, Rogaland *fylke* (county), southwestern Norway. Extending approximately 25 mi (40 km) northward from Eigersund and 10 to 15 mi inland from the North Sea, the plain is bounded on the southeast by the Dalane Plateau. Composed of glacial deposits of sand and clay, it has fertile soil and is one of Norway's finest agricultural areas. Unlike most of the Norwegian coast, the plain is not protected by islands, but the dangerous reef, Jærens Rev, lies about 3 mi offshore. Trees have been planted along the coast to prevent soil erosion. Dairying is important; the Jæren is the principal supplier of milk to the city of Stavanger, just to the north. There are excellent bathing beaches along the coast, and ancient burial mounds and many runic inscriptions are found on the plain's glacial boulders.

Ja'far al-'Askarī, also called JA'FAR PASHA, in full JA'FAR PASHA IBN MUṢṬAFĀ IBN 'ABD AR-RAḤMAN AL-'ASKARĪ (b. 1887, Baghdad—d. Oct. 30, 1936, Baghdad), army officer and Iraqi political leader who played an important role in the Arab nationalist movements during and after World War I.

A subject of the Ottoman Empire, Ja'far Pasha served in the imperial army. He participated in attacks on Egypt after the outbreak of World War I and was captured by the British. When he learned of ruthless Ottoman attempts to repress Arab nationalists in Syria, he decided to join Ḥusayn ibn 'Alī, *amīr* of Mecca, who, with British aid, had declared a revolt against Ottoman authority in Mecca. By 1916 Ja'far Pasha had assumed the burden of organizing Ḥusayn's newly formed Arab army, and he subsequently commanded it in operations against the Turks. After the war he served in the administration of an Arab state in Syria, headed by Ḥusayn's son Fayṣal. French military intervention caused the state's collapse, but Fayṣal, with British support, became king (*see* Fayṣal I) of a newly founded Iraqi national government.

As Iraq's first minister of defense, Ja'far Pasha is considered the "father of the Iraqi Army." He also served twice as Iraqi prime minister. In 1936 Bakr Ṣidqī overthrew the Iraqi government and ordered the execution of Ja'far Pasha. In later years the memory of his death served as a rallying point for opponents of Bakr Ṣidqī's rule.

Ja'far ibn Muḥammad, also called JA'FAR AṢ-ṢĀDIQ (Arabic: Ja'far the Trustworthy) (b. 699/700 or 702/703, Medina, Arabia—d. 765, Medina), sixth *imām*, or spiritual successor to the Prophet Muḥammad, of the Shī'ah branch of Islām and the last to be recognized as *imām* by all the Shī'ī sects. Theologically, he advocated a limited predestination and proclaimed that Ḥadīth (traditional sayings of the Prophet), if contrary to the Qur'ān, should be rejected.

Ja'far was the son of Muḥammad al-Bāqir, the fifth *imām,* and great-grandson of the fourth caliph, 'Alī, who is considered to have been the first *imām* and founder of Shī'ah (Arabic Shī'at 'Alī, the party of 'Alī). On his mother's side, Ja'far was descended from the first caliph, Abū Bakr, whom Shī'ī usually consider a usurper. This may explain why he would never tolerate criticism of the first two caliphs.

There is some doubt whether the Shī'ī conception of an infallible religious leader, or *imām,* was really formulated before the 10th century, except possibly in some sort of "underground movement." But the Shī'ī certainly felt that the political leadership of Islām exercised by the caliph should belong to the direct descendants of 'Alī. Moreover, this political leadership was not clearly separated from religious leadership, and, to the end of the Umayyad regime, the caliphs sometimes preached in the mosque, using the sermon to reinforce their authority. Consequently, af-

ter his father's death, sometime between 731 and 743, Ja'far became a possible claimant to the caliphate and a potential danger to the Umayyads.

The Umayyad regime was already threatened by other hostile elements, including the Persians, who resented Arab domination. The spread of Shī'ah throughout Iran through a mixture of religious, racial, and political motives compounded the opposition. The successful revolt of 749–750 that overthrew the Umayyads, however, was under the leadership of the 'Abbāsid family, descended from one of the Prophet's uncles; and they, not the family of 'Alī, founded the new ruling dynasty.

The new caliphs were, understandably, worried about Ja'far. Al-Manṣūr (ruled 754–775) wanted him in his new capital, Baghdad, where he could keep an eye on him. Ja'far preferred to stay in Medina and reportedly justified this by quoting a saying he ascribed to the Prophet that, though the man who leaves home to make a career may achieve success, he who remains at home will live longer. After the defeat and death of the 'Alid rebel Muḥammad ibn 'Abd Allāh in 762, however, he thought it prudent to obey the Caliph's summons to Baghdad. After a short stay, however, he convinced al-Manṣūr that he was no threat and was allowed to return to Medina, where he died.

A just assessment of Ja'far is made difficult by later Shī'ī accounts, which depict every *imām* as a sort of superman. He undoubtedly was both politically astute and intellectually gifted, keeping out of politics and not openly claiming the imamate. A pious family man, Ja'far had 10 children—7 by two wives and 3 by concubines. He entertained generously, gathering around him learned pupils including Abū Ḥanīfah and Mālik ibn Anas, founders of two of the four recognized Islāmic legal schools, the Ḥanaīyah and Mālikīyah, and Wāṣil ibn 'Ata', founder of the Mu'tazilī school. Equally famous was Jābir ibn Hayyān, the alchemist known in Europe as Geber, who credited Ja'far with many of his scientific ideas and indeed suggested that some of his works are little more than records of Ja'far's teaching or summaries of hundreds of monographs written by him. As to the manuscripts of half a dozen religious works bearing Ja'far's name, scholars generally regard them as spurious. It seems likely that he was a teacher who left writing to others.

Various Muslim writers have ascribed three fundamental religious ideas to him. First, he adopted a middle road about the question of predestination, asserting that God decreed some things absolutely but left others to human agency—a compromise that was widely adopted. Second, in the science of Ḥadīth, he proclaimed the principle that what was contrary to the Qur'ān (Islāmic scripture) should be rejected, whatever other evidence might support it. Third, he described Muḥammad's prophetic mission as a ray of light, created before Adam and passed on from Muḥammad to his descendants.

Shī'ī divisions date from Ja'far's death. His eldest son, Ismā'īl, predeceased him, but the "Seveners," represented today chiefly by the Ismā'īlīs (followers of Ismā'īl)—argued that Ismā'īl merely disappeared and would reappear one day. Three other sons also claimed the imamate; of these, Mūsā al-Kāẓim gained widest recognition. Shī'ī sects not recognizing Ismā'īl are mostly known as "Twelvers"; they trace the succession from Ja'far to the 12th *imām,* who disappeared and is expected to return at the Last Judgment. (J.A.H.)

Ja'far Pasha, in full Ja'far Pasha ibn Muṣṭafā ibn 'Abd ar-Raḥman al-'Askarī: *see* Ja'far al-'Askarī.

Jaffa (Israel): *see* Tel Aviv–Yafo.

Jaffna, historic monarchy in northern Ceylon (modern Sri Lanka), populated by Tamil-speaking people of South Indian origin. It had become well established by the 14th century and survived as an independent entity until its subjugation by the Portuguese in the 17th century.

Almost from the beginning of Ceylon's recorded history, sporadic invasions by the Tamils of South India had been commonplace. One of the best known quasi-historical incidents in Ceylon's history is the victory in the 2nd century BC of the Sinhalese king Duṭṭhagāmaṇī over the Tamil usurper Eḷāra. From the 12th century the Tamils made increasingly permanent inroads into the northern part of Ceylon and by the 14th century were solidly established there. Except for a short period of subjugation by the Sinhalese in the 15th century, the kingdom of Jaffna generally maintained its independence until the incursion of the Portuguese.

Jaffna, port, and capital of Northern Province, Sri Lanka (Ceylon), situated on a peninsula at the island's northern tip. The trading centre for the agricultural produce of the peninsula and nearby islands, it is linked with the rest of the nation by a railway. Jaffna is no longer a major port but conducts some trade with southern India and Burma. Fishing is important in the economy.

Jaffna was the capital of a Tamil kingdom for centuries before it was conquered by Europeans, and the town still has many distinctive Tamil cultural characteristics. It fell under Portuguese rule in 1617 and was their last possession in Sri Lanka before its capture by the Dutch in 1658. The name Jaffna is a Portuguese adaptation of the Tamil for "port of the lyre." A fort and a church remain from the Dutch period. Near the fort is the famous Hindu temple, Kandaswamy Kovil. The British held Jaffna after 1795. Pop. (1982 est.) 121,000.

Jagan, Cheddi (Berret) (b. March 22, 1918, Plantation Port Mourant, British Guiana), politician and union activist who in 1953 became the first popularly elected premier of British Guiana (now Guyana). He subsequently headed the country's government again from 1957 to 1964.

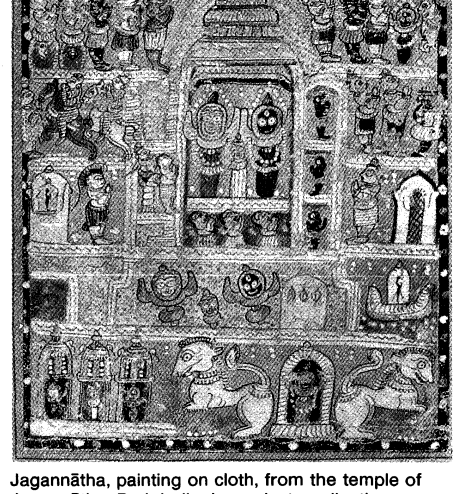
The son of a foreman on a sugarcane plantation, Jagan studied dentistry at the Northwestern University Dental School, Chicago (D.D.S. 1942). When he returned to practice dentistry in British Guiana in 1943, he became active in union and political activities and was elected to the British Guianan legislature in 1947.

In 1950 Jagan and his American-born wife established Guiana's first modern political party, the People's Progressive Party (PPP), with himself as its leader. In elections held under the new British-granted constitution of 1953, the PPP won a majority of the seats in the House of Assembly and Jagan became the country's premier. His subsequent program of radical socioeconomic reforms, however, along with the strikes and demonstrations encouraged by his party, prompted the British authorities in late 1953 to dismiss him from office, suspend the new constitution, and send in troops to prevent the consolidation of a government that they viewed as pro-Communist. Jagan practiced dentistry for the next four years, and in the meantime the PPP in 1955 split along racial lines, with most of its black members seceding under Forbes Burnham to form the People's National Congress (PNC) and its members of East Indian descent remaining in the ranks.

The PPP won the elections of 1957, and Jagan pursued moderate policies of socioeconomic reform as the new government's minister of trade and industry (there was no prime ministerial position). In the elections of 1961 the PPP emerged with a slim majority, and Jagan became British Guiana's premier in that year. He remained committed to establishing a socialist economy within a framework of parliamentary democracy and neutralism in foreign affairs, but his second term was marred by a long general strike and by serious rioting that once again compelled the stationing of British troops in Guiana (1961–64). Under a new system of proportional representation instituted by the British in 1964 to accurately reflect the relative voting strengths of blacks and East Indians, the PPP lost the general elections of 1964 to the PNC. Jagan served as leader of the parliamentary opposition from then on and was the PPP's general secretary from 1970. He also wrote several books analyzing Guyana's history and contemporary economic and political problems.

Jagannātha (Sanskrit: "Lord of the World"), form under which the Hindu god Krishna is worshipped at Puri (Orissa), one of the most famous religious centres of India, and at Ballabhpur, a suburb of Shrīrāmpur, West Bengal. The 12th-century temple of Jagannātha in Puri towers above the town. In its sanctuary, roughhewn wooden images represent Jagannātha, his brother Balabhadra (Balarāma), and his sister Subhadrā. Some scholars suggest Buddhist influence in the threefold nature of the temple image. Modern representations made in Puri of the 10 *avatāra*s (incarnations) of Vishnu often show Jagannātha as one of the 10 in place of the more usually accepted Buddha.

The most important of the numerous yearly festivals is the Rathayātrā (car festival), which takes place on the second day of the bright fortnight of Āṣāḍha (June–July). The image is placed in a car so heavy that the efforts of hundreds of devotees are required to move it, and it is dragged through deep sand to the country house of the god. The journey takes several days, and thousands of pilgrims participate. Reports of these processions in the past



Jagannātha, painting on cloth, from the temple of Jagannātha, Puri, India; in a private collection
P. Chandra

have been much exaggerated, although accidents are common and occasionally a frenzied pilgrim attempts to throw himself under the car. The English word juggernaut, with its connotation of a force crushing whatever is in its path, is derived from this festival.

Jagdalpur, also called JAGADALPUR, town, administrative headquarters of Bastar district, Madhya Pradesh state, central India, just south of the Indrāvati River. Surrounded by dense forests, it is connected by road with Raipur and Kānker and is heavily engaged in agricultural trade. Sometimes called Bastar, it served as the capital of the former Bastar princely

state. There are two colleges affiliated with Ravishankar University. Pop. (1981) town, 51,286; metropolitan area, 63,632.

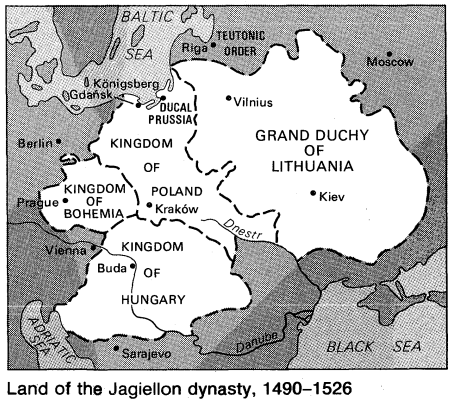
Jagello (Lithuanian duke): *see* Władysław II Jagiełło.

Jagersfontein, town, southwestern Orange Free State, South Africa, southwest of Bloemfontein. The town is historically known as a diamond-mining centre. A 50-carat diamond found on a farm in the area in 1870 led to the establishment of the town in 1882 and the opening of a diamond pipe mine six years later. The second and eighth largest rough diamonds ever discovered in the world were taken from this mine—the Excelsior of 995 carats (in 1893) and the Reitz of 650 carats (in 1895; later cut into the Jubilee). The Jagersfontein mine closed during the Great Depression, reopened after World War II, but closed once again in 1970. Sheep are raised in the semi-arid area surrounding the town. Pop. (1978 est.) mun., 4,629.

Jaghbūb, al-, also spelled GIARABUB, or JARABUB, oasis, northeastern Libya, near the Egyptian border. Located at the northern edge of the Libyan Desert on ancient pilgrim and caravan routes, it was the centre for the Sanūsī religious order (1856–95) because of its isolation from Turkish and European influence. The sect founded there a religious retreat and its Islāmic university and library. The walled town is dominated by the domed tomb of Sīdī Muḥammad ibn ʿAlī as-Sanūsī al-Kabīr (1791–1859), founder of the order. Its gardens produce dates. There is a road connection with Ṭubruq 180 mi (290 km) north. Pop. (1964) 1,101.

Jagiello (Lithuanian duke): *see* Władysław II Jagiełło.

Jagiellon DYNASTY, family of monarchs of Poland-Lithuania, Bohemia, and Hungary



Land of the Jagiellon dynasty, 1490–1526

that became one of the most powerful in east central Europe in the 15th and 16th centuries. The dynasty was founded by Jogaila, the grand duke of Lithuania, who married Queen Jadwiga of Poland in 1386 and became King Władysław II Jagiełło of Poland. Thus both Poland and Lithuania were united in the person of their sovereign (who soon, however, appointed a grand duke to rule for him in Lithuania). Together they constituted a formidable power, which defeated their major common enemy, the Knights of the Teutonic Order, at the Battle of Tannenberg (Grünfelde; July 15, 1410).

The dynasty was threatened with division into separate houses and disruption of the federation after Władysław's brother Swidrygiełło was named to replace his cousin Vytautas (Witold) as grand prince of Lithuania (1430). But Vytautas' brother Sigismund defeated Swidrygiełło and became the grand duke (1434). Then, rather than become divided, the dynasty extended its power; Władysław III Warneńczyk, who succeeded his father as king of Poland in 1434, also assumed the throne of Hungary (as Ulászló I) in 1440. After Władysław was killed fighting the Turks at the Battle of Varna (1444), the Poles elected as their king his brother, Casimir IV, who had succeeded the assassinated Sigismund as grand duke of Lithuania in 1440.

Largely sympathetic to the Lithuanian desire for autonomy and determined to create a strong, central royal power, Casimir clashed with the Polish magnates, large landowners who had dominated the earlier Jagiellon reigns, by granting extensive and exclusive rights and privileges to the gentry in order to gain their political and financial support for his active foreign policy. As a result, Casimir was able not only to engage successfully in the Thirteen Years' War (1454–66) against the Teutonic Knights, by which he acquired a large portion of their territory, but also to place his son Władysław on the thrones of Bohemia (as Vladislav II; 1471) and Hungary (as Ulászló II; 1490) and to fight the Turks (1485–89), who had disrupted his kingdom's trade by seizing control of the mouths of the Dniester and Danube rivers.

During the reigns of Casimir's sons John Albert and Alexander I, however, the Jagiellon rulers lost a large degree of their power in Poland to the nobility (as did Władysław in Bohemia and Hungary); and, by weakening their realm, they exposed it to the aggression of the Teutonic Knights and the state of Muscovy, which expanded into Lithuanian territory.

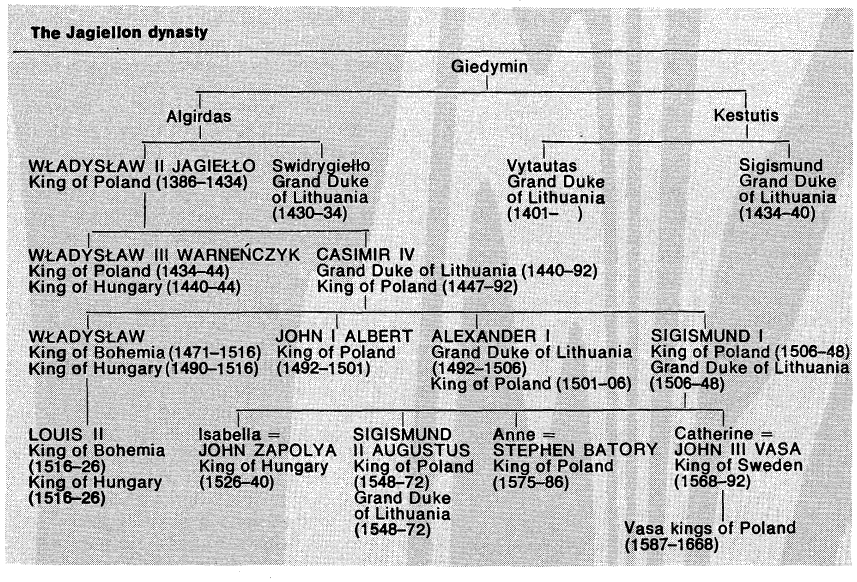
When Sigismund I the Old succeeded his brother Alexander in 1506, the Polish–Lithuanian federation was seriously threatened by foreign invasion as well as by internal decay. Gradually strengthening his government (although not diminishing gentry power), Sigismund used diplomatic means to come to terms with the Holy Roman emperor Maximilian I, who had been encouraging the Teutonic Order and Muscovy to attack Poland and Lithuania. He defeated the Muscovite army at Orsha (1514) and successfully contended with the Teutonic Order so that in 1525 it converted its lands into the secular Duchy of Prussia, which became a Polish fief.

Sigismund's nephew Louis II succeeded Władysław as king of Bohemia and Hungary in 1516, but his death at the Battle of Mohács (at which the Turks destroyed the Hungarian monarchy; 1526) brought an end to Jagiellon rule there. Sigismund, on the other hand, improved the political stability of Poland and Lithuania, incorporated Mazovia into his realm (1526), and also promoted the development of Renaissance culture in Poland.

Nevertheless, the Polish monarchy continued to lose power to the magnates and gentry, which contended with each other for political dominance; and when Sigismund II Augustus ascended the throne (1548), he was obliged to manoeuvre between the magnates and the gentry while maintaining his father's policy of avoiding foreign conflict. But when Livonia sought his protection from Muscovy and incorporation into his realm (1561), he allied with the gentry to finance the major war against Muscovy, which he entered to secure his control over Livonia and the Baltic seacoast. Since Lithuania could not bear the major burden of the war, he tried to create a firmer union between Poland and Lithuania. In 1569 he arranged for the two countries to enter the Union of Lublin and form a Polish–Lithuanian commonwealth. Three years later Sigismund II Augustus died, leaving no heirs, thereby ending the Jagiellon dynasty.

jāgīrdār system (Persian *jāgīr:* "holding land"; and *dār:* "official"), form of land tenancy developed in India during the time of Muslim rule (beginning in the early 13th century) in which the collection of the revenues of an estate and the power of governing it were made over to an official of the state. The bestowal of a *jāgīr* on a *jāgīrdār* could be either conditional or unconditional. A conditional *jāgīr* required in reciprocity from the beneficiary some form of public service such as the levying and maintaining of troops for the benefit of the realm. An assignment of land was usually made for life, and, on the death of the holder, the *jāgīr* would again revert to the state, though it was possible for the heir to renew it on payment of a fee.

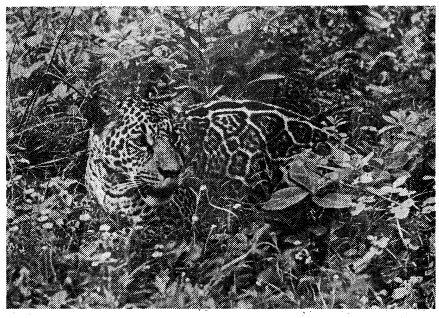
The system was introduced by the early sultans of Delhi. Being feudalistic in character, it tended to enfeeble the central government by setting up quasi-independent baronies. The practice was slowed by Sultan Ghiyāṣ-ud-Dīn Balban (reigned 1266–87) and abolished by Sultan ʿAlāʾ-ud-Dīn Khaljī (1296–1316), only to be revived again by Sultan Fīrūz Shāh Tughluq (1351–88), from which time it continued. The early Mughal emperors (16th century) wished to abolish it, preferring to reward their officials with cash salaries, but it was reintroduced by the later Mughals and contributed greatly to the weakening of the state. The English East India Company was given a *jāgīr* by the nawab Muḥammad ʿAlī of Arcot in the present Tamil Nadu state 120 miles (190 kilometres) in length along the Bay of Bengal and 47 miles in width inland; it became the



nucleus of the later Madras Presidency. Under the British the old *jāgīrdār* holdings were largely considered the properties of individual families, particularly in the area of Mahārāshtra. With Indian independence, legislative measures were taken to abolish the system of absentee landownership.

Jagoda, Genrikh Grigoryevich (Soviet leader): *see* Yagoda, Genrikh Grigoryevich.

jaguar (*Leo onca*), largest New World member of the cat family (Felidae), found from the U.S.–Mexican border southward to Patagonia, Arg., usually in swamps, jungles, and other wooded regions. It is virtually extinct in the northern part of its range and survives in reduced numbers only in remote areas of



Jaguar (*Leo onca*)
E. Hanumantha Rao—Photo Researchers

South America; the largest known population exists in the Amazon rain forest. Also known as *el tigre* and *tigre Americano*, the jaguar is grouped with such felids as the lion and tiger as one of the big, or roaring, cats. It snarls, growls, and makes deep, hoarse grunts.

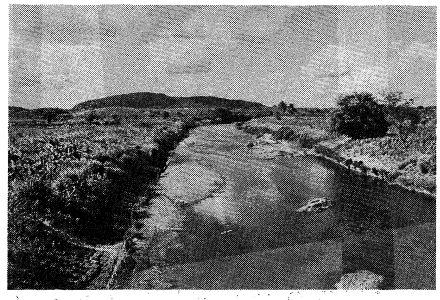
The jaguar resembles the leopard but is larger and more heavily built. The male jaguar, which is generally larger than the female, may attain a length of from 1.7 to 2.7 metres (5.6 to 9 feet), including the 0.6–0.9-m tail, with a shoulder height of 0.7–0.8 m; it weighs from 100 to 160 kilograms (220 to 350 pounds). The jaguars of South America are largest.

The ground colour of the jaguar varies greatly from white to black. The typical coloration is orange tan with black spots arranged in rosettes with a black spot in the centre. The tail is irregularly marked with black; the nose and upper lip are light reddish brown. Except for its black spots in the rosettes, the coat pattern of the jaguar is similar to that of the leopard.

A solitary predator, the jaguar usually preys on such animals as deer, tapirs, capybaras, birds, and fish; but it will also take cattle, horses, and dogs. It is a savage fighter when cornered but does not normally molest human beings. It is swift and agile, enters water freely, and appears to enjoy bathing. In the north it mates toward the end of the year, but in the tropics it seems not to be restricted to a particular breeding season. After a gestation period of about 100 days, the female bears one to four spotted cubs. The young are raised by the female and generally remain with their mother for about two years.

The jaguar was formerly classified as *Panthera onca*. There are a number of local races in various parts of its range.

Jaguaribe River, river, Ceará state, northeastern Brazil, formed by the junction of the Carapateiro and Trici rivers (originating in the Serra Grande) and flowing northeastward for approximately 350 mi (560 km) to enter the Atlantic Ocean east of the Ponta (point) Maceió. Upstream from Limoeiro do Norte the river branches, converging again 19 mi from its mouth. The Jaguaribe's flow is erratic: long periods of drought during which much of it is dry are followed by catastrophic floods in which the towns along its lower course are

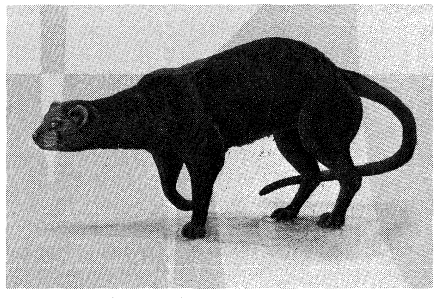


The Jaguaribe River near Aracati, Braz.
Plessner International

inundated. There are irrigation dams at Orós and Cariús. Drought-resistant carnauba palms, used to make wax, cellulose, and thatched roofs, grow abundantly along the river's banks and have been used by the Brazilian government in reforestation programs in the northeast.

jaguarundi, also spelled JAGUARONDI (*Felis yagouaroundi*), small, unspotted, New World cat (family Felidae), also known as the otter-cat because of its otter-like appearance and swimming ability. The jaguarundi is native to forested and brushy regions, especially those near water, from South America to the southwestern United States; it is, however, very rare north of Mexico.

A sleek, long-bodied animal, it has small ears, short legs, and a long tail. The adult ranges from 90 to 130 centimetres (36 to 52 inches) in length, including the 30–60-cm tail; stands 25–30 cm at the shoulder; and weighs from 4.5 to 9 kilograms (10 to 20 pounds). There are two colour varieties of the jaguarundi: a



Jaguarundi (*Felis yagouaroundi*)
Drawing by H. Douglas Pratt

reddish brown form, known as the eyra, and a gray form. Kittens of both varieties may appear in the same litter.

The jaguarundi lives alone and may be active at any time of day or night. It preys on birds and small mammals. Breeding takes place at the end of the year, and a litter of two or three young is born after a gestation period of about 63 days.

Jahaic languages, also called SEMANG LANGUAGES, grouping of the Austro-Asiatic language family that includes Batek, Che Wong, Jahaii, Kensiu, Kintak, and Mintil. There are several alternative classifications.

The language group is a small one, with total speakers estimated at about 2,000. They are located mainly in the inland area of Malaysia, though some extend across the border into Thailand.

Jahān Shāh, Jahān also spelled JIHĀN (reigned *c.* 1438–67), leader of the Turkmen Kara Koyunlu (*q.v.*; Black Sheep) in Azerbaijan.

Under his rule the Kara Koyunlu extended their domain over Iraq, Fārs, and Isfahan (1453). In 1458 Jahān Shāh invaded Khorāsān and seized Herāt from the Timurid Abū Sa'īd, but the growing power of the Ak Koyunlu (*q.v.*; White Sheep) under Uzun Hasan (*q.v.*) brought about an agreement between Abū Sa'īd and Jahān Shāh to divide Iran between them. Defeated by the Ottoman Turks in 1461, Uzun Hasan fought the Kara Koyunlu and defeated and killed Jahān Shāh in 1467.

Jahāngīr, also spelled JEHANGIR (b. Aug. 31, 1569, Fatehpur Sīkri, India—d. Oct 28, 1627, en route to Lahore), Mughal emperor of India (1605–27).

Born Prince Salīm, Jahāngīr was early marked for the succession by his father Akbar. Impatient, however, he revolted in 1599 while Akbar was engaged in the Deccan. Akbar on his deathbed confirmed Jahāngīr as his successor.

Jahāngīr continued his father's traditions. A war with the Rājput principality of Mewār was ended in 1614 on generous terms. Akbar's campaigns against Ahmadnagar were continued fitfully, with Mughal arms and diplomacy often thwarted by the able Ḥabshī, Malik 'Ambār. In 1617 and 1621, however, Prince Khurram (later Shāh Jahān; *q.v.*) concluded apparently victorious peaces. Jahāngīr was not a strict Sunnī Muslim; he allowed, for example, the Jesuits to dispute publicly with Muslim *'ulamā'* (theologians) and to make converts.

After 1611 Jahāngīr accepted the influence of his Persian wife, Mehr on-Nesā', the Nūr Jahān, her father I'timād-ud-Dawlah, and her brother Āṣaf Khān. Together with Prince Khurram, this clique dominated politics until 1622. Thereafter, Jahāngīr's declining years were darkened by a breach between Nūr Jahān and Prince Khurram, who rebelled openly between 1622 and 1625. In 1626 Jahāngīr was temporarily placed under duress by Mahābat Khān, another rival of Nūr Jahān's group. He died while travelling from Kashmir to Lahore.

A heavy drinker and opium eater (until excess taught him comparative moderation), Jahāngīr encouraged Persian culture in Mughal India. He possessed a sensitivity to nature, acute perception of human character, and artistic sensibility, which expressed itself in an unmatched patronage of painting.

jahannam, Islāmic hell, described somewhat ambiguously in the Qur'ān and by Muḥammad. In one version hell seems to be a fantastic monster that God can summon at will; in another description it is a crater of concentric circles on the underside of the world that all souls must cross in order to enter paradise by way of a bridge, narrow as a razor's edge. (The Muslim theologian and philosopher al-Ghazālī considers the bridge in metaphoric terms as the straight path to God that every Muslim is expected to travel.) Punishment in hell is graded and varied according to offenses, and sinners are released only when God wills.

Muslim theologians have attempted to clarify the problems inherent in the Qur'ānic description of hell. Avicenna (Ibn Sīnā), for example, speaks of hell as a state in which souls retain sensual lusts but suffer because they have no bodies with which to fulfill their desires.

jāhilīyah, in Islām, the period preceding the revelation of the Qur'ān to the Prophet Muḥammad. In Arabic the word means ignorance or barbarism and indicates a negative Muslim evaluation of pre-Islāmic life and culture in Arabia as compared to the teachings and practices of Islām. The term has a positive connotation only in literature; pre-Islāmic Arabic poetry is esteemed by Muslims for its precise and rich vocabulary, sophisticated metrical structures, and fully developed systems of rhyme and thematic sequence.

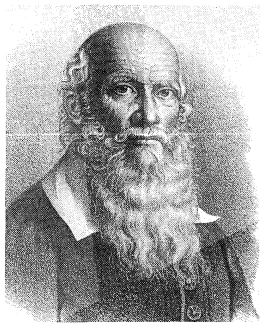
Jāḥiẓ, al-, in full ABŪ 'UTHMĀN 'AMR IBN BAḤR IBN MAḤBŪB AL-JĀḤIẒ (b. *c.* 776, Basra, Iraq—d. 868/869, Basra), Islāmic theologian, intellectual, and litterateur known for his individual and masterful Arabic prose.

His family, possibly of Ethiopian origin, had only modest standing in Basra, but his intellect and wit gained him acceptance in scholarly circles and in society. During the reign of the ʿAbbāsid caliph al-Maʾmūn, al-Jāḥiẓ moved to the regime's capital, Baghdad. He did not take a position at court but supported himself, at least in part, with contributions from patrons, often of high rank, in return for the dedications of his books. When the court moved to Sāmarrāʾ, al-Jāḥiẓ journeyed there, but shortly before his death he retired to Basra.

Few of his treatises on theology and politics are extant; some are known only from quotations by other authors. His prose masterpieces, however, are available. These essays are at the same time anthologies in which poetry, jokes, and anecdotes, however obscure or daring, have been introduced by al-Jāḥiẓ to illustrate his points. His unfinished *Kitāb al-ḥayawān* ("Animals"), in seven volumes, is a bestiary drawing on Aristotle and also an anthology of Arabic literature with animal themes to which theological, sociological, and linguistic discussions have been added. *Kitāb al-bayān wa al-tabyīn* ("Elegance of Expression and Clarity of Exposition"), another long work, treats literary style and the effective use of language. *Kitāb al-bukhalāʾ* ("Book of Misers") is a collection of stories about the avaricious. Al-Jāḥiẓ, in effect, provides in his works an entire education in the humanities of his time.

Although noteworthy for his intellectual freedom, al-Jāḥiẓ often supported government policy in his writings. He was, for example, part of the rationalist Muʿtazilite school of theology supported by the caliph al-Maʾmūn and his successor. When Muʿtazilism was abandoned by the caliph al-Mutawakkil, al-Jāḥiẓ remained in favour by writing essays such as *Manāqib at-turk* (Eng. trans., "Exploits of the Turks," in *Journal of the Royal Asiatic Society,* 1915), a discussion of the military qualities of the Turkish soldiers, on whom government policy depended.

Jahn, Friedrich Ludwig (b. Aug. 11, 1778, Lanz, Brandenburg, Prussia—d. Oct. 15, 1852, Freyburg an der Unstrut, Prussian Saxony), the German "father of gymnastics" who founded the Turnverein (gymnastic club) movement in Germany. He was a fervent patriot who



Jahn, lithograph by Georg Engelbach
Historia-Photo

believed that physical education was the cornerstone of national health and strength and important in strengthening character and national identity.

Jahn studied theology, history, and philology (1796–1802) at the universities of Halle, Frankfort an der Oder, Göttingen, and Greifswald. He spent the next years tutoring, travelling, and attending classes at Jena and Göttingen. In 1809 he settled in Berlin, where he held several teaching positions at secondary schools. There he began a program of outdoor physical exercise for students. He invented the parallel bars, the rings, the balance beam, the horse, and the horizontal bar, which became standard equipment for gymnastics. He established a strong following among both youths and adults and in 1811 opened his first gymnastic club.

In 1813 Jahn joined the volunteer Lützow corps and commanded its third battalion until after the fall of Napoleon in 1815, returning then to Berlin and resuming work as a state teacher at his gymnastic club. *Deutsche Turnkunst zur Einrichtung der Turnplätze* (*A Treatise on Gymnastics,* 1828), written with Ernst Eiselen, was published in 1816. In the politically reactionary climate of 1819, Jahn came under suspicion for his outspoken nationalistic views and strong influence on youth, and the government arrested him, closed his gymnastic club, and imprisoned him for almost a year. After his release he was confined to the city of Kolberg until 1825, when he was given his freedom. He was forbidden, however, to live in a city with a university or a secondary school, and so he moved to Freyburg an der Unstrut, where he lived the rest of his life. Jahn was awarded the Iron Cross for military bravery in 1840. Two years later a national ban on gymnastics, which had been in effect since 1819, was lifted. He served in the national parliament (1848–49).

Jahn wrote a vigorous defense of cultural nationalism, based on his investigation of the German language and culture, *Das Deutsches Volkstum* ("German Nationality"; 1810).

Jahra, al-, town and *muḥāfaẓah* (governate) in central Kuwait. Located about 30 mi (50 km) west of Kuwait city, the oasis town is the capital of the *muḥāfaẓah.* It is the centre of the country's principal agricultural region, producing primarily fruits and vegetables. Al-Jahra *muḥāfaẓah* is 4,315 sq mi (11,176 sq km) in area. Although it comprises about two-thirds of the area of Kuwait, most of the *muḥāfaẓah* is sparsely populated desert. Pop. (1980), town, 67,311; *muḥāfaẓah,* 190,820.

jahrzeit (Judaism): *see* yahrzeit.

Jahwarid DYNASTY, Muslim Arab dynasty that ruled Córdoba, Spain, after the dissolution of the Umayyad caliphate of Córdoba (1031), one of the party kingdoms (*ṭāʾifahs*). Years of civil war following the breakdown of central caliphal authority in 1008 prompted the Cordoban council of notables, led by a prominent aristocrat, Abū al-Ḥazm Jahwar ibn Jahwar, to abolish the institution of the caliphate and proclaim Córdoba a republic. Jahwar was elected head and, as virtually an absolute sovereign ostensibly assisted by a council, restored peace and economic prosperity in his 12-year-reign (1031–43). His son Abū al-Walīd Muḥammad ar-Rashīd (reigned 1043–58) managed through political chicanery to keep the ʿAbbādids of Seville out of Córdoba but eventually resigned his authority to his own vizier, Ibn ar-Raqā. When ʿAbd al-Malik, ar-Rashīd's jealous son, assassinated the vizier in 1058, his father rewarded him with virtually caliphal standing and authority in the state. Extremely unpopular, ʿAbd al-Malik and his father were handed over to the ʿAbbādids by the Cordobans themselves when the Abbādids took the city in 1069.

jai alai, ball game of Basque origin played in a three-walled court with a hard rubber ball that is caught and thrown with a cesta, a long, curved wicker scoop strapped to one arm. Called *pelota vasca* in Spain, the Western Hemisphere name jai alai (Basque "merry festival") was given to the game when it was imported to Cuba in 1900.

History. Jai alai developed from a form of handball, and it is presumed that the availability of a lively ball made possible by the introduction of rubber to Europe from South America permitted players to speed up the game. The next step, it is thought, was the introduction of the *guante,* a simple leather glove worn on the right hand, which in turn led to the use of a flat wooden bat, or *pala.* A cartoon for a tapestry by Goya in the Prado museum, Madrid, "Juego de Pelota" (1777–90), depicts such a bat in use on a one-walled court. Later the *guante* developed into a catching and throwing device leading finally to the evolution of the cesta, at first a short implement but now about .76 metre (2.5 feet) long, gracefully curved and efficient, with which the player can catch the ball and hurl it with tremendous power and speed. Each cesta is custom-made of Pyrenees Mountain reeds woven over a light, ribbed frame of Spanish chestnut; a leather glove sewn to the outside holds the player's hand securely. The *pelota* (*q.v.,* Spanish "ball") is a little smaller than a baseball and harder and heavier than a golf ball. It is made of hand-wound virgin rubber with a few final turns of linen or nylon thread and covered with two layers of hardened goat skin, the outer layer of which can be replaced. In play, speeds of 240 kilometres (150 miles) per hour are not uncommon. Professional players have worn protective helmets in the United States since 1967.

The court and the fronton. The modern three-walled playing court, or cancha, averages about 53.3 m long by 15.2 m wide and is 12.2 m or more high. The walls and the floor are made of special material to withstand the pounding of the ball. The spectators sit in tiers along the open side with the front of the court to their right, the side wall directly in front of them, and the back wall to their left.

The entire plant is the fronton; some Basque frontons date from as early as 1785. The game is played professionally in 10 frontons in Spain: 5 in the Basque country, of which the one in Guernica is the finest; 2 in Barcelona; and one each in Palma de Mallorca, Zaragoza, and Madrid. It is also played in southern France and in Milan. In the Western Hemisphere it is popular in Mexico, where there are two frontons in Mexico City and one each in Acapulco and Tijuana. It was played in the United States in the 1920s and 1930s, first in Chicago and then in New Orleans, but in both places it was withdrawn after the gambling laws were changed to ban betting on the game; it was demonstrated without wagering in New York City in 1938. The Miami fronton, with 5,100 seats, the world's largest, was the only one in the United States when Florida adopted a law in 1935 permitting pari-mutuel wagering on the sport. Since that time professional courts have been established at Tampa, West Palm Beach, Daytona Beach, Orlando, and Dania (all in Florida) and in Hartford, Conn. The game was popular in Cuba before it was banned after the revolution in 1959, and there are two frontons in the Philippines. Except for the United States, where there are only two frontons for amateurs, it is a popular amateur sport wherever it is played professionally.

Players. First-class players traditionally have come from the Basque country. Outstanding contemporaries include Juan Cruz Bustinduy (playing name Juaristi) and Francisco Asis in the front court and Ramon Soroa and Tomás Cortajarena in the back court. Most players reach their top form in their late 20s or early 30s, but one of the greatest of all time was Erdoza Menor, who played until he was in his 50s; he dropped dead on the court of a heart attack. Management of the fronton in Miami supports training schools in Spain for the development of young players, the one at Guernica having graduated many of the world's greatest. There is also a school at Miami where promising young amateurs may receive four or five years of training for a professional career.

The game. The principles of the game are very simple. The ball is served against the front wall and must land in a designated serving zone; the opposing player in the case of

singles, or one of the opposing partners in doubles games, must catch and return the ball before it touches the floor more than once. The ball must be caught and thrown in one continuous motion. The object is to bounce the ball off the front wall with such speed and English (spin) that the opposition cannot return it and loses the point. Play continues until the ball is missed or goes out of bounds. The ball is out of bounds if it strikes the area clearly marked in red around the front wall, strikes the overhead screen above the court or any other area marked in red or outside the foul line. If a player stops his throw because another player is in front of him, interference may be called, and the point will be played over.

The basic game played outside the United States, *partidos,* is a match singles or doubles game to 10 to 40 points. Betting is on the eventual outcome of the game, at any time during the game. As the points fluctuate, so does the spread of the odds. The American game is adapted to the pari-mutuel system. Six to eight one- or two-member teams compete for five to seven points. Two players or teams play for one point, the losing side retiring from the court and the winning side continuing to play until it loses a point and is retired or wins enough points to win the game; playoffs determine second (place) and third (show) positions. Betting is the same as at horse races, each player being identified by a number that is called his "post position." Under the American Qualifying Point System eight post positions (players or teams) play for five points. Play follows the usual elimination system until three positions have made three points each; the three then play off for win, place, and show places. The popular quiniela wager, in which the bettor picks two players or teams to finish first and second, in either order, was originated for jai alai wagering in the 1930s by Richard I. Berenson, former president of the Miami fronton. The quiniela wager has since flourished at horse races, dog races, and other events throughout the world. The quiniela in jai alai wagering was followed by the perfecta, in which the bettor must pick first and second in that order. Horse racing's daily double, the selection of the winners in two different events, also became popular in jai alai; and a Big Q., picking the quiniela in two events, was later introduced. (L.S.B.)

Jailolo (Indonesia): *see* Halmahera.

Jaime (Spanish personal name): *see under* James.

Jaina canon, the sacred texts of Jainism, a religion of India, whose authenticity is disputed between sects. The Svetambara canon consists principally of 45 works divided as follows: (1) 11 Aṅgas, the main texts—a 12th has been lost for at least 14 centuries; (2) 12 Upāṅgas, or subsidiary texts; (3) 10 Prakīṛṇakas, or assorted texts; (4) 6 Cheda-sutras on the rules of ascetic life; (5) 2 Cūlikā-sutras on cognition and epistemology; and (6) 4 Mūla-sutras on miscellaneous topics. Svetambara, however, originally accepted a canon of 71 works said to derive from a 5th-century religious Council of Valabhī.

The Svetambara works cover a variety of topics, including a list of the Tirthankaras, or Jinas (Jaina saviours), exploits and teachings of these figures, and doctrines. Some of the Aṅgas contain supposed dialogues between Mahāvīra, the most recent Tirthankara, and his followers. Others are said to retain some of the earliest parts of the canon, which appears to have been preserved originally in oral form. The canon is written in the Prākrit dialect, though from the Gupta period (4th–6th century AD) Jaina writers have used Sanskrit for a wider audience.

The Digambara sect disputes the authenticity of the entire Svetambara canon. The Digambara believe that the original is lost but that the substance of Jaina doctrine has been preserved in a variety of religious and philosophic texts written by various leaders and scholars of the Jaina community over the centuries.

Jaina painting: *see* Western Indian painting.

Jaina vrata (Sanskrit *vrata,* "vow"), in Jainism, a religion of India, any of the vows that govern the activities of both monks and laymen. The *mahāvrata*s, or five great vows, are undertaken for life only by ascetics. They are (1) noninjury, (2) abstention from lying, (3) nonstealing, (4) chastity, and (5) lack of all possessions.

The layman is not expected to be able to observe such vows strictly or perfectly while living the life of a householder. If he has passed through the preliminary stages of spiritual discipline (*guṇasthāna*), he may promise to observe 12 vows for a stated period of time and may if he wishes renew the pledge at the completion of that time.

The first five vows are called *aṇuvrata*s, "partial (literally "tiny," as contrasted with *mahā,* "big") vows," and are more moderate versions of the *mahāvrata*s: abstinence from gross violence, gross falsehood, and gross stealing; contentment with one's own wife; and limitation of one's possessions. The remaining vows are the three *guṇavrata*s and the four *śīkṣā-vrata*s, which are intended to help and encourage in the observance of the *aṇuvrata*s. Though the lists of these commands differ, they generally include retreat or restriction of the area of one's movements; retreat or abstention from harmful punishment; retreat from or limitation of the use of objects of enjoyment and comforts; the practice of equanimity; spending some time fasting in the fashion of a monk and observing diet control; giving offerings, gifts, and services to monks and others; and voluntarily dying by self-starvation (*sallekhanā*) when the observance of vows becomes physically impossible.

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Jainism, a religion and philosophy of India, founded in about the 6th century BC by Vardhamāna, who is known as Mahāvīra ("Great Hero")—the 24th of the Tirthankaras ("Ford-makers"), Jinas ("Conquerors"; whence the name Jainism), the great religious figures on whose example the religion is centred—in protest against the orthodox Vedic (early Hindu) ritualistic cult of the period; its earliest proponents may have belonged to a sect that rebelled against the idea and practice of taking life prevalent in the Vedic animal sacrifice.

A brief treatment of Jainism follows. For full treatment, *see* MACROPAEDIA: Jainism.

Jainism, which does not espouse belief in a creator god, has as its ethical core the doctrine of ahimsa, or noninjury to all living creatures, and as its religious ideal the perfection of man's nature, to be achieved predominantly through the monastic and ascetic life.

History. According to Jains their faith is eternal and has been revealed through the successive ages of the world by the Tirthankaras, each of whom attained perfection and absolute freedom and then preached Jainism to the world. The first Tirthankara, Ṛṣabha, is thus the traditional founder of Jainism, but though his name occurs in the Vedas and the Purāṇas very little else is known of him; nor is there historical evidence of the other Tirthankaras until Pārśva, the 23rd in the line, who is thought to have died in the late 8th century BC.

The actual and historical founder of Jainism was Mahāvīra, who was born *c.* 599 BC near Patna in what is now Bihār state. His father was a ruling Kshatriya (the second of the four Hindu social classes), chief of the Nāta clan. Mahāvīra was an elder contemporary of Siddhārtha Gautama (the Buddha) and is referred to in Buddhist writings as Nātaputra ("Son of the Nāta"). When he was about 28 years of age he took up the life of an ascetic. After years of hardship and meditation he attained enlightenment; thereafter he preached Jainism for about 30 years and died at Pāvā (also in Bihār) in 527 BC. Pāvā has been, since then, one of the chief places of Jain pilgrimage; Dewali, the Hindu New Year festival, is a day of great pilgrimage for Mahāvīra.

Jainism has never been torn by philosophic dispute, but from the beginning it was subject to schismatic movements. In the 4th or 3rd century BC the Jains began to split into two sects on points of rules and regulations for monks, a rift which was complete at least by the end of the 1st century AD. The Digambaras ("Sky-clad"; *i.e.,* naked) hold that an adherent should own nothing, not even clothes. They also believe that salvation is not possible for women. The Svetambaras ("White-robed") differ from them on these points.

Literature. According to the Svetambaras, the sacred literature preserved orally since Mahāvīra was systematized and written down by a council convened about the end of the 4th century BC, but it is generally agreed that it was not given its present shape until some 800 years later (AD 454 or 467). The Svetambara canon (agama) consists of 45 texts: 11 Aṅgas ("Parts")—a 12th, the Dṛṣṭivāda, is not extant—12 Upāṅgas (subsidiary texts), 4 Mūla-sutras (basic texts), 6 Cheda-sutras (concerned with discipline), 2 Cūlikā-sutras (appendix texts), and 10 Prakīṛṇakas (mixed, assorted texts). Digambaras give canonical status to two principal works in Prākrit: the Karmaprabhṛta ("Chapters on *Karman*") and the Kaṣāyaprābhṛta ("Chapters on *Kaṣāya*s") and accord great respect to several other works and commentaries.

Philosophy. Jain metaphysics is a dualistic system dividing the universe into two ultimate and independent categories: soul or living substance (jiva), which permeates natural forces such as wind and fire as well as plants, animals, and human beings; and non-soul, or inanimate substance (ajiva), which includes space, time, and matter.

The next most important concept is that of karma, which, in contrast to the more abstract Hindu-Buddhist conception of the principle, is regarded in Jainism as a substance, subtle and invisible, yet material, which flows into and clogs the jiva, causing the bondage of life and transmigration. This inflow can be stopped by many lives of penance and disciplined conduct, resulting in the final moksha, or liberation, the ultimate goal of human endeavour. Souls are divided into those that have attained perfection and those still in bondage.

Ethics. The Jain ethic is a direct consequence of the philosophy of soul and karma. Since the individual's primary duty is the evolution and perfection of his soul and that of his fellow creatures, ahimsa, or the refraining from harming any living being, is the cardinal principle. Jains build asylums and rest houses for old and diseased animals, where they are kept and fed until they die a natural death. The three ideals of *samyagdarśana* ("right belief"), *samyagjñāna* ("right knowledge"), and *samyakcārita* ("right conduct") are known as the three jewels, or *ratnatraya.*

Mythology and cosmology. Lesser gods are classified into four main groups: *bhavanavāsī*s (gods of the house), *vyantara*s (intermediaries), *jyotiṣka*s (luminaries), and *vaimānika*s (astral gods). These are each subdivided into several groups. Besides these, certain other gods and goddesses are mentioned in various Jaina texts,

including several that suggest Hindu influence or borrowing from some common ancient Indian heritage. All these deities are assigned a position subordinate to the Tirthankaras and other liberated souls.

Time is conceived as eternal and formless. The world is infinite and was never created. Space (*ākāśa*), all-pervasive and formless, provides accommodation to all objects of the universe and is divided into the space of the universe (*lokākāśa*) and that of the non-universe (*a-lokākāśa*), the latter having no substance in it. Through the centre of the universe runs the region of mobile souls in which all living beings, including men, animals, gods, and devils, live. Above the central region is the upper world of two parts; below it lies the lower world subdivided into seven tiers.

The Jains have erected monumental stupas in honour of their saints, and the richness and quality of their architecture and carving in stone have few equals. Jaina temples generally contain a number of metal images of various types and metal plaques depicting auspicious symbols.

Jainism preaches universal tolerance, and its attitude toward other forms of religion is that of noncriticism. It is not competitive and has never cared for the spread of its faith. Among its followers are the traders and merchants of Gujarāt and Mahārāshtra states.

Jaintia, in Indian history, a state in Assam, in northeastern India, stretching from what is now the northern frontier between Bangladesh and India over the Jaintia Hills to the Kalong River in the Assam plain. The people were of Khāsi origin.

In 1824, when the Burmese invaded Assam, the Raja allied with the British, who annexed his territory in 1832. Bengali traders and European tea planters moved in, producing tension that led to a rebellion in 1862. This was suppressed in a campaign that led to criticism of severity of British authorities in India.

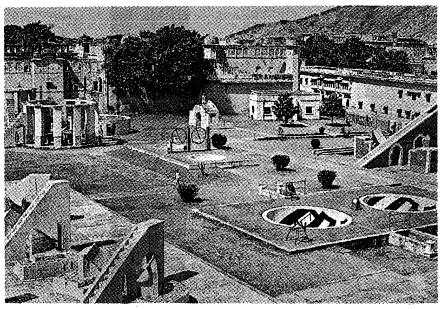
Jaintia Hills, physical region, eastern Meghālaya state, northeastern India. The sparsely populated mountainous region (part of the Meghālaya plateau) has an average elevation of more than 3,000 feet (900 m). It receives generally heavy rainfall and is densely forested. Fine woods are produced, but there is little industry. The Kopili River, which is the largest stream in the region, is rocky and swift and has many spectacular waterfalls. There are several species of rare wildlife.

The inhabitants of the Jaintia Hills are primarily tribal Jaintias, who, like the Khāsis to the west, are thought to be descendants of the first Mongolian migration to India. Until the 19th century, these people had a three-tiered system of administration. Under British rule, however, this system was broken down, and after independence it was replaced by a district council for tribal affairs and an Indian officer who administered other matters.

Partly because of their isolation, the Jaintias have largely maintained their matriarchal culture. They still practice shifting cultivation (potatoes are the main crop), though the Indian government attempted—with some success—to promote settled farming. Jaintias more than other tribal groups of the region have been influenced by Hinduism and Aryan ways, and thus settled farming was more readily accepted in the Jaintia Hills.

While the region remains isolated and less developed than much of India, British hegemony and its aftermath brought about a remarkable degree of unity among the peoples of the hill districts of Meghālaya.

Jaipur, city, capital of Rājasthān state, northwestern India. A walled town surrounded (except to the south) by hills, Jaipur was founded in 1727 by Maharaja Sawai Jai Singh to replace Amber as the capital of the princely state of Jaipur (founded by the Rājputs in the 12th century AD). Known for its beauty, the city is unique in its straight-line planning; its buildings are predominantly rose-coloured, and it is sometimes called the "pink city."



Observatory (Jantar Mantar) at Jaipur, Rājasthān, India
Harrison Forman

Jaipur has major road, rail, and air connections and is a commercial trade centre. Industries include engineering and metalworking, handloom weaving, distilling, and the manufacture of glass, hosiery, carpets, blankets, shoes, and drugs. Jaipur's famous arts and crafts include the making of jewelry, enamel, metalwork, and printed cloths, as well as stone, marble, and ivory carving.

The chief buildings are the city palace, an 18th-century open-air observatory (Jantar Mantar); Hawā Mahal (Hall of Winds); Rām Bāgh palace; and Nāhargarh, or Tiger Fort. Other public buildings include a museum and a library. Jaipur is the seat of the University of Rājasthān, founded in 1947.

The city is surrounded by fertile alluvial plains to the east and south and hill chains and desert areas to the north and west. Bajra (pearl millet), barley, gram (chick-pea), pulses, and cotton are the chief crops grown in this region; iron-ore, beryllium, mica, feldspar, marble, copper, and garnet deposits are worked. Pop. (1981) town, 977,165; metropolitan area, 1,015,160.

Jaisalmer, town, western Rājasthān state, northwestern India. Connected by road with Jodhpur, Barmer, and Phalodi, the town is a major caravan centre, trading in wool, hides, salt, fuller's earth, camels, and sheep. Jaisalmer, noted for its buildings of yellowish-brown stone, was founded in 1156 by Rāwal Jaisal, a chief of the Rājputs (the warrior rulers of the historic region of Rājputāna). The fort, on a hill that overlooks the town, houses the royal palace, several ancient Jaina temples, and a library called the Gyāna Bhandār (A Store of Knowledge), which contains old Sanskrit and Prākrit manuscripts.

The surrounding region, once a princely state, consists almost entirely of sandy waste, forming part of the Great Indian (Thar) Desert. The Kakni, the only river, spreads over a large area, forming Bhij Lake. Bajra (pearl millet) and jowar (sorghum) are the chief crops. The breeding of goats, camels, sheep, and cattle is widespread; and limestone, fuller's earth, and gypsum deposits are worked.

In the 12th century Jaisalmer state reached the height of its power. After the sack of the capital by the Muslim Delhi emperor 'Alā'-ud-Dīn Khaljī early in the 14th century, its fortunes declined. It subsequently became a Mughal fiefdom and entered into political relations with the British in 1818. In 1949 it joined the state of Rājasthān. Pop. (1981) 22,041.

Jājau, Battle of (June 12, 1707), decisive engagement over succession to the Mughal throne of India, following the death of the emperor Aurangzeb, and fought at Jājau, a few miles south of Āgra on the Yamuna River. The crown passed to Aurangzeb's eldest surviving son, Bahādur Shāh.

After Aurangzeb died on March 3, 1707, the contest was between Bahādur Shāh, governor of Kābul in Afghanistan, and his next brother, 'Aẓam Shāh. Careful preparations and quick movements enabled Bahādur Shāh to reach Āgra on June 12 and to secure the imperial treasure. Both sides numbered more than 100,000 combatants, the exact numbers being uncertain, but Bahādur Shāh was stronger in artillery. This advantage, with the desertion of part of 'Aẓam Shāh's support and a shortage of water in intense heat, decided the day. Both 'Aẓam Shāh and his son Bīdār Bakht were killed.

Jajce, town in Bosnia and Hercegovina, Yugoslavia, 29 miles (47 km) south of Banja Luka, on the Vrbas River. The ancient capital of the Bosnian kings, it fell to the Turks in 1461, when the last king was executed. It was taken again, by Hungary, and was the centre of the banat of Jajce in 1463–1528. The Turks returned in 1528 and remained for 350 years. Austrian occupation began in 1878, and Jajce was the scene of local resistance. The town became part of Yugoslavia after World War I. During World War II it was the base of operations for the Communist resistance forces under Marshal Tito. Jajce was the site of the second session of the provisional parliament that drafted the postwar constitution and founded the Federal Republic of Yugoslavia on Nov. 29, 1943.

Jajce is a tourist attraction, noted for its much photographed and publicized Turkish wooden water mills on the rapids of the Pliva River. The falls of the Pliva into the Vrbas canyon are nearby. Two hydroelectric stations are on the Pliva and Vrbas rivers, and an electrochemical plant produces calcium carbide. Pop. (1981 prelim.) mun., 41,197.

jajmānī system, reciprocal social and economic arrangement between families of different castes within a village community in India, by which one family exclusively performs certain services for the other, such as ministering to the ritual, barbering, or providing agricultural labour. These relations continue from one generation to another, and payment is normally made in the form of a fixed share in the harvest (*e.g.,* a fixed amount of grain) rather than in cash. The patron family is called *jajmān* (from Sanskrit *yajamāna,* "sacrificial patron who employs priests for a ritual"); the client family is the *jajmānī.* The patron family itself can be the client of another whom it patronizes for certain services and by whom it is in turn patronized for other services. The hereditary character allows for certain forms of bond labour, since it is the family obligation to serve its hereditary patrons.

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Jakarta, formerly (until 1949) BATAVIA, or (1949–72) DJAKARTA, largest city and the capital of the Republic of Indonesia. Located at the mouth of the Ciliwung (Liwung River) on the northwestern coast of the island of Java, the city is coextensive with the metropolitan district of Jakarta Raya and in 1966 was designated a special capital region (*daerah khusus ibukota*), a status approximating that of a state or province. Jakarta, long a major centre for trade and finance, has also developed into an important centre for industry and education.

A brief treatment of Jakarta follows. For full treatment (including a map), *see* MACROPAEDIA: Jakarta.

Jakarta occupies a low, flat alluvial plain

that is easily flooded during the rainy season. Its tropical climate is characterized by high temperatures and rainfall, together producing oppressive humidity that averages between 75 and 85 percent.

Jakarta has undergone tremendous growth and development since Indonesia reached independence in 1949. As the national capital and the chief centre of state planning, the city contains government ministries that are economically significant. It is also a major centre for trade: east of the city, Tanjungpriok, the largest port in Indonesia, handles exports from western Java and imports, many of which are transshipped to other Indonesian islands. Banking and commerce remain concentrated in the city centre, while new housing and industrial development are concentrated on the city's outskirts. Jakarta's manufacturing sector is minor compared to the city's service and trade functions. The chief industrial establishments are iron foundries, margarine and soap factories, and breweries.

A mixture of Western and Oriental architectural styles is everywhere apparent in Jakarta. The large public squares, such as Medan Merdeka (Freedom Field) and Lapangan Banteng (Place of the Gaur), are British and Dutch in character, whereas the Oriental style is evident in the city's types of houses, the wide, tree-lined streets, and the spacious gardens and house lots. The kampong (village) house, often built from wood or bamboo mats, is found in large concentrations throughout the city. Kampongs are often substandard, and housing in the city is generally overcrowded. Traffic jams occur during morning and evening rush hours, and the *betjak* (two-passenger tricycle taxi) is still common in local neighbourhoods. Large, modern stores in the main shopping areas contrast with the colourful markets and open-air shops.

The Kota (Fort), or Old City, remains the central business district and the financial capital of Indonesia. It also contains several buildings from the colonial period, notably the Old Portuguese Church and the old city hall, now a museum. In the present city centre, north of Medan Merdeka, is the Presidential Palace, also dating from colonial times, and the National Monument, which, at 360 feet (110 m), is one of the highest structures in Jakarta. The nearby Istiqlal Mosque was designed to be the largest in Indonesia. Other major architectural features include the 14-story Indonesia Sheraton (originally the Hotel Indonesia), the city's first high-rise building, and the Senayan Sports Complex.

Jakarta's cultural life is greatly enhanced by its many institutions of higher education. The largest and best-known is the Universitas Indonesia. Jakarta is an important centre for newspaper publishing, and the national radio and television networks broadcast programs from the city. Traditional arts, such as wayang dance and dramas, gamelan music, and wayang puppetry, are presented at the annual Jakarta Fair and at the Taman Ismail Marzuki centre.

Local transportation is provided by bus and rail services; railways and roads, radiating east, west, and south, connect Jakarta with the productive areas of eastern and central Java and with the major cities. Jakarta has two airports that operate domestic and international flights. Area 228 square miles (590 square km). Pop. (1981 est.) 6,556,000.

Jakarta Zoological Gardens: *see* Ragunan Zoological Gardens.

Jakob Thorarensen (Icelandic poet): *see* Thorarensen, Jakob.

Jakobshavn, Greenlandic ILULÍSSAT, town on the west coast of Greenland, near the mouth of Jakobshavn Fjord on Disko Bay. The town's first permanent houses were built by Danes in 1741 on the site of a Greenlandic (Eskimo) settlement. It was named in honour of Jakob Severin, who, in a 1739 naval battle, defeated four Dutch vessels in Disko Bay. Jakobshavn was the birthplace of the explorer Knud Rasmussen. The town has a number of 18th-century buildings, two small harbours, a shrimp canning plant, a memorial to Rasmussen, and a heliport. The town's Greenlandic name means "icebergs." Pop. (1989 est.) 4,239.

Jakobson, Roman, Russian ROMAN OSIPOVICH JAKOBSON (b. Oct. 11 [Sept. 29, Old Style], 1896, Moscow, Russia—d. July 18, 1982, Boston, Mass., U.S.), Russian born American linguist and Slavic-language scholar, a principal founder of the European movement in structural linguistics known as the Prague school. Jakobson extended the theoretical and practical concerns of the school into new areas of study.

Jakobson became professor of Russian at the Higher Dramatic School, Moscow, in 1920, and in 1928, with his colleagues of the Prague school, Nikolaj S. Trubetzkoy and S.I. Karcevskij, he announced a radical departure from the classical structural position of the influential Swiss linguist Ferdinand de Saussure. They suggested that their methods of studying the function of speech sounds could be applied both synchronically, to a language as it exists, and diachronically, to a language as it changes. Among his earlier works were *Remarques sur l'évolution phonologique du russe comparée à celles des autres langues slaves* (1929; "Comments on Phonological Change in Russian Compared with That in Other Slavic Languages") and *Kharakteristichke yevrazi-yskogo yazykovogo soyuza* (1931; "Characteristics of the Eurasian Language Affinity").

Jakobson began his association with Masarykova University (now the Purkyně University) of Brno, Czech., in 1933, becoming professor of Russian philology (1934) and Czech medieval literature (1936) there. The European political situation, however, compelled him to flee successively to the universities of Copenhagen, Oslo, and Uppsala, Swed., where he served as visiting professor. In 1941 he reached New York City, where he taught at Columbia University (1943–49). He was professor of Slavic languages and literature and general linguistics at Harvard University (1949–67).

The titles of Jakobson's works indicate the expanding scope of his research—*e.g., Kindersprache* and *Aphasie und allgemeine Lautgesetze* (both 1941; *Studies in Child-Language* and *Aphasia*). Among his later works are *Preliminaries to Speech Analysis* (1952), a pioneering work in the distinctive feature analysis of speech sounds, written in collaboration with C. Gunnar, M. Fant, and Morris Halle, and *Fundamentals of Language* (1956; rev. ed. 1971), also with Halle. Jakobson's *Selected Writings,* 6 vol. (1967–71), are concerned with phonological studies, the word, language, poetry, grammar, Slavic epic studies, ties, and traditions. His *The Sound Shape of Language,* with Linda R. Waugh, was published in 1979.

Jakobstad (Finland): *see* Pietarsaari.

Jakpa, Sumalia Ndewura (fl. 17th century), African king who founded a dynasty in Gonja, in what is now northern Ghana, in the early 17th century.

Originally a Mande invader, Jakpa established a loosely knit federation of states that extended over the entire northern part of present-day Ghana and parts of Togo and Benin. Jakpa's invasion of Ghana was probably the result of a dispute within an Islāmic force (of which he himself was part) then attempting to convert nations in what are now Mali and Burkina Faso (formerly Upper Volta). His kingdom was of great influence in West Africa because of its strategic location on the east–west trade routes between Central Africa and the Islāmic African nations in the southern Sahara. The kingdom was reduced in size and influence in the 18th century.

The name Jakpa is itself a title, and there is some doubt whether the events attributed to this ruler are those of Sumalia Ndewura (the first Jakpa) alone or are the combined record of a series of rulers assuming this title. *See also* Guang.

Jakun, any member of an aboriginal people found in the interior eastern portions of the Malay Peninsula. The major Jakun subgroups include the Biduanda, Mantera, Orang Laut, Orang Kanak, and Orang Ulu. The combined population was about 20,000 in the late 20th century. Later invaders from the highly developed states of Sumatra occupied the coasts of Malaya and often amalgamated with the Jakun. Those natives who resisted the newcomers finally retired to the interior, and they still retain much of early Malayan culture. In physical type the Jakun are basically southern Mongoloids as distinguished from neighbouring peoples, the Senoi and Semang; their language is archaic Malay.

Jakun houses of bamboo and thatch stand in jungle clearings where dry-land rice, sweet potatoes, millet, and other crops are raised; these are supplemented by jungle products and game hunted with blowgun and poison darts. Several family clearings make up a settlement, each settlement having a headman who is the leader in raids and in the search for game.

In common with many other Malayan peoples, the Jakun believe in multiple souls for humans, other animals, plants, and even inanimate objects. It is held that souls may leave their hosts and that they may be enticed or coerced by magic. It is thought that the souls of the right-hand side of an individual go to an afterworld at death, but that those of the left side wander on earth. Religion is centred upon many superior beings and family ancestors, for whom ceremonies are conducted by mediums.

JAL: *see* Japan Air Lines Co., Ltd.

Jalāl ad-Dīn ar-Rūmī, also called MAWLĀNĀ (b. *c.* Sept. 30, 1207, Balkh, Ghūrid empire [now in Afghanistan]—d. Dec. 17, 1273), the greatest Ṣūfī mystic and poet in the Persian language, famous for his lyrics and for his didactic epic *Mašnavī-ye Ma'navī* ("Spiritual Couplets"), which widely influenced Muslim mystical thought and literature. After Rūmī's death, his disciples were organized as the Mawlawīyah order, called in the West the Whirling Dervishes.

Jalāl ad-Dīn's father, Bahā' ad-Dīn Walad, was a noted mystical theologian, author, and teacher. Mainly because of the threat of the approaching Mongols, Bahā' ad-Dīn and his family left their native town in about 1218. According to a legend, in Nīshāpūr, Iran, the family met Farīd od-Dīn ʿAṭṭār, a Persian author of mystical epics, who blessed young Jalāl ad-Dīn. After a pilgrimage to Mecca and journeys through the Middle East, Bahā' ad-Dīn and his family reached Anatolia (Rūm, hence the surname Rūmī), a region that enjoyed peace and prosperity under the rule of the Turkish Seljuq dynasty. After a short stay at Laranda (Karaman), where Jalāl ad-Dīn's mother died and his first son was born, they were called to the capital, Konya, in 1228. Here, Bahā' ad-Dīn Walad taught at one of the numerous madrasahs (religious schools); after his death in 1231 he was succeeded in this capacity by his son.

A year later, Burhān ad-Dīn Muḥaqqiq, one of Bahā' ad-Dīn's former disciples, arrived in Konya and acquainted Jalāl ad-Dīn more deeply with some mystical theories that

had developed in Iran. Burhān ad-Dīn, who contributed considerably to Jalāl ad-Dīn's spiritual formation, left Konya about 1240. Jalāl ad-Dīn is said to have undertaken one or two journeys to Syria (unless his contacts with Syrian Ṣūfī circles were already established before his family reached Anatolia); there he may have met Ibn al-'Arabī, the leading Islāmic theosophist whose interpreter and stepson, Ṣadr ad-Dīn al-Qunawī, was Rūmī's colleague and friend in Konya.

The decisive moment in Rūmī's life occurred on Nov. 30, 1244, when in the streets of Konya he met the wandering dervish—holy man—Shams ad-Dīn (Sun of Religion) of Tabriz, whom he may have first encountered in Syria. Shams ad-Dīn cannot be connected with any of the traditional mystical fraternities; his overwhelming personality, however, revealed to Jalāl ad-Dīn the mysteries of divine majesty and beauty. For months the two mystics lived closely together, and Rūmī neglected his disciples and family so that his scandalized entourage forced Shams to leave the town in February 1246. Jalāl ad-Dīn was heartbroken; his eldest son, Sulṭān Walad, eventually brought Shams back from Syria. The family, however, could not tolerate the close relation of Jalāl ad-Dīn with his beloved, and one night in 1247 Shams disappeared forever. It has recently been established that he was indeed murdered, not without the knowledge of Rūmī's sons, who hurriedly buried him close to a well that is still extant in Konya.

This experience of love, longing, and loss turned Rūmī into a poet. His mystical poems—about 30,000 verses and a large number of *robā'īyāt* ("quatrains")—reflect the different stages of his love, until, as his son writes, "he found Shams in himself, radiant like the moon." The complete identification of lover and beloved is expressed by his inserting the name of Shams instead of his own pen name at the end of most of his lyrical poems. The *Dīvān-e Shams* (The collected Poetry of Shams) is a true translation of his experiences into poetry; its language, however, never becomes lost in lofty spiritual heights or nebulous speculation. The fresh language, propelled by its strong rhythms, sometimes assumes forms close to popular verses. There would seem to be cause for the belief, expressed by chroniclers, that most of this poetry was composed in a state of ecstasy, induced by the music of the flute or the drum, the hammering of the goldsmiths, or the sound of the water mill in Meram, where Rūmī used to go with his disciples to enjoy nature. He found in nature the reflection of the radiant beauty of the Sun of Religion and felt flowers and birds partaking in his love. He often accompanied his verses by a whirling dance.

A few years after Shams ad-Dīn's death, Rūmī experienced a similar rapture in his acquaintance with an illiterate goldsmith, Ṣalāḥ ad-Dīn Zarkūb. It is said that one day, hearing the sound of a hammer in front of Ṣalāḥ ad-Dīn's shop in the bazaar of Konya, Rūmī began his dance. The shop owner had long been one of Rūmī's closest and most loyal disciples, and his daughter became the wife of Rūmī's eldest son. This love again inspired Jalāl ad-Dīn to write poetry. After Ṣalāḥ ad-Dīn's death, Ḥusām ad-Dīn Chelebi became his spiritual love and deputy. Rūmī's main work, the *Maṣnavī-ye Ma'navī*, was composed under his influence. Ḥusām ad-Dīn had asked him to follow the model of the poets 'Aṭṭār and Sanā'ī, who had laid down mystical teachings in long poems, interspersed with anecdotes, fables, stories, proverbs, and allegories. Their works were widely read by the mystics and by Rūmī's disciples. Jalāl ad-Dīn followed Ḥusām ad-Dīn's advice and composed nearly 26,000 couplets of the *Maṯnavī* during the following years. It is said that he would recite his verses even in the bath or on the roads, accompanied by Ḥusām ad-Dīn, who wrote them down. The *Maṣnavī*, which shows all the different aspects of Ṣūfism in the 13th century, often carries the reader away with loose associations of thought, so that one understands what subjects the master had in mind at a particular stage of his life. The work reflects the experience of divine love; both Ṣalāḥ ad-Dīn and Ḥusām ad-Dīn were, for Rūmī, renewed manifestations of Shams ad-Dīn, the all-embracing light. He called Ḥusām ad-Dīn, therefore, Ḍiyā' al-Ḥaqq (Light of the Truth); *ḍiyā'* is the Arabic term for sunlight.

Rūmī lived for a short while after completing the *Maṣnavī*. He always remained a respected member of Konya society, and his company was sought by the leading officials as well as by Christian monks. Ḥusām ad-Dīn was his successor and was in turn succeeded by Sulṭān Walad, who organized the loose fraternity of Rūmī's disciples into Mawlawīyah, known in the West as the Whirling Dervishes because of the mystical dance that constitutes their principal ritual. Sulṭān Walad's poetical accounts of his father's life are the most important source of knowledge of Rūmī's spiritual development.

Besides his poetry, Rūmī left a small collection of occasional talks as they were noted down by his friends; in the collection, known as *Fīhi mā fīhi* ("There is in it what is in it"), the main ideas of his poetry recur. There also exist some letters directed to different persons. It is impossible to systematize his ideas, which at times contradict each other; and changes in the use of symbols often puzzle the reader. His poetry is a most human expression of mystical experiences, in which each reader can find his own favourite ideas and feelings—from enthusiastic flights into the heavens to matter-of-fact descriptions of daily life. Rūmī's influence on Turkish cultural life can scarcely be overstated; his mausoleum, the Green Dome, today a museum in Konya, is still a place of pilgrimage for thousands.

(An.Sc.)

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Jalālābād, formerly JALĀLKOT, capital of Nangarhār *velāyat* (province), eastern Afghanistan, on the Kābul River, at an altitude of 1,940 ft (590 m). It lies on the route from Kābul, the Afghan capital (110 mi [177 km] north-northwest), via the Khyber Pass to Peshāwar, Pakistan, and handles much of Afghanistan's trade with Pakistan and India. The town stands at an important strategic position, commanding the entrances to the Laghmān and Konar (Kunar) valleys. It is a military centre, with an airfield.

The site of Jalālābād has been occupied since the 2nd century BC, and Akbar (1542–1605), regarded as the greatest Mughal ruler of India, started the modern town as early as the 1560s. It came under Afghan rule in 1834. During the First (1839–42) and Second (1879–80) Anglo-Afghan wars, Jalālābād was occupied by the British. After their military intervention in 1979, Soviet forces established a military command near Jalālābād and gained control of the town in early 1980. Afghan guerrillas maintained control of the province, and fighting continued intermittently. Several million Afghan refugees and the headquarters of several Afghan guerrilla groups were across the Pakistan border in nearby Peshāwar.

The town is surrounded by a large irrigated plain, producing fruit, almonds, rice, and grain. Light industries include a sugarcane refinery and handicraft shops. An urban modernization program to improve water systems and pave the roads has been undertaken. The University of Nangarhār, established in 1963, is located in Jalālābād. Pop. (1982 est.) 57,824, mainly Pashtuns.

Jalālkot (town, Afghanistan): *see* Jalālābād.

Jalapa, department, southeastern Guatemala, with an area of 797 sq mi (2,063 sq km). Its area includes the continental divide, and it is drained by the affluents of the Motagua and Ostua rivers. The climate is mild in the valleys but cool in the mountains. Most of the inhabitants are Indians, who grow corn (maize), wheat, beans, tobacco, and rice. Dairy cattle are raised for cheese production, and the dense forests yield lumber. Roads, all but one unpaved, cross the isolated plateaus, intersecting at the capital, Jalapa (*q.v.*), in the centre of the department. Pop. (1982 est.) 162,907.

Jalapa, capital, Jalapa department, southeastern Guatemala, in a picturesque valley of the central highlands at an elevation of 4,469 ft (1,362 m) above sea level. In addition to its administrative role, Jalapa functions as a commercial and manufacturing centre for the fertile agricultural and pastoral hinterland. Because of its isolation the town has retained much colonial architecture and culture. Jalapa is connected to the Pan-American Highway in the south by a paved road, and it is connected in the north to the highway leading to Guatemala City. Pop. (1981 prelim.) mun., 54,539.

Jalapa, in full JALAPA ENRÍQUEZ, city, capital of Veracruz state, east central Mexico, in the Sierra Madre Oriental, at 4,681 ft (1,427 m) above sea level. When Hernán Cortés marched through it in 1519, it was a thriving Indian village. The city is known for its climate, for its abundant flowers, and as a market for the coffee and tobacco produced nearby. It was famous in colonial days for its annual fair, held to dispose of the goods brought from Cádiz, in Spain, by the returning Spanish silver fleet. The massive Spanish-Moorish architecture of the city is reminiscent of viceregal days. Veracruzana University (1944) is located there. The city is accessible by railroad and highway. Pop. (1980 est.) 212,000.

Jālaun, town and district, Uttar Pradesh state, northern India. The district occupies an area of 1,756 sq mi (4,549 sq km) on the Ganges alluvial plain and is bounded on the north by the Yamuna River. The Betwa Canal system provides irrigation water; crops include wheat, gram, and mustard. There are acacia tree plantations near the town of Kālpi. Orai, the administrative headquarters, is 65 mi (105 km) southwest of Kānpur, with which it is linked by road and rail. Orai is a trade centre for agricultural produce. Jālaun town, for which the district is named, is 12 mi northwest of Orai. Pop. (1981) town, 27,650; district, 986,238.

Jalāyirid, Mongol tribe that supported the Il-Khan Hülegü's rise to power and eventually provided the successors to the Il-Khan dynasty as rulers of Iraq and Azerbaijan. A Jalāyirid dynasty made its capital at Baghdad (1336–1432).

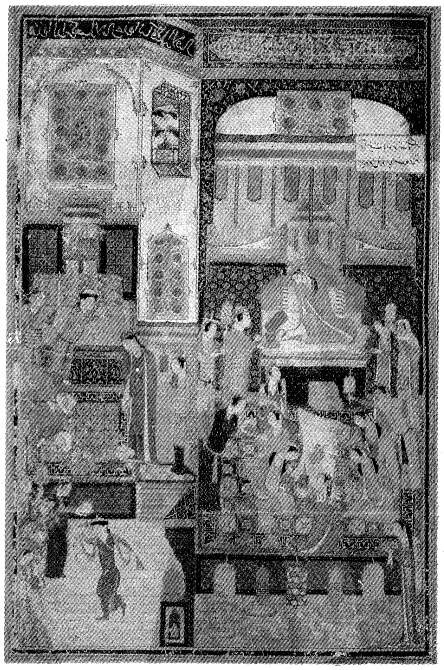
Ḥasan Buzurg, founder of the dynasty, had served as governor of Anatolia (Rūm) under the Il-Khan Abū Sa'īd (reigned 1317–35). Following the death of Abū Sa'īd, Ḥasan Buzurg competed for real control of the empire with his rival, the Chūpānid *amīr* Ḥasan Kūčük

("the Small," so designated to distinguish him from Ḥasan Buzurg, "the Great"); they set up rival khanates. Soon afterward the empire broke down into local dynasties in Anatolia, Iran, Azerbaijan, Georgia, and Armenia.

Ḥasan Buzurg had, meanwhile, established his line in Baghdad, from which he conducted his agitation against the Chūpānids. His son Uways I (reigned 1356–74) enlarged Jalāyirid domains by seizing Azerbaijan (1360) and placing the Moẓaffarid principality of Fārs under his suzerainty (1361–64). The dynasty, however, was beset by the westward migrations and invasions of various Turkic and Mongol tribes. The khans of the Golden Horde, successors of Batu, unsuccessfully attempted the conquest of Azerbaijan in 1356–59, while the Timurids routed Aḥmad (reigned 1382), forcing him to leave Baghdad and seek the protection of the Mamlūks of Egypt until Timur's death in 1405. The Kara Koyunlu (*q.v.*) Turkmens, initially in Jalāyirid service, eventually overwhelmed Azerbaijan and western Iran, executed Aḥmad (1410), and captured Baghdad.

A subsidiary line of Jalāyirids maintained itself as vassals of the Timurids in lower Iraq until it was conquered by the Kara Koyunlu in 1432.

Jalāyirid school, school of miniature painting that flourished in Baghdad under the Jalāyirids, a local dynasty of governors in power from 1336 to 1432. Along with their contemporaries, the Moẓaffarids of southern Iran, the Jalāyirid school developed a system of



"Wedding Celebrations of Humāyūn" from the *Khamseh* of Khwājū Kermānī, Jalāyirid school miniature by Junayd, 1396 (British Library, London, MS. Add. 18113)

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perspective, though in a primitive form, that had been suggested by Mongol Il-Khan paintings of the late 13th-century school of Tabriz. Older Mesopotamian schools of painting had traditionally set figures along the bottom and drawn them to the top of the picture plane, thus destroying any suggestion of depth. Later Mongol painting in Iraq-Iran used a larger part of the picture for landscape and background. Figures and groups of figures could then be set on varying levels, one over the other, producing the illusion that one was behind the other.

The Jalāyirid school was influenced as well by the Baghdad school (*q.v.*) of the 13th century, which was noted for the depiction of expressive, individualized faces rather than facial types, for a sense of movement, and for attention to the details of everyday life. The Jalāyirids continued to develop these characteristics, trying especially to create individualized faces. The result was a successful blend of styles: subtle realism combined with a highly developed sense of colour and design. At the end of the 14th century, the emergence of a great painter, Ustād Junayd, heralded the arrival of the classic style of Persian miniature painting.

Jaldapāra Wild Life Sanctuary, wildlife preserve in Jalpaiguri district, West Bengal state, northeastern India, established in 1941 mainly for the protection of the great Indian rhinoceros. It extends over an area of 40 sq mi (105 sq km) in the northern part of the state near the Bhutan border and is composed of forested flatlands dissected by the Torsa River and its tributaries. The forest cover consists mainly of scattered teak and tall grass. Also within the sanctuary are swamp deer, leopard, sambar, hog deer, barking deer, wild pig, jungle fowl, peafowl, quail, and an occasional elephant or tiger. There are riding elephants available in the preserve.

Jālgaon, town, administrative headquarters of Jālgaon district, Mahārāshtra state, western India, on the Bombay–Nāgpur road and the Bombay–Allahābād railway. Although insignificant before the 19th century, it then attracted merchants and weavers so that it could boast of more than 400 handlooms by 1860. From the late 1800s it grew steadily, and it is now one of the chief commercial centres of the Khāndesh cotton-growing region. It has 12 colleges affiliated with the University of Poona.

Jālgaon district (4,545 sq mi [11,771 sq km]) is situated in the Tāpti River Valley on the northern rim of the Deccan Plateau. It is bounded in the north by the Sātpura Range of the Western Ghāts, with peaks rising to 3,500 ft (1,000 m). The hills descend steeply to the Tāpti River, the fast-flowing tributaries of which have deeply dissected its banks, creating a typical badland landscape. South of the Tāpti, the land is gently undulating and rises gradually to the Ajanta Range, 600 ft above the river basin. The region is important as a part of the Khāndesh cotton belt; millet and oilseeds are also grown. Irrigation projects on the Tāpti, Bori, and Girna rivers were begun in the mid-1970s to alleviate the pressures of a seasonal and scanty rainfall. Industries include cotton mills and artificial silk, thread, and fireworks factories. Several educational societies operate primary, secondary, and trade schools in the district. The Indian Institute of Philosophy (1916) is located at Amalner. Pop. (1981) town, 145,335; district, 2,618,274.

Jalīlī FAMILY, prominent Iraqi family that ruled the Ottoman *paşalik* (province) of Mosul (in modern Iraq) in the period 1726–1834. Although the founder of the Jalīlī line, 'Abd al-Jalīl, was a Christian slave, his son Ismā'īl distinguished himself as a Muslim public official and became *wālī* (governor) of Mosul in 1726. Ḥajj Ḥusayn Pasha, who succeeded his father in 1730, became the central figure of the dynasty by successfully repulsing a siege of the city by the Persian Nāder Shāh in 1743. Assorted members of the Jalīlī family held the office of *wālī* of Mosul as well as administrative positions in other Ottoman provinces until 1834, when the Ottoman Empire was reorganized under a centralized, modern form of government.

Jalisco, state, west central Mexico, bounded by the states of Nayarit and Aguascalientes and Zacatecas (north), Guanajuato (east), Michoacán and Colima (south), and by the Pacific Ocean (west). Its capital is Guadalajara (*q.v.*), and it has an area of 31,211 sq mi (80,836 sq km). The Sierra Madre Occidental traverses the state, separating the narrow, heavily forested coastal plain from a high plateau region, part of the great Anáhuac tableland, with an average elevation of about 5,000 ft (1,500 m). The sierra region is largely volcanic, and earthquakes are frequent. Among the many lakes is Chapala, Mexico's largest and a popular resort.

Jalisco was first invaded by Spaniards about 1526 and was incorporated into Nueva Galicia, which also included Aguascalientes and Zacatecas. In 1889 its area was much reduced by the separation of the territory of Tepic, now Nayarit (*q.v.*) state, from its coastal zone.

Jalisco's economy is based on a variety of crops (corn [maize], wheat, and beans on the uplands and sugarcane, cotton, rice, and tobacco in the warmer districts), forest products from the coast, livestock raising in the uplands, and mining (silver, gold, mercury, copper, and various precious stones). Among the varied industries are textile mills and cement and electric-power plants. Rail and highway networks in Jalisco are extensive, linking Guadalajara with Mazatlán, Mexico City, and other inland urban centres. The population includes a large percentage of Indians and mestizos. Pop. (1980 prelim.) 4,293,549.

Jālor, also spelled JALORE, or JHALORE, town, administrative headquarters of Jālor district, Rājasthān state, northwestern India. It lies just south of the Sukri River, a tributary of the Lūni. Connected by road and rail with Jodhpur, it is the agricultural market for the district. A medieval stronghold, Jālor was the 12th-century capital of the Cauhān Rājputs (the warrior rulers of the historic region of Rājputāna) and was captured *c.* 1310 by the Delhi emperor 'Alā'-ud-Dīn Khaljī. An 11th-century hill fort overlooks the town. Jālor has a government college affiliated with the University of Rājasthān.

Jālor district (4,108 sq mi [10,640 sq km]), previously part of Jodhpur princely state, comprises a semifertile region drained by the Lūni River and its tributaries. In the eastern portion are scattered outliers of the Arāvalli Range. Tube wells irrigate the district's bajra (pearl millet), oilseed, and sesame crops. Horse breeding is widespread, and marble deposits are worked. Pop. (1981) town, 24,100; district, 903,073.

Jalpaiguri, town, administrative headquarters of Jalpaiguri district, West Bengal state, northeastern India, just west of the Tīsta River. The chief agricultural distributing centre of the state, the town is connected by road and rail with Darjeeling, Silīguri, and Saidpur (Bangladesh). Jute pressing, sawmilling, and match manufacture are the major industries; nearby are railway workshops. Jalpaiguri, constituted a municipality in 1885, has five colleges affiliated with the University of North Bengal.

Jalpaiguri district (2,411 sq mi [6,245 sq km]) comprises two distinct tracts separated by the Tīsta. The region to the west is a level, densely populated expanse, growing rice, jute, and sugarcane; to the east is a submontane area called the Western Duārs, with six passes (*duārs*, "doors") in the Sinchula Hills into Bhutan. There are dense forests and extensive tea gardens; tobacco, jute, oilseed, and potato cultivation flourishes; and coal, copper ore, limestone, and dolomite deposits are worked. The district has several game sanctuaries. In the south are the ruins of the 9th-century city of Bhitargarh. The original district, formed in 1869, was reduced in 1947 by the transfer of its southwestern portion into Dinājpur district of East Pakistan (now Bangladesh). Pop. (1981) town, 61,743; district, 2,214,871.

Jalta (Ukrainian S.S.R.): *see* Yalta.

Jaluit Atoll, coral formation in the Ralik (western) chain of the Republic of the Marshall Islands, situated in the west-central Pacific Ocean. The atoll has a total land area of 4.4 square miles (11.4 square km) and a lagoon that is easily accessible and provides a good anchorage. The first missionaries to the Marshall Islands landed on Jaluit in 1857. The atoll was also the site (1885) of Germany's formal declaration of a protectorate over the islands. Chosen as an administrative centre by Germany, it continued as such under the Japanese. Heavily fortified by the Japanese, Jaluit was devastated by U.S. bombing in World War II. Jabor, the chief settlement, grew after the war. Copra is exported and fishing is important. Pop. (1985 est.) 609.

Jamaame, also spelled JAMAME, or GIAMAME, former Italian MARGHERITA, town, southern Somalia, eastern Africa. Jamaame is situated on the eastern bank of the lower Jubba River, in the southeastern coastal lowlands near the Indian Ocean. The town is an important agricultural, commercial, and industrial centre. Bananas, the major crop, are exported through Kismaayo (Chisimayu), a port located 35 miles (56 km) to the south. Cotton, peanuts (groundnuts), and corn (maize) are also grown in the area. The National Plastic and Carton Company was established at Jamaame in collaboration with the Italian government in 1974. This industry was able to promote banana exports when it developed a local packing material to replace imported packing, thus reducing the price of Somali bananas in Europe. The town is connected by roads with Kismaayo and Mogadishu (Muqdisho). Pop. (latest census) 22,030.

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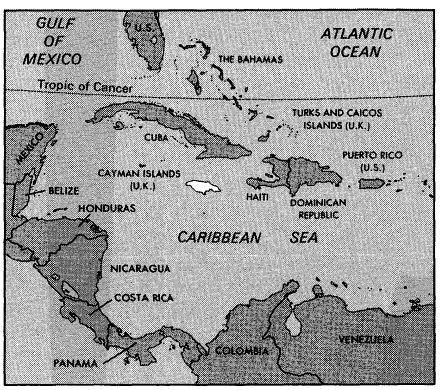
Jama'are, also spelled JAMAARI, town and traditional emirate, Bauchi state, northern Nigeria. The town is situated along the Jamaari River, which is a tributary of the Katagum, and at the intersection of roads leading from Wudil, Azare, and Faggo. Traditionally founded in 1811 by Muhammadu Wabi I, a leader in the Fulani jihad (holy war) led by Usman dan Fodio, the emirate was not officially recognized until 1835, when Sambolei, the chief of the Jama'are Fulani, was rewarded with it for his aid against the Hausa rebels of Katsina by Muḥammad Bello, the *sarkin musulmi* ("commander of the faithful") and sultan of Sokoto. Emir Muhammadu Maude built the walls (20 feet [6 m] high with four gates) of Jama'are town in the 1850s, but the town barely survived attacks by the forces of Emir Buhari of Hadejia in the 1850s and 1860s. Jama'are's emir Muhammadu Wabi II submitted to the British after the fall of Kano city to the latter in 1903. Incorporated into the Katagum division of Kano province, Jama'are was transferred to Bauchi province in 1926 and became part of Bauchi state in 1976.

Most of the inhabitants of the emirate are members of the Fulani, Shirawa, Kanuri, or Hausa peoples. They cultivate peanuts (groundnuts), cotton, sorghum, millet, cowpeas, and vegetables, which they grow on the floodplain; they also keep goats, cattle, sheep, donkeys, and horses. The Hadejia–Jama'are River Basin Development Authority was created in the late 1970s to improve agricultural productivity in the area. Cotton weaving and dyeing, especially with indigo, are important local activities. Jama'are is headquarters of a local government council, and there are a primary teacher-training college, a general hospital, and a leprosy clinic in the town. Pop. town (1972 est.), 15,740.

Jamaica, island nation of the West Indies, situated 90 miles (145 km) south of Cuba at a crossroads of major sea trade routes in the middle of the Caribbean Sea. It covers an area of 4,244 square miles (10,991 square km) and is the third largest island in the Caribbean, after Cuba and Hispaniola. The capital is Kingston. The island is about 146 miles (235 km) long from east to west and about 35 miles (56 km) wide from north to south. The population in 1990 was estimated at 2,431,000.

A brief treatment of Jamaica follows. For full treatment, *see* MACROPAEDIA: West Indies.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.



Jamaica

The land. Jamaica has three major physiographic regions: the coastal lowlands and valleys, a limestone plateau, and the interior highlands. The heavily cultivated coastal lowlands that encircle the island are most extensive (5 to 10 miles [8 to 16 km] wide) in the south and west. Toward the centre the lowlands rise to a highly dissected limestone plateau (average elevation 1,500 feet [460 m] above sea level) covering about one-half of the total area of the island; the largely inaccessible higher parts of the plateau, called the Cockpit Country (500 square miles [1,295 square km]), have a karst topography, with sinkholes and underground caverns and streams. The interior of the island is dominated by the rugged and thickly forested highlands (5,000 to 7,000 feet [1,524 to 2,134 km] in elevation) with mountain ranges oriented east–west; the Blue Mountains in the east are the principal mountain system and culminate in Blue Mountain Peak (7,402 feet [2,256 m]), the highest point in the country. The Black River in the west is the longest (44 miles [71 km]) and the major river; it is navigable for 25 miles (40 km) in its lower reaches. Many of the smaller rivers disappear in the sinkholes of the karst region. There are several natural mineral springs.

Jamaica's maritime tropical climate has equable temperatures throughout the year. The mean temperature is about 75° F (24° C) in winter; it rises to about 80° F (27° C) in summer. The island's average annual rainfall of 82 inches (2,095 mm) is concentrated in two rainy seasons: May–June and September–November. Rainfall varies from more than 200 inches (5,080 mm) in the eastern mountains to about 30 inches (760 mm) in the southwestern coastal region. Hurricanes have occasionally struck the island, sometimes causing severe damage. The natural vegetation varies from dense bamboo, ebony, mahogany, and rosewood forests in the northeast and east to dry savanna vegetation with scattered dwarf trees and cacti in the southwest. Banana plantations are largely concentrated in the valleys and the foothills of the northeast, and sugarcane plantations occupy most of the level coastal plains. The island's wildlife is limited to wild pig, mongoose, lizard, bat, and several species of birds, including the streamertail hummingbird, which is the national bird.

The most important mineral resource is bauxite, found in the central part of the country. Other minerals include gypsum in the east, silica sand in the west, and limestone throughout the island.

The people. The population consists mostly of black and mulatto descendants of African slaves. Small minorities from the United Kingdom, India, China, Syria, Portugal, and Germany live in Jamaica. English is the official language, and a creole derived from English, a variety of African languages, Spanish, and French is widely spoken. The Church of England was the early established church, but today Pentecostal, Baptist, and other Christian denominations prevail. Jewish, Hindu, and Muslim communities are also represented. Syncretic revivalist sects based largely on Christianity and spirit possession include the Pocomania and Cumina sects, and the island is the home of the Rastafarian sect.

Jamaica's average annual population growth rate is relatively low for a developing country. Family-planning programs influenced the decline in the birth rate, reducing it by half between the 1960s and the late 1970s. Consequently, less than two-fifths of the population is younger than 15 years of age. Improved health-care programs have caused the death rate to decline also. Emigration is encouraged by the government to alleviate the effects of a growing population, and the United States and Canada are the chief destinations of Jamaican migrants.

Nearly half of Jamaica's population lives in urban areas. Significant rural-to-urban migration during the 1960s and '70s led to increased unemployment in urban areas. The government began agrarian-reform programs to improve neglected rural areas. The coastal lowlands are the most densely populated area of the country.

Economy. Jamaica has a developing, mixed economy largely based on tourism, alumina and bauxite exports, and sugarcane cultivation. The gross national product (GNP) has slowly declined, as has the GNP per capita, which remains relatively low by world standards.

Agriculture accounts for about one-twentieth of the GNP and employs approximately one-fourth of the work force. The main agricultural export is raw sugar, with molasses and rum as important by-products. Other export crops include bananas, cocoa beans, fruit juices, coffee, citrus fruits, and coconuts. Production of the main food crops of roots and tubers, corn (maize), rice, and copra does not keep pace with demand, and additional food must be imported. Although the output of some crops has increased, agricultural production in general has stagnated, as the sector has been neglected in favour of developing the mineral and tourist industries.

Jamaica is one of the world's largest producers of bauxite and alumina. The government maintains a degree of control over all mining operations and a share in total production. Bauxite and alumina account for almost half of the country's total exports.

Industry accounts for one-sixth of the GNP and employs one-tenth of the work force. The bauxite–alumina industries dominate, but local manufacturing has expanded and produces processed foods, cement, tobacco, textiles, and various consumer goods. Electricity is largely generated from imported fuels.

Services account for about one-half of the GNP and employ a comparable percentage of the work force. Tourism is Jamaica's largest earner of foreign exchange. Licensing is required of all enterprises and individuals operating in the tourism sector, and extensive

investment and training programs have been implemented to upgrade tourist services.

Jamaica's main trading partner is the United States. Jamaica's external debt grew steadily during the 1980s as imports (largely of petroleum, chemicals, and foodstuffs) continued to exceed exports by substantial margins. Government policy for economic recovery includes active encouragement of foreign investment in the private sector and assistance from the International Monetary Fund. Unemployment and inflation continue to be major problems.

A passenger railway crosses the island from Kingston to Montego Bay, and there are several minor lines for transporting bauxite. About two-fifths of the road network is paved. The principal ports include Kingston and Montego Bay, also the sites of the country's international airports.

Government and social conditions. Jamaica is an independent parliamentary state within The Commonwealth. Under its 1962 constitution, the British monarch, represented by the governor-general, is the head of state. The governor-general's role is largely ceremonial, however, and executive power is exercised by the Cabinet under the leadership of the prime minister, who is the leader of the majority party in parliament. The bicameral parliament is composed of a House of Representatives, with 60 directly elected members, and a Senate, with 21 members appointed by the governor-general, 13 with the advice of the prime minister and 8 with the advice of the leader of the opposition party. General elections are held at least once every five years. The Jamaica Labour Party and the People's National Party are the main political organizations. The Jamaican judicial system is headed by the Court of Appeals.

Social-security provisions, covering all employed persons, include accidental injury, old-age, disability, and survivor benefits. Health conditions are somewhat better than those of most other Caribbean countries. Tuberculosis, influenza, whooping cough, venereal diseases, scarlet fever, and dengue fever are the major health problems. The average life expectancy is about 70 years. Education is compulsory in certain districts and free between the ages of 6 and 15, and about 90 percent of the population is literate. The main branch of the University of the West Indies is located in Mona, a northeastern section of Kingston.

Cultural life. There is a vigorous and productive art movement in Jamaica, stemming in part from the development of a national literature in the 1940s. The works of Jamaican novelists may be read in several languages, and Jamaican artists have exhibited successfully abroad. The National Dance Theatre Company, founded in 1962, has earned international recognition. There has also been a resurgence in Jamaican folk and popular music, chiefly based on the colourful rhythmic intensity inherited from African cultures. Reggae, a Jamaican musical style that originated in the 1960s, had achieved international popularity by the following decade.

History. When Christopher Columbus sighted Jamaica in 1494 during his second voyage to the New World, the island was inhabited by Arawak Indians. The Arawak had migrated from South America through the greater Antilles about AD 250 and probably reached Jamaica a few hundred years later. Fifteen years after Columbus sighted Jamaica, it was colonized by the Spanish, who were soon disappointed with the island's lack of gold. Jamaica thereafter became a neglected colony under the Spanish.

In 1655 the island fell into British hands. During the 17th and 18th centuries the British were consistently harassed and attacked by the Maroons, armed and organized freed slaves who operated from the thick woods and mountains, including the Cockpit Country. British buccaneers operated from Port Royal on Jamaica, attacking Spanish ships and keeping the Spanish fleet tied down.

The slave trade, introduced by the Spanish, continued to flourish under British rule. It grew steadily in volume as the sugar produced by Jamaican slave labourers increased in quantity and value, and by the end of the 18th century Jamaica had become a prized colonial possession.

The plantation system collapsed with the abolition of slavery on Jamaica in the late 1830s. In 1866 the crown-colony form of government, with the governor wielding executive and legislative power, was established. By the late 1930s, dissatisfaction with the crown-colony system increased with the consequences of the Great Depression, causing widespread rioting and later the formation of labour unions and a growing demand for self-determination.

A 1944 constitution provided for a bicameral legislature, ministerial government, and universal adult suffrage. Full internal self-government was obtained in 1959, and three years later Jamaica became an independent country within the Commonwealth. The Jamaica Labour Party (JLP) dominated the parliament in the early years of independence. In 1972 the People's National Party (PNP) won a landslide victory. Under its charismatic leader, Michael Manley, the government moved sharply to the left and nationalized a number of businesses. Manley was reelected in 1976, but in 1980 the JLP led by a moderate conservative, Edward Seaga, was returned to power. The PNP won again in 1989, however, returning Manley to the head of government.

Jamaica Bay, shallow inlet of the Atlantic Ocean, covering about 20 square miles (50 square km) on the southwestern shore of Long Island, in southeastern New York, U.S. Part of the Port of New York, the bay is sheltered on the south by Rockaway Peninsula and is traversed by the Cross Bay Boulevard. Dotted with marshy islands, Jamaica Bay connects with the ocean to its southwest by way of Rockaway Inlet, which is bridged. Near the entrance channel is Coney Island. On the Brooklyn shore is Floyd Bennett Field, which was a U.S. naval air station; and on the northeast shore, at Idlewild, is the John F. Kennedy International Airport.

Jamaican fruit bat (*Artibeus jamaicensis*), tailless fruit-eating bat, belonging to the family Phyllostomatidae, that inhabits neotropical regions. The bat's body is characterized by the presence of a very small flight membrane between the hind legs. This species feeds mainly on fruit and will fly as much as 10 km (6 miles) to a feeding site. From there it carries fruit to a feeding roost in a nearby tree. The Jamaican fruit bat also eats insects, catching flies that approach the roost by hooking them in its wing tips. Its preferred roosts are caves or hollow trees; males may hang in the nearby foliage. *A. jamaicensis* has an odour similar to that of a perfumed soap. The bat occasionally destroys fruit crops.

Jamaican sorrel (plant): *see* roselle.

Jamāl ad-Dīn al-Afghānī, in full JAMĀL AD-DĪN AL-AFGHĀNĪ AS-SAYYID MUḤAMMAD IBN ṢAFDAR AL-ḤUSAYN (b. 1838, Asadābād, Persia [now Iran]—d. March 9, 1897, Istanbul), Muslim politician, political agitator, and journalist whose belief in the potency of a revived Islāmic civilization in the face of European domination significantly influenced the development of Muslim thought in the 19th and early 20th centuries.

Very little is known about Afghānī's family or upbringing. Despite the appellation Afghānī, which he adopted and by which he is known, some scholars believe that he was not an Afghan but a Persian Shīʿite (*i.e.,* a member of one of the two major divisions of Islām), born in Asadābād near Hamadan in Persia. An appreciable part of Afghānī's activities took place in areas where Sunnism (the other major division of Islām) was predominant, and it was probably to hide his Persian and Shīʿite origin, which would have aroused suspicion among Sunnites, that he adopted the name Afghānī. As a young man he seems to have visited, perhaps in order to extend and perfect his theological and philosophical education, Karbalāʾ and an-Najaf, the Shīʿite centres in southern Mesopotamia, as well as India and perhaps Istanbul. The intellectual currents with which he came in contact remain obscure, but whatever they were, they made him early into a religious skeptic.

Only from about November 1866, when Afghānī appeared in Qandahār, Afg., can evidence be pieced together to form a consecutive and coherent picture of his life and activities. From the death in 1863 of the famous Dōst Moḥammad Khān, who had ruled for more than 20 years, Afghanistan had been the scene of civil wars occasioned by the quarrels of his sons over the succession. In 1866 one of these sons, Shīr ʿAlī Khān, was established in the capital, Kābul, but two of his brothers, Moḥammad Afḍal Khān and Moḥammad Aʿẓam Khān, were threatening his tenure. In January 1867 Shīr ʿAlī was defeated and expelled from Kābul, where Afḍal and, upon his death shortly afterward, Aʿẓam reigned successively in 1867–68. At the end of 1866 Aʿẓam captured Qandahār, and Afghānī immediately became Aʿẓam's confidential counselor, following him to Kābul. He remained in this position until Aʿẓam was in turn deposed by Shīr ʿAlī, who succeeded in regaining his throne in September 1868.

That a foreigner should have attained so quickly such a position was remarked upon in the contemporary accounts; some scholars speculate that Afghānī (who then called himself Istanbulī) was, or represented himself to be, a Russian emissary able to obtain for Aʿẓam Russian money and political support against the British, with whom Aʿẓam was on bad terms. When Shīr ʿAlī succeeded in regaining the throne, he was naturally suspicious of Afghānī and expelled him from his territory in November 1868.

Afghānī next appeared in Istanbul in 1870, where he gave a lecture in which he likened the prophetic office to a human craft or skill. This view gave offense to the religious authorities, who denounced it as heretical. Afghānī had to leave Istanbul and in 1871 went to Cairo, where for the next few years he attracted a following of young writers and divines, among them Muḥammad ʿAbduh, who was to become the leader of the modernist movement in Islām, and Saʿd Pasha Zaghlūl, founder of the Egyptian nationalist party, the Wafd. Again, a reputation of heresy and unbelief clung to Afghānī. The ruler of Egypt then was the khedive Ismāʿīl, who was both ambitious and spendthrift. By the mid-1870s his financial mismanagement led to pressure by his European creditors and great discontent among all his subjects. Ismāʿīl tried to divert their wrath from himself to the creditors, but his maneuvers were clumsy, and, in response to French and British pressure, his suzerain, the Ottoman sultan, deposed him in June 1879. During this period of political effervescence, Afghānī attempted to gain and manipulate power by organizing his followers in a Masonic lodge, of which he became the leader, and by delivering fiery speeches against Ismāʿīl. He seems to have hoped to attract thereby the favour and confidence of Tawfīq, Ismāʿīl's son and successor, but the latter, reputedly fearing that Afghānī was propagating republicanism in Egypt, ordered his deportation in August 1879.

Afghānī then went to Hyderābād and later, via Calcutta, to Paris, where he arrived in January 1883; his stay there contributed greatly to his legend and posthumous influence as an Islāmic reformer and a fighter against European domination. In Paris, Afghānī, together with his former student ʿAbduh, published an anti-British newspaper, *al-ʿUrwat al-wuthqā* ("The Indissoluble Link"), which claimed (falsely) to be in touch with and have influence over the Sudanese Mahdī, a messianic bearer of justice and equality expected by some Muslims in the last days. He also engaged Ernest Renan, the French historian and philosopher, in a famous debate concerning the position of Islām regarding science. He tried unsuccessfully to persuade the British government to use him as intermediary in negotiation with the Ottoman sultan, Abdülhamid II, and then went to Russia, where his presence is recorded in 1887, 1888, and 1889 and where the authorities seem to have employed him in anti-British agitation directed to India. Afghānī next appeared in Iran, where he again attempted to play a political role as the shah's counselor and was yet again suspected of heresy. The shah, Nāṣer od-Dīn Shāh, became very suspicious of him, and Afghānī began a campaign of overt and violent opposition to the Iranian ruler. Again, in 1892, his fate was deportation. For this, Afghānī revenged himself by instigating the shah's murder in 1896. It was his only successful political act.

From Iran, Afghānī went to London, where he stayed briefly, editing a newspaper attacking the shah and urging resistance to him and particularly to the tobacco concession that had been granted to a British subject. He then went to Istanbul, in response to an invitation made by an agent of the sultan. The sultan may have hoped to use him in pan-Islāmic propaganda, but Afghānī soon aroused suspicion and was kept inactive, at arm's length and under observation. He died in Istanbul. His burial place was kept secret, but in 1944 what was claimed to be his body, owing to the mistaken impression that he was an Afghan, was transferred to Kābul, where a mausoleum was erected for it. (E.Ke.)

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Jamāl ad-Dīn Ḥasan ibn Yūsuf ibn ʿAlī ibn Muṭhahhar al-Ḥillī: *see* Ḥillī, al-.

Jamālpur, city, north-central Bangladesh, on the west bank of the Old Brahmaputra River. An important trade centre for rice, jute, oilseeds, sugarcane, and tobacco, it is connected by rail with Mymensingh, Jagannāthganj Ghāt, and Bāhādurābād Ghāt and by road with Mymensingh and Tangail and with Meghālaya, India. It has two colleges affiliated with the University of Dhākā.

The surrounding region is largely agricultural; chief crops are rice, jute, wheat, sugarcane, oilseeds, and pulses. Pop. (1981 prelim.) 89,847.

Jamālpur, town, central Bihār state, northeastern India. It is situated at the foot of the Monghyr Ghāt (hills) near the Ganges River. The town was established in 1862 as a railway settlement and contains large locomotive engineering workshops, as well as major iron and steel foundries. Slate quarries are located to the southwest. Jamālpur has two colleges affiliated with Bhāgalpur University. It was constituted a municipality in 1883. Pop. (1981) 78,356.

Jamalzadeh, Mohammad Ali, Persian MOḤAMMAD ʿALĪ JAMĀLZĀDEH, Jamalzadeh also transliterated JAMALZADA, JAMĀL-ZĀDEH, or JAMĀLZĀDAH (b. 1892, Eṣfāhan [Isfahan], Iran), prose writer who became one of the most important figures in 20th-century Persian literature.

Jamalzadeh was educated in Beirut and in Europe. After studying law in France, he went to Berlin and joined a group of Iranian nationalists opposed to foreign intervention in Iran and wrote for the respected periodical *Kāva;* there he published his early stories and historical pieces. His first successful story was "Farsi shakar ast" ("Persian Is Sugar"), which was reprinted in 1921/22 in *Yakī būd yakī nabūd* (*Once Upon a Time*), a collection of short stories that laid the foundation for modern Persian prose.

In the introduction to this collection—a highly influential manifesto—Jamalzadeh argued the virtues of prose as a literary form, stating that prose was as vital as poetry to a nation's literature. The collection caused a great stir, not only because of its innovative prose style, modern diction, and its use of colloquial Persian but also for its satirical, outspoken criticism of society—which aroused the anger of conservative Iranians.

For the next 20 years Jamalzadeh pursued a nonliterary career. In 1931 he took a position in the International Labour Office in Geneva, a post he held for 25 years, during which time he made occasional visits to Iran. He also taught Persian at the University of Geneva. Most of Jamalzadeh's writing was done during and after World War II. His satirical novel *Dār al-majānīn* (1942; "The Madhouse") was followed by the novel *Qultashan-e dīvān* (1946; "The Custodian of the Divan"), a scathing attack on contemporary Iranian values and culture. Other important works include *Rāh-ye āb-nāmeh* (194–; "The Story of the Water Channel") and memoirs of his early years in Isfahan, *Sar ū tah-ye yak karbās yā Eṣfahān-nāmeh* (195–; "The Beginning and End of a Web, or the Book of Eṣfahān," translated as *Isfahan Is Half the World: Memories of a Persian Boyhood*). Jamalzadeh also translated many literary works from English, German, and French and wrote a number of historical, sociopolitical, and economic works.

Where the same name may denote a person, place, or thing, the articles will be found in that order

Jambi, also spelled DJAMBI, *kotamadya* (city) and *propinsi* (province), southeastern Sumatra, Indonesia. The province is bounded by Bengkulu and Sumatera Selatan ("South Sumatra") provinces on the south, by Sumatera Barat ("West Sumatra") province on the west and northwest, by Riau province on the north, and by the Strait of Berhala on the east. It covers an area of 17,345 square miles (44,924 square km).

In the 7th century the area was part of the Buddhist Śrivijaya Empire of southern Sumatra and subsequently formed part of the Majapahit Empire of eastern Java. The rise of Islām in the Indonesia archipelago during the 16th century was accompanied by the formation of a separate Muslim state of Jambi. The ruler of Jambi participated in an alliance against Sultan Iskandar Muda (ruled 1607–36) of Aceh, later refused to accept suzerainty of the Mataram state of Java, and cooperated with the Dutch (who had entered the region in the early 17th century) against Mataram. Moḥammad Fakhruddin, who ruled Jambi 1833–41, invaded Palembang in 1833 but was defeated by the Dutch and recognized Dutch suzerainty. Dutch colonial rule was firmly established by the first quarter of the 20th century. The Japanese occupied the province during World War II, and it was incorporated in the Republic of Indonesia in 1950.

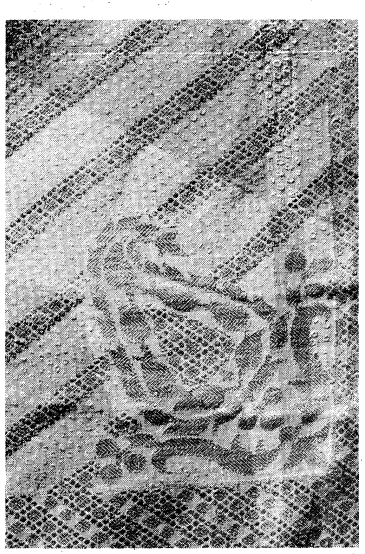
Almost one-third of the province is covered by the Barisan Mountains in the west, whose spurs thrust eastward, forming deep ravines and valleys. The mountains are surmounted by volcanic cones, including Mount Masurai (9,623 feet [2,933 m]) and Mount Sumbing (8,228 feet). Mangroves are found in the estuaries and along the tidal rivers in the east. The principal waterway is the Batanghari River, which is navigable for deep-draft vessels from the city of Jambi to the sea (50 miles [80 km]). The western mountainous region is covered with temperate evergreen forests of pine, rhododendron, alder, maple, and ash. Agriculture dominates the economy, and products include rubber, tobacco, palm oil, copra, rice, corn (maize), and resin. Industries produce carved wood, mats and baskets, processed tobacco, beverages, rubber goods, woven cloth, and milled rice. The majority of the population is Minangkabau and Batak peoples with an admixture of Chinese, Arabs, and Indians.

The city of Jambi, the provincial capital, lies on both sides of the Batanghari. It is a rubber-processing centre. Roads lead southward to Palembang and to the western coast; there is air service but no railroad.

Jambi was at one time (*c.* AD 1100) the centre of the empire of Śrivijaya. Later, as an independent sultanate, it became more and more entangled with Dutch financial and administrative affairs until, following an unsuccessful revolt in 1916–17, it was brought under direct Dutch rule. Pop. (1980) city, 230,373; (1986 est.) province, 1,822,200.

Jambol (Bulgaria): *see* Yambol.

jāmdānī, type of figured muslin that is one of the greatest accomplishments of the Indian weaver. The origins of figured muslin are not clear; it is mentioned in Sanskrit literature of the Gupta period (4th–6th century AD). It is known, however, that in the Mughal period (1556–1707) the finest *jāmdānī*s were produced at Dacca (Dhākā), in the state of Bengal (now Bangladesh), the work being characterized by extremely elaborate designs. The weaving of *jāmdānī*s was introduced in Lucknow, Uttar Pradesh, under the nawabs of Oudh in the late 18th century and at-



Detail of a *jāmdānī* scarf from Dacca, Bangladesh, 19th century; in a private collection
P. Chandra

tained great excellence. Because these textiles required great skill in their manufacture, they were very costly and could be afforded only by the very rich.

A striking feature of *jāmdānī* muslins are the patterns of Persian derivation. The fabric is usually a gray cotton ornamented with brightly coloured cotton and gold and silver wire. In saris, the characteristic garment worn by Indian women, the corners are woven in patterns derived from shawls. The field is decorated with bunches of flowers suggestive of the jasmine or with diagonally arranged circles.

James, name of rulers grouped below by country and indicated by the symbol •.

Foreign-language equivalents:
Italian ..... Giacomo
Spanish ..... Jaime

GREAT BRITAIN

•**James I** (b. June 19, 1566, Edinburgh Castle, Edinburgh—d. March 27, 1625, Theobalds, Hertfordshire, Eng.), king of Scotland (as James VI; 1567–1625) and first Stuart king of England (1603–25), who styled himself "king of Great Britain." A strong advocate of royal absolutism, he promoted peace in Europe and colonial expansion in America.



James I, painting attributed to John de Critz, *c.* 1620; in the National Maritime Museum, Greenwich, Eng.

By courtesy of the National Maritime Museum, Greenwich, Eng.

James was the only son of Mary, Queen of Scots, and her second husband, Henry Stewart, Lord Darnley. Eight months after James's birth his father died when his house was destroyed by an explosion. After her third marriage, to James Hepburn, earl of Bothwell, Mary was defeated by the rebel lords and abdicated the throne. James, one year old, became king of Scotland on July 24, 1567; Mary left the kingdom on May 16, 1568, and never saw her son again. During his minority James was surrounded by a small band of the great Scottish lords, from whom emerged the four successive regents, the earls of Moray, Lennox, Mar, and Morton. There did not exist in Scotland the great gulf between rulers and ruled that separated the Tudors and their subjects in England. For nine generations the Stuarts had in fact been merely the ruling family among many equals, and James all his life retained a feeling for those of the great Scottish lords who gained his confidence.

The young king was kept fairly isolated but was given a good education until the age of 14. The course had been rather narrow, mainly three languages, Greek, French, and Latin, always set within a biblical (chiefly Old Testament) framework. His mother's books provided him with an introduction to the French poets. More useful than all his tutors' teaching was the library of classical, religious, and, to a lesser extent, historical writings that his tutors, George Buchanan and Peter Young, assembled for him.

In his youth King James wrote poetry, with energy but slender talent. His works included a long translation from the French of Guillaume de Salluste, Seigneur du Bartas, a Gascon Huguenot, and in the whole series of the King's verse there is only one reference to Scottish scenery, to the cloud-topped Cheviot Hills. The young sovereign impressed his Scottish subjects considerably with his great knowledge.

When he grew to manhood he was slender and of average height. He was constantly on horseback and loved the chase, hunting dogs, and horses, activities that endeared him to the people of Scotland. Later, however, his English subjects noticed his weak and spindly legs and his narrow jaws, which made it difficult for him to eat.

Even as a young man, he liked to influence those around him, an outgrowth of his conception of his great position. From the time he grew up his most salient quality was his pleasure in giving, accompanied, unfortunately, by an absence of any money sense. Through his life he also had a deep desire for peace.

Though he opposed the attempts of Presbyterian ministers to undermine royal authority in Scotland, James was always a convinced doctrinal Presbyterian. In his later years he would be described in general terms as an Anglican; but he never desired to introduce the English creed into his native country. It is clear that he considered his differences with the Presbyterian ministers in the years of his Scottish reign as political rather than doctrinal. Their form of rule was ultimately theocratic and therefore incompatible with his idea of monarchy.

He retained through life a vivid belief in the power and enmity of the devil and was deeply harassed by this belief. Uncommunicative and brooding, he always kept to himself. He was very sure of his decisions. He was only 15 when he arranged for the execution of the Regent Morton on the charge of murdering his father, Darnley. In 1600 he became annoyed at the opposition of John Ruthven, the earl of Gowrie, to his tax proposals and was, in fact, disturbed by the very proximity of the Gowrie family; and, in August of the year, at the Gowrie home, the Earl and his brother, Alexander, were killed in mysterious circumstances. James claimed that his life had been threatened and the killings occurred in the ensuing struggle, but the Gowrie conspiracy has never been satisfactorily explained.

In August 1589, James was married to Anne, the daughter of Frederick II of Denmark, who, in 1594, gave birth to their first son, Prince Henry. Throughout his life, however, James exhibited little interest in the opposite sex. It seems that he never had a mistress and was interested in women only as the wives and mothers of his male friends. The first friend who influenced him greatly was his cousin Esmé Stuart, seigneur of Aubigny, whom he created duke of Lennox. James was no traveller and relied on Lennox for information about the French court.

From early manhood James's policy was determined by his need to remain on good terms with the childless Elizabeth I of England in order to ensure his claim as heir to the English throne. When his mother, who had been a prisoner in England for 20 years, was executed at Fotheringhay in 1587, he lodged only a formal protest. He realized that he was in no position to attack the English polity and that it would not be in his best interest to do so.

In 1597, in Scotland, he published a treatise, *Daemonologie,* which gives a clear idea of his fear of the spirit world, and two years later he brought out a first small, private edition of the *Basilikon Doron,* described as "His Majesties instructions to his dearest sonne Henry the Prince." Somewhat narrow in scope, the examplars are drawn almost entirely from Scotland, and the theological passages are of low intensity.

In this part of the reign the administration of the realm was carried on with the King's full consent by a group known as the Octavians. There were certain difficulties with the Kirk, the (Presbyterian) Church of Scotland, but the King showed himself both cool and crafty. Because the Kirk had no power to reward, its influence in the King's circle was slight. It was also clear that his conflict with the Church of Scotland was without danger; it did not call upon James's small store of physical courage.

In the last years of the reign of Queen Elizabeth, a private correspondence began between King James and Sir Robert Cecil, Queen Elizabeth's secretary of state, who was to serve him after his accession. A sense of the glory of kingship bound James to the King of France and to the King of Spain, England's traditional enemies. This highly defined sense of identity with others of his estate led James to believe that he could bring England peace, as indeed he was to do in 1604 by speedily ending the war with Spain.

When Elizabeth died in 1603, King James set out for England, leaving the ministers to whom he was long accustomed in their posts in Scotland. During the later part of his reign he returned to Scotland only once, in 1617. Throughout his reign in England he received Scotsmen at his court, but they were not liked in his southern kingdom. Shortly after he moved to England, he ceased marital relations with his wife. Though he appreciated the Queen's concern for masques and pageantry, he disliked her recurring interest in Roman Catholicism and did not wish her to influence his children's minds. Still he always remained courteous to her as the King of Denmark's sister. She died in 1619.

The happiest period of James's rule was the nine years between his accession to the English throne and the death of Cecil, whom he created earl of Salisbury. He never had another minister who was both experienced and powerful. In the later portion of his reign his two successive favourites, Robert Carr, who became Viscount Rochester and earl of Somerset, and George Villiers, who was created duke of Buckingham, exerted an extraordinary influence over the King.

But James was not appreciated in England as he had been in Scotland. He hardly understood the rights or the temper of the English Parliament and thus came into conflict with it. He had little contact with the English middle classes, and he suffered from the narrowness of his horizons. Elizabeth had travelled throughout her country and played her part before the nation; the crowds along the roadside all could hear her calculated loud asides. But James was domestic; perhaps his outdoor servants, his huntsmen, and the keepers of his hunting lodges were the only members of the rural working class with whom he came in contact. In his later years his judgment faltered. The King had a sympathy, which his countrymen found inexplicable, for the Spanish ambassador, Diego Sarmiento de Acuña, the count of Gondomar. When Sir Walter Raleigh, who had been released from the Tower of London and a death sentence and had gone to Guiana in search for gold, came into conflict with the Spaniards, then at peace with England, Gondomar persuaded James to have Raleigh beheaded. The King's last decisive action, also a result of Gondomar's influence, was the arrangement of Prince Charles's journey to Madrid to seek a Spanish princess in marriage.

The Duke of Buckingham began an en-

mity with Prince Charles, who became the heir when his brother Prince Henry died in 1612, but in the course of time the two formed an alliance from which the King was quite excluded. In the last 18 months of the reign the King, in effect, exercised no power; Charles and Buckingham decided most issues. James died at his favourite country residence, Theobalds, in Hertfordshire. (D.Ma.)

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A good biography is D.H. Willson, *King James VI and I* (1956); Antonia Fraser, *King James VI of Scotland, I of England* (1975), argues for a reinterpretation in the light of new research. See also David Mathew, *The Jacobean Age* (1938) and *James I* (1967); Charles Williams, *James I* (1934); and H. Ross Williamson, *King James I* (1935).

• **James II,** also called (1634–85) DUKE OF YORK (b. Oct. 14, 1633, London—d. Sept. 16, 1701, Saint-Germain, Fr.), last Roman Catholic king of Great Britain (1685–88), whose deposition in favour of William III and Mary II permanently established Parliament as the ruling power in England.



James II, detail of a painting by Sir Godfrey Kneller, *c.* 1685; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

James II was the second surviving son of Charles I and Henrietta Maria. He was created duke of York in January 1634. During the Civil War he lived at Oxford—from October 1642 until the city surrendered in June 1646. He was then removed by order of Parliament to St. James's Palace, from which he escaped to the Netherlands in April 1648. He rejoined his mother in France in early 1649. Joining the French army in April 1652, he served in four campaigns under the great French general Turenne, who commended his courage and ability. When his brother, Charles II, concluded an alliance with Spain against France in 1656 he reluctantly changed sides, and he commanded the right wing of the Spanish army at the Battle of the Dunes in June 1658.

At the restoration of his brother Charles to the English throne in 1660, James became lord high admiral and did much to maintain the efficiency and improve the organization of the navy. He also showed considerable interest in colonial ventures; it was on his initiative that New Amsterdam was seized from the Dutch in 1664 and renamed New York in his honour. He commanded the fleet in the opening campaigns of the Second and Third Dutch wars. This was to be his last taste of active military command until 1688. In politics he was a strong supporter of the Earl of Clarendon, whose daughter Anne he married in September 1660. Both before and after marriage he had the reputation of being as great a libertine as his brother. But in 1668 or 1669 he was admitted to the Roman Catholic Church, though, on his brother's insistence, he continued to take the Anglican sacraments until 1672, and he attended Anglican services until 1676. Charles II also insisted that James's daughters, Mary and Anne, be raised in the Protestant faith.

James's conversion had little effect on his political views, which were already formed by his reverence for his dead father and his close association with the High Church Party. James, in fact, was always more favourable to the Anglican Church than was his Protestant brother. He welcomed the prospect of England's reentering the European war on the side of the Dutch; and he consented to the marriage of his elder daughter, Mary, to the Protestant William of Orange in 1677. For most of his life James was the spokesman of the conservative Anglican courtiers, who believed that his views on monarchy and Parliament coincided with theirs, who found his formal and humourless nature more congenial than Charles's slippery geniality, and who respected his frank acknowledgment of his religious beliefs.

In view of the Queen's childlessness, however, the conversion of the heir presumptive to the throne roused great alarm in the general public. James resigned all of his offices in 1673 rather than take an anti-Catholic oath imposed by the so-called Test Act and thus made his position known publicly. Later that year, his first wife having died, he gave further offense by marrying a Roman Catholic princess, Mary of Modena. By 1678 James's Catholicism had created a climate of hysteria in which the fabricated tale of a "Popish Plot" to assassinate Charles and put his brother on the throne was generally believed. From 1679 to 1681 three successive Parliaments strove to exclude James from the succession by statute. During this crisis James spent long periods in exile at Brussels and Edinburgh. But owing largely to his own tenacious defense of his rights, the exclusionists were defeated. In 1682 he returned to England and resumed the leadership of the Anglican Tories, whose power in local government was reestablished and increased by the "remodelling" of the borough corporations and the government of the counties in their favour. By 1684 James's influence on state policy was paramount, and when he finally came to the throne on Feb. 16, 1685, with very little overt opposition or even criticism, it seemed likely that the strong support of the Anglicans would make him one of the most powerful of the 17th-century British kings.

The new royalist Parliament that assembled in May 1685 voted James a large income, and there seemed no reason why he should not in time secure adequate toleration for his co-religionists. But unsuccessful rebellions led by the Duke of Monmouth in England and the Duke of Argyll in Scotland, in the summer of 1685, marked a turning point in his attitude. James's distrust of his subjects, conceived in the turbulent 1670s, was at once sharpened. The rebellions were put down with great ferocity, the army was considerably increased, and the new regiments were granted to Roman Catholic officers who had had military experience abroad and whose loyalty was undoubted. This last act of policy provoked a quarrel between King and Parliament, which was prorogued in November 1685, never to meet again. In 1686 the division between the King and his former allies, the Anglican Tories, deepened. After many of them had been replaced, the judges of King's Bench in the collusive action *Godden* v. *Hales* found in favour of the king's power to excuse individuals from the Test oath; Roman Catholics were admitted to the privy council and later to the high offices of state. A commission for ecclesiastical causes was set up to administer James's powers as supreme governor of the Anglican Church, and its first act was to suspend Henry Compton, bishop of London, one of the most outspoken critics of royal policy.

In 1687 James intensified his Roman Catholic policy and dismissed his Anglican brothers-in-law Clarendon and Rochester. Magdalen College, Oxford, was given over for the use of Roman Catholics, and a papal nuncio was officially accredited to St. James's. In April James issued the so-called Declaration of Indulgence suspending the laws against Roman Catholics and Protestant dissenters alike; in July he dissolved Parliament, and in September he launched an intensive campaign to win over the Protestant dissenters and with their aid secure a new Parliament more amenable to his wishes.

What those wishes were is still not clear: some of his utterances suggest a genuine belief in religious toleration as a matter of principle; others point to the establishment of Roman Catholicism as the dominant if not the exclusive religion of the state. This confusion may well reflect the state of James's own mind, which undoubtedly deteriorated in the years 1687–88, and some of his assertions, accusations, and threats at this time verge on the insane.

The unexpected news that the Queen was pregnant (November 1687), establishing the prospect of a Roman Catholic succession, had great effect on most Protestants; while a wholesale "remodelling" of borough corporations, lord lieutenancies, deputy lieutenancies, and magistracies that winter inflamed the majority of the nobility and gentry, whose political and social power suffered by it. Ever since the spring of 1687 many English leaders had been in touch with William of Orange, the husband of the heiress presumptive and the champion of Protestant Europe against Louis XIV. The spark was touched off by James himself, when he reissued his Declaration of Indulgence on May 7, 1688, and on May 14 ordered it to be read in the churches. The Archbishop of Canterbury and six of his bishops petitioned James to withdraw the order. Their petition was subsequently published, and James made the mistake of prosecuting its authors for seditious libel. Meanwhile, on June 20, in slightly mysterious circumstances, the Queen gave birth to a son.

On July 10 the seven bishops were acquitted—a tremendous defeat for the government—and that same day seven leading Englishmen sent a letter inviting William of Orange to lead an army to England and call a free parliament to arbitrate on the legitimacy of the Prince of Wales. By September William's intentions were obvious, but James declined Louis XIV's offer of assistance for fear of the reaction in England; in any case he was confident in the ability of his forces to repel invasion. William sailed in late October, under cover of the general war that had by then broken out in Europe, evaded the English fleet, and landed at Tor Bay on Nov. 15, 1688. In the subsequent "campaign," James's Protestant officers deserted to the enemy in such large numbers that he dared not commit the army to a pitched battle. This, together with the defection of his daughter Anne, finally shattered his nerve. He attempted to flee to France but was intercepted at Kent on December 21; 12 days later he was allowed to escape. On Feb. 22, 1689, the Convention Parliament declared that James had abdicated and next day offered the crown to William and Mary. The Scots Parliament followed suit in May.

In March 1689 James landed in Ireland, and a Parliament summoned to Dublin acknowledged him as king. But his Irish–French army was defeated by William at the Boyne (July 11, 1690), and he returned to France. William's generals reconquered Ireland the following year. In Ireland James had shown none of his former military ability, and he now aged rapidly, falling increasingly under the influence of his pietistic wife. He became daily more absorbed in his devotions, and his more aggressive supporters soon came to regard him as something of a liability. The Treaty of Rijswijk between England and France (1697) removed his last hopes of restoration.

(J.P.K.)

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• **James (III):** *see* James Edward, the Old Pretender.

SCOTLAND

• **James I** (b. 1394—d. Feb. 20/21, 1437, Perth, Perth, Scot.), king of Scots from 1406 to 1437. During the 13 years (1424–37) in which he had control of the government, he established the first strong monarchy the Scots had known in nearly a century.



James I, oil painting by an unknown artist; in the Scottish National Portrait Gallery, Edinburgh

By courtesy of the Scottish National Portrait Gallery, Edinburgh

James was the son and heir of King Robert III (1390–1406). In 1406 Robert decided to send him to France, presumably to keep him out of the reach of the powerful and treacherous Robert Stewart, duke of Albany. On the way James was captured by English sailors and taken as a prisoner to the royal court in London. Robert died shortly thereafter, and Albany, who became regent, had no desire to ransom young king James. Upon Albany's death in 1420, his son Murdac held the regency until James was released in 1424.

James immediately took harsh measures to break the power of the Scottish nobility. In 1425 he arrested many of the leading lords; a few—including Murdac and other members of his family—were executed. The King even attempted, with limited success, to assert his authority over the fiercely independent Highland lords. He acquired the resources he needed to run his government by confiscating the estates of his enemies, by eliminating graft in the collection of customs, and by bringing the chief financial officers of the realm under his personal supervision. His attempts to prevent church revenues from being sent to Rome involved him in a long series of disputes with the papacy. The popularity James enjoyed rested to a large extent on his improvements in the administration of justice for common people. Nevertheless, he was assassinated by a group of conspirators led by Walter, earl of Atholl, who aspired to win the crown for himself. No general uprising followed the murder, and the King's widow quickly had the conspirators captured and executed. James was a highly cultured man; he is usually accepted as the author of the long vernacular poem *The Kingis Quair* ("The King's Book"). His career is recounted in E.W.M. Balfour-Melville's *James I, King of Scots* (1936).

• **James II** (b. Oct. 16, 1430, Edinburgh—d. Aug. 3, 1460, Roxburgh Castle, Roxburgh, Scot.), king of Scots from 1437 to 1460. He survived the civil strife of the first half of his reign and eventually emerged as a masterful ruler who consolidated his power throughout the kingdom.



James II, painting by an unknown artist; in the Scottish National Portrait Gallery, Edinburgh

By courtesy of the Scottish National Portrait Gallery, Edinburgh

The only surviving son of King James I, he succeeded to the throne at the age of six upon his father's assassination (February 1437). Because he was too young to take control of the government, the strong central authority his father had established quickly collapsed. In the ensuing turmoil three rival families—the Crichtons, the Livingstons, and the Douglases—fought to gain control of the young king. James finally assumed his royal duties upon his marriage to Mary of Gueldres in 1449. His first task was the restoration of monarchical authority. He immediately seized the Livingston estates, but he maintained an uneasy peace with the powerful Douglas family until 1450, when he quarrelled with William, 8th earl of Douglas. In February 1452 he stabbed the Earl to death. Three years later James demolished the Douglas castles and confiscated their vast estates. The revenues from these lands enabled him to set up a strong central government and make improvements in the administration of justice.

James then turned his attention to the English, who had renewed their claims to rule Scotland. He attacked English outposts in Scotland in 1456 and 1460. In the latter campaign he was killed during a siege of Roxburgh Castle.

• **James III** (b. May 1452—d. June 11, 1488, near Stirling, Stirling, Scot.), king of Scots from 1460 to 1488. A weak monarch, he was confronted with two major rebellions because he failed to win the respect of the nobility.

He received the crown at the age of eight upon the death of his father, King James II. Scotland was governed first by James's mother, Mary of Gueldres (died 1463), and James Kennedy, bishop of St. Andrews (died 1465), and then by a group of nobles headed by the Boyds of Kilmarnock, who seized the King in 1466. In 1469 James overthrew the Boyds and began to govern for himself. Unlike his father, he was, however, unable to restore strong central government after his long minority. He evidently offended his nobles by his



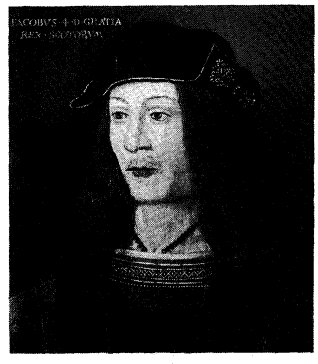
James III, painting by an unknown artist; in the Scottish National Portrait Gallery, Edinburgh

By courtesy of the Scottish National Portrait Gallery, Edinburgh

interest in the arts and by taking artists for his favourites. In 1479 he arrested his brothers, Alexander, duke of Albany, and John, earl of Mar, on suspicion of treason. Albany escaped to England, and in 1482 English troops entered Scotland and forced James to restore the Duke to his domains. During this invasion dissident Scottish nobles hanged James's favourites. By March 1483 the King had recovered enough power to expel Albany.

Nevertheless, even without English aid to his discontented subjects, James was unable to ward off revolts. In 1488 two powerful border families, the Homes and the Hepburns, raised a rebellion and won to their cause his 15-year-old son, the future king James IV. James III was captured and killed after his defeat at the Battle of Sauchieburn, Stirling, on June 11.

• **James IV** (b. March 17, 1473—d. Sept. 9, 1513, near Branxton, Northumberland, Eng.),



James IV, painting by an unknown artist; in the Scottish National Portrait Gallery, Edinburgh

By courtesy of the Scottish National Portrait Gallery, Edinburgh

king of Scotland from 1488 to 1513. An energetic and popular ruler, he unified Scotland under royal control, strengthened royal finances, and improved Scotland's position in European politics.

James succeeded to the throne after his father, James III, was killed in a battle against rebels on June 11, 1488. The 15-year-old monarch immediately began to take an active part in government. He extended his authority to the sparsely populated areas of western and

northern Scotland and by 1493 had humbled the last lord of the Isles.

Although his reign was internally peaceful, it was disturbed by wars with England. Breaking a truce with England in 1495, James prepared an invasion in support of Perkin Warbeck, a pretender to the English throne. The war was confined to a few border forays, and a seven-year peace was negotiated in December 1497, though border raids continued. Relations between England and Scotland were further stabilized in 1503, when James married Margaret Tudor, the eldest daughter of the English king Henry VII; this match resulted, a century later, in the accession of James's great-grandson, the Stuart monarch James VI of Scotland, to the English throne as King James I.

James IV's growing prestige enabled him to negotiate as an equal with the rulers of continental Europe, but his position was weakened as he came into conflict with King Henry VIII of England (ruled 1509–47). In 1512 James allied with France against England and the major continental powers. When Henry invaded France in 1513, James decided, against the counsel of his advisers, to aid his ally by advancing into England. He captured four castles in northern England in August 1513, but his army was disastrously defeated at the Battle of Flodden, near Branxton, on Sept. 9, 1513. The King was killed while fighting on foot, and most of his nobles perished. James left one legitimate child, his successor, James V (ruled 1513–42); in addition, he had many illegitimate children, several of whom became prominent figures in Scotland.

True to the ideal of the Renaissance prince, James strove to make his court a centre of refinement and learning. He patronized literature, licensed Scotland's first printers, and improved education. His career is recounted in R.L. Mackie's *King James IV of Scotland* (1958).

• **James V** (b. April 10, 1512, Linlithgow, West Lothian, Scot.—d. Dec. 14, 1542, Falkland, Fife), king of Scotland from 1513 to 1542.

During the period of his minority, which lasted throughout the first half of his reign, James was a pawn in the struggle between



James V, detail of a painting by an unknown artist, *c.* 1540; at Hardwick Hall, Derbyshire

By courtesy of the National Trust, Hardwick Hall (Duke of Devonshire Collection), Derbyshire

pro-French and pro-English factions; after he assumed personal control of the government, he upheld Roman Catholicism against the Protestant nobles and allied his country with France.

James was 17 months old when he succeeded to the throne of his father, James IV (ruled 1488–1513). In the power struggle that developed between the pro-French regent, John Stewart, duke of Albany, and the head of the English party, Archibald Douglas, earl of Angus, each side sought to gain possession of the young ruler. James's mother, Margaret Tudor, complicated events by shifting her allegiance from her husband, Angus, to Albany.

Albany retired to France in 1524, and Angus kept James in confinement from 1526 until 1528, when the King escaped and forced Angus to flee to England. By 1530 James had consolidated his power in Scotland. He signed a treaty with his uncle, King Henry VIII of England, in 1534, but in 1538 he married the French noblewoman Marie de Guise and thereafter allied with France against England. A cruel man, he instituted in his later years a near reign of terror in Scotland, and his financial exactions did not endear him to his subjects.

When Henry VIII's forces attacked Scotland in 1542, James's small army, weakened by the disaffection of the Protestant nobles, crossed into England and was easily routed near the border at Solway Moss on Nov. 24, 1542. The disaster caused the King to suffer a mental breakdown; he died on Dec. 14, 1542, a week after the birth of his daughter—his only surviving legitimate child—Mary Stuart (Mary, Queen of Scots). Among his several illegitimate children was James, earl of Moray (died 1570), who became regent of Scotland when Mary Stuart abdicated her throne in 1567.

• **James VI–VII:** *see* James I–II (Great Britain).

• **James (VIII):** *see* James Edward, the Old Pretender.

Sicily

• **James I:** *see* James II (Spain: Aragon).

Spain: Aragon

• **James I,** byname JAMES THE CONQUEROR, Spanish JAIME EL CONQUISTADOR (b. Feb. 2, 1208, Montpellier, County of Toulouse—d. July 27, 1276, Valencia, Valencia), the most renowned of the medieval kings of Aragon (1213–76), who added the Balearic Islands and Valencia to his realm and thus initiated the Catalan-Aragonese expansion in the Mediterranean that was to reach its zenith in the last decades of the 14th century.

James was the son of Peter II of Aragon and Mary of Montpellier. When Peter, allied with the Albigensian heretics, died fighting against the crusaders sent against them at the Battle of Muret, James was only five years old and was at Carcassonne, Fr., in the hands of the crusaders' leader, Simon de Montfort. James was released in April 1214 and recognized as sovereign in Aragon and Catalonia; placed under the protection of the Knights Templars at Monzón, he was cared for and educated by them. The regency was exercised by his great-uncle, Count Sancho of Roussillon (in Aragon, now in France), until 1218, when Sancho resigned in the face of opposition from some Aragonese and Catalonian nobles. The ensuing rebellions, during which the King often found himself in great danger, formed a hard school for the forging of his character. Fearless even as a youth, he fought an Aragonese noble in hand-to-hand combat, took part in the siege of the port of Castejón in 1222, and three years later tried to seize another port.

In 1227 James took over the effective government of his kingdoms and at once began the first of his great campaigns of reconquest—that of the Balearic Islands. Majorca was captured in December 1229, and the occupation was rounded off in 1235 by the conquest of Ibiza by the Bishop of Saragossa. Thenceforward, the islands were a bulwark to defend the Catalan coasts and a base from which trade



James I, detail of an illumination from the *Crónica de Jaime I;* in the University of Barcelona

Archivo Mas, Barcelona

and political expansion could be launched eastward.

In 1233 James began a second war of reconquest—against the Saracen rulers of the Kingdom of Valencia. The campaign lasted three long years and suffered various interruptions before the capital itself was captured in 1238. The occupation of the kingdom was completed later with the capture of other towns, and in 1244 a treaty was signed by which the boundaries of Aragon and Castile were delimited in the newly conquered areas.

James I married twice. In 1221 he married Leonor, daughter of Alfonso VIII of Castile, but he later divorced her and in 1235 married the daughter of Andrew II of Hungary, Yolande, by whom he had many children. In 1248 and 1262 he divided his realms among his sons but only succeeded in causing virulent civil strife. In the second division, his elder son, Peter, received Aragon, Valencia, and Catalonia, and his younger son, James, received the Balearic Islands, Roussillon, and other Pyrenean counties that he was to hold in fief from Peter. This division of realms among his heirs was not James's only political blunder. By the Treaty of Corbeil (1258) he renounced his claims to territories in the south of France, thus abandoning the traditional policy that the Catalan dynasty had hitherto pursued across the Pyrenees. He was, however, able to develop relations and promote trade with the states of North Africa; and, with a clear view of the future, he married his principal heir, Peter, to Constance of Sicily, thus making it easy for the latter kingdom to be added in later years to the crown of Aragon. Always a chivalrous soldier, James helped his son-in-law Alfonso X of Castile to suppress the rebellion of the Moors in the Kingdom of Murcia (1266); he also set out on a crusade to the Holy Land (1269), though this was a failure.

A soldier of extraordinary courage and great gifts of leadership, James was a stout man, strong and handsome; he has been criticized for his many love affairs that caused him to be described as an *home de fembres* ("lady's man"). On balance, his reign was very beneficial. The important code of maritime law called the *Llibre del consolat del mar* was compiled; the Kingdom of Valencia received its own legal system; various cities, including Barcelona, acquired their own civic administrations; and the Cortes—the representative assembly—came into being. The King protected men of letters, inspired the chronicle

that bears his name (though he did not himself write it), and brought his different peoples to a degree of political and cultural maturity that can reasonably be described as admirable.
(E.Sa.)

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• James II, byname JAMES THE JUST, Spanish JAIME EL JUSTO (b. *c.* 1264—d. Nov. 3, 1327, Barcelona), king of Aragon from 1295 to 1327 and king of Sicily (as James I) from 1285 to 1295.

At the death of his father, Peter III, on Nov. 11, 1285, he inherited Sicily, and his elder brother became Alfonso III of Aragon, Catalonia, and Valencia. When his brother died (1291) he inherited Aragon and resigned Sicily (1295), marrying Blanche, daughter of Charles II of Naples, in an endeavour to make peace with the Angevins. Sardinia and Corsica were both assigned to him in compensation for Sicily, but he was able to occupy Sardinia only (1324). He was succeeded by his son Alfonso IV.

James, SAINT, also called JAMES, THE LORD'S BROTHER (d. *c.* AD 62, Jerusalem; Western feast day May 1), a Christain Apostle, according to St. Paul, although not one of the original Twelve Apostles. He was leader of the Jerusalem Christians, who with SS. Peter and John the Evangelist is one of "the pillars of the church."

Confusion has arisen over his identity because he has often been mistaken for St. James, son of Alphaeus. Exactly what Gal. 1:19 means by designating him "the Lord's brother" is also uncertain, although he is mentioned elsewhere in the Gospels as one of Jesus' four brothers (Mark 6:3; Matt. 13:55). Hypotheses have been forwarded that James and Jesus were brothers (after Tertullian and Clement of Alexandria), stepbrothers (after Origen, among others), or cousins (after St. Jerome).

James evidently was not a follower of Jesus during his public ministry. Paul attributes James's later conversion to the appearance of Christ resurrected (I Cor. 15:7). Three years after Paul's conversion, James was an important leader in the Jerusalem Church (Gal. 1:18–19), where he assumed even more significance after King Herod Agrippa I of Judaea beheaded, *c.* AD 44, the Apostle St. James, son of Zebedee, and Peter fled from Jerusalem (Acts 12:1–17). He was the chief spokesman for the Jerusalem Church at the Council of Jerusalem regarding Paul's mission to the Gentiles (Acts 15:13) and final visit to Jerusalem (Acts 21:18).

Later tradition records that James was called "the Just" and was noted for his fulfillment of Jewish law. Though opposing those Jewish Christians who required that Gentile Christians submit to Jewish Law, including circumcision, he believed Jewish Christians should continue loyalty to Jewish practice and piety, as he did himself. His piety and zeal for the Law had become a basis for various legends; thus, later traditions emphasize James's piety and popularity with Jews and Jewish Christians. This popularity is evident in the Jews' anger when priestly authorities had James put to death, reputedly either by stoning (after Flavius Josephus, historian of the Jews) or by being thrown from a Temple tower (after the early Christian writer St. Hegesippus). The early church designates him the first bishop of Jerusalem, though the title is not used in the New Testament. The tradition that he was the author of the Letter of James, a New Testament book of moral instructions, is not supported by modern scholarship.

James (SON OF ALPHAEUS), SAINT, also called JAMES THE LESS (fl. 1st century AD; Western feast day May 1; Eastern feast day October 9), one of the Twelve Apostles.

He may be that James whose mother, Mary, is mentioned among the women at Jesus' crucifixion and tomb (Mark 15:40, 16:1; Matt. 27:56). He is not to be confused with the Apostle St. James, son of Zebedee, or James, "the Lord's brother." Depending upon the Bible consulted, he is probably the brother (Revised Standard and New English) or father (Authorized and Douay) of the Apostle St. Judas (Jude). Nothing further is known of him, and a late legend of his martyrdom in Persia is spurious.

In the Western Church, his identity with James, "the Lord's brother," was originally assumed in the feast of SS. Philip and James on May 1, the date of the dedication of the Church of the Holy Apostles, Rome, where supposed relics of these saints were brought *c.* 560.

James (SON OF ZEBEDEE), SAINT, also called JAMES THE GREAT (b. Galilee, region of Palestine—d. *c.* AD 44, Jerusalem; feast day July 25), one of the Twelve Apostles, distinguished as being in Jesus' innermost circle and the only Apostle whose martyrdom is recorded in the New Testament (Acts 12:2).

He and his younger brother, the Apostle St. John, are designated Boanerges (from the



St. James, detail from a mural, 12th century; in the monastery of Eski Gümüs, Tur.
Sonia Halliday

Greek *boanerges*), or "sons of thunder" (Mark 3:17), perhaps because of their characteristic fiery zeal (Mark 9:38, Luke 9:54). With SS. Peter and Andrew, James and John were the first four disciples whom Jesus called (Mark 1:16–19) and whose question ("Tell us, when will this [the end of time] be, and what will be the sign when these things are all to be accomplished?") sparks Jesus' eschatological discourse in Mark 13.

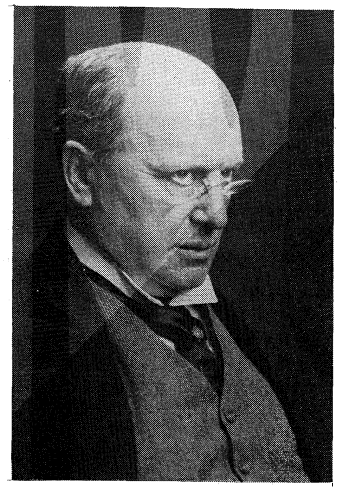
As a member of the inner circle, James witnessed the raising of Jairus' daughter (Mark 5:37, Luke 8:51), the Transfiguration (Mark 9:2), and Jesus' agony in the Garden of Gethsemane (Mark 14:33, Matt. 26:37). James and John asked Jesus to let them sit, one at his right and one at his left, in his future glory (Mark 10:35–40), a favour Jesus said was not his to grant. James was beheaded by order of King Herod Agrippa I of Judaea; according to Spanish tradition, his body was taken to Santiago de Compostela, where his shrine attracts pilgrims from all over the world.

James THE CONQUEROR: *see* James I *under* James (Spain: Aragon).

James, THE OLD PRETENDER: *see* James Edward, the Old Pretender.

James, Frank: *see* James, Jesse and Frank.

James, Henry (b. April 15, 1843, New York City—d. Feb. 28, 1916, Rye, Sussex, Eng.),



Henry James, 1905
Smith College Archives

American novelist and, as a naturalized English citizen from 1915, a great figure in the transatlantic culture. His fundamental theme was the innocence and exuberance of the New World in clash with the corruption and wisdom of the Old, as illustrated in such works as *Daisy Miller* (1879), *The Portrait of a Lady* (1881), *The Bostonians* (1886), and *The Ambassadors* (1903).

Early life and works. Henry James was a shy, book-addicted boy who assumed the role of quiet observer beside his active elder brother, William. They were taken abroad as infants, were schooled by tutors and governesses, and spent their preadolescent years in the then still parochial Manhattan. Returned to Geneva, Paris, and London during their teens, the James children acquired languages and an awareness of Europe vouchsafed to few Americans in their times. On the eve of the Civil War the James family settled at Newport, R.I., and there, and later in Boston, Henry came to know New England intimately. A back injury suffered as a volunteer fireman at Newport caused him to lead a sedentary life for some years and diminished his sense of guilt at his recoil from the fratricidal Civil War. For a few months he entertained the illusion that he should have a professional career; when he was 19 years of age he enrolled at the Harvard Law School but devoted his study time to Charles-Augustin Sainte-Beuve, Honoré de Balzac, and Nathaniel Hawthorne. His first story appeared anonymously two years later in the New York *Continental Monthly* and his first book reviews in the *North American Review.* When William Dean Howells became editor of *The Atlantic Monthly,* James found in him a friend and mentor who published him regularly. Between them, James and Howells inaugurated the era of American "realism." By his mid-20s James was regarded as one of the most skillful writers of short stories in America. Critics, however, deplored his tendency to write of the life of the mind, rather than of action. The stories of these early years show the leisurely existence of the well-to-do at Newport and Saratoga. They contain within them echoes of George Sand and Prosper Mérimée. His English model was George Eliot, his American, Hawthorne. His apprenticeship was thorough. He wrote sto-

ries, reviews, and articles for almost a decade before he attempted a full-length novel. There had to be also the traditional "grand tour," and James went abroad for his first adult encounter with Europe in 1869. His year's wandering in England, France, and Italy set the stage for a lifetime of travel, always along the familiar and well-beaten paths of these countries. James never married. By nature he was friendly and even gregarious, but while he was an active observer and participant in society, and in his own literary world, he tended, until late middle age, to be "distant" in his relations with people and was careful to avoid "involvement."

Career—first phase. Recognizing the appeal of Europe, given his cosmopolitan upbringing, James made a deliberate effort to discover whether he could live and work in the United States. Two years in Boston, two years in Europe, mainly in Rome, and a winter of unremitting hackwork in New York City convinced him that he could write better and live more cheaply abroad. Thus began his long expatriation—heralded by publication in 1875 of *Roderick Hudson,* the story of an American sculptor's struggle by the banks of the Tiber between his art and his passions; *Transatlantic Sketches,* his first collection of travel writings; and a collection of tales. With these three substantial books, he inaugurated a career that saw about 100 volumes through the press during the next 40 years.

During 1875–76 James lived in Paris, writing literary and topical letters for the *New York Tribune* and working on his novel *The American.* He sought out the Russian novelist Ivan Turgenev, whose work appealed to him, and through Turgenev was brought into Gustave Flaubert's *cénacle,* where he got to know Edmond de Goncourt, Émile Zola, Daudet, and the then still unpublished Guy de Maupassant. James admired the intensity of the French writers, deplored their "unclean" subjects, and felt closest to Turgenev. From the Russian cosmopolite he received confirmation of his own view that a novelist need not worry about "story," that in focussing on character, he would arrive at the life experience of his protagonist. Much as he liked France, James felt he would be an eternal outsider there, and late in 1876 he crossed to London. There, in small rooms in Bolton Street off Piccadilly, he wrote the major fiction of his middle years. In 1878 he achieved international renown with his story of an American flirt in Rome, *Daisy Miller.* In England he was promptly taken up by the leading Victorians and became a regular at Lord Houghton's breakfasts, where he consorted with Alfred Tennyson, William Gladstone, Robert Browning, and others. A great social lion, James dined out 140 times during 1878 and 1879 and visited in many of the great Victorian houses and country seats. Elected to London clubs, publishing his stories simultaneously in English and American periodicals, mingling with George Meredith, Robert Louis Stevenson, Edmund Gosse, and other writers, a familiar in the studios of James McNeill Whistler and John Singer Sargent, he established himself as a significant figure in Anglo-American literary and artistic relations, along with his friend the poet and essayist James Russell Lowell, who in the 1880s was Washington's minister to the court of St. James's.

James's reputation was founded on his versatile studies of the American woman. In a series of witty tales he pictured the "self-made," bold and brash American innocent who insists upon American standards in European society. James ended this first phase of his career by producing his masterpiece, *The Portrait of a Lady,* a study of a young woman from Albany who brings to Europe her narrow provincialism and pretensions, but also her sense of her own sovereignty, her "free spirit," her refusal to be treated, in the Victorian world, merely as a marriageable object. As a picture of Americans moving in the expatriate society of England and of Italy this novel has no equal in the history of modern fiction. It is a remarkable study of a band of egotists while at the same time offering a shrewd appraisal of the American character. It embodies the national myth: an ideal of freedom and equality hedged with historical blindness and pride; a self-interest which often takes generous form; a sense of hurt when this generosity is interpreted as a wielding of power. James's understanding of power in personal relations was profound.

Career—middle phase. In the 1880s James wrote two novels dealing with social reformers and revolutionaries, *The Bostonians* and *The Princess Casamassima.* In the novel of Boston life James analyzed the struggle between conservative masculinity embodied in a Southerner living in the North and an embittered man-hating suffragette. *The Bostonians* remains the fullest and most rounded American social novel of its time in its study of cranks, faddists, and "do-gooders." In *The Princess Casamassima* James exploited the anarchist violence of the decade and depicted the struggle of a man who toys with revolution and is destroyed by it. These novels were followed by *The Tragic Muse,* in which James projected a study of the London and Paris art studios and the stage, the conflict between art and "the world." Between 1890 and 1895 he tried to win success on the stage and failed, then spent several years seeking to adapt his dramatic experience to his fiction. The result was a complete change in his storytelling methods. In *The Spoils of Poynton* (1897), *What Maisie Knew* (1897), *The Turn of the Screw* and *In the Cage* (1898), and *The Awkward Age* (1899) James began to use the methods of alternating "picture" and dramatic scene, close adherence to a given angle of vision, a withholding of information from the reader, making available to him only that which the characters see. The subjects of this period are the developing consciousness and moral education of children—in reality James's old international theme of innocence in a corrupting world, transferred to the English setting.

Career—final phase. The experiments of this "transition" phase led James to the writing of three grandiose novels at the beginning of the new century, which represent his final—his "major"—phase, as it has been called. In these novels James pointed the way for the 20th-century novel. He had begun as a realist who describes minutely his crowded stage. He ended by leaving his stage comparatively bare, and showing a small group of characters in a tense situation, with a retrospective working out, through multiple angles of vision, of their drama. In addition to these technical devices he resorted to an increasingly allusive style, which became dense and charged with symbolic imagery. His late "manner" derived in part from his dictating directly to a typist; and in part from his unremitting search for ways of projecting subjective experience in a flexible prose. At the same time he extended his original subject from the narrow study of personal and interpersonal dilemmas to a view of society and civilization within which his characters struggle for self-identity and survival.

The first of the three novels was *The Ambassadors* (1903). This is a high comedy of American-European manners, of a middle-aged American who goes to Paris to bring back to a Massachusetts industrial town a wealthy young man who, in the view of his affluent family, has lingered too long abroad. The novel is a study in the growth of perception and awareness in the elderly hero, and it balances the relaxed moral standards of the Continent against the parochial rigidities of New England. The second of this series was *The Wings of the Dove,* published in 1902, before *The Ambassadors,* although written after it. This novel, dealing with a melodramatic subject of great pathos set in London and Venice, becomes a powerful study of well-intentioned humans who, with dignity and reason, are at the same time also birds of prey. The final novel was *The Golden Bowl* (1904), a study of adultery, with four principal characters. The first part of the story is seen through the eyes of the aristocratic husband and the second through the developing awareness of the wife.

The three novels transcend mere "plot" and "character" or the melodrama of their themes; in the comedy of *The Ambassadors,* in the soap-opera plot of the *Wings,* and in the high drama of the *Bowl,* James wrote a continuous picture of a flawed civilization that could preserve itself only by recognizing human privacy and freedom and the significance of moral and spiritual "controls." The novels are "philosophical" studies not merely of Western society's modes of survival; they embody a social ethic that suggests that man in the West must cultivate the molds and traditions—however defective—that have shaped him out of chaos, and cherish the artifacts and forms by which he lives.

Honours came to James belatedly. He received degrees from Oxford and Harvard; he was elected to the National Institute of Arts and Letters and in 1905 to the American Academy of Arts and Letters; and on becoming a British subject in 1915—throwing his moral weight into Great Britain's struggle in World War I—he received the Order of Merit from King George V. After James's death his ashes were taken to America and buried in the James family plot in Cambridge Cemetery, where the headstone describes him as "interpreter of his generation on both sides of the sea."

Assessment. Henry James's career was one of the longest and most productive—and most influential—in American letters. A master of prose fiction from the first, he practiced it as a fertile innovator, enlarged the form, and placed upon it the stamp of a highly individual method and style. He wrote for 51 years—20 novels, 112 tales, 12 plays, several volumes of travel and criticism, and a great deal of literary journalism. Beyond his craft, he made himself a formidable figure in the transatlantic culture. He recognized and helped to fashion the myth of the American abroad and incorporated this myth in the "international novel" of which he was the artisan and master. His fundamental theme was the innocence of the New World, the corruption—and wisdom—of the Old, and the clash between the two. In his vision of an exuberant and democratic America confronting an alien aristocratic culture he had a troubled and prophetic sense of America's coming-of-age and the moral problems the United States would encounter as a world power in the 20th century.

James's public remained limited during his lifetime. Since the revival of interest in his work following centenary observances of 1943 he reached an ever-widening audience; his works were translated in many countries, and he was recognized in the late 1960s as one of the subtlest craftsmen who ever practiced the art of the novel. His rendering of the inner, the "phantasmagoric," life made him a forerunner of the "stream of consciousness" movement in the 20th century. In his originality, distinction of style, and inventiveness he is the prototype of the disinterested American artist and a "novelist's novelist." Since mid-20th century he has acquired the status of a classic and also of a "culture-hero." Earlier hostility in the United States, because of his expatriation and abandonment of citizenship, has largely disappeared; and there exists a singular unanimity in English and American

criticism in seeing him as a large creative figure who began as a "representationalist" and ended in the camp of the moderns as impressionist and symbolist. Writers as different as James Joyce and Graham Greene, Joseph Conrad and Virginia Woolf, were influenced by him; and the modern school of fictional criticism regards him as its supreme theorist, deriving from him much of its fundamental terminology. (L.Ed./Ed.)

MAJOR WORKS. *Novels: Roderick Hudson,* 1875; *The American,* 1877; *Watch and Ward,* 1878; *The Europeans,* 1878; *Daisy Miller,* 1878; *Confidence,* 1879; *Washington Square,* 1880; *The Portrait of a Lady,* 1881; *The Bostonians,* 1886; *The Princess Casamassima,* 1886; *The Reverberator,* 1888; *The Tragic Muse,* 1890; *The Other House,* 1896; *The Spoils of Poynton,* 1897; *What Maisie Knew,* 1897; *In the Cage,* 1898; *The Awkward Age,* 1899; *The Sacred Fount,* 1901; *The Wings of the Dove,* 1902; *The Ambassadors,* 1903; *The Golden Bowl,* 1904; *The Ivory Tower,* 1917 (unfinished); *The Sense of the Past,* 1917 (unfinished).

Short stories: A Passionate Pilgrim and Other Tales, 1875; *An International Episode,* 1879; *The Madonna of the Future and Other Tales,* 1879; *The Diary of a Man of Fifty,* 1880; *The Siege of London,* 1883; *Tales of Three Cities,* 1884; *The Author of Beltraffio,* 1885; *Stories Revived,* 1885; *The Aspern Papers,* 1888; *A London Life,* 1889; *The Lesson of the Master,* 1892; *The Real Thing and Other Tales,* 1893; *The Private Life,* 1893; *Terminations,* 1895; *Embarrassments,* 1896; *The Two Magics: The Turn of the Screw, and Covering End,* 1898; *The Soft Side,* 1900; *The Better Sort,* 1903; *Julia Bride,* 1909; *The Finer Grain,* 1910; *The Outcry,* 1911 (based on an unproduced play).

Plays: Daisy Miller, 1883; *The American,* 1891; *Theatricals,* 1894 (two comedies, *Tenants* and *Disengaged*); *Guy Domville,* 1895; *Theatricals: Second Series,* 1894 (*The Album* and *The Reprobate*); *The High Bid,* 1908.

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Literary and art studies: French Poets and Novelists, 1878; *Hawthorne,* 1879; *The Art of Fiction,* 1884; *Partial Portraits,* 1888; *Picture and Text,* 1893; *William Wetmore Story and His Friends,* 1903; *The Question of Our Speech,* 1905 (and "The Lesson of Balzac," two lectures); *Views and Reviews,* 1908; *Notes on Novelists,* 1914; *Notebooks,* 1947.

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James, Henry, Sr. (b. June 3, 1811, Albany, N.Y., U.S.—d. Dec. 18, 1882, Cambridge, Mass.), U.S. philosophical theologian, the father of the novelist Henry James and of the philosopher William James.

A graduate of Union College, Schenectady, N.Y. (1830), he worked in business and law and then studied at Princeton Theological Seminary (1835–37). Though reared in a strict Presbyterian family, he was repelled by orthodox Protestantism and gave up adherence to institutional religion. He lived in Europe for several years and while in England in 1844 became acquainted with the teachings of Emanuel Swedenborg, which became the framework for his own philosophy. His best writings were compiled by William James in *The Literary Remains of Henry James* (1885).

James, Jesse and Frank, in full JESSE WOODSON JAMES and ALEXANDER FRANKLIN JAMES (respectively b. Sept. 5, 1847, near Centerville, Mo.,U.S.—d. April 3, 1882, St. Joseph, Mo.; b. Jan. 10, 1843, near Centerville [now Kearny]—d. Feb. 18, 1915, Kearny), two brothers who became the most notorious



Jesse James
By courtesy of the State Historical Society of Missouri

outlaws of the American West, engaging in daring bank and train robberies that came to typify the hazards of the 19th-century frontier as it has been portrayed in motion picture Westerns.

Reared on a Missouri farm, Jesse and Frank shared their family's sympathy with the Southern cause when the Civil War broke out (1861). Frank joined William C. Quantrill's Confederate guerrillas, becoming friends with Cole Younger, a fellow member. Jesse followed suit by joining "Bloody" Bill Anderson's guerrilla band. At the end of the war the bands surrendered, but Jesse was reportedly shot and severely wounded by Federal soldiers while under a flag of truce. He and Frank, joined by eight other men, then began their outlaw career by robbing a bank in Liberty, Mo., on Feb. 13, 1866. During the same year, Cole Younger joined the gang, with the other Younger brothers (*q.v.*) following suit one by one during the next few years. The James gang robbed banks from Iowa to Alabama and Texas and began holding up trains in 1873. The bandits also preyed upon stagecoaches, stores, and individuals. Throughout their long career and afterward, their exploits were seized upon by writers who exaggerated and romanticized their deeds to meet the demands of Eastern readers for bloody Western tales of derring-do. To the Missouri Ozark people, Jesse James emerged as a romantic figure, hounded into a life of crime by authorities who never forgave his allegiance to the South. Jesse and Frank did, in fact, always seek to justify their banditry on grounds of persecution.

On Sept. 7, 1876, the James gang was nearly destroyed while trying to rob the First National Bank at Northfield, Minn. Of the eight bandits only the James brothers escaped death or capture. In 1881 Missouri governor Thomas T. Crittenden offered a $10,000 reward for their capture, dead or alive. While living at St. Joseph under the pseudonym of Thomas Howard, the unarmed Jesse was adjusting a picture on the wall in his home when he was shot in the back of the head and instantly killed by Robert Ford, a gang member, who claimed the reward. A few months later, Frank James gave himself up. He was tried for murder in Missouri and found not guilty, tried for robbery in Alabama and found not guilty, and finally tried for armed robbery in Missouri and again released. A free man, he retired to a quiet life on his family's farm, dying in 1915 in the room in which he was born.

James, Letter of, New Testament writing addressed to the early Christian churches ("to the twelve tribes in the dispersion") and attributed to James, a Christian Jew, whose identity is disputed. There is also wide disagreement as to the date of composition. The letter is moralistic rather than dogmatic and reflects early Jewish Christianity. The writer covers such topics as endurance under persecution, poverty and wealth, control of the tongue, care for orphans and widows, cursing, boasting, oaths, and prayer. The only New Testament reference to anointing of the sick (5:14) is cited, mostly by Roman Catholic and Eastern Orthodox theologians, as a probable reference to what they consider one of the seven sacraments.

James, Liturgy of Saint, a eucharistic service based on the Antiochene Liturgy, said to be the most ancient Christian liturgy. Modified forms of the Liturgy of St. James are used by Catholic Syrians, Monophysite Syrians (Jacobites), Maronites, and the Orthodox of Zakynthos and Jerusalem. In most Eastern churches, Orthodox and Catholic, it has been superseded by the Byzantine liturgy of St. John Chrysostom.

The Liturgy of St. James has the following order of service: (1) readings from Scriptures—Old Testament, Epistles, Acts, and Gospels; (2) a sermon from the bishop; (3) a dismissal of the catechumens; (4) a prayer for the faithful; (5) the kiss of peace and words of greeting from the bishop; (6) the washing of hands; (7) the offering of gifts; (8) the Eucharist—prayer, preface, Sanctus, words of institution, anamnesis (remembrance of the dead), epiclesis (invocation of the Holy Spirit), intercessory prayers for the church, for the living, and for the dead, preparatory prayers for Communion, celebration of Communion, and prayer of thanksgiving; and (9) the final blessings from the bishop.

James, Protevangelium of (biblical literature): *see* Protevangelium of James.

James, William (b. Jan. 11, 1842, New York City—d. Aug. 26, 1910, Chocorua, N.H., U.S.), U.S. philosopher and psychologist, a leader of the philosophical movement of Pragmatism and of the psychological movement of functionalism.

Early life and education. James was the eldest son of Henry James, an idiosyncratic and voluble man of pungent wit and vigorous writing style, whose philosophical interests attracted him to the theology of Emanuel Swedenborg. One of William's brothers was the distinguished Henry James, novelist and critic and one of the most influential theorists of fiction in the English-speaking world. The elder Henry James had begun as a theological student but had developed at Princeton Theological Seminary an "antipathy to all ecclesiasticisms which he expressed with abounding scorn and irony throughout all his later years." Both his physical and his spiritual life were marked by restlessness and wanderings, largely in Europe, that affected the training of his children at school and their education at

home. Building upon the works of Swedenborg, which had been proffered as a revelation from God for a new age of truth and reason in religion, the elder James had constructed a



William James
By courtesy of the Harvard University News Service

system of his own that seems to have served him as a vision of spiritual life. This philosophy provided the permanent intellectual atmosphere of William's home life, to some degree compensating for the undisciplined irregularity of his schooling, which ranged from New York to Boulogne, Fr., and to Geneva and back. The habits acquired in dealing with his father's views at dinner and at tea carried over into the extraordinarily sympathetic yet critical manner that William displayed in dealing with anybody's views on any occasion.

When James was 18 years of age he tried his hand at studying art, under the tutelage of William M. Hunt, an American painter of religious subjects. But he soon tired of it and the following year entered the Lawrence Scientific School of Harvard University. From courses in chemistry, anatomy, and similar subjects there, he went to the study of medicine in the Harvard Medical School; but he interrupted this study in order to accompany the eminent naturalist Louis Agassiz, in the capacity of assistant, on an expedition to the Amazon. There James's health failed, and his duties irked him. He returned to the medical school for a term and then during 1867–68 went to Germany for courses with the physicist and physiologist Hermann von Helmholtz, who formulated the law of the conservation of energy; with Rudolf Virchow, a pathologist; with Claude Bernard, the foremost experimentalist of 19th-century medicine; and with others. At the same time he read widely in the psychology and philosophy then current, especially the writings of Charles Renouvier, a Kantian Idealist and relativist.

The acquaintance with Renouvier was a focal point in James's personal and intellectual history. He seems from adolescence to have been a delicate boy, always ailing, and at this period of his stay in Germany he suffered a breakdown, with thoughts of suicide. When he returned home in November 1868, after 18 months in Germany, he was still ill. Though he took the degree of M.D. at the Harvard Medical School in June 1869, he was unable to begin practice. Between that date and 1872 he lived in a state of semi-invalidism in his father's house, doing nothing but reading and writing an occasional review. Early in this period he experienced a sort of phobic panic, which persisted until the end of April 1870. It was relieved, according to his own statement, by the reading of Renouvier on free will and the decision that "my first act of free will shall be to believe in free will." The decision carried with it the abandonment of all determinisms—both the scientific kind that his training had established for him and that seems to have had some relation to his neurosis and the theological, metaphysical kind that he later opposed in the notion of "the block universe." His revolutionary discoveries in psychology and philosophy, his views concerning the methods of science, the qualities of men, and the nature of reality all seem to have received a definite propulsion from this resolution of his poignant personal problem.

Interest in Psychology. In 1872 James was appointed instructor in physiology at Harvard College, in which capacity he served until 1876. But he could not be diverted from his ruling passion, and the step from teaching physiology to teaching psychology—not the traditional "mental science" but physiological psychology—was as inevitable as it was revolutionary. It meant a challenge to the vested interests of the mind, mainly theological, that were entrenched in the colleges and universities of the United States; and it meant a definite break with what Santayana called "the genteel tradition." Psychology ceased to be mental philosophy and became a laboratory science. Philosophy ceased to be an exercise in the grammar of assent and became an adventure in methodological invention and metaphysical discovery.

With his marriage in 1878, to Alice H. Gibbens of Cambridge, Mass., a new life began for James. The old neurasthenia practically disappeared. He went at his tasks with a zest and an energy of which his earlier record had given no hint. It was as if some deeper level of his being had been tapped: his life as an originative thinker began in earnest. He contracted to produce a textbook of psychology by 1880. But the work grew under his hand, and when it finally appeared in 1890, as *The Principles of Psychology,* it was not a textbook but a monumental work in two great volumes, from which the textbook was condensed two years later.

The *Principles,* which was recognized at once as both definitive and innovating in its field, established the functional point of view in psychology. It assimilated mental science to the biological disciplines and treated thinking and knowledge as instruments in the struggle to live. At one and the same time it made the fullest use of principles of psychophysics (the study of the effect of physical processes upon the mental processes of an organism) and defended, without embracing, free will.

Interest in religion. The *Principles* completed, James seems to have lost interest in the subject. Creator of the first U.S. demonstrational psychological laboratory, he disliked laboratory work and did not feel himself fitted for it. He liked best the adventure of free observation and reflection. Compared with the problems of philosophy and religion, psychology seemed to him "a nasty little subject" that he was glad to have done with. His studies, which were now of the nature and existence of God, the immortality of the soul, free will and determinism, the values of life, were empirical, not dialectical; James went directly to religious experience for the nature of God, to psychical research for survival after death, to fields of belief and action for free will and determinism. He was searching out these things, not arguing foregone conclusions. Having begun to teach ethics and religion in the late 1880s, his collaboration with the psychical researchers dated even earlier. Survival after death he ultimately concluded to be unproved; but the existence of divinity he held to be established by the record of the religious experience, viewing it as a plurality of saving powers, "a more of the same quality" as oneself, with which, in a crisis, one's personality can make saving contact. Freedom he found to be a certain looseness in the conjunction of things, so that what the future will be is not made inevitable by past history and present form; freedom, or chance, corresponds to Darwin's "spontaneous variations." These views were set forth in the period between 1893 and 1903 in various essays and lectures, afterward collected into works, of which the most notable is *The Will to Believe and Other Essays in Popular Philosophy* (1897). During this decade, which may be correctly described as James's religious period, all of his studies were concerned with one aspect or another of the religious question.

His natural interest in religion was reinforced by the practical stimulus of an invitation to give the Gifford Lectures on natural religion at the University of Edinburgh. He was not able to deliver them until 1901–02, and their preparation focussed his labours for a number of years. His disability, involving his heart, was caused by prolonged effort and exposure during a vacation in the Adirondacks in 1898. A trip to Europe, which was to have taken up a sabbatical year away from university duties, turned into two years of invalidism. The Gifford Lectures were prepared during this distressful period. Published as *The Varieties of Religious Experience* (1902), they had an even greater acclaim as a book than as articles. Cautious and tentative though it was, the rich concreteness of the material and the final summary of the evidence—that the varieties of religious experience point to the existence of specific and various reservoirs of consciousness-like energies with which we can make specific contact in times of trouble—touched something fundamental in the minds of religionists and at least provided them with apologetic material not in conflict with science and scientific method. The book was the culmination of James's interest in the psychology of religion.

Career in philosophy. James now explicitly turned his attention to the ultimate philosophic problems that had been at least marginally present along with his other interests. Already in 1898, in a lecture at the University of California on philosophical conceptions and practical results, he had formulated the theory of method known as Pragmatism. Originating in the strict analysis of the logic of the sciences that had been made in the middle 1870s by Charles Sanders Peirce, the theory underwent in James's hands a transforming generalization. He showed how the meaning of any idea whatsoever—scientific, religious, philosophical, political, social, personal—can be found ultimately in nothing save in the succession of experiential consequences that it leads through and to; that truth and error, if they are within the reach of the mind at all, are identical with these consequences. Having made use of the pragmatic rule in his study of religious experience, he now turned it upon the ideas of change and chance, of freedom, variety, pluralism, and novelty, which, from the time he had read Renouvier, it had been his preoccupation to establish. He used the pragmatic rule in his polemic against monism and the "block universe," which held that all of reality is of one piece (cemented, as it were, together); and he used this rule against internal relations (*i.e.,* the notion that you cannot have one thing without having everything), against all finalities, staticisms, and completenesses. His classes rang with the polemic against absolutes, and a new vitality flowed into the veins of American philosophers. Indeed, the historic controversy over Pragmatism saved the profession from iteration and dullness.

Meanwhile (1906), James had been asked to lecture at Stanford University, in California, and he experienced there the earthquake that nearly destroyed San Francisco. The same year he delivered the Lowell Lectures in Boston, afterward published as *Pragmatism: A New Name for Old Ways of Thinking* (1907). Various studies appeared—"Does Consciousness Exist?" "The Thing and Its Relations,"

"The Experience of Activity"—chiefly in *The Journal of Philosophy*; these were essays in the extension of the empirical and pragmatic method, which were collected after James's death and published as *Essays in Radical Empiricism* (1912). The fundamental point of these writings is that the relations between things, holding them together or separating them, are at least as real as the things themselves; that their function is real; and that no hidden substrata are necessary to account for the clashes and coherences of the world. The Empiricism was radical because until this time even Empiricists believed in a metaphysical ground like the hidden turtle of Hindu mythology on whose back the cosmic elephant rode.

James was now the centre of a new life for philosophy in the English-speaking world. The continentals did not "get" Pragmatism; if its German opponents altogether misunderstood it, its Italian adherents—among them, of all people, the critic and devastating iconoclast Giovanni Papini—travestied it. In England it was championed by F.C.S. Schiller, in the United States by Dewey and his school, in China by Hu Shih. In 1907 James gave his last course at Harvard. In the spring he repeated the lectures on Pragmatism at Columbia University. It was as if a new prophet had come; the lecture halls were as crowded on the last day as on the first, with people standing outside the door. He was feted and photographed; he himself describes the visit as the "high tide of my existence." Shortly afterward came an invitation to give the Hibbert Lectures at Manchester College, Oxford. These lectures, published in 1909 as *A Pluralistic Universe,* state, in a more systematic and less technical way than the *Essays,* the same essential positions. They present, in addition, certain religious overbeliefs of James's, which further thinking—if the implications of the posthumous *Some Problems in Philosophy* may be trusted—was to mitigate. These overbeliefs involve a panpsychistic interpretation of experience (one that ascribes a psychic aspect to all of nature) that goes beyond radical Empiricism and the pragmatic rule into conventional metaphysics.

Home again, James found himself working, against growing physical trouble, upon the material that was partially published after his death as *Some Problems in Philosophy* (1911). He also collected his occasional pieces in the controversy over Pragmatism and published them as *The Meaning of Truth* (1909). Finally, his physical discomfort exceeded even his remarkable voluntary endurance. After a fruitless trip to Europe in search of a cure, he returned, going straight to the country home in New Hampshire, where he died in 1910.

Significance and influence. It is still too early to estimate James's significance and influence. In psychology, his work is of course dated, but it is dated as is Galileo's in physics or Darwin's in biology because it is the originative matrix of the great variety of new developments that are the current vogue. In philosophy, his positive work is still prophetic. The world he argued for was soon reflected in the new physics, as diversely interpreted, with its resonances from Charles Peirce, particularly by Albert Einstein, Bertrand Russell, and the Danish quantum physicist Niels Bohr—a world of events connected with one another by kinds of next-to-next relations, a world various, manifold, changeful, originating in chance, perpetuated by habits (that the scientist calls laws), and transformed by breaks, spontaneities, and freedoms. In human nature, James believed, these visible traits of the world are equally manifest. The real specific event is the individual, whose intervention in history gives it in each case a new and unexpected turn. But in history, as in nature, the continuous flux of change and chance transforms every being, invalidates every law, and alters every ideal.

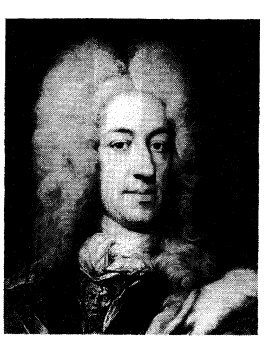
James lived his philosophy. It entered into the texture and rhythms of his rich and vivid literary style. It determined his attitude toward scientifically unaccepted therapies, such as Christian Science or mind cure, and repugnant ideals, such as militarism. It made him an anti-imperialist, a defender of the small, the variant, the unprecedented, the weak, wherever and whenever they appeared. His philosophy is too viable and subtle, too hedged, experiential, and tentative to have become the dogma of a school. It has functioned rather to implant the germs of new thought in others than to serve as a standard old system for others to repeat. (H.M.K.)

BIBLIOGRAPHY. The best and most comprehensive biography, richly documented, is still Ralph B. Perry, *The Thought and Character of William James,* 2 vol. (1935), which should be supplemented by the following: *The Letters of William James,* 2 vol., ed. by his son, Henry James (1920), valuable as a historical and biographical source; *The Philosophy of William James, Drawn from His Own Works,* with an introduction by Horace M. Kallen (1925); Gay Wilson Allen, *William James* (1967), a sympathetic popularization; and Henry James, *Notes of a Son and Brother* (1914). See also Henri Bergson's provocative chapter on James in *The Creative Mind* (1946); T. Flournoy, *La Philosophie de William James* (1911; Eng. trans., 1917); and C.H. Grattan, *The Three Jameses* (1932, reprinted 1962).

James Bay, shallow southern extension of Hudson Bay, located between northern Ontario and Quebec, Canada. Generally less than 200 ft (60 m) deep, the bay is 275 mi (443 km) long and 135 mi wide and contains numerous islands, all of which are administered by the Northwest Territories. Akimiski, the largest island, has an area of 1,159 sq mi (3,002 sq km). The many rivers that flow into James Bay, including La Grande, Eastmain, Rupert, Broadback, Nottaway, Harricana, Moose, Albany, Attawapiskat, and Ekwan, are responsible for its low salinity. Among the chief settlements on the bay's forested shores are the trading posts of Fort-George, Nouveau-Comptoir, East-main, Fort-Rupert, Lake River, Attawapiskat, Fort Albany, Moose Factory, and Moosonee (the northern terminus of the Ontario Northland Railway). Visited in 1610 by the English navigator Henry Hudson, the bay was named after Capt. Thomas James, who explored it in 1631.

James Edward, THE OLD PRETENDER, in full JAMES FRANCIS EDWARD STUART (b. June 10, 1688, London—d. Jan. 1, 1766, Rome), son of the deposed Roman Catholic monarch James II of England and claimant to the English and Scottish thrones. Styled James III of England and James VIII of Scotland by his supporters, he made several halfhearted efforts to gain his crown.

At his birth it was widely believed that he was an impostor who was slipped into the Queen's bed in a warming pan in order to provide a Catholic successor to the throne. When the Protestant ruler William of Orange, stadholder of Holland, deposed James II in 1688, the infant prince was taken to France, where his father set up a court in exile. Upon the death of James II in 1701, the French king Louis XIV proclaimed James king of England. James's adherence to Catholicism caused the English Parliament to pass a bill of attainder against him in 1701.



James Edward, the Old Pretender, detail of a painting attributed to L.G. Blanchet; in the Scottish National Portrait Gallery, Edinburgh

By courtesy of the Scottish National Portrait Gallery, Edinburgh

In 1708 the Pretender set out in French ships to invade Scotland, but he was driven away by the British before he could land. He distinguished himself fighting in the French Army in the War of the Spanish Succession (1701–14). In 1714 he refused to accept suggestions by Robert Harley and Viscount Bolingbroke that he renounce Catholicism and become an Anglican in order to be designated Queen Anne's heir to the throne of England.

John Erskine, 6th earl of Mar, raised a Jacobite (from the Latin equivalent of the name James) rebellion in Scotland in 1715, and the Pretender landed at Peterhead, Aberdeen, on December 22. By Feb. 10, 1716, the uprising had collapsed and James had returned to France. He passed the remainder of his life in or near Rome.

James's son Charles Edward, the Young Pretender (*q.v.*) precipitated one last, futile Jacobite rebellion in England in 1745.

James Island (Galápagos Islands): *see* San Salvador Island.

James River, also called JIM RIVER, or DAKOTA RIVER, river rising in Wells County, central North Dakota, U.S., and flowing in a generally south-southeasterly direction across South Dakota, to join the Missouri River about 5 mi (8 km) below Yankton after a course of 710 mi. Major cities along the river are Jamestown, N.D., and Huron, S.D. A number of dams have been constructed for recreation and water-supply purposes. A dam near Jamestown provides flood protection and water for irrigation. The river's drainage basin covers 22,000 sq mi (56,980 sq km).

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James River, river in Virginia, U.S., formed by the junction of Jackson and Cowpasture rivers and cutting across the Great Appalachian Valley in northern Botetourt County. It flows in an easterly direction, crossing the Blue Ridge Mountains near Lynchburg and continuing past Richmond, which marks the fall line and head of tidewater, about 100 mi (160 km) above its mouth; it then meanders in a southeasterly direction to enter Hampton Roads through a 5-mi-wide estuary at Newport News after a course of 340 mi. As it flows through a gorge in the Blue Ridge, it drops in the Balcony Falls and again in a 3-mi series of rapids (an 84-ft drop) above Richmond, where the river has been impounded by the Bosher Dam.

The Appomattox and Chickahominy rivers are the chief tributaries. The James is navigable for deep drafts to Richmond. A 4½-mi bridge spans the river above Newport News. Jamestown Island, on the river's lower course, was the site of the first permanent English settlement (1607) in America. During the Civil War, Federal troops used the James in their attempt to capture Richmond and dug the Dutch Gap Canal during their siege.

Jameson, Sir Leander Starr, BARONET (b. Feb. 9, 1853, Edinburgh—d. Nov. 26, 1917, London), southern African statesman who, as friend and collaborator of Cecil Rhodes,

was notorious for his abortive raid into the Transvaal to overthrow the Boer government of Paul Kruger in 1895.

After studying medicine at University College, London, Jameson seemed destined for a great future as a physician in Britain, but poor health and a strong sense of adventure led him to the diamond mines in Kimberley, Griqualand West, in 1878. There he met Rhodes. They became fast friends and shared a dream to extend British rule from the Cape to Cairo.

On Rhodes's behalf, Jameson undertook missions in 1889 and 1890 to charm Lobengula, king of the Ndebele (sometimes called Matabele), into confirming mineral concessions in present-day Zimbabwe for the British South Africa Company. In 1891, Jameson, again as Rhodes's representative, explored the area between inland Salisbury and coastal Beira (now in Mozambique) and gained concessions from local chiefs. Later that year he was made administrator of Mashonaland, thereby establishing the first settled government. At the conclusion of the Matabele War (1893), the lands of Lobengula were incorporated under Jameson's authority to create the embryo colony of Rhodesia.

The Boer government of the Transvaal Republic was the chief obstacle to Rhodes's plans for the federation of all South Africa under the British. Thus, he plotted with Jameson and with Uitlander (Afrikaans: foreigner; *i.e.,* British) leaders of the Transvaal to overthrow it. "Dr. Jim" was to raise a force and move against Johannesburg to support an Uitlander uprising.

Internal Uitlander disputes caused Rhodes to postpone the action, but the impetuous Jameson decided to force the issue and invaded the Transvaal on Dec. 29, 1895, with 500 mounted men. The raid was a disaster: Jameson and his men were defeated and captured; Rhodes's political career was ruined; and Jameson was sent to England, tried, and sentenced to 15 months' imprisonment. He was released after a few months because of severe illness.

Jameson returned to South Africa and was elected to represent Kimberley in the Cape Colony Parliament (1900). When Rhodes died in 1902, Jameson took over leadership of the Progressive Party and became prime minister (1904–08). After helping to promote the Union of South Africa, he founded the Unionist Party (1910) and led the opposition in the Union Parliament until forced to retire to England because of his health. A baronetcy was conferred on him in 1911 (it lapsed upon his death, for he never married). Though he died in England, his body was taken to the Matopo Hills in Rhodesia (now Zimbabwe) and buried near that of Rhodes.

Jameson Raid (Dec. 29, 1895–Jan. 2, 1896): *see* Jameson, Sir Leander Starr.

Jamestown, seaport town and capital of St. Helena, British island in the South Atlantic Ocean. The town was founded in 1659, when the British East India Company built a fort and established a garrison at the site on James Bay, naming it after the Duke of York (later James II). Jamestown, consisting of little more than a single street, runs up a narrow, deep-sided valley for a mile to a height of 500 ft (150 m). There is little economic activity. Main sources of revenue are customs duties, wharfage, and the sale of postage stamps to philatelists. St. Helena's only hospital is in Jamestown. Plantation House (governor's residence) and the Cathedral of St. Paul's are 2 mi (3 km) south. Longwood, where Napoleon was exiled and died in 1821, is 2½ mi southwest and is in the custody of the government of France. Pop. (1978 est.) 1,500.

Jamestown, city, Chautauqua County, southwestern New York, U.S., at the south end of Lake Chautauqua, 70 mi (113 km) southwest of Buffalo. It was named for James Prendergast, who in 1811 purchased 1,000 ac (400 ha) of land there and built a mill; a settlement developed, and furniture and textiles were early manufactures. Abundant waterpower, the opening of the Erie Canal (1825), and the arrival of the Erie Railroad in the 1850s encouraged industrial development. Manufactures now include auto and screw machine products, tools, washing and voting machines, and office furniture and equipment. Many dairy and fruit farms are in the vicinity, and the city is a base for the nearby resort areas of Lake Chautauqua and the Alleghenies. The Fenton Historical Center is housed in a 19th-century mansion that was the home of New York governor (1865–69) Reuben Fenton and was once the headquarters of the Grand Army of the Republic. Jamestown Community College was founded in 1950. Inc. village, 1827; city, 1886. Pop. (1980) 35,775.

Jamestown, city, seat (1873) of Stutsman County, southeast central North Dakota, U.S., at the confluence of the James and Pipestem rivers. The site was settled in 1872 by construction crews of the Northern Pacific Railway. The garrison at Ft. Seward (now a historic site) guarded the railroad workers from 1872 until the fort was abandoned in 1877. The city, which grew as an agricultural service centre, has flour mills, grain elevators, and stockyards. North Dakota State Hospital opened there in 1885 and Jamestown College in 1886. The Crippled Children's School was established in 1941 by the Lutheran Hospital and Homes Society of America. Frontier Village at the city's southeastern edge includes reconstructed pioneer buildings and a huge three-story-high statue of the American bison. Jamestown Dam, just north on the James River, provides flood protection, water for irrigation, and recreation opportunities. Inc. 1896. Pop. (1980) 16,280.

Jamestown, town (township), Newport County, southern Rhode Island, U.S., coextensive with Conanicut Island, one of the three main islands in Narragansett Bay. It is connected by bridges to Newport (east) and the mainland (west). Settled *c.* 1672 and incorporated in 1678, it was named for King James II. Beaver Tail (1749), at the southern tip of the island, is one of the oldest lighthouses on the New England coast. The Old Windmill (1787; restored to working order) is headquarters for the Jamestown Historical Society. Parts of the Revolutionary Conanicut Battery (Beaver Head Fort) remain. Jamestown, including Jamestown village, is a residential community and summer resort. Pop. (1980) 4,040.

Jamestown, site of the first permanent British settlement in North America, founded May 14, 1607, located on a peninsula (later Jamestown Island) in the James River in Virginia. Named in honour of King James I, the colony initiated the cultivation of tobacco, established the first representative government on the continent (1619), brought the first African slaves to the colonies, and built the first Anglican church in America. Situated in an unhealthful marshy area, the colony always had a small population because of a high mortality rate. In 1608 Jamestown was accidentally burned, and two years later it was about to be abandoned by its inhabitants when Thomas West, Lord De La Warr, arrived with new energy and new supplies. Other fires occurred in 1676 and 1698. Jamestown fell into decay when the seat of government of Virginia was moved in 1699 to the Middle Plantation (later Williamsburg).

By the mid-19th century the peninsula had become an island. Conservation efforts halted the erosion of the site, and excavations uncovered invaluable artifacts. In 1936 the island was incorporated into the Colonial National Historical Park, and 17th-century replicas have re-created the colonial atmosphere.

Jāmī, in full MOWLANĀ NŪR OD-DĪN ʿABD OR-RAḤMĀN EBN AḤMAD (b. Nov. 7, 1414, district of Jam—d. Nov. 9, 1492, Herāt, Timurid Afghanistan), Persian scholar, mystic, and poet who is often regarded as the last great mystical poet of Iran.

Jāmī spent his life in Herāt, except for two brief pilgrimages to Meshed (Iran) and the Hejaz. During his lifetime his fame as a scholar resulted in numerous offers of patronage by many of the contemporary Islāmic rulers. He declined most of these offers, preferring the simple life of a mystic and scholar to that of a court poet. His work is notably devoid of panegyrics. His prose deals with a variety of subjects ranging from Qur'ānic commentaries to treatises on Ṣūfism (Islāmic mysticism) and music. Perhaps the most famous is his mystical treatise *Lava'iḥ* (*Flashes of Light,* 1906), a clear and precise exposition of the Ṣūfī doctrines of *waḥdat al-wujūd* (the existential unity of Being), together with a commentary on the experiences of other famous mystics.

Jāmī's poetical works express his ethical and philosophical doctrines. His poetry is fresh and graceful and is not marred by unduly esoteric language. His most famous collection of poetry is a seven-part compendium entitled *Haft Awrang* ("The Seven Thrones," or "Ursa Major"), which includes *Salmān o-Absāl* (Eng. trans., 1856) and *Yūsof o-Zalīkhā* (Eng. trans., 1882). Although this collection is modelled on the works of the 13th-century romantic poet Neẓāmī, it bears Jāmī's unmistakable mark of originality and intellectual vigour.

jāmiʿ (Islām): *see* mosque.

Jamm, al- (Tunisia): *see* Thysdrus.

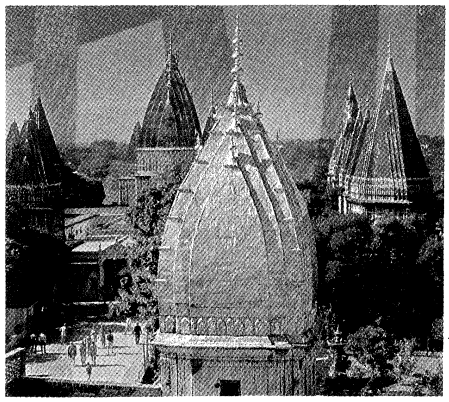
Jammes, Francis (b. Dec. 2, 1868, Tournay, Fr.—d. Nov. 1, 1938, Hasparren, near Bayonne), French poet and novelist whose simple rustic themes were a refreshing contrast to the decadent element in French literature of the turn of the century.

A timid, provincial clerk, he was befriended by the Symbolist poet Stéphane Mallarmé and the novelist André Gide. His poetry reacted against Symbolism and followed a new poetic trend known as Naturism. It urged a return to nature, to the small daily happenings of life, to a childlike simplicity. He first attracted attention with *De l'Angélus de l'aube à l'Angélus du soir* (1898; "From the Morning Angelus to the Evening Angelus"). His conversion to Roman Catholicism (1905), under the guidance of the poet Paul Claudel, led him to a growing piety. *Les Géorgiques chrétiennes* (3 vol., 1911–12; "The Christian Georgics") is the saga of a religious peasant family told in everyday language. He was content, despite his fame, to remain in the country, sharing the daily life of the villagers. Short stories, novels, and his memoirs (1923) complete his literary production in the same pastoral and intimate tone. He had reached the stature of a patriarch for the young poets of the pre–World War II generation when he died at the age of almost 70.

jamming, in electronics, broadcasting a strong signal that overrides or obscures a target signal. Jamming of radio and television stations broadcasting from beyond borders may be carried out by a country that does not wish its citizens to receive programs from abroad. In military activities, jamming is frequently employed to confuse enemy radar or communications. The techniques of jamming are many and varied, but most of them simply consist of broadcasting a powerful radio signal, modulated with noise, on the precise frequency of the signal being jammed.

Jammu, city, winter capital of the Indian-held sector of Jammu and Kashmir state and ad-

ministrative headquarters of Jammu district, northern India, on the Tāwi River, south of Srīnagar. Once the capital of the Dogra Rājput dynasty, it became part of Ranjit Singh's domain in the 19th century. It is now a railroad and manufacturing centre. The University of Jammu was established in 1969.



Raghuvir temples, Jammu, Jammu and Kashmir state, India
Vidyavrata

Jammu district occupies an area of 1,222 sq mi (3,165 sq km) and is bordered by Pakistan (south and west) and the Siwālik Range (north). It is mainly agricultural, the leading crops being wheat, rice, corn (maize), and barley. Main population centres include Jammu, Akhnūr, and Sāmba. Pop. (1981) city, 206,135; metropolitan area, 223,361; district, 943,395.

Jammu and Kashmir, territory of the northwestern Indian subcontinent, parts of which are claimed by India and Pakistan and whose northern border is also disputed by the People's Republic of China. India identifies Jammu and Kashmir as a constituent state with special status under the Constitution of the Republic of India. The territory embraced by the Indian claim has an area of 38,830 sq mi (100,569 sq km) in the vicinity of the western Himalayan mountain ranges, including about 14,500 sq mi under Chinese occupation. The Indian state's summer capital is Srīnagar and its winter capital is Jammu. Its disputed border is with the Sinkiang Uighur autonomous region of China on the northeast; it is bounded by the Indian states of Himāchal Pradesh and Punjab on the south and by the Pakistani-occupied portion of the territory on the northwest and west. Pakistan identifies a large portion of the territory as Azad Kashmir, and two adjoining sections, the Gilgit Agency and Baltistān, are logical extensions of Pakistan. The capitals of the three Pakistani-claimed areas are at Muzaffarābād, Gilgit town, and Skārdu, respectively. The Pakistan-held area lies directly north of undisputed Pakistan and is bounded north and west by Afghanistan and on the east by the Indian-held territory.

The following article summarizes the administrative history, geography, demographic patterns, economy, and culture of the modern state of Jammu and Kashmir, India. Full treatment is provided in the following MACROPAEDIA articles. For geography and history, *see* India; for information about the Pakistani-occupied portion of the territory of Jammu and Kashmir, *see* Pakistan.

According to legend, an ascetic named Kaśyapa reclaimed the land of Kashmir from a vast lake, and the reclaimed land came to be known as Kaśyapamar and, later, Kashmir. Buddhism was introduced by Aśoka (*c.* 265–238 BC), and later the region gained prominence as a centre of Hindu culture. A succession of Hindu dynasties ruled over Kashmir until 1346, when it came under Muslim rule; it was annexed to the Sikh kingdom of the Punjab in 1819 and to the Dogra kingdom of Jammu in 1846. The Dogra (Hindu) dynasty ruled the region until 1947, when British India was partitioned into a Hindu India and a Muslim Pakistan.

When Indian troops entered Kashmir to counter the Pathan tribesmen who had invaded the Bāramūlla district, Hari Singh, the maharaja of Kashmir, signed an Instrument of Accession to the Indian Union in 1947. Later, when India took the matter to the United Nations (January 1948), Pakistan proposed a plebiscite. India agreed in principle but never implemented the proposal. Pakistan has consistently opposed the accession of Kashmir to India and has continued to insist on a plebiscite, which Pakistan is confident would be in its favour because of the large proportion of Muslims in the population of Kashmir.

China began conducting military manoeuvres in the Aksai Chin and Ladākh area of eastern Kashmir in the 1950s. The northeastern part of Ladākh has been occupied by China since the Sino-Indian war in October 1962. The war was mostly caused by a disagreement over the McMahon Line, which had served as the frontier between India and China since 1914. The disputed territory includes a Chinese-built road of strategic importance to China.

Warfare resumed between Pakistan and India in 1965 and again in 1971 and led to the "line of control" that has since formed the boundary between the Pakistani- and Indian-controlled portions of the territory of Jammu and Kashmir.

More than 90 percent of the Indian state of Jammu and Kashmir is mountainous. Physiographically the region comprises (southwest to northeast) the fertile Jammu and Pūnch plains (1,000 to 2,000 ft [300 to 600 m] above sea level), the thickly forested (coniferous) Himalayan foothills (2,000 to 7,000 ft), the heavily glaciated Pīr Panjāl Range (12,500 ft), the Vale of Kashmir at an elevation of 5,300 ft, the complex central Himalayan ranges (more than 20,000 ft), the Upper Indus Valley (11,000 ft), and the Karakoram Range, which contains K2 (28,250 ft), the second highest peak in the world after Mt. Everest. The Indus, Jhelum, Chenāb, and the Tāwi are the principal rivers; the Dal and the Wular are the major lakes.

The climate varies from alpine in the northeast to subtropical in the southwest. The mean temperature in January varies from 57° F (14° C) at Jammu to 2° F (−17° C) at Dras; the corresponding June temperatures are 91° F (33° C) and 64° F (18° C). Annual average precipitation, both in the form of rain (July to September) and snow (December to March), ranges from 3 in. (75 mm) in the north to 45 in. in the southwest; snowfall averages between 30 and 35 in. at Sonāmarg in the north and decreases southwestward.

The state, having less than 1 percent of the total population of India, is the only Indian state with a two-thirds Muslim majority. Hindus make up about 30 percent of the population, and there are minorities of Sikhs and Buddhists. Urdū is the official language. In the 1971 census roughly one-fourth of the total population was urban, mostly concentrated in the two cities of Srīnagar and Jammu.

The majority of the population pursue subsistence agriculture and grow rice, corn (maize), wheat, barley, pulses, oilseeds, and tobacco on terraced slopes. In the Vale of Kashmir large orchards produce apples, pears, peaches, mulberries, walnuts, and almonds. The Vale of Kashmir (Pampur) is the sole producer of saffron in the Indian subcontinent. Transhumance of sheep, goats, yaks, and ponies is practiced by Gūjar and Gaddi nomads; the well-known cashmere (pashmina) of commerce is the product of the goats raised there. Sericulture is widespread.

The mineral and fossil-fuel resources of the state are limited, including small deposits of anthracite coal, iron ore, bauxite, copper, zinc, and marble. The state's economy is characterized by such handicraft industries as handloom weaving of local silk and wool, carpet and rug weaving, wood carving, and papier-mâché. Precision instruments, metalware, sporting goods, furniture, matches, and resin and turpentine are the major industrial products. Tourism is one of the oldest industries and is an important source of the state's revenue. Transportation is a vital problem in this rugged and forested region. Jammu is the terminus of the Northern Railway of India. The Jawahar Tunnel (1959) at Banihāl Pass facilitates year-round road traffic, and air passenger service exists between Srīnagar and New Delhi.

The Indian state of Jammu and Kashmir retains a special status with the national government defined by Article 370 of the Constitution of India. While the rest of the states follow the Constitution of India, the Indian state of Jammu and Kashmir has its own constitution (adopted in 1956) that affirms the integrity of the state within the Republic of India. The national (union) government has direct legislative powers in defense, external affairs, and communications in the state and indirectly deals with citizenship, Supreme Court jurisdiction, and emergency powers. The Indian state of Jammu and Kashmir has a governor appointed by the president of India. Executive power is vested in the elected chief minister and the Council of Ministers. There is a bicameral legislature and a state High Court, whose judges are appointed by the president of India.

The Pakistani state of Azad Kashmir has a government protected and financed by Pakistan and headed by a state president and a State Council of 12 members. There is a state High Court. The government is overseen by Pakistan's Ministry of Kashmir Affairs. The Gilgit Agency and Baltistān are administered by political agents of the Pakistani government.

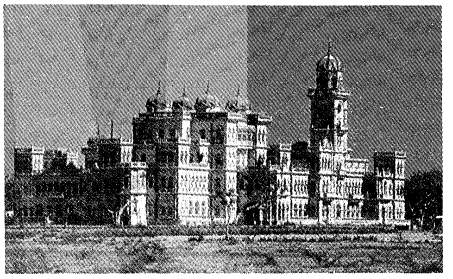
The Kashmīrī language, belonging to the Dardic branch of the Indo-Aryan group of languages, is rich in folklore and literature. The literary traditions go back to AD 1200, when Kalhaṇa chronicled the history of Kashmir in *Rājataraṅgiṇī*. The outstanding architectural monuments are the ruins of the temples of Avantīpura and Pattan (both of the 9th century AD) and the temple of Śaṅkarācārya (4th century BC). The sacred shrines of Vaiṣṇo Devi and Amarnāth Cave (Hindu) and the Hazratbāl Mosque (Muslim) attract thousands of pilgrims annually.

There are two universities in the Indian state: the University of Jammu at Jammu and the University of Kashmir at Srīnagar. Education is free at all levels. Azad Kashmir in Pakistan has several colleges, and primary education is free. Pop. (1981 est.) Indian-held sector, 6,000,000; Pakistani-held sector, 1,600,000.

Jāmnagar, town, administrative headquarters of Jāmnagar district, southwestern Gujarāt state, west central India, on the Kāthiāwār Peninsula, southeast of Bedi, its port on the Gulf of Kutch of the Arabian Sea. Founded in 1540, it was the capital of former Nawānagar state. Its historic temples and palaces contrast with modern factories, hospitals, and residential districts. Cement, pottery, textiles, and salt are the main industrial products, and the town is famous for its *bāndhanī* (tie-dyeing work), gold embroidery, and metalware. Jāmnagar is served by highways, railways, and an airport.

Jāmnagar district occupies 5,454 sq mi (14,125 sq km) in the western Kāthiāwār Peninsula and is bounded by the Gulf of Kutch (north) and the Arabian Sea (west). Formerly known

as Halar district, it is composed mainly of the old princely states of Nawānagar and Dhol Devani. Most of the district is flat, although parts of the Barda Hills lie within its boundaries. Mangrove stands on the shores of the Gulf of Kutch provide firewood and pasture. The principal crops are grains, cotton, and potatoes. Handloomed cloth and silk are the chief manufactures, and fishing is important. Dwārka, with its famous Hindu temples, and Okha port were included in Jāmnagar district



Royal Palace at Jāmnagar, Gujarāt, India
Baldev—Shostal Assoc./EB Inc.

in 1959. The highways and railroads serving the district centre upon Jāmnagar town. Pop. (1981) town, 277,615; metropolitan area, 317,362; district, 1,393,076.

Jamrūd, town in the Khyber Agency of Peshāwar Division, North-West Frontier Province, Pakistan, lying 1,512 ft (461 m) above sea level at the entrance to the Khyber Pass. It is connected by road and rail with Peshāwar and with Landi Kotal through the pass by the Afghan border. Noted for its fort built with 10-ft (3-m) thick walls *c.* 1836 by the Sikh Hari Singh Nalwa, one of Ranjit Singh's generals, it was originally named Fatehgarh to commemorate the Sikh victory over the disunited tribes. The fort gained importance as a British frontier outpost in the Second Afghan War (1878–79) and was their base of operations during the Tīrāh campaign (1897–98) when the Pashtun Afrīdī rose in a religious war. A collecting station for the Khyber tolls, Jamrūd also has several marble quarries.

Jamshedpur, town, Singhbhūm district, Bihār state, northeastern India, at the junction of the Subarnarekhā and Kharkai rivers. Sometimes called Tatanagar, the city was founded by the industrialist Dorabji Jamsetji Tata in 1907 and rapidly grew in importance. The second largest town in the state, it is a major rail and road junction. Industries include India's principal ironworks and steelworks, a vehicle assembly plant, and the manufacture of agricultural implements, enamelled ironware, and locomotive engine parts. It houses the National Metallurgical Laboratory and eight colleges affiliated with Rānchi University. Pop. (1981) town, 457,061; metropolitan area, 669,580.

Jämtland, *län* (county) of western Sweden, on the Norwegian border. Its land area of 19,273 sq mi (49,917 sq km) takes in the traditional *landskap* (provinces) of Jämtland and Härjedalen. The land rises in the west to 5,780 ft (1,762 m) but falls to below 1,500 ft in the east. It is drained by the rivers Ljungan, Indalsälven, Ångermanälven, and Ljusnan; Storsjön is the largest of its many lakes. The region around Storsjön has been settled since pre-Christian times.

Frösön, an island in Storsjön, was the ancient capital, as well as the site of a sacrificial temple. The northernmost rune stone in Sweden was erected near the lakeshore in about 1050. Except for a brief period (1563–70), Jämtland was part of Denmark's Norwegian domains until 1645.

The core of Jämtland is a relatively fertile lowland that lends itself to agriculture. Dairying is a chief occupation, together with lumbering and quarrying. The beautiful lake scenery and wild mountains with many waterfalls also make the *län* a tourist area. Östersund is the capital, and Åre is a popular resort. Pop. (1984 est.) 134,946.

Jamuna (Asia): *see* Brahmaputra River.

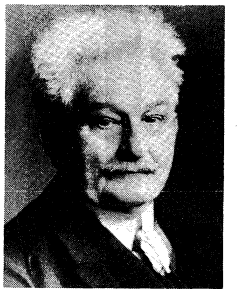
Jan (Czech, Dutch, Polish, etc., personal name): *see under* John.

Jan Mayen, island, part of the Kingdom of Norway, in the Greenland Sea of the Arctic Ocean, about 300 mi (500 km) east of Greenland. It is approximately 35 mi long and 9 mi across at its widest point, with an area of 144 sq mi (373 sq km). It is the peak of a submarine volcanic ridge, and Beerenberg volcano (7,470 ft [2,277 m]), the last major eruption of which was in 1732, forms the Nord-Jan, the northeastern region of the island. The remainder, Sør-Jan, the southern region, is low and hilly. There are no harbours. The island is bleak and desolate, and its climate is foggy and stormy, with temperatures ranging from −25° F (−32° C) in December to 50° F (10° C) in July. There is a little tundra, on which a few foxes subsist.

The island was possibly first sighted in 1607 by Henry Hudson, who called it Hudson's Tutches (Touches). In 1614 a Dutch sea captain, Jan May, claimed territorial rights to the island for his company and Holland. It was early used as a whaling base, but by 1642 the whales had been exterminated from the surrounding waters. It was frequently visited, but the first to winter on the island were the personnel of an Austrian weather station established there during the First International Polar Year (1882–83). A Norwegian meteorological observatory and a radio station were built in 1921, and on May 8, 1929, Norway annexed Jan Mayen. During World War II the U.S. armed forces maintained a weather station there. In 1958–59 an airstrip and a radio and navigation station were erected on the island by the NATO (North Atlantic Treaty Organization) allies. This equipment was extended with a console navigation system in 1970. Apart from the station personnel, the island is uninhabited.

Janáček, Leoš (b. July 3, 1854, Hukvaldy, Moravia, Austrian Empire—d. Aug. 12, 1928, Ostrava, Czech.), composer, one of the most important exponents of musical nationalism of the 20th century.

Janáček was a choirboy at Brno and studied at the Prague, Leipzig, and Vienna conservatories. In 1881 he founded a college of organists at Brno, which he directed until 1920. He directed the Czech Philharmonic Orchestra from 1881 to 1888 and in 1919 became professor of composition at the Prague Conservatory. Deeply interested in folk music, he collected folk songs with František Bartoš and between 1884 and 1888 published the journal *Hudební Listy* (*Musical Pages*). His first opera, *Šárka* (1887–88; produced 1925), was a Romantic work in the spirit of Wagner and Smetana. In his later operas he developed a distinctly Czech style intimately connected with the inflections of his native speech and, like his purely instrumental music, making use of the scales and melodic characteristics of Moravian folk music. His most important operas were *Jenůfa* (original title, *Její pastorkyňa,* 1904; *Her Foster Daughter*), which established Janáček's international reputation; *Věc Makropulos* (1926; *The Makropulos Case*), *Z mrtvého domu* (1930; *From the House of the Dead*), the two one-act satirical operas *Výlet pana Broučka do Měsíce* (*Mr. Brouček's Excursion to the Moon*) and *Výlet pana Broučka do XV stol* (*Mr. Brouček's Excursion to the 15th Century*), both performed in Prague in 1920,



Janáček
Eastfoto

and the comic opera *Příhody Lišky Bystroušky* (1924; *The Cunning Little Vixen*). His operas are marked by a skilled use of music to heighten dramatic impact.

His choral works also show his manner of modelling the writing for voices on the inflections of his native language, most significantly the *Glagolská mše* (1926; *Glagolitic Mass*), also called the *Slavonic* or *Festival Mass.* It is written in the liturgical language Old Slavonic, but because it uses instruments it cannot be performed in the Orthodox Church service. His song cycles *Zápisník zmizelého* (1917–19; *Diary of One Who Vanished*) and *Říkadla* (1925–27; *Nursery Rhymes*) are also notable.

Janáček visited Russia three times and developed an interest in Russian language and literature. Works arising from this interest include the opera *Kát'a Kabanová* (1921) and the orchestral rhapsody *Taras Bulba* (1918).

Janáček also wrote a number of instrumental chamber works in which, as in his vocal works, he manipulates blocks of strong harmonies and repetitive melodies influenced by the contours of his native folk music. His use of elements of folk music and his attention to speech inflection mark him as a 20th-century counterpart of Mussorgsky. Although some influence of the French musical Impressionists appears in his later works, Janáček's style remained highly individual and original.

Jane SEYMOUR (b. 1509?, England—d. Oct. 24, 1537, Hampton Court, London), third wife of King Henry VIII of England and mother of King Edward VI. She succeeded—where Henry's previous wives had failed—in providing a legitimate male heir to the throne.

Jane's father was Sir John Seymour of Wolf Hall, Savernake, Wiltshire. She became a lady in waiting to Henry's first wife, Catherine of Aragon, and then to Anne Boleyn, who mar-



Jane Seymour, portrait by Hans Holbein the Younger, 1536; in the Kunsthistorisches Museum, Vienna
By courtesy of the Kunsthistorisches Museum, Vienna

ried the King in 1533. Henry probably became attracted to Jane in 1535, when he visited her father at Wolf Hall, but, though willing to marry him, she refused to be his mistress. That determination undoubtedly helped bring about Anne Boleyn's downfall and execution (May 19, 1536). On May 30, 1536, Henry and Jane were married privately.

During the remaining 17 months of her life Jane managed to restore Mary, Henry's daughter by Catherine of Aragon, to the King's favour. Mary was a Roman Catholic, and some scholars have interpreted Jane's intercession to mean that she had little sympathy with the English Reformation. The future Edward VI was born on Oct. 12, 1537, but, to Henry's genuine sorrow, Jane died 12 days later.

Jane's family enjoyed Henry's favour until the end of his reign. On the accession of Edward VI to the throne, Jane's brother, Edward Seymour, earl of Hertford, became regent as lord protector with the title duke of Somerset. Another brother, Thomas Seymour of Sudeley, was lord high admiral from 1547 to 1549.

Janenz, Theodor Friedrich Emil (actor): *see* Jannings, Emil.

Janequin, Clément (b. *c.* 1485, Châtellerault, Fr.—d. 1558, Paris), a leading 16th-century French composer of chansons, famous for his program chansons, part-songs in which sounds of nature, of battles, and of the streets are imitated.

He worked in Bordeaux in the service of Lancelot du Fau, who became bishop of Luçon, and later for the bishop of Bordeaux. He entered the priesthood and in 1525 became canon of St. Emilion. Variously employed after 1529, when the bishop died, he was at times a student and settled in Paris in 1549. From about 1555 he was singer, and later composer, to Henry II, although not a full-time servant of the King. He died a pauper.

Although he set psalms and composed two masses and a motet, Clément's fame lies in his 286 chansons. His program chansons include "La Bataille de Marignan" ("La Guerre"), imitating sounds of battle; "Voulez ouir les cris de Paris," with Paris street cries; and "Le Chant des oiseaux," with the sounds of birds. His style shows fine formal balance and subtle handling of texts. He is rare among great composers in that he never held an important and regular position as musician or composer to a nobleman or a bishop or archbishop.

Janesville, city, seat (1839) of Rock County, southern Wisconsin, U.S., on the Rock River, 37 mi (60 km) southeast of Madison. Settled in 1835 and named for a pioneer, Henry F. Janes (who later moved west to found Janesville, Minn., and Janesville, Iowa), it developed as a trading centre for a dairying, grain, and logging region. In 1919 General Motors Corporation opened a tractor factory, which became a Fisher Body and Chevrolet plant (1922); it, with the Parker Pen Company, now leads the city's diversified industries. Janesville was the birthplace (1862) of Carrie Jacobs Bond, composer of sentimental songs, and a monument marks the site where she wrote "I Love You Truly." The Tallman Restorations include two 19th-century houses. The nearby Milton House Museum, a Civil War landmark, was a station on the Underground Railroad for runaway slaves. A University of Wisconsin centre was established in 1966 in Janesville, and the Blackhawk Technical Institute opened there in 1968. Inc. 1853. Pop. (1980) city, 51,071; metropolitan area (SMSA), 139,420.

Janet: *see* Clouet, Jean.

Janet, Pierre(-Marie-Félix) (b. May 30, 1859, Paris—d. Feb. 24, 1947, Paris), psychologist and neurologist influential in bringing about in France and the United States a connection between academic psychology and the clinical treatment of mental illnesses. He stressed psychological factors in hypnosis and contributed to the modern concept of mental and emotional disorders involving anxiety, phobias, and other abnormal behaviour.

Janet's report (1882) of an unusual case of hypnosis and clairvoyance gained him the attention of neurologist Jean Charcot. As a Ph.D. candidate at the University of Paris, Janet studied automatic acts and in his thesis (1889), which went into many editions, introduced but did not amplify the concept of the unconscious. This situation engendered a later dispute with Sigmund Freud over priority. At Charcot's invitation he became director of the psychological laboratory at the largest Paris mental institution, the Salpêtrière Hospital (1889). There he completed his work for his M.D., which he received for the thesis *L'état mental des hystériques* (1892; *The Mental State of Hystericals,* 1901), in which he attempted to classify forms of the hysteria neurosis. Charcot, in his introduction to the thesis, concurred with Janet's plea to unite the efforts of psychology and medicine.

Appointed lecturer in psychology at the Sorbonne (1898) and professor at the Collège de France (1902–36), Janet was also a practicing physician specializing in nervous and mental disorders. He wrote and lectured on a wide range of subjects, including impairment of the ability to act independently, hysteria, obsession, amnesia, and personality.

Jang Bahadur (Nepalese statesman): *see* Jung Bahadur.

Jangijul' (Uzbek S.S.R.): *see* Yangiyul.

Jangjangbure (The Gambia): *see* MacCarthy Island.

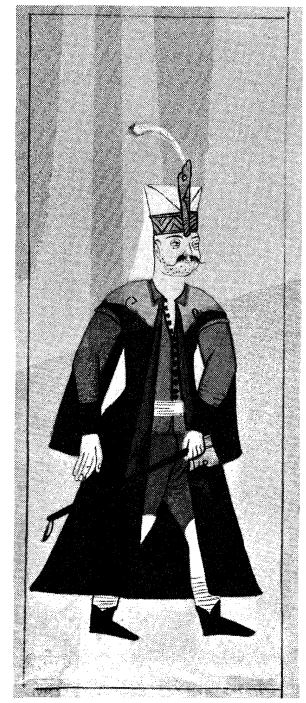
Janīn, also spelled JENĪN, town, northern Samaria, central Palestine. Contained within mandated Palestine during 1923–48, it was in the area annexed by Jordan in 1950 following the Arab–Israeli War of 1948–49; since the Six-Day War of 1967 it has been in the West Bank territory under Israeli administration.

The original ancient settlement is mentioned in the Amarna Letters, a series of 14th-century-BC diplomatic documents found at Tell el-Amarna, Egypt. Some authorities identify it with the biblical Levitical city of Engannim (Hebrew: Gardens' Spring; Levitical cities were allocated because the Levites were not participants in the territorial division of the Holy Land among the tribes). In the Middle Ages the town was taken by the crusaders, who called it Le Grand Gerin. Janīn was a Turkish-German base in World War I; a memorial to fallen German aviators remains. It was an important centre for Jordanian and Iraqi forces in 1948; though much of the strategic territory in the vicinity was taken by Israel, Janīn remained in Arab hands. In 1949–67 it was the northern apex of "the triangle" (Janīn, Ṭūl Karm, Nābulus), a staging area for Arab guerrilla activity against Israel.

Lying in a well-settled Arab agricultural region, Janīn has long been the chief marketing centre of northern Samaria; wheat, olives, dates, carobs, and figs are grown in the vicinity. Ruins of an interesting Byzantine church have been excavated in the town. Pop. (1984 est.) 25,000.

Janina (Greece): *see* Ioánnina.

Janissary, also spelled JANIZARY, Turkish YENIÇERI (New Soldier, or Troop), member of an elite corps in the standing army of the Ottoman Empire from the late 14th century to 1826. Highly respected for their military prowess in the 15th and 16th centuries, the Janissaries became a powerful political force within the Ottoman state. The Janissary corps was originally staffed by Christian youths from the Balkan provinces who were converted to Islām on being drafted into the Ottoman service. Subject to strict rules, including celibacy, they were organized into three unequal divisions (*cemaat, bölükhalkı, segban*) and commanded by an *ağā*. In the late 16th century the celibacy rule and other restrictions were relaxed, and by the early 18th century the original method of recruitment was abandoned.



Janissary, detail of a Turkish miniature from *A Briefe relation of the Turkes, their Kings, Emperors or Grand-Signeurs*; in the British Library (Ms. Add 23880)

Reproduced by permission of the British Library

The Janissaries frequently engineered palace coups in the 17th and 18th centuries, and in the early 19th century they resisted the adoption of European reforms by the army. Their end came in June 1826 in the so-called Auspicious Incident. On learning of the formation of new, westernized troops, the Janissaries revolted. Sultan Mahmud II declared war on the rebels and, on their refusal to surrender, had cannon fire directed on their barracks. Most of the Janissaries were killed, and those who were taken prisoner were executed.

Janissary music: *see* Turkish music.

Janmāṣṭamī, Hindu festival celebrating the birth (*janma*) of the god Krishna (Kṛṣṇa) on the eighth (*aṣṭamī*) day of the dark fortnight of the month of Bhādrapada (August–September). The eighth also has significance in the Krishna legend that he is the 8th of the 10 usually enumerated avatars (incarnations) of Lord Vishnu and the eighth child of his mother, Devakī.

The occasion is observed with particular splendour in Mathura and Vrindāvanā (Brindāban), the scenes of Krishna's childhood and early youth. The preceding day devotees keep a vigil and fast until midnight, the traditional hour of his birth. Then the image of Krishna is bathed in water and milk, dressed in new clothes, and worshipped. Temples and household shrines are decorated with leaves and flowers; sweetmeats are first offered to the god and then distributed as *prasāda* (the god's favour) to all the members of the household. The devotees of Krishna commemorate the events of his birth by preparing elaborate representations of Mathura, where he was born, the Yamuna River, over which he was trans-

ported to safety, and Gokul (ancient Vraja), the scene of his childhood, using small images of the god, the other participants, and the animals and birds of the forest. Pots of milk are hung from tall poles in the streets, and men form human pyramids to reach and break the pots—this in imitation of Krishna's childhood play with the cowherd boys, when they stole the curds hung out of reach by their mothers. The festival is also a time for group singing and dancing, in both the folk and the classical traditions.

Jannings, Emil, original name THEODOR FRIEDRICH EMIL JANENZ (b. July 23, 1884, Rorschach, Switz.—d. Jan. 2, 1950, Strobl, near Salzburg, Austria), internationally known German actor famous for his tragic roles in motion pictures.

Jannings was reared in Görlitz, Austria, where he began his stage career. He joined a traveling stock company and in 1906 began acting for Max Reinhardt, the leading German theatrical director, in Berlin. He started appearing in motion pictures in about 1915.

In 1924 the film *The Last Laugh,* directed by F.W. Murnau, brought him his best-remembered role as an aging hotel doorman demoted to the position of washroom attendant; in *Variety* (1925) he was a married sideshow operator deceived by a woman trapeze artist; and in *The Blue Angel* (1930), which introduced the sultry leading lady Marlene Dietrich, he was an aging professor hopelessly in love with a young nightclub singer. Critics acclaimed Jannings as one of the finest actors in the world on the basis of these three motion pictures.

In 1929 Jannings won the first Academy Award for acting for his performances in the American-made films *The Way of All Flesh* (1928), in which he played an embittered family man, and *The Last Command* (1928), in which he was an exiled Russian general reduced to playing bit parts in war films.

Returning to Germany, Jannings continued to work in films during the Nazi regime and afterward.

János (Hungarian personal name): *see under* John.

Janowitz, Morris (b. Oct. 22, 1919, Paterson, N.J., U.S.—d. Nov. 7, 1988, Chicago), innovative American sociologist and political scientist who made major contributions to sociological theory and wrote accurate historical studies of the social sciences. His work as a political scientist concentrated mainly on civil-military affairs, based on data gathered since World War II.

After earning his B.A. at New York University (1941) and his Ph.D. at the University of Chicago (1948), he was research assistant for War Community Research, Library of Congress (1941), and senior propaganda analyst, Organization and Propaganda Section, the U.S. Department of Justice (1941–43), before teaching at the University of Chicago. He started as an instructor in sociology (1947–48), rising through academic ranks there and at the University of Michigan, Ann Arbor, until he became chairman of the department of sociology at the University of Chicago (1961–72). He collaborated with Bruno Bettelheim on *Dynamics of Prejudice* (1950), a psychological and sociological study of veterans. *Sociology and the Military Establishment* (1959; revised 1965), *The Professional Soldier* (1960), and *Social Change and Prejudice* (with Bettelheim, 1964) follow the basic study, developing new theory through social change.

Janowitz served as Pitt professor and distinguished professor at the University of Cambridge (1972–73) and as Kimpton distinguished-service professor in the department of sociology at the University of Chicago. He also wrote *The Last Half Century; Societal Change and Politics in America* (1978), a major synthesis of ideas on social control.

Jansen, Cornelius Otto (b. Oct. 28, 1585, Acquoi, near Leerdam, Holland—d. May 6, 1638, Ypres, Flanders, Spanish Netherlands [now in Belgium]), Flemish leader of the Roman Catholic reform movement known as Jansenism. He wrote biblical commentaries and pamphlets against the Protestants. His major work was *Augustinus,* published by his friends in 1640. Although condemned by Pope Urban VIII in 1642, it was of critical importance in the Jansenist movement.



Jansen, engraving by Jean Morin

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

Education. Jansen entered the University of Louvain, in the Spanish Netherlands in 1602 to study theology. According to the custom adopted by the humanists of the Renaissance, Jansen Latinized his name to Cornelius Jansenius. His teacher, Jacques Janson, taught the doctrine of the theologian Michael Baius (Michel de Bay), who had died at Louvain in 1589. According to the latter, man is affected from his birth by the sin of Adam, his ancestor. His instincts lead him necessarily to evil. He can be saved only by the grace of Christ, accorded to a small number of the elect who have been chosen in advance and destined to enter the Kingdom of Heaven. This doctrine, inspired by certain writings of St. Augustine, attracted Jansen and another student who had come to study at Louvain, a Frenchman named Jean Duvergier de Hauranne, who was to become a leader of the Jansenist movement. The two young men became friends in Paris, where Jansen went in 1604. They decided to revive theology, which they believed the theologians of the Sorbonne had reduced to subtle and vain discussions among Scholastics. Jansen and Duvergier thought that it was necessary to render to God the homage owed by men and that the pride of the Renaissance savants had alienated Christians from the Jesus who loved the simple and the humble.

In 1611 Jansen followed Duvergier to the home of the latter's parents, located in the outskirts of Bayonne. The bishop of the city entrusted to Jansen the direction of the episcopal college there from 1612 to 1614. For three years afterward the young Dutchman, with Duvergier, dedicated himself to the study of the writings of the early Church Fathers.

Return to Louvain: the Augustinus. In 1617 Jansen returned to Louvain, where he directed the college of Sainte-Pulchérie, created for Dutch students. A violent dispute had arisen at Louvain between the disciples of Baius and the Jesuits, who considered as dangerous the doctrines of this theologian, who had been condemned by Pope Pius V in 1567. Jansen then undertook a thorough study of the works of Augustine by which Baius had been inspired. He read them, he declared, 10 times consecutively. But he devoted himself most particularly to the texts drafted by Augustine to combat the doctrine of Pelagius, who had held that, in spite of the fault committed by Adam, man continues to be entirely free to do good and to obtain salvation by means of his own merits. Jansen then began his great work, the *Augustinus.* For him, the divine grace that alone can save man is not due at all to his good actions. It is, he claimed, a gratuitous gift by means of which Christ leads the elect to eternal life, but the multitude, "the mass of perdition," is doomed to damnation. Thus, men are predestined to obtain grace or to suffer condemnation. In reality, Augustine had not envisaged the fate of human beings with such great rigour. He had even proclaimed the power of man's free will at the time when he was engaged in the struggle against the Manichaeans. But Augustine had then been constrained to enclose the liberty of man within strict limits, in order to refute the affirmations of Pelagius, who had radically reduced the value of the divine grace obtained by Jesus on the cross.

Jansen was so fascinated by Augustine's treatise against the Pelagians that he apparently lost sight of Augustine's works against the Manichaeans.

Jansen also wrote commentaries on the evangelists and on the Old Testament—notably on the Pentateuch—as well as a "Discourse on the Reformation of the Inner Man." He was likewise the author of pamphlets directed against the Protestants.

Last years. Having acquired the degree of doctor in theology at Louvain, Jansen became the rector of that university in 1635, and in 1636 he became bishop of Ypres. The Jesuit scholar René Rapin asserted in his book *Histoire du Jansénisme* (1861) that Jansen had obtained his mitre as a result of the personal intervention of the king of Spain, Philip IV. This sovereign had recognized him for having published a pamphlet entitled *Mars Gallicus,* in which he strongly criticized the policy of the French cardinal and prime minister, Richelieu, who had contracted an alliance with the Dutch Protestants against Spain. In 1638, a short time after his elevation to the episcopate, Jansen died of the plague. In 1640 his friends published at Louvain the work he had dedicated to St. Augustine, under the title *Augustinus Cornelii Jansenii, Episcopi, seu Doctrina Sancti Augustini de Humanae Naturae, Sanitate, Aegritudine, Medicina adversus Pelagianos et Massilienses* ("The Augustine of Cornelius Jansen, Bishop, or On the Doctrines of St. Augustine Concerning Human Nature, Health, Grief, and Cure Against the Pelagians and Massilians").

This book had cost its author 22 years of effort. In the epilogue Jansen declared: "I leave my work to the judgment of the Roman Church. . . . I retract all that she will decide that I ought to (must) retract."

Condemnation of Jansen's teachings. In a bull of 1642, Pope Urban VIII forbade the reading of the *Augustinus,* which had been published without the authorization of the Holy See and was based on the doctrine of Baïus, already condemned. Five propositions in the *Augustinus* were condemned by Pope Innocent X in 1653, and by his successor, Alexander VII. The bishops of France were required to make all of the priests, monks, and nuns sign a formulary conforming to the pontifical decisions. But Duvergier de Hauranne, who had become the abbé of Saint-Cyran, had taught the doctrine of Jansen to the nuns of the abbey of Port-Royal. This convent became a focus of resistance against the Jesuits, who, having obtained the pontifical decisions in their favour, intended to impose them. From that time, a conflict began between the Jesuits

and Antoine Arnauld, a disciple of "Monsieur de Saint-Cyran" (Duvergier de Hauranne) who called himself an Augustinian. The Jesuits, however, called him a Jansenist. According to them, the doctrine of Arnauld was that of Jansen and not of St. Augustine. Blaise Pascal wrote *Les Provinciales* ("Provincial Letters") in 1656 and 1657 to defend Antoine Arnauld. The latter was condemned by the Faculty of Theology at the Sorbonne.

Although Louis XIV was determined to eliminate the Jansenists as a threat to the unity of his kingdom, there was a temporary peace after Clement IX became pope in 1667, and the conflict ceased to be a major concern when the papacy and the French Church clashed on Gallicanism. But after the controversy between the papacy and the monarchy was settled, Louis XIV obtained from Clement XI in 1705 the bull *Vineam Domini,* which renewed the earlier condemnations. In 1709 Louis XIV ordered the dispersal of the nuns of Port-Royal into diverse convents, and he had the abbey destroyed in 1710. He then obtained in 1713 the bull *Unigenitus Dei Filius,* which condemned 101 propositions of Quesnel. The promulgation of *Unigenitus* as French law in 1730 finally caused the decline in strength of the Jansenist party.

In 1723 followers of Jansen's views established an autonomous Jansenist Church at Utrecht, Holland, which still existed in the late 20th century. Jansenism also spread to Italy, where in 1786 the Synod of Pistoia, which was later condemned, propounded extreme Jansenist doctrines. (M.M.E.)

BIBLIOGRAPHY. Charles-Augustin Sainte-Beuve, *Port-Royal* (in French), 3rd ed., vol. 1, ch. 11 (1867), studies Jansen's theological concepts and those of the Abbé of Saint-Cyran and includes the correspondence between the two men, which later inspired the editing of the *Augustinus.* Marc Escholier, *Port-Royal* (1965; Eng. trans. 1968), explains the relationship between Jansen and Saint-Cyran, and discusses the theological theses supported in the *Augustinus* by Jansen.

Jansky, Karl (Guthe) (b. Oct. 22, 1905, Norman, Okla., U.S.—d. Feb. 14, 1950, Red Bank, N.J.), U.S. engineer whose discovery of radio waves from an extraterrestrial source inaugurated the development of radio astronomy, a new science that from the mid-20th century extended the range of astronomical observations far beyond the reaches possible with optical telescopes alone.

In 1928 Jansky joined the Bell Telephone Laboratories in New Jersey, where his assignment was to track down and identify the various forms of interference that were plaguing telephone communications. He built a linear, directional antenna by which he was able to identify all the sources of interference except one. After months of study he discovered in 1931 that the source of the unidentified radio interference came from the stars. By the following spring he concluded that the source lay in the direction of the constellation Sagittarius, which Harlow Shapley and Jan H. Oort had established as the direction of the centre of the Milky Way Galaxy.

Jansky published his findings in late 1932 but did not pursue the further development of radio astronomy, a task performed by the U.S. engineer and amateur astronomer Grote Reber. In honour of Jansky's epoch-making discovery, the unit of radio-wave emission strength was named the jansky.

Janson, Cornelius, also spelled JANSSEN: *see* Johnson, Cornelius.

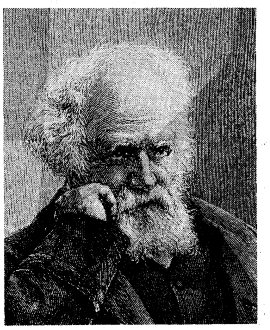
Janssen, Johannes (b. April 10, 1829, Xanten, Prussia—d. Dec. 24, 1891, Frankfurt am Main), Roman Catholic German historian who wrote a highly controversial history of the German people, covering the period leading to and through the Reformation.

Reared in a staunchly Catholic home, he attended local schools and then studied theology at the academy in Münster (1849–50), philology at the University of Louvain (1850–51), and history at the University of Bonn (1851–53). After completing his dissertation on 12th-century church history at Bonn, he moved to Frankfurt in 1854, where he continued to study and also taught at the Catholic Gymnasium.

In 1857 Janssen decided to write his *Geschichte des deutschen Volkes seit dem Ausgang des Mittelalters,* 8 vol. (1876–94; "History of the German People from the Close of the Middle Ages"). His work, which ended on the eve of the Thirty Years' War (1618), was based on the thesis that the harmonious relations between church and state during the Middle Ages had raised Germany to a position of political and moral prominence that reached its height during the 14th and 15th centuries. Henceforth, he concluded, the effect of the Reformation under the leadership of Martin Luther was a progressive weakening of the German social structure that gradually led to chaos and national deterioration.

Janssen's work was enthusiastically received by German Catholics but was bitterly criticized by Protestant historians for its extremely partisan viewpoint. Nevertheless, his stress on social and cultural history was extremely important in the development of German *Kulturgeschichte* ("history of civilization") and is valuable for its detailed contribution to studies on the 15th century.

Janssen, Pierre(-Jules-César) (b. Feb. 22, 1824, Paris—d. Dec. 23, 1907, Meudon, Fr.), French astronomer who in 1868 discovered



Pierre Janssen, detail from an engraving
By courtesy of the Staatsbibliothek, Berlin

how to observe solar prominences without an eclipse. His work was independent of that of the Englishman Joseph Norman Lockyer, who made the same discovery at about the same time.

Janssen was permanently lamed by an accident in early childhood. He studied at the University of Paris, and in 1865 he became professor of general science in the school of architecture. He was an enthusiastic observer of eclipses. In 1870, when Paris was besieged during the Franco-German War, he fled the surrounded city in a balloon so that he could reach the path of totality of a solar eclipse in Africa. (His effort went for nothing, for the eclipse was obscured by clouds.) In 1876 he was appointed the first director of the Meudon Observatory, near Paris. In 1893, using observations from the meteorological observatory he had established on Mont Blanc, he proved that strong oxygen lines appearing in the solar spectrum were caused by oxygen in the Earth's atmosphere. He was the first to regularly photograph the Sun; in 1904 Janssen published his great *Atlas des photographies solaires,* containing more than 6,000 solar pictures. A crater on the Moon is named for him.

Janssens, Abraham, also called ABRAHAM JANSSENS VAN NUYSSEN (b. *c.* 1575, Antwerp—d. Jan. 25, 1632, Antwerp), Flemish painter who was the leading exponent of the classical Baroque style in Flanders during the early 17th century. His stylistic development indicates that he was in Rome between 1598 and 1601 and probably revisited the city sometime between 1602 and 1610. His earliest pictures are characteristic of the northern Mannerist tradition. In about 1610 he was influenced by the dramatic lighting and vigorous modelling of Caravaggio and the Roman Baroque school. His mature style, however, was largely shaped by such classicists of the Bolognese school as the Carracci and Domenichino. After 1625 he fell under the spell of Rubens, as did most artists in Flanders at the time, and his technique became looser and his compositions more animated.

Jansson, Hans (b. Jan. 7, 1792, Låbyn, Swed.—d. Feb. 1, 1854, Värmland province), mid-19th-century parliamentary leader of Sweden's peasant class.

After the deaths of the early 19th-century peasant champions Anders Danielsson and Nils Månsson in the 1830s, Jansson, who was elected to the peasant chamber of the Riksdag (estates assembly) in 1828 and came to represent several districts, became the foremost peasant parliamentarian for the next decade. True to the concerns of his predecessors and his class, Jansson fought for reduction of defense spending, reduction in civil service expenditure, expanded public education, and tax relief. His fight for an increase in the franchise and for parliamentary reform reflected not only class objectives but also the basic issue of general liberal opposition to the strong monarchical and conservative system. Jansson, like Danielsson before him, was a leader of this movement. In his parliamentary career Jansson served on such bodies as the state budget committee, the constitution committee, and the committee on representation questions. He served as Riksdag speaker in 1844–45 and 1847–48.

Jansson, Tove (Marika) (b. Aug. 9, 1914, Helsinki), Finnish artist and writer-illustrator of children's books (in Swedish). In her books she created the fantastic self-contained world of Moomintrolls, popular especially in northern and central Europe, although translations in 20 languages have provided a worldwide audience.

Her comic strip "Moomin" ran in the *Evening News,* London, from 1953 to 1960. Her Moomin world has been praised for its individualistic characters, complicated plots, and sophisticated humour. Jansson won the Stockholm Award for best children's books in 1952, the Selma Lagerlöf Medal in 1953, the International Hans Christian Andersen Medal in 1966, and many other honours.

Her first book, *Mumintrollet och kometen* (published in English as *Comet in Moominland*), was published in 1946. Along with numerous other Moomin books, she has written an autobiography, *Bild-huggarens dotter* (1968; *Sculptor's Daughter,* 1969), short stories, plays, and adult fiction.

Januarius, SAINT, Italian SAN GENNARO (d. 305?, Pozzuoli, Italy; feast day September 19), bishop of Benevento and patron saint of Naples. He is believed to have been martyred during the persecution under the Roman emperor Diocletian in 305. His fame rests on the relic, allegedly his blood, which is kept in a glass vial in the Naples cathedral. Of solid substance, it liquefies 18 times each year. While no natural explanation has been given, the phenomenon has been tested frequently and seems genuine.

January, first month of the Gregorian calendar. *See* month.

January Insurrection (1863–64), Polish rebellion against Russian rule in Poland; the insurrection was unsuccessful and resulted in the imposition of tighter Russian control over Poland.

After Alexander II became emperor of Russia and king of Poland in 1855, the strict and repressive regime that had been imposed on Poland after the November Insurrection (1830–31) was substantially relaxed. Nevertheless, conspiratorial societies that opposed any form of Russian rule in Poland remained active and gained support, particularly among students and other groups of urban youth. When those groups sponsored patriotic demonstrations in the early 1860s, the moderate reformer Count Aleksander Wielopolski, who had become the virtual head of government in Poland, devised a plan to recruit all the radical youths into the Russian army. But those designated for conscription secretly fled from Warsaw (Jan. 14–15, 1863), sought refuge in the nearby woodlands, and on January 22 issued a manifesto calling for a national insurrection. Although they were greatly outnumbered, poorly equipped, and successful in only a few engagements, the rebels gained support among the artisan, worker, lower gentry, and official classes in the cities and stimulated peasant revolts against the large landlords in rural areas.

Establishing an underground government in Warsaw, the rebels waged a guerrilla war with small units of badly trained troops against the regular Russian army of 300,000 men; the insurrection spread beyond Poland into Lithuania and a section of Belorussia and attracted volunteers from the portions of Poland under Prussian and Austrian rule. But the rebels, although managing to convince sympathetic foreign powers to send protests to Alexander, failed to obtain vitally needed military assistance from them; and as moderates assumed dominance in the insurgent government (by July) and delayed the enactment of promised peasant reforms, they lost mass peasant support for the rebellion.

By the time Romuald Traugutt emerged to provide strong leadership for the revolutionary movement (mid-October), the rebellion had lost its dynamism. The Lithuanian insurrection had been brutally crushed by the "hangman of Vilnius," Mikhail Nikolayevich Muravyov; the new viceroy in Poland, Teodor Berg, similarly imposed a harsh regime in Warsaw; and Russian efforts (begun in the summer of 1863) to win the peasants' loyalty by granting reforms provided added incentive for the peasantry to abandon the rebels. Although the insurgent army survived the winter of 1863–64 in southern Poland, Traugutt and the other leaders of the rebellion who had not already fled the country were arrested in April 1864; their execution in August marked the end of the January Insurrection.

Janus, in Roman religion, the animistic spirit of doorways (*januae*) and archways (*jani*). The worship of Janus traditionally dated back to Romulus and a period even before the actual founding of the city of Rome. There were many *jani* (*i.e.,* ceremonial gateways) in Rome; these were usually freestanding structures that were used for symbolically auspicious entrances or exits. Particular superstition was attached to the departure of a Roman army, for which there were lucky and unlucky ways to march through a *jani*. The most famous *jani* in Rome was the Janus Geminus, which was actually a shrine of Janus at the north side of the Forum. It was a simple rectangular bronze structure with double doors at each end. Traditionally, the doors of this shrine were left open in time of war and were kept closed when Rome was at peace. According to the Roman historian Livy, the gates were closed only twice in all the long period between Numa Pompilius (7th century BC) and Augustus (1st century BC).

Some scholars regard Janus as the god of all beginnings and believe that his association with doorways is derivative. He was invoked as the first of any gods in regular liturgies.



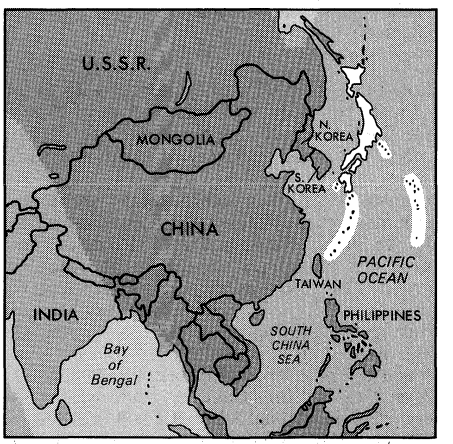
The god Janus, beardless, Roman coin; in the Bibliothèque Nationale, Paris

Larousse

The beginning of the day, month, and year, both calendrical and agricultural, were sacred to him. The month of January is named for him, and his festival took place on January 9, the Agonium. There were several important temples erected to Janus, and it is assumed that there was also an early cult on the Janiculum, which the ancients took to mean "the city of Janus."

Janus was represented by a double-faced head, and he was represented in art either with or without a beard. Occasionally he was depicted as four-faced—as the spirit of the four-way arch.

Japan, Japanese NIHON, or NIPPON, island country lying off the east coast of Asia, covering an area of 145,870 square miles (377,801 square km). Its capital, Tokyo, is one of the most populous cities in the world. Its four main islands—Hokkaido, Honshu, Shikoku, and Kyushu—stretch about 1,500 miles (2,400 km) from northern Hokkaido in the northeast to the Ryukyu Islands (south of Kyushu) in the southwest and average about 130 miles (210 km) across from northwest to southeast. Japan is separated from the People's Republic



Japan

of China to the southwest by the East China Sea; from the Soviet Union, North Korea, and South Korea to the west by the Sea of Japan; and from the Soviet islands of Sakhalin and the Kurils to the north and northeast, respectively, by La Perouse (Sōya) Strait, the Sea of Okhotsk, and Nemuro Strait. The Pacific Ocean comprises the entire eastern coastal boundary. The population in 1988 was estimated to be 122,810,000.

A brief treatment of Japan follows. For full treatment, *see* MACROPAEDIA: Japan.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. Japan's islands, composed of several volcanic arcs, or ranges, are the outcome of recent orogenic, or mountain-building, forces. The mountain ranges formed along this circum-Pacific ridge cover more than four-fifths of Japan's land surface and divide the country's four main islands, Hokkaido (in the northeast), Honshu (in the centre; the largest and most populous), Shikoku, and Kyushu (both situated southwest of Honshu), into four major regions. Each region is composed of interior highlands of volcanic origin encircled by narrow coastal lowlands, widening at places to form habitable plains. The northeastern-most of these regions encompasses most of Hokkaido, including the Kitami Mountains in the north and the Hidaka Mountains in the south, both of which run generally north to south. The second region embraces southwestern Hokkaido and northern Honshu, coincides with a southerly arc of mountains lying convex to the Pacific, and culminates in the Sendai Plain of northeastern Honshu island. The third region embraces Japan's most rugged country, from the Hida Range (part of the Japanese Alps) in the north to Mount Fuji in the south, the highest mountain in the country at 12,388 feet (3,776 m); its plains are those of the relatively large Kantō of central Honshu where Tokyo lies, and Nōbi to the southwest, centred on Nagoya. The fourth region ranges from the Chūgoku Mountains of southwestern Honshu southwestward across the Inland Sea and Shikoku island and arcs westward to north-central Kyushu, again generally convex to the Pacific. The Ryukyu Islands, including Okinawa, form an arc to the south and west of Kyushu.

Japan is situated within one of the Earth's geologically more active zones, its major epicentres lying offshore along seabed faults; the country thus suffers violent volcanic eruptions—at least 60 within historic times—and almost perpetual earthquake activity—about 1,500 a year, most minor but a few devastating. Tsunami (huge sea waves) often accompany the offshore tremors and may cause severe damage along the entire Pacific coast.

Japan's five largest river basins are the Tone on Honshu; the Ishikari on Hokkaido; and the Kitakami, the Shinano, and the Kiso also on Honshu. The country's hydrology is greatly influenced by its terrain. Average annual precipitation for the whole country exceeds 60 inches (1,500 mm), and few locations receive less than 40 inches (1,000 mm). Rivers tend to be swift and to drain very small areas, resulting in dramatic variations in streamflow. The extreme engineering difficulties involved in such fluctuation have not prevented the development of large-scale irrigation; about two-thirds of the country's agricultural area is irrigated. Hydroelectric plants abound, and flood control projects are numerous. Nevertheless, during periods of heavy rainfall and typhoons, flooding remains a major problem.

Japan's temperatures are generally mild because of the warming effects of the Kuroshio (Japan Current; analogous to the Atlantic's Gulf Stream) and the Tsushima Current. Winter and summer temperatures vary widely from north to south; Asahikawa in central Hokkaido has a mean temperature in January, the coldest month, of 16° F (−9° C) and a mean temperature in August, the hottest month, of 70° F (21° C); comparable readings at Kagoshima in southern Kyushu are 45° F (7° C) and 81° F (27° C). The winter monsoon, from late September to late March, deposits its moisture as rain and snow on the side of the country facing the Sea of Japan and brings dry, windy weather to the Pacific side. The summer monsoon, from mid-April to early September, brings rain, including destructive typhoons, to the Pacific coast.

About one-eighth of the country's land area

is arable, and less than one-fiftieth is suitable for pasture. Forests occupy two-thirds of the land. There are semitropical rain forests in the Ryukyu and Bonin islands of southern Japan. Broad-leafed evergreen forests, consisting primarily of camphor, pasania, oak, and holly trees, extend from Kyushu to Honshu's northern lowlands. The evergreen–deciduous demarcation descends gradually from above 3,300 feet (1,000 m) in Kyushu to sea level in northern Honshu. Representative deciduous trees are beech, katsura (Judas tree), maple, oak, and birch. Coniferous trees are found in the north and on the eastern periphery of Hokkaido up to elevations of 2,300 feet (700 m).

Bears, foxes, deer, wild boars, raccoon dogs (*tanuki*), antelope, hares, and Japanese macaques inhabit the country's remote, heavily forested mountain regions. More than a third of the country's birds are water birds. Japanese waters contain whales, dolphins, porpoises, and a wide variety of commercial fish.

The people. For all practical purposes the Japanese are a single ethnic group, a branch of the Mongoloid race. There are three significant minority groups: ethnic Japanese called *burakumin,* Koreans (most of them Japanese-born), and Okinawans. In addition, an indigenous people, the Ainu, survive in limited numbers on Hokkaido. The relatively tiny foreign community in Japan is composed largely of Chinese. The official language is Japanese, the use of which coincides with the territory of Japan. Although there are two major dialects and a number of subdialects, standard Japanese, based on the dialect spoken in Tokyo, is understood throughout the country.

In Japan, Shintō (an indigenous folk religion), various sects of Buddhism, and Christianity coexist. There are also a variety of "new religions," of which the Sōka-gakkai, based on a sect of Buddhism, has one of the largest followings. No one religion is dominant, and each is affected by the others. Buddhism is classified into 12 major sects and almost 60 branches. Chief among them are the Nichiren, Jōdo Shin (Shin), Shingon, Jōdo, Zen, and Tendai sects. A small proportion of the population is Christian.

Although Japan's population density is relatively high, the increase of the population has been exceeded by economic growth, and the standard of living has risen steadily. The nation's population is concentrated within the limited spaces of the plains and coastal lowlands, however, and less than one-fourth of the total population is rural. During the 20th century most of the increase in population has been absorbed into the ever-expanding urban areas, while neighbouring rural districts have remained constant or declined in population. Rural areas outside the direct influence of urbanization are subject to a marked population decline. Adult males migrate to the Pacific coast, and many of those who stay behind leave home periodically for jobs as temporary labourers; thus there is a constant outflow of population from the mountainous areas and isolated islands to the cities.

A striking demographic feature that has developed since World War II is the decline of birth and death rates in response to improvement in birth control measures and health conditions. Only one-fifth of the population is under 15 years of age, which is relatively low. Life expectancy is 75 years for males and 81 years for females.

Economy. Japan has a prosperous and well-developed economy largely based on manufacturing and services. A market economy predominates, although the government exercises effective administrative guidance in the private sector. Japan's gross national product (GNP) per capita is among the highest in the world.

Agriculture accounts for about 3 percent of the GNP and employs approximately 8 percent of the work force. Land reform after World War II greatly increased production, but the fragmentation of holdings remains a deterrent to extensive modernization. Japan is not self-sufficient in agriculture and imports approximately one-fourth of its food requirements. Rice is the leading staple and comprises more than one-third of agricultural production. Other important crops include potatoes, radishes, mandarin oranges, cabbages, sweet potatoes, Chinese cabbages, onions, cucumbers, and apples.

More than two-thirds of Japan's forested area is distributed among a large number of small private holdings. The remainder is publicly owned, and there large-scale reforestation has taken place. Production levels are low, however, because much of the forestland is located in inaccessible mountain areas, and unequal to demand; timber is a major import commodity.

Emperors and empresses regnant of Japan

	reign*
Jimmu	*(660)–585 BC*
Suizei	*(581)–549 BC*
Annei	*549–511 BC*
Itoku	*(510)–477 BC*
Kōshō	*(475)–393 BC*
Kōan	*(392)–291 BC*
Kōrei	*(290)–215 BC*
Kōgen	*(214)–158 BC*
Kaika	*158–98 BC*
Sujin	*(97)–30 BC*
Suinin	*(29 BC)–AD 70*
Keikō	*(71)–130*
Seimu	*(131)–190*
Chūai	*(192)–200*
Jingū Kōgō (regent)	*201–269*
Ōjin	*(270)–310*
Nintoku	*(313)–399*
Richū	*(400)–405*
Hanzei	*(406)–410*
Ingyō	*(412)–453*
Ankō	*453–456*
Yūryaku	*456–479*
Seinei	*(480)–484*
Kenzō	*(485)–487*
Ninken	*(488)–498*
Buretsu	*498–506*
Keitai	*(507)–531*
Ankan	*531(534)–535*
Senka	*535–539*
Kimmei	539–571
Bidatsu	(572)–585
Yōmei	585–587
Sushun	587–592
Suiko (empress regnant)	593–628
Jomei	(629)–641
Kōgyoku (empress regnant)	(642)–645
Kōtoku	645–654
Saimei (empress regnant: Kōgyoku rethroned)	(655)–661
Tenji	661(668)–672
Kōbun	672
Temmu	672(673)–686
Jitō (empress regnant)	686(690)–697
Mommu	697–707
Gemmei (empress regnant)	707–715
Genshō (empress regnant)	715–724
Shōmu	724–749
Kōken (empress regnant)	749–758
Junnin	758–764
Shōtoku (empress regnant: Kōken rethroned)	764(765)–770
Kōnin	770–781
Kammu	781–806
Heizei	806–809
Saga	809–823
Junna	823–833
Nimmyō	833–850
Montoku	850–858
Seiwa	858–876
Yōzei	876(877)–884
Kōkō	884–887
Uda	887–897
Daigo	897–930
Suzaku	930–946
Murakami	946–967
Reizei	967–969
En'yū	969–984
Kazan	984–986
Ichijō	986–1011
Sanjō	1011–16
Go-Ichijō	1016–36
Go-Suzaku	1036–45
Go-Reizei	1045–68
Go-Sanjō	1068–72
Shirakawa	1072–86
Horikawa	1086–1107
Toba	1107–23
Sutoku	1123–41
Konoe	1141–55
Go-Shirakawa	1155–58
Nijō	1158–65
Rokujō	1165–68
Takakura	1168–80
Antoku	1180–85†
Go-Toba	1183(1184)–98
Tsuchimikado	1198–1210
Juntoku	1210(1211)–21
Chūkyō	1221
Goshirakawa	1221(1222)–32
Shijō	1232(1233)–42
Go-Saga	1242–46
Go-Fukakusa	1246–59/60
Kameyama	1259/60–74
Gouda	1274–87
Fushimi	1287(1288)–98
Go-Fushimi	1298–1301
Go-Nijō	1301–08
Hanazono	1308–18
Go-Daigo	1318–39
Go-Murakami	1339–68
Chōkei	1368–83
Go-Kameyama	1383–92
The Northern court	
Kōgon	1331(1332)–33
Kōmyo	1336(1337/38)–48
Sukō	1348(1349/50)–51
Go-Kogon	1351(1353/54)–71
Go-Enyū	1371(1374/75)–82
Go-Komatsu	1382–92
Go-Komatsu	1392–1412
Shōkō	1412(1414)–28
Go-Hanazono	1428(1429/30)–64
Go-Tsuchimikado	1464(1465/66)–1500
Go-Kashiwabara	1500(1521)–26
Go-Nara	1526(1536)–57
Ōgimachi	1557(1560)–86
Go-Yōzei	1586(1587)–1611
Go-Mizunoo	1611–29
Meishō (empress regnant)	1629(1630)–43
Go-Kōmyō	1643–54
Go-Sai	1654/55(1656)–63
Reigen	1663–87
Higashiyama	1687–1709
Nakamikado	1709(1710)–35
Sakuramachi	1735–47
Momozono	1747–62
Go-Sakuramachi (empress regnant)	1762(1763)–71
Go-Momozono	1771–79
Kōkaku	1780–1817
Ninkō	1817–46
Kōmei	1846(1847)–66
Meiji, personal name Mutsuhito, era name Meiji	1867(1868)–1912
Taishō, personal name Yoshihito, era name Taishō	1912(1915)–26
Hirohito, era name Shōwa	1926(1928)–1989
Akihito, era name Heisei	1989–

*Reign dates for the first 28 sovereigns (given in italics) are taken from the *Nihon shoki* ("Chronicles of Japan"). The first 14 sovereigns are considered legendary; and while the latter 14 are known to have existed, their exact reign dates have not been verified historically. When the year of actual accession and year of formal coronation are different, the latter is placed in parenthesis after the former. If the two events took place in the same year, no special notation is used. If only the coronation year is known, it is placed in parenthesis. †Antoku's reign overlaps that of Go-Toba. Go-Toba was placed on the throne by the Minamoto clan after the rival Taira clan had fled Kyōto with Antoku.

The fishing industry in Japan has the largest output of any in the world. The establishment by many nations of economic zones extending 200 nautical miles offshore greatly hampered Japanese fishing in foreign waters, and it has been necessary for the Japanese to intensify the exploitation of their own coastal and inland waters.

Mining is a relatively unimportant industry in Japan, accounting for only a fractional percentage of the GNP. All of Japan's requirements of bauxite, crude petroleum, and iron ore and most of its copper ore and coking coal have to be met by imports. Almost two-thirds of Japan's electricity is generated from petroleum and other imported fuels, about one-fourth by nuclear-power plants, and about one-eighth by hydroelectric plants.

Manufacturing and construction together account for two-fifths of the GNP and employ approximately one-third of the work force. Japanese manufacturing has undergone tremendous growth since 1950. Japan, one of the top industrial nations in the world, is a leading producer of ships, automobiles, synthetic fibres, paper, cement, synthetic resins, and steel. Machinery production has expanded to meet a growing domestic demand, but the electronics industry has grown at a much faster pace as Japanese technology has become increasingly competitive on the world market. Services account for almost three-fifths of the GNP and employ a comparable fraction of the work force.

Relatively low unemployment and high labour productivity can be attributed in part to the corporate practice of retaining employees even in times of economic recession. Trade unions are generally organized by enterprise, then by federations, which in turn are organized into larger groupings. Two of the largest union groups are the General Council of Trade Unions of Japan (Sōhyō) and the Japanese Confederation of Labour (Dōmei).

An important characteristic of the Japanese financial system is the high degree of interdependence between the central bank (the Bank of Japan), the commercial banks, and industry. Industry relies on commercial banks for a substantial part of its fund requirements, and the commercial banks in turn rely on large-scale borrowing from the Bank of Japan. Thus, the Bank of Japan, wholly financed by the government, is in a strong position to adjust the volume of credit. The government's involvement in banking strengthens its advisory role in the private sector, and its constant consultation with business during the formulation of economic policy results in unique cooperation and understanding between the public and private sectors.

Almost three-fifths of Japan's road network, which includes expressways between major cities and to some scenic areas, is paved. Railways, formerly state-controlled, play an extremely important role in transporting passengers between and within urban areas. Japan is noted for its very high-speed passenger trains. It is also one of the world's principal seagoing nations, with major ports at Yokohama, near Tokyo, and Kōbe, near Ōsaka and Kyōto. Tokyo is by far the nation's largest single focus of air transport.

Japan has maintained an overall balance of payments surplus since 1976 and accounts for an increasing share of the world export market. High labour productivity has kept Japan's export prices low, and the variety of industrial output, the shift to products with relatively high added value, and advanced sales-promotion techniques have further benefited export performance. Major exports include motor vehicles, office machinery, iron and steel, consumer electronics, chemicals, and scientific and optical equipment. Foodstuffs, crude petroleum, machinery and equipment, chemicals, and metal ores and scrap are the country's main imports. The United States is Japan's principal trade partner, receiving more than one-third of Japanese exports and supplying more than one-fifth of Japanese imports. Japan's other significant export markets include South Korea, Germany, Taiwan, Hong Kong, China, and the United Kingdom. Principal suppliers after the United States include Indonesia, South Korea, Australia, China, Saudi Arabia, and Taiwan. The United States and several European countries have developed large deficits in bilateral trade with Japan, and, in response to increasing international protectionism, businesses have exercised some restraint in exporting.

Government and social conditions. Japan is a constitutional monarchy with a parliamentary political system. The country's constitution, adopted in 1947, designates the emperor as the symbolic head of state. The highest organ of state power is the popularly elected Diet (Kokkai), a bicameral legislative body. It consists of a House of Representatives, with 512 members elected to four-year terms, and a House of Councillors, with 252 members elected to six-year terms. In the lawmaking process, the House of Representatives takes precedence over the House of Councillors, which has only limited power to delay legislation. Executive power in Japan rests with the Cabinet, consisting of the prime minister and the ministers of state. The prime minister is appointed by the emperor on the Diet's recommendation. The House of Representatives may dismiss the Cabinet with a vote of no-confidence. The judicial system, headed by the Supreme Court, includes high, district, family, and summary courts.

Electoral politics in Japan have been dominated by the Liberal-Democratic Party (Jiyū-Minshutō), a moderately conservative organization, since the mid-1950s; its hold on the electorate had begun to slip by the late 1980s. Major opposition parties have included the Japan Socialist Party (Nihon Shakaitō), the Clean Government Party (Kōmeitō), the Democratic Socialist Party (Minshatō), and the Japan Communist Party (Nihon Kyōsantō). The Japanese constitution renounces war as a sovereign right; the country, nevertheless, has a self-defense force.

Japan's social-welfare system, consisting of both public and private health and welfare programs, covers virtually the entire population. The system provides benefits for unemployment, work injury, disability, sickness, maternity, and old age.

Prime ministers of Japan

name	party	term
Itō Hirobumi (*1st time*)		1885–88
Kuroda Kiyotaka		1888–89
Yamagata Aritomo (*1st time*)		1889–91
Matsukata Masayoshi (*1st time*)		1891–92
Itō Hirobumi (*2nd time*)		1892–96
Matsukata Masayoshi (*2nd time*)		1896–98
Itō Hirobumi (*3rd time*)		1898
Ōkuma Shigenobu (*1st time*)	Constitutional	1898
Yamagata Aritomo (*2nd time*)		1898–1900
Itō Hirobumi (*4th time*)	Friends of Constitutional Government	1900–01
Katsura Tarō (*1st time*)		1901–06
Saionji Kimmochi (*1st time*)	Friends of Constitutional Government	1906–08
Katsura Tarō (*2nd time*)		1908–11
Saionji Kimmochi (*2nd time*)	Friends of Constitutional Government	1911–12
Katsura Tarō (*3rd time*)		1912–13
Yamamoto Gonnohyōe (*1st time*)		1913–14
Ōkuma Shigenobu (*2nd time*)		1914–16
Terauchi Masatake		1916–18
Hara Takashi	Friends of Constitutional Government	1918–21
Takahashi Korekiyo	Friends of Constitutional Government	1921–22
Katō Tomosaburō		1922–23
Yamamoto Gonnohyōe (*2nd time*)		1923–24
Kiyoura Keigo		1924
Katō Takaaki	Constitutional	1924–26
Wakatsuki Reijirō (*1st time*)	Constitutional	1926–27
Tanaka Giichi	Friends of Constitutional Government	1927–29
Hamaguchi Osachi	Constitutional Democratic	1929–31
Wakatsuki Reijirō (*2nd time*)	Constitutional Democratic	1931
Inukai Tsuyoshi	Friends of Constitutional Government	1931–32
Saitō Makoto		1932–34
Okada Keisuke		1934–36
Hirota Kōki		1936–37
Hayashi Senjūrō		1937
Konoe Fumimaro (*1st time*)		1937–39
Hiranuma Kiichirō		1939
Abe Nobuyuki		1939–40
Yonai Mitsumasa		1940
Konoe Fumimaro (*2nd time*)		1940–41
Konoe Fumimaro (*3rd time*)		1941
Tōjō Hideki		1941–44
Koiso Kuniaki		1944–45
Suzuki Kantarō		1945
Higashikuni Naruhiko		1945
Shidehara Kijūrō		1945–46
Yoshida Shigeru (*1st time*)	Liberal	1946–47
Katayama Tetsu	Socialist	1947–48
Ashida Hitoshi	Democratic	1948
Yoshida Shigeru (*2nd time*)	Liberal	1948–49
Yoshida Shigeru (*3rd time*)	Liberal	1949–52
Yoshida Shigeru (*4th time*)	Liberal	1952–53
Yoshida Shigeru (*5th time*)	Liberal	1953–54
Hatoyama Ichirō (*1st time*)	Japan Democratic	1954–55
Hatoyama Ichirō (*2nd time*)	Japan Democratic	1955
Hatoyama Ichirō (*3rd time*)	Liberal-Democratic	1955–56
Ishibashi Tanzan	Liberal-Democratic	1956–57
Kishi Nobusuke (*1st time*)	Liberal-Democratic	1957–58
Kishi Nobusuke (*2nd time*)	Liberal-Democratic	1958–60
Ikeda Hayato (*1st time*)	Liberal-Democratic	1960
Ikeda Hayato (*2nd time*)	Liberal-Democratic	1960–63
Ikeda Hayato (*3rd time*)	Liberal-Democratic	1963–64
Satō Eisaku (*1st time*)	Liberal-Democratic	1964–67
Satō Eisaku (*2nd time*)	Liberal-Democratic	1967–70
Satō Eisaku (*3rd time*)	Liberal-Democratic	1970–72
Tanaka Kakuei (*1st time*)	Liberal-Democratic	1972
Tanaka Kakuei (*2nd time*)	Liberal-Democratic	1972–74
Miki Takeo	Liberal-Democratic	1974–76
Fukuda Takeo	Liberal-Democratic	1976–78
Ōhira Masayoshi (*1st time*)	Liberal-Democratic	1978–79
Ōhira Masayoshi (*2nd time*)	Liberal-Democratic	1979–80
Suzuki Zenkō	Liberal-Democratic	1980–82
Nakasone Yasuhiro (*1st time*)	Liberal-Democratic	1982–84
Nakasone Yasuhiro (*2nd time*)	Liberal-Democratic	1984–87
Takeshita Noboru	Liberal-Democratic	1987–89
Uno Sōsuke	Liberal-Democratic	1989
Kaifu Toshiki	Liberal-Democratic	1989–

Health conditions in Japan are comparable to those in the most advanced Western nations. Since the end of World War II, the country has reduced its incidence of infectious diseases and greatly lowered its infant mortality rate. Japanese also enjoy some of the highest life expectancy rates in the world at 76 years for men and 82 years for women. There has, however, been an increase in the incidence of cancer and heart disease.

Japan provides a complete and thorough education for almost all its people. Six years of elementary and three years of lower secondary school are compulsory, and about nine-tenths of all lower secondary graduates attend upper secondary school for three years. Upon graduation from secondary studies, students may enroll in a two- or three-year junior college, a four-year university, or a five-year technical college. Adult literacy is virtually universal, and Japan is a nation of avid readers.

The news media are free from government censorship. The press had a reputation for being largely pro-establishment until the late 1970s, when newspapers increasingly engaged in investigative reporting.

Cultural life. Japan's cultural milieu is characterized by an inseparable mixture of traditional Japanese culture with introduced elements of Chinese and later of Western cultures. Cultural and art forms have resulted that are stylized and highly refined, emphasizing simplicity, elegance, and grace; these include flower arranging, the tea ceremony, Kabuki and Nō theatre, architecture, and garden design. Hokusai, Hiroshige, and other masters of the wood-block print developed a visual art for a popular audience. Japanese literature includes what may be considered the world's first full novel, *Genji monogatari* (*The Tale of Genji*), by Murasaki Shikibu, a court lady in Kyōto in the late 10th and early 11th centuries; the novel has become the country's most important literary form in the 20th century. The novelist Kawabata Yasunari won the Nobel Prize for Literature for 1968. Other internationally renowned modern Japanese writers have included Natsume Sōseki, Akutagawa Ryūnosuke, Dazai Osamu, Tanizaki Jun'ichirō, and Mishima Yukio. Japanese cinema has a large international following, with most interest being focused on the works of Kurosawa Akira, Ozu Yasujiro, and Mizoguchi Kenji. Many critics consider Kurosawa's best films to be among the masterpieces of world cinema.

History. Evidences of Paleolithic tools from 10,000 to 30,000 years old have been found in Japan, but no firm date can be given for the appearance of the first human settlements. Though Japanese tradition dates the country's beginnings in 660 BC, with the reputed accession of the first emperor, Jimmu, historical records place the first unified Japanese state ruled by the Yamato court in the early 5th century AD. This state was prosperous and powerful and for a time controlled part of Korea, but it declined in the mid-6th century.

During its decline, Buddhism arrived in Japan by way of Korea. For several centuries the Japanese had borrowed heavily from Chinese culture, especially in their adoption of the Chinese writing system to write the Japanese language. By the 9th century, however, Japan had begun to sever its links with the mainland and to adapt what it had acquired; Japanese Buddhism had also developed its own distinct character.

Politically, the emperors of this time became more and more subordinated to powerful regent families. One such family, the Fujiwara, held power through the 11th century. At the same time, however, the rise of powerful warrior families in the provinces was leading to the development of a military class, the samurai, that assumed increasingly exclusive political authority in local affairs. In 1192 the samurai Minamoto Yoritomo defeated a rival and established Japan's first military government, or shogunate (*q.v.*), at Kamakura; this form of government (with intermittent periods of feudal and civil warfare) persisted until 1867.

During the Kamakura shogunate (1192–1333), Mongol invasions launched at Japan from Korea in 1274 and 1281 were smashed by sudden typhoons, the Kamikaze ("Divine Wind"). The military expenses of preparing a defense against these invasions led to the collapse of the Kamakura shogunate. The succeeding Muromachi period under the Ashikaga shoguns (1338–1573) was marked by warfare between powerful families and the existence from time to time of more than one emperor. Political unification was initiated by Oda Nobunaga and achieved by Toyotomi Hideyoshi in 1590. The complete unification of the country did not occur, however, until after Hideyoshi's death (1598), when Tokugawa Ieyasu, one of Hideyoshi's supporters, decisively defeated his principal rivals in the Battle of Sekigahara (1600).

The Tokugawa shogunate (1603–1867) embarked on a policy of isolation that resulted in the persecution of most of the Christians converted since the arrival of the Jesuit Francis Xavier in 1549; in the expulsion of all Europeans (except for a few Dutch traders at Nagasaki); and in the proscription of Japanese travel abroad. The stability of the government brought peace to Japan for the first time in several hundred years. The government-imposed seclusion gave rise to a flourishing indigenous culture, but it also tended to stagnate society. Many sections of the population began to chafe under the limitations, particularly the rising merchant class that had gradually supplanted the old samurai class. When the Tokugawa shogunate could no longer keep the European and American traders away, its popular support collapsed.

In 1868, with the accession of the emperor Meiji, it was proclaimed that imperial power had been restored. Actual political control, however, was in the hands of a group of young, far-seeing leaders from southwest Japan. These leaders, later called the genro (elder statesmen), undertook the remarkable modernization work of the Meiji Restoration, sending fact-finding missions throughout the Western world for new ideas and technology. Japan's economy and political and social institutions were systematically modernized along Western lines; this process culminated in the promulgation of a constitution in 1889. Japan then embarked on an imperialist drive that led to war with China (1894–95) and Russia (1904–05) and to the annexation of Korea (1909); additional territorial and trade demands were made on China in succeeding decades. The global economic troubles of the early 1930s contributed to further military dominance of the government at home and aggression abroad. The Japanese seized control of Manchuria in 1931, renaming it Manchukuo; allied with Nazi Germany as the Tokyo-Berlin Axis; and in 1941 attacked the U.S. fleet at Pearl Harbor and occupied European colonial possessions in Southeast Asia. After early successes on every front, the Japanese forces were gradually overcome by U.S. and other Allied troops. In August 1945 the United States dropped atomic bombs on Hiroshima and Nagasaki, destroying those cities; shortly thereafter the Japanese surrendered to the Allied powers.

The U.S. postwar occupation of Japan led to a new constitution (1947); the occupation itself ended in 1952. In rebuilding Japan's ruined industrial plant, new technology was used in every major industry. A tremendous economic recovery followed, bringing general prosperity. A far-sighted trade policy resulted in larger shares for Japanese manufacturers in all foreign markets, including those of the United States and other Western industrial powers. In the 1970s Japan's economic growth was slowed by the rise in the price of imported oil and by worldwide economic recession. Although Japan was able to maintain and even increase its favourable balance of trade (*i.e.*, more exports than imports) into the 1990s, its trading partners were becoming more resistant to the share of Japanese goods in their markets.

japan (varnish): *see* black varnish; japanning.

Japan, Sea of, Japanese NIHON-KAI, Korean DONG HAE, Russian YAPONSKOYE MORE, marginal sea of the western Pacific Ocean that is bounded by Japan and the Soviet island of Sakhalin to the east and by the Soviet Union and Korea on the Asian mainland to the west.

A brief treatment of the Sea of Japan follows. For full treatment, *see* MACROPAEDIA: Pacific Ocean.

The sea lies in a deep basin and is separated from the East China Sea to the south by the Tsushima Strait and Korea Strait and from the Sea of Okhotsk to the north by the La Perouse, or Sōya, Strait and Tatar Strait. To the east it is also connected with Japan's Inland Sea by the Kanmon Strait.

The Sea of Japan covers a surface area of approximately 389,000 square miles (1,008,000 square km). It has a mean depth of 4,429 feet (1,350 m) and a maximum depth of 12,276 feet (3,742 m). The underwater relief of the sea is subdivided into three parts: the Japan Basin, the deepest section, in the north; the Yamato Basin in the southeast; and the Tsushima Basin, the shallowest waters, in the southwest. The continental shelves are wide on the Japanese side of the sea, but those along the fringes of Siberia and the Korean Peninsula are narrow, with an average width of about 19 miles (30 km). The Sea of Japan contributes greatly to the mild climate of Japan because of the ameliorating effect exerted by its relatively warm waters. Fisheries and mineral deposits, including magnetite sands as well as natural-gas and petroleum deposits off Japan and Sakhalin Island, form the main economic resources. The sea is also increasingly being used as a commercial waterway as trade between East Asian countries grows.

Japan, Supreme Court of: *see* Supreme Court of Japan.

Japan Air Lines Co., Ltd. (JAL), Japanese NIHON KŌKŪ, Japanese airline that is one of the largest air carriers in the world. The airline was founded in 1951. It was originally a private company but was reorganized in 1953 as a semigovernmental public corporation. It is headquartered in Tokyo.

Japan Air Lines was at first a domestic carrier, but it became an international airline in 1954, when it inaugurated flights to San Francisco. In the next 10 years it expanded its service to Southeast Asia, other cities in the United States, Europe, India, the Middle East, and Australia. In the late 1960s JAL began round-the-world service, and in 1970 it became the first non-Soviet airline to fly a regular route over Siberia. In the 1980s its route network was extended to cover several cities in China. JAL also has affiliates that operate hotels and that offer package tours. In 1987 the Japanese government decided to sell off its shares in JAL, thus releasing the airline from government control.

Japan Communist Party, Japanese NIHON KYŌSANTŌ, or NIPPON KYŌSANTŌ, Japanese political party founded in 1922 by Katayama Sen. Initially outlawed, it operated clandestinely until October 1945, when the Allied command restored freedom of political association in Japan.

In 1949 the Japan Communist Party won

35 seats in the House of Representatives and nearly 10 percent of the vote; but condemnation by the Cominform, "red purges" by General Douglas MacArthur, and an extremely radical position taken by its leadership shattered the party so that it lost all its seats in the elections of 1952. In 1955 the party reorganized and began a steady ascent in membership and seats in the Diet. Its leaders took a nationalist stance, ostensibly independent of the policies proclaimed in Moscow and Peking; and in 1964, in reaction, some members broke away and formed small splinter parties. The Japan Communist Party thereafter averaged between 5 and 10 percent of the vote and succeeded in electing members to the Diet. Its daily paper *Akahata* ("Red Flag") achieved a circulation of more than 3,000,000.

Japan Current (Pacific Ocean): *see* Kuroshio.

Japan Series, Japanese NIPPON SHIRI-ZU, in baseball, a seven-game play-off between champions of the two professional major-league divisions in Japan, the Central League and the Pacific League.

Baseball in Japan was established on a professional basis in 1934. By 1936 seven professional teams had been organized. A system of two leagues composed of six teams each was instituted in 1950. Each 130-game season culminates in the Japan Series. For the results of the Japan Series, *see* Sporting Record: *Baseball.*

Japan Socialist Party, Japanese NIHON SHAKAITŌ, or NIPPON SHAKAITŌ, leftist reform party in Japan that supports a gradually evolving socialized economy and a neutralist foreign policy. It is the second largest political party in Japan after the Liberal-Democratic Party.

Japan's first socialist parties appeared in the mid-1920s; moderate factions of the country's labour movement combined to form the Social Mass Party (Shakai Taishūtō) in 1932. The left failed to elect many candidates before World War II, and all of Japan's traditional parties "voluntarily" dissolved themselves on the eve of war in 1940.

In November 1945, Japanese political parties began to re-form under the U.S. occupation. The Japan Socialist Party was formed by adherents of three or four prewar proletarian parties and won about 18 percent of the vote in the elections of 1946. In 1947 the Socialists won 26 percent of the vote and formed a coalition government with the centrist Democratic Party (Minshutō).

This period in power broke the coalition and weakened the Socialists; in 1951 they split into left and right socialist parties, and each won roughly 13 percent of the vote until the two wings rejoined in October 1955. The union lasted until the autumn of 1959, when the Socialists again split into the left-wing Japan Socialist Party and the right-wing Democratic Socialist Party (Minshu Shakaitō).

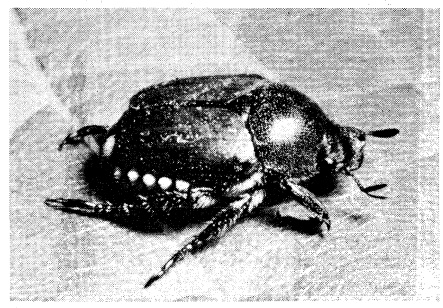
From the 1960s through the '80s, the Japan Socialist Party, though clearly a minority party, dominated Japanese reform politics, winning about 20 to 30 percent of the seats in the House of Representatives over the years. In 1986 Doi Takako was elected chairman of the Japan Socialist Party, thus becoming the first woman to head a major political party in Japan. In the late 1980s the party was able to increase its representation in the Diet at the expense of the scandal-ridden Liberal-Democrats, who nevertheless remained in power.

Japan Trench, deep submarine trench lying east of the Japanese islands, in the floor of the western North Pacific Ocean. It is one of a series of depressions stretching south from the Kuril Trench and the Bonin Trench to the Mariana Trench. The 27,929-foot (8,513-metre) Tuscarora Deep (north) was once considered the deepest point in the world (since found to be in the Mariana Trench).

Japanese Alps, also called NIHON ALPS, mountains, central Honshu, Japan. The term Japanese Alps was first applied to the Hida Mountains in the late 19th century but now also includes the Kiso and Akaishi mountains to the south.

The ranges serve as a popular recreational and mountain-climbing area. The Hida Mountains are included within Chūbu-sangaku National Park, which stretches over Nagano, Gifu, Toyama, and Niigata prefectures. Southern Alps National Park contains the Akaishi Mountains. There, one of the highest mountains in Japan, Mount Shirane, rises to 10,472 feet (3,192 m) in the peak Mount Ontake.

Japanese beetle, an insect, *Popillia japonica,* that is a major pest and belongs to the subfamily Rutelinae (family Scarabaeidae, order Coleoptera). It was accidentally introduced into the United States from Japan in about 1916, probably as larvae in the soil around imported plants. Japanese beetles are known to feed upon more than 200 species of plants, including a wide variety of trees, shrubs, grasses, and nursery plants. They are gregarious insects, often feeding in large groups upon a single tree. A swarm of Japanese beetles can denude a peach tree in 15 minutes, leaving nothing but bare branches and the fruit pits.



Japanese beetle (*Popillia japonica*)
William E. Ferguson

Female beetles burrow from 25 to 100 mm (1 to 4 inches) below the surface of the soil to deposit their eggs, which hatch in about 14 days. The larvae live the entire winter below the surface of the ground in this stage, feeding upon the tender roots of plants. During May the larvae transform to prepupa and then to pupa stages, the adult beetles emerging in June or July. The beetles range from Maine to South Carolina, and infestations have been noted in other parts of North America.

The adult beetle, about 10 mm (0.4 inch) long, is bright metallic green in colour with coppery-brown wing covers (elytra), five patches of white spots on each side, and two prominent white tufts on top of the exposed tip of the abdomen. Unlike the larva, the adult feeds on the flowers, fruit, and foliage of the plant.

Efforts are being made to control the spread of this pest. Poisonous sprays control the adult beetles but differ in the length of their protection against reinfestation. Several of the beetle's natural enemies—species of parasitic wasps and flies that in Japan were found to prey on the larvae—have been imported into the United States, where some of them have become established. Of even greater promise as a biological control is a disease-inducing bacterium, *Bacillus popilliae,* which causes milky disease in larvae; its use has reduced Japanese beetle infestations in some areas.

Japanese cedar, also called JAPANESE REDWOOD, or PEACOCK PINE (*Cryptomeria japonica*), a coniferous evergreen timber tree and only species of the genus *Cryptomeria* of the deciduous cypress family (Taxodiaceae), native to eastern Asia. The tree may attain 45 m (150 feet) or more in height and a circumference of 4.5 to 7.5 m (15 to 25 feet). It is pyramidal, with dense, spreading branches in whorls about the trunk.

The Japanese cedar is frequently used in eastern Asia for reforestation and for garden and avenue plantings. The fragrant, reddish brown wood is used for the construction of ships, houses, bridges, furniture, and vats, and for ornamental carving. Incense is made from the leaves.

Japanese Chin: *see* Japanese spaniel.

Japanese Civil Code, Japanese MIMPŌ, body of private law adopted in 1896 that, with post-World War II modifications, remains in effect in present-day Japan. The code was the result of various movements for modernization following the restoration of the emperor in 1868. A legal code was required that would fill the needs of the new free-enterprise system that predominated with the dissolution of feudal landholdings. At the same time, the Japanese desired to present themselves to the world as a more civilized nation in hope of renegotiating certain unfavourably balanced and often even humiliating treaties with Western nations. The resulting code was modeled on the first draft of the German Civil Code, itself very Roman in structure and substance.

The code is divided into five books. Those on family and succession retain certain vestiges of the old patriarchal family system that was the basis of Japanese feudalism. It was in these sections that most of the postwar revisions were made. At that time it was considered no longer necessary or desirable to pay such homage to the past, and the sections dealing with family law and succession were brought closer to European civil law.

The writing of the code provoked considerable disagreement among segments of the Japanese legal and commercial communities, largely over how much Japanese custom should be included. There was also disagreement as to whether the code should be based on the French or the English system of law. This disagreement arose from the rather strange position of both those systems in Japanese law schools and courts. After the restoration, law schools had been set up that gave courses in both English and French law. Because of the way the courses and examinations were constructed, it was possible to become a lawyer or judge by knowing only one system of law. In their courtrooms, some judges administered only French law and others only English.

After the first Japanese Civil Code had been adopted in 1890, with very little debate, a storm of criticism arose from the legal community. This code had been the work of a French jurist, Gustave-Emil Boissonade, the author of the criminal and penal codes of 1882. Opponents argued that, if the civil code were to be based upon French law, then Japanese lawyers trained in the French system would have an advantage over those trained in the English. Further, the proposed commercial code was based on German laws, and there were many lawyers and persons engaged in commerce who felt there would be confusion if the two codes were based upon different laws.

The code was made into a political issue by those wishing to preserve the old feudalism, who charged that the old customs, particularly the patriarchal family system, had been ignored in the individualistic code of Boissonade. A revised code was produced, based on the first draft of the German Civil Code but giving considerable weight to the old customs, particularly in family and inheritance law. The final German-based code was very similar in most respects to that of Boissonade, both including strong protection for landed property.

The code was promulgated in 1896 and went into effect in 1898.

Japanese crab: *see* king crab.

Japanese deer, hoofed mammal, a subspecies of sika (*q.v.*).

Japanese ivy: *see* Boston ivy.

Japanese language, language spoken by 115,000,000 persons in the islands of Japan, including the Ryukyus. Some 1,000,000 people of Japanese descent who live in other parts of the world speak Japanese with some degree of proficiency.

A brief treatment of the Japanese language follows. For full treatment, *see* MACROPAEDIA: Languages of the World.

Japanese is composed of a large number of dialects, some of which are mutually unintelligible. Mainland dialects are divisible into three or four groupings of related dialects, but the greatest differences in dialects are to be found between mainland dialects and those of the Ryukyu Islands. Currently there are strong forces making for the homogenization of the language. The rapid spread of literacy and elementary education that has occurred since the Meiji Restoration (1868) has established a common written language that derives from the dialect of residential Tokyo. Aside from their own dialect, many people throughout Japan now speak this common tongue, though with their own accents. Under the impact of the electronic media this process of assimilation is accelerating, especially among the younger generations. As a consequence, local dialects are fading faster than previously.

Japanese is a polysyllabic language. It uses 5 vowels *a, i, u, e, o,* and 15 consonants *p, t, k, b, d, g, ts (ch), s (sh), z (j), m, n, r, h, y* and *w.* Most Japanese dialects use pitch accents. Stress accents are never used. Nouns are inflected, and verbs and adjectives conjugate with endings. The personal pronoun system is quite complex and reflects an intricate system of social hierarchy.

The filiation of Japanese with other languages is not clear, though it is probably related to Korean and possibly to the Altaic languages. There are two hypothesis on the origin of Japanese. It could be that a Proto-Japanese-speaking people on the Asian continent gave Japan the ancestor tongue by way of the Yayoi culture in northern Kyushu 2,000 years ago. This protolanguage was then eclipsed on the continent by other languages. The stronger hypothesis has Proto-Japanese dialects developing from Korean 5,000 years ago and slowly squeezing out competing contemporaneous dialects. Some evidence for this exists from 8th-century recordings of non-Proto-Japanese features of certain Eastern dialects that have since largely disappeared.

The history of the language is usually divided into four periods: Old Japanese (to the 8th century); Late Old Japanese (9th–11th century); Middle Japanese (12th–16th century); and Modern Japanese (from the 17th century). In this evolution the syntax has not varied much, but there has been considerable change in phonology, morphology, and vocabulary. Principal among the sound changes is the shift of initial *p-* to *h-*, the loss of three vowels *ï, ë,* and *ö,* and the disappearance of vestigial vowel harmony. There has also been the replacement of older "finite" forms of verbs and adjectives with noun-modifying forms.

Though the vocabulary is largely indigenous, Chinese from the 6th to the 9th century played an important role in the development of the language. A large percentage of Japanese words derive from Chinese loan elements, much as English has borrowed extensively from Greek, Latin, and French. The adoption of Chinese characters for writing has had far-reaching consequences on written and spoken Japanese. This adoption is traceable to the 3rd century, but the earliest extant records longer than a few words are from the 8th century. Originally the characters were used to write Chinese, but then they came to symbolize native Japanese words similar in meaning to that of the Chinese. In this process most of the characters were simplified and made more cursive to the point that in many cases little or nothing is left of their original shape.

Every Chinese character, or *kanji,* has developed a twofold reading. It can represent a Japanese word that imitates the sound and meaning of the original Chinese, known as the *on* reading, or it can represent a native word of similar meaning, known as the *kun* reading. It is this latter reading that is the accustomed meaning of the character when it is used by itself. Furthermore, every character has a third use in which its *on* or *kun* sound can be phonetically to represent a Japanese syllable while abstracting from its *on* or *kun* meaning. A *kanji* used as a phonogram is called a *kana.*

Syllabic writing is traceable to the 6th century, when *kanji* were used as phonograms, but it was not until the 9th century that standardized systems of *kana* began to develop. Eventually two different systems of phonetic representation emerged, both based on *kanji.* One system, called *hiragana,* or "common *kana,*" was formulated by simplifying and stylizing the cursive *kanji* that had been used as phonograms in the 8th-century imperial anthology of poetry, the *Man'yō-shū.* The use of *hiragana* was given impetus through the writing of poetry, diaries, and novels by court women of the Heian period (794–1185). At that time *hiragana* was known as *onnade,* or "letters of women," as men generally continued to write in *kanji.* The other system is called *katakana,* or "partial *kana.*" It developed from diverse systems of priestly shorthand that aided the reading of Chinese texts and Buddhist scriptures by supplying, in the form of abbreviated *kanji* strokes, Japanese particles and endings missing in the Chinese. *Katakana* was at first highly individualized and specific to every sect and sometimes even to every individual, but in the 10th century common elements began to appear as popularity normalized its use.

Until the 15th century Japanese was written with a mixture of *kanji* and *katakana.* At that time the *hiragana* symbols became the popular and literary medium, with *katakana* being used for scholarly and practical texts. In modern Japanese *katakana* is used only in machine-printed telegrams and memoranda of offices and companies or for foreign loanwords, onomatopoetic words, and the names of flora and fauna. Present writing is in *kanji* and *hiragana,* the orthography of which has been reformed since World War II. In these reforms the unrestricted use of thousands of *kanji* characters was limited to a list of 1,850 symbols for official and daily use, and their shapes and strokes were greatly simplified. In the early 1980s the number of characters on the list was increased to 1,945, and additional character simplifications were adopted. *Kana* spellings are now based on contemporary pronunciation, in contrast to the prior retention of spellings based on the sound of Late Old Japanese.

Japanese law, the law as it has developed in Japan as a consequence of a meld of two cultural and legal traditions, one indigenous Japanese, the other Western. Before Japan's isolation from the West was ended in 1853 with Commo. Matthew Perry's visit, Japanese law developed independently of Western influences. Conciliation was emphasized in response to social pressures exerted through an expanded family unit and a close-knit community. Few rules prescribed how disputes should be resolved. The closest counterpart to the Western lawyer was the *kujishi,* an innkeeper who developed a counselling function. Remarkably little law in the modern sense existed; a static society, which officially discouraged commercial activity, apparently neither desired nor needed a developed legal order.

Fundamental changes inevitably followed Japan's sudden involvement with the Western world. The Meiji Restoration of 1868 ended the Tokugawa shogunate and restored effective political power to the emperor. Japan sought to construct an economic, political, and legal structure capable of commanding respect internationally, ending extraterritoriality, and preserving national independence. The introduction of Western law was one element in a wholesale importation of things Western.

In legal matters the Japanese took for models the systems of continental Europe, especially the German. The drafters of the Japanese Civil Code (*q.v.*) of 1896 surveyed many legal systems, including the French, Swiss, and common laws, taking something from each. Their final product is, however, best characterized as following the first draft of the German Civil Code. In its subsequent development the Japanese legal system remained true to these sources. The 1947 revisions of the code provisions dealing with relatives and succession, which had reflected traditional Japanese attitudes, completed the transition of Japanese civil law to the continental European family of laws.

On some points, however, Japanese law is closer to that of the United States than to European models, largely as a result of the post-World War II occupation and of later contacts with U.S. legal thinking and education. The examination of witnesses in civil cases is now (at least theoretically) modelled after U.S. procedure. The absence of a special hierarchy of administrative courts is consistent with U.S. ideas. Many aspects of labour and corporation law are U.S.-inspired.

Nevertheless, in its rules and institutions, the Japanese legal system is closer to the civil law of Europe than to the common law. In many ways, moreover, the Japanese legal order differs markedly from all Western legal orders. In Japan, most importantly, law plays a far less pervasive role in the resolution of disputes and the creation and adjusting of rules regulating conduct. The paucity of Japanese decisions involving automobile accidents, manufacturer's liability for defective products, and nuisance may surprise a Western observer. He may also note the small size of the Japanese bar and the persistence of extralegal methods of resolving disputes. Local police stations provide conciliation rooms. Elders act as go-betweens. For many purposes a family transcending man, wife, and dependent children still exists. The notion that a business is analogous to a family unit persists and colours all labour relations, especially in small- and middle-sized firms. In the relatively homogeneous Japanese society, social status carries heavy obligations, and community pressure is extremely powerful.

As Japan becomes Westernized, law may come to play in Japan a role fully comparable to its role in the West; the sociological supports essential to the continued vitality of the Japanese conception of law are being undercut by the shift from a rural, agricultural economy to an urban, mechanized society. In all events, current Japanese law in the books still gives a less accurate picture of how Japanese society actually adjusts disputes than Western book law does for Western society.

Japanese literature, the body of written works produced by Japanese authors in Japanese or, in its earliest beginnings, in the Chinese classical language since Japan at that time had no written language. Since the two countries did not speak the same language, this

made for great difficulty in writing: the Chinese characters were used by early writers in the Japanese language for their phonetic value rather than their meanings, which resulted in complications that makes comprehension by modern readers extremely difficult.

A brief treatment of Japanese literature follows. For full treatment, *see* MACROPAEDIA: Japanese Literature.

The earliest extant Japanese literature dates from the 7th century. Although it is one of the richest and most rewarding literatures in the world, it often has been restricted by style. This is exemplified in such poetic forms as the *tanka* (short poem) and such devices as the *makura-kotoba* ("pillow word") that resulted in poetry honed so fine as to be beyond reach of the populace, thus restricting the literature to court circles or scholars. Throughout its existence, however, there has never been a "dark age" when no literature was produced, and when literature did begin to acquire a popular base, appreciation of the "classics" of court poetry became widespread.

The great literary monument of the Nara period (AD 710–784) is also the first great milestone of Japanese literature: the *Man'yōshū* (after 759; "Collection of Ten Thousand Leaves"), a magnificent anthology of poetry. This contained about 4,500 works, including many *tanka* and 260 *chōka* (long poems) that frequently ended with one or more *hanka* ("envoys"). A good number of the works were composed outside the court, by common people who had little access to literature. The *Kojiki* (712; "Records of Ancient Matters") and *Nihon-gi*, or *Nihon shoki* (720; "Chronicles of Japan"), which are the earliest collections of myths in Japan, were also compiled during this time. Mythological themes can be found throughout Japanese literature, but these two collections have been the most influential and remain the subject of much study and debate. While in other cultures mythology developed into literature (most notably in Greece), in Japan the primary purpose of the myths was political. The *Kojiki* and *Nihon-gi* were written to give greater authority to the power of the ruling class by tracing back the genealogy of the Imperial family to the beginning of the world.

During the Heian period (794–1185) the first lengthy work of fiction in Japanese literature, *Utsubo monogatari* (956–983; "The Tale of the Hollow Tree"), was written by Minamoto Shitagō, but it was crude and uneven in comparison to a somewhat later novel of the period, *Genji monogatari* (*The Tale of Genji*). Completed by Murasaki Shikibu by about 1010, *The Tale of Genji* is considered by many to be the finest work in all Japanese literature and perhaps the first important novel written in any language. It embodies the best of the feminine sensitivities that are characteristic of early Japanese literature, deriving from the fact that much of the early poetry was written by ladies of the court. So profound was the influence of the adventures of Prince Genji that derivative works continued to be written for centuries.

The supreme accomplishment in the *tanka* poetry tradition came in about 1205, during the Kamakura period (1192–1333), when Fujiwara Sadaie completed the anthology the *Shin kokinshū* ("The New Kokinshū"). By that time the samurai had come to power and established military discipline. Although there were far fewer women writers of distinction, the vigour of the court poets remained undiminished—the *Shin kokinshū* exemplified the best poetry of several centuries. Another literary genre of the period was the war story. The *Heike monogatari* (*c.* 1220; *The Tale of the Heike*), the greatest of these works, employed imported Chinese words in order to convey contrasting sounds lacking in Japanese. It is considered to be the foremost classic of the Japanese style.

For nearly 250 years in the Tokugawa period (1603–1867) Japan was virtually isolated from the rest of the world by government decree. While this resulted in a flowering of indigenous forms of literature, it also stultified Japan's literary energies by depriving the Japanese of any of the revitalizing influences of foreign writings. Perhaps the most important development was the emergence of the *haiku,* an exceedingly brief form of poetry that has continued to be popular. The origin of the *haiku*—composed of 17 syllables arranged in lines of five, seven, and five syllables—is in the first verse of *renga* (linked-verse) poetry, which had been popular since the Muromachi period (1338–1573). Serious *haiku* poetry was at first opposed by such groups as the Danrin school, which held that rapid and impromptu composition had far more meaning than the polishing of one perfect sequence. Ihara Saikaku, one of the leaders of this latter movement, once composed the extraordinary total of 23,500 verses in a day and a night. The persistence of Matsuo Bushō and his disciples, however, established *haiku* as an accepted poetic form.

When Commo. Matthew Perry's fleet opened Japan to the Western world, there was at first little effect on Japanese literature. The writers of *gesaku* fiction, the "playful composition" that was typical of the closing years of the Tokugawa period, had brought Japanese literature to its lowest ebb, but it had also brought reading within the reach of a wide population that now became susceptible to influences of foreign translations. These introduced the use of ordinary speech in both poetry and prose, a rarity in Japanese writing. Gradually, Western influences began to infiltrate, bringing entirely new forms as well as methods of self-expression. During the Meiji period (1868–1912) and in the early 20th century, the novel became the dominant form of prose literature.

The end of World War II and the democratization of the country resulted in a new wave of powerful poetry, drama, fiction, and the "I novel" (*shishōsetsu*), the autobiographic form best exemplified by the writings of Shiga Naoya. Tanizaki Jun-ichirō, Kawabata Yasunari (who was awarded the Nobel Prize for Literature in 1968), Abe Kōbō, and Oē Kenzaburō produced powerful novels that were translated and were received well in the West. Mishima Yukio, however, was the first Japanese writer to become internationally known and praised; he paved the way for others who have helped give Japanese literature a wider international audience.

Japanese music, a form of East Asian music derived in large part from Chinese and Korean sources but also containing remnants of its indigenous northern (Ainu) culture. In later years Japan's isolation as an island nation permitted its music to develop without further foreign influence of great consequence.

A brief treatment of Japanese music follows. For full treatment, *see* MACROPAEDIA: East Asian Arts.

Stone whistles of the Jōmon culture (3rd millennium BC) are the earliest evidence of musical instruments in Japan. In the Yayoi period (3rd century BC to 3rd century AD) bronze bells were being made. Excavated tombs of the Tumulus period (*c.* 250–*c.* 500), when the Yamato people became dominant in Japan, reveal figurines (*haniwa*) depicting musicians and musical instruments, among them the barrel drum, four- and five-stringed zithers, and croatal bells. In 453 a Korean emperor sent 80 musicians to the funeral of a Japanese ruler, and in the 6th century Japan accepted Buddhism and began sending select converts to China for training in the traditional rituals, including the use of music. By the 8th century the documentary history of Japanese music was under way.

During the Heian period (794–1185) the various kinds of music, imported and indigenous, were arranged in an order that remained unchanged until modern times. The general term *To-gaku* (Tang music) embraced all music from China and south and central Asia and the standardized instrumentation consisting of bamboo flutes (*ōteki*) and short bamboo double-reed instruments (*hichiriki*) played in unison, mouth organ (*shō*), three percussion instruments providing repeated patterns (gong *shōko,* small double-side drum *kakko,* big suspended drum *taiko*), and two stringed instruments supplying a drone (*koto, biwa*). All Korean, northeast Asian, and Manchurian music was incorporated into *Koma-gaku,* the instrumentation consisting of a Korean flute (*Koma-bue*) and *hichiriki* in unison and three percussion instruments (*taiko, shōko,* and the hourglass-shaped drum *san-no-tsuzumi*). The term *mikagura* was used for the music of the imperial Shintō rites and some song dances of the earliest times, accompanied by a low-pitched flute (*kagura-bue*), *hichiriki,* and the six-stringed zither *wagon.* Two new types of composition were incorporated in court music: *saibara,* songs of provincial pack-horse drovers, heard with Chinese instrumentation, and *rōei,* poems in the Chinese style chanted in a sophisticated manner and accompanied only by flute, *hichiriki,* and mouth organ.

During the 12th and 13th centuries Buddhist religious music was reformed. Hymns in the vernacular (*shōmyō*), flexible and expressive in character, were added to the old liturgical chants (*bombai*). In the feudal Kamakura (1192–1333) and Muromachi (1338–1573) periods the Nō theatre rose to prominence. *Kuregaku* and *Tō-sangaku,* popular types of music from the early Middle Ages, had survived in rural dance pantomimes (*dengaku*), and popular acrobatic performances (*sarugaku-nō*) were gradually absorbed into the tradition. During the centuries of feudal government itinerant Zen Buddhist monks, the *komusō,* played the bamboo end-blown flute *shakuhachi,* and wandering bards, or *heike-biwa,* recited tales to the accompaniment of the four-stringed lute (*biwa*).

The century of transition from the feudal era to the Tokugawa regime (1603–1868) was a time of a strong Western influence exerted by Spanish and Portuguese missionaries. In the mission schools Christian hymns, Gregorian litanies, and secular European music were taught, and this influence and the knowledge of Western melody and musical expression merged with folk song and the various types of entertainment music of the period. With the growth of cities and the increasing wealth of the merchant class, the puppet theatre (*bunraku; jōruri*) became popular, as did the Kabuki theatre. The *samisen*—a long-necked, three-stringed instrument played with a plectrum—became the principal instrument of Kabuki accompaniments. Secular concert music (solo songs and chorus in alternation, accompanied by percussion instruments, *samisen,* and *koto* groups) was of three schools: Naga-uta, Tokiwazu, and Kyomoto. Instrumental solo music for the 13-stringed *koto* was greatly favoured, as were the many variants of geisha songs and chamber music for voice, *koto,* and *shakuhachi.*

The modern period dates from the opening of the country after the Meiji Restoration of 1868. French military music had already been introduced by some independent feudal lords (daimyō), and in the 1870s the imperial court pressed for the immediate introduction of Western music. Under the baton of the Englishman William Fenton, the Imperial musicians were the first to perform an all-Western orchestral concert (1877). In public education Japanese melody and music theory were abolished, and Western nomenclature, notation,

harmony, and melody were imposed. After the establishment of the Imperial Academy of Music in Tokyo (1878), Western music made rapid headway. Most cities by the mid-20th century had one or several modern orchestras, and Japanese music of former times survived only in closed guilds, in the various Buddhist and Shintōist sects, and in Nō and Kabuki theatre.

Japanese National Railways (JNR), Japanese NIHON KOKUYŪ TETSUDŌ, national railroad corporation of Japan from the early 20th century until its privatization in 1987.

The first railroad in Japan, built by British engineers, opened in 1872, between Tokyo and Yokohama. After some initial opposition to foreign influence, Japanese engineers began building railroads at a rapid rate, and the railways' expansion was promoted as part of national policy. In 1907 the state began buying up private lines, and out of these efforts emerged the JNR in 1949, which became the backbone of Japan's rail network. By the mid-1980s JNR's rail lines provided passenger and freight service over more than three-fourths of Japan's track mileage and had a total route length of about 12,900 miles (20,800 km). The remainder was operated by a number of privately owned intercity passenger railroads.

In 1964 the first section of the Shinkansen, a high-speed passenger line, was opened between Tokyo and Ōsaka, and the line was subsequently extended until it became one of the mainstays of the railway's operations. It was also in 1964, however, that JNR first began to lose money on its operations, and these losses continued over the next two decades until the corporation had amassed a huge long-term debt. JNR's bureaucratized decision-making processes hindered its ability to compete with private railways in specific localities, and its bloated, highly paid work force contributed to its unprofitability and thus to the deterioration of its financial position. In 1987 JNR was broken up into six smaller regional private railways, a nationwide cargo railway corporation, and several other companies, all of which had the chance to become profitable.

Japanese Orthodox Church, autonomous body of the Eastern Orthodox Church, in canonical relation with the patriarchate of Moscow, which confirms the election of the metropolitan of Tokyo. The Japanese Orthodox Church was created by the efforts of an outstanding missionary, Nikolay Kasatkin (1836–1912), who became the first Orthodox archbishop of Japan and was canonized a saint in 1970.

Since the beginning of the mission (1872), the church was never dependent upon foreign missionary personnel. Japanese priests are ordained after being trained in a seminary in Tokyo, and an assembly of clergy and laity is in full control of the affairs of the church. This indigenous character of Japanese Orthodoxy permitted it to survive several political trials and periods of isolation, such as the Russo-Japanese War and the two World Wars. Between 1945 and 1970 the church was under the ecclesiastical jurisdiction of the Russian metropolitanate of America. In 1970 it received a permanent autonomous statute from the patriarchate of Moscow, its mother church. The Orthodox cathedral of Tokyo—called Nikolay Cathedral, after its founder, Nikolay Kasatkin—is one of the largest religious buildings in the Japanese capital. The church, numbering about 30,000 members, has dioceses in Tokyo, Kyōto, and Sendai.

Japanese philosophy, the conceptual expression of Japanese culture since the turn of the 6th century AD. The term philosophy has been considered somewhat misleading in reference to Japanese thought, since Japanese premodern thinking tended to be directed more toward the realm of existence than toward that of essence. Japanese philosophy is not generally indigenous; Japanese thinkers have always freely appropriated foreign philosophical systems and insights to express their own understanding of the meaning of life and the world. The Japanese have skillfully assimilated alien philosophical categories in developing their own systems.

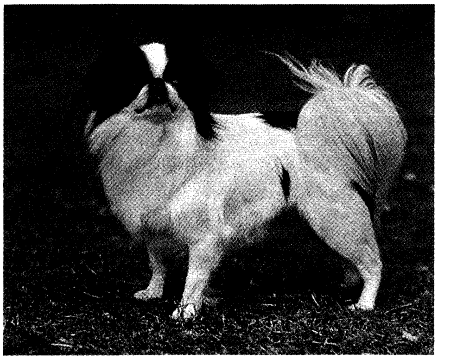
Historically, before the Meiji era (beginning in 1868), one of the two principal schools of Japanese thought arose from Buddhism and was highly tinged with a religious and often somewhat metaphysical character; a second school arose from Confucianism and was essentially a system of moral philosophy. From the 18th century on, there were some independent thinkers who were critical of these two major schools, but their ideas were limited to a small circle, and they left little influence.

Since the Meiji Restoration, Western philosophy has been liberally and abundantly introduced into Japan. At first, British and American philosophies predominated; but in the course of the 20th century, the influence of German philosophy became increasingly strong. Leading Japanese philosophers were especially influenced by recent German Idealism, Phenomenology, and Existentialism. By the late 20th century philosophy in the Western sense of the term was taught as a compulsory subject in most Japanese colleges and universities; and Eastern thought, under the name of Indian or Chinese philosophy, was relegated to specialized courses. In order to distinguish Western philosophy from Buddhist and Chinese thought, a new term, *tetsugaku* ("wise learning"), was coined and has come rapidly into use.

Japanese raisin tree: *see* raisin tree.

Japanese redwood: *see* Japanese cedar.

Japanese spaniel, also called JAPANESE CHIN, breed of toy dog that originated in China and was introduced to Japan, where it was kept by royalty. The breed became known in the West when Commodore Matthew Perry returned from Japan in 1853 with several dogs that had been presented to him. The Japanese spaniel is a compact, dainty-looking dog with large, dark eyes, a short muzzle, and a heavily plumed tail that curls over its back. It stands about 8 to 9 inches (20 to 23 cm) and weighs about 7 pounds (3 kg). Its full, straight, silky coat is black-and-white or reddish brown and white. The breed is valued as an alert, affectionate pet.



Japanese spaniel
Sally Anne Thompson—EB Inc.

Japanese torreya, also called NUT-BEARING TORREYA, or KAYA (*Torreya nucifera*), an ornamental evergreen timber tree of the yew family (Taxaceae), native to the southern islands of Japan. Although it is the hardiest species of its genus and may be 10 to 25 m (about 35 to 80 feet) tall, it assumes a shrubby form in less temperate areas. Spreading, horizontal, or slightly ascending branches give the tree a compact ovoid or pyramidal head. The bark is smooth and red but on old trees may become brownish and flaky. The curved, lance-shaped leaves are rigid, spiny pointed, and dark glossy green on the upper side; they emit a pungent, disagreeable odour when bruised. The seeds, 2 to 2.5 cm (about 3/4 inch to 1 inch) long, are used for food in Japan; they contain an oil used in cooking.



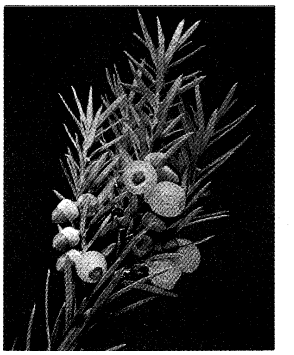
Japanese torreya (*Torreya nucifera*)
Shunji Watari—EB Inc.

The fleshy seed covering, or aril, is light green in colour, sometimes tinged with purple. The yellowish, durable wood is used for furniture, cabinetry, carving, and articles of turnery.

Japanese varnish tree: *see* varnish tree.

Japanese writing system: *see* kana.

Japanese yew, also called SPREADING YEW (*Taxus cuspidata*), an ornamental evergreen shrub or tree of the yew family (Taxaceae), native to Japan and widely cultivated in the Northern Hemisphere. Rising to a height of 16 m (about 52 feet), it resembles the English yew but is hardier and faster growing. Each leaf has two distinct, yellowish bands on its underside. There are many horticultural varieties of Japanese yew. Plants propagated from cuttings of lateral branches tend to be prostrate and shrubby, while cuttings from leader shoots are erect and symmetrically conical. Several hybrids have been obtained by crossing the Japanese yew with the English yew; the most common, *Taxus x media,* has about 10 varieties.



Japanese yew (*Taxus cuspidata*)
Grant Heilman—EB Inc.

Japanism, also spelled JAPONISM, French JAPONISME, aesthetic cult that had a major impact on Impressionist painting. Japanism began in the mid-19th century, just after Japanese trade with the West was opened, and lasted for a generation in France and England. Japanism depended upon the careful study of

imported works of Japanese art, usually recent popular prints (*Ukiyo-e*) rather than important older paintings.

Such prints were collected by such painters as Édouard Manet, Edgar Degas, Claude Monet, and other artists. The clarity of line, spaciousness of composition, and boldness and flatness of colour and light in Japanese prints had a direct impact on their work and on that of their followers. Less important and more ephemeral was an attempt in France to emulate Japanese interior design, following the display of Japanese decorative arts at the 1867 Exposition Universelle in Paris.

japanning, in the decorative arts, process popular in 18th-century Europe for finishing and ornamenting wood, leather, tin, and papier-mâché; japanning emulated the celebrated lacquerwork of the Japanese. In modern industry, the term refers to the decoration and protection of the surfaces of metal articles with finishes hardened by oven heating.

Black japan, among the most widely used traditional materials, is a mixture of molten asphalt, natural-resin varnishes, drying oils,



Japanned urn, Pontypool ware, *c.* 1795; in the National Museum of Wales, Cardiff, Wales

By courtesy of the National Museum of Wales, Cardiff, Wales

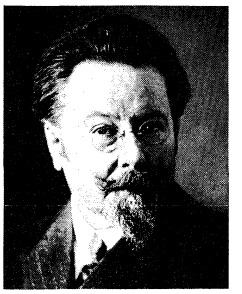
and turpentine having a clear, brownish undertone. The japans have largely been displaced by modern baking enamels: these are tough, durable coatings composed of pigments ground in synthetic-resin varnishes. The word japan survives more actively in an altogether different product—japan colours. These are quick-drying, lustreless paints miscible with turpentine and universally sold in tubes and cans for sign painting and decorative work.

Japonism (art history): *see* Japanism.

Japurá River, Portuguese YAPURÁ, Spanish YUPURU, river that rises as the Río Caquetá east of Pasto, Colombia, in the Colombian Cordillera Central. It meanders generally east-southeastward through the tropical rain forest of southeastern Colombia. After receiving the Rio Apaporis at the Brazilian border, it takes the name Japurá and flows eastward to join the stretch of the Amazon known as the Solimões River, above Tefé. Its total length, including the Caquetá, is about 1,750 miles (2,816 km). At its mouth it forms a network of channels and large islands, with seasonal lakes. The river, which has a strong current, is navigable for small boats in Brazil.

Jaques-Dalcroze, Émile (b. July 6, 1865, Vienna—d. July 1, 1950, Geneva), Swiss music teacher and composer who originated the eurythmics system of musical instruction.

In his youth Jaques-Dalcroze studied composition and by 1892 was professor of harmony



Jaques-Dalcroze

H. Roger-Viollet

at the Geneva Conservatory. Convinced that current methods of training professional musicians needed reform, he revised the teaching of harmony and developed his system of rhythmic education, in which bodily movements are used to represent musical rhythms. About 1905 he applied eurythmics to elementary school children and later demonstrated his controversial methods in England and on the Continent. In 1910 he founded the first school for eurythmic instruction at Hellerau, Ger., and in 1914 established a central school in Geneva, which he headed until his death.

Eurythmics was designed to deepen awareness of musical rhythms and aimed "to create by the help of rhythm a rapid and regular current of communication between brain and body." His pupils were taught to indicate note values by movements of the feet and body and time values by movements of the arms. The Dalcroze method (or a modified version of it) was frequently used to give plastic expression to fugues, symphonies, and operas. Eurythmics also influenced the development of 20th-century dance through the contributions of such students as Rudolf Laban, Mary Wigman, Hanya Holm, Marie Rambert, Kurt Jooss, and Uday Shankar.

Jaques-Dalcroze, who had studied with Anton Bruckner and Robert Fuchs in Vienna and with Léo Delibes in Paris, wrote three string quartets and two violin concerti, as well as numerous pieces for the piano. His arrangements of popular songs, children's rounds, and chansons de geste were used for the teaching of eurythmics in schools. He also published the *Méthode Jaques-Dalcroze* (5 parts, 1907–14), *Eurythmics, Art and Education* (1930), and *Rhythm, Music and Education* (1922).

jarabe, folk dance for couples, popular in central and southern Mexico and Jalisco state. Derived in colonial times from Spanish popular music and such dances as the seguidil-



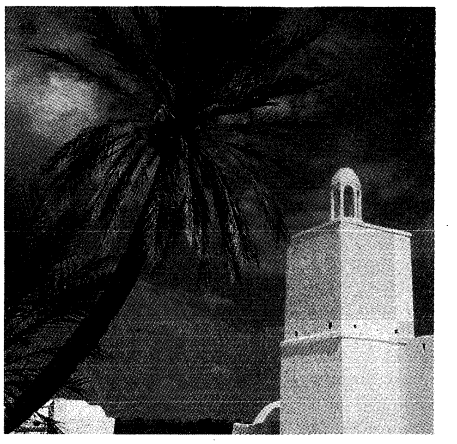
Jarabe, detail from a mosaic by Diego Rivera, on the Teatro des los Insurgentes, Mexico City

Shostal—EB Inc.

las and fandangos, it was also influenced by native Mexican couple dances imitating the courtship of doves. The jarabe is a dance of flirtation, the man vigorous and attentive, the woman coy. In some versions she dances around the edge of the sombrero he tosses to the floor. Jarabe melodies are traditional medleys of earlier popular tunes. One, the *jarabe tapatío* (a *tapatío* is a person from Guadalajara), became popularized outside Mexico as the Mexican hat dance. Other jarabes include the *jarabe tehuano* and the *jarabe tlaxcalteco.*

Jarabub (Libya): *see* Jaghbūb, al-.

Jarbah, Jazīrat, French ÎLE DE DJERBA, or JERBA, island in the Gulf of Gabes, Mediterranean Sea, off the Tunisian mainland, to which it is connected by a causeway. About 17 miles (27 km) long by 16 miles wide and having an area of 197 square miles (510 square km), the island, known to ancient geographers as the "land of the lotus eaters," was originally settled by the Romans. After being conquered by the Arabs in 655 and made a dependency of Tūnis and al-Qayrawān (Kairouan), it passed back and forth between Sicilian, Norman, and Ḥafṣid control from the 12th to the 15th century. After several unsuccessful attempts by the Spanish to take the island in the 16th century, it passed under Ottoman control. Now a part of Tunisia, Jarbah is noted for its orchards (especially dates and olives), fishing (sponges and oysters), and



Minaret of one of the countless little, white mosques on Jarbah island, Tunisia

Alpha—The Image Works

woolens and blankets. Its fine beaches and international airport have also made it a popular tourist resort. Ḥawmat as-Sūq (Houmet es-Souk) is the principal town and chief market centre, and Ajīm is the main port. Pop. (1984) 92,269.

Jardim Botânico do Rio de Janeiro: *see* Botanical Garden of Rio de Janeiro.

jardin anglais, English ENGLISH GARDEN, type of garden that developed in 18th-century England, originating as a revolt against the architectural garden, which relied on rectilinear patterns, sculpture, and the unnatural shaping of trees. The revolutionary character of the *jardin anglais* lay in the fact that, whereas gardens had formerly asserted man's control over nature, in the new style, man's work was regarded as most successful when it was indistinguishable from nature's. This led to another change: in the architectural garden the eye had been directed along artificial, linear vistas that implied man's continued control of the surrounding countryside; but in the *jardin anglais* the natural world was brought up to the doors of the mansion.

The revolt was foreshadowed at the end of the 16th century by the philosopher Francis Bacon, who was outspokenly critical of the artificiality of "knot gardens." He was supported in the early 18th century by Joseph Addison and Alexander Pope, who argued that trees should be allowed to grow into natural shapes; by the artist William Hogarth, who



Jardin anglais, Stourhead, Wiltshire, Eng.
Peter Coats

pointed out the beauty of a wavy line; and by a new attitude that nature was good. As the factotum of the Whig aristocracy, William Kent (*q.v.*) was responsible for beginning the wholesale transformation of the old formal parterres into the new fashion. The classic example of the transformation was at Stowe in Buckinghamshire, where the greatest of England's formal gardens was by stages turned into a landscaped park under the influence of Kent and then of Lancelot Brown.

Jardin Botanique National de Belgique: *see* National Botanical Garden of Belgium.

Jardin des Plantes, officially MUSÉUM NATIONAL D'HISTOIRE NATURELLE, English BOTANICAL GARDEN, or NATIONAL MUSEUM OF NATURAL HISTORY, one of the world's foremost botanical gardens, located in Paris. It was founded in 1626 as a royal garden of medicinal plants and was first opened to the public in 1650. Under the superintendence of G.-L.L. Buffon (1739–88) the garden was greatly expanded, and it developed into a centre of scientific study associated with such prominent figures of early French botany and zoology as the Jussieu brothers, Georges Cuvier, and Jean-Baptiste Lamarck. During the early 19th century it supported expeditions to many distant parts of the world, which led to the acquisition of large numbers of plants that had been previously unknown to Western science.

Still located at its original site, the Jardin des Plantes covers 28 hectares (68 acres), on which are situated 6 greenhouses for display and 22 for service functions. Approximately 23,500 species of plants are cultivated in these greenhouses and in outdoor plots. The garden features cacti, grasses, bromeliads, orchids, ferns, aroids, Australian flora, alpine plants, iris, cannas, and conifers. The herbarium maintained at the garden is one of the world's finest and consists of more than 6 million dried reference specimens. A botanical library, a small zoo, a labyrinth, and various natural-history exhibits are also part of the garden–museum complex.

Jari River, also spelled JARY, river, northern Brazil, rising on the southern slopes of the Tumuc-Humac Mountains and flowing in a generally southeasterly direction for about 350 miles (560 km) to join the Amazon River at Bôca do Jari, opposite Grande de Gurupá Island. The Jari forms the border between Pará and Amapá states, and its lower course is navigable. An American entrepreneur, Daniel Ludwig, began large-scale development of the Jari River valley in the late 1960s to exploit its potential for lumber production. As part of the development project, in the late 1970s the Japanese built a floating cellulose factory on the Jari River. After the project ran into financial difficulties in the early 1980s, the Brazilian government took it over.

Jarīd (Tunisia): *see* Tawzar.

Jarīd, Shaṭṭ Al-, also spelled CHOTT DJERID, large saline lake in southwestern Tunisia, occupying a salt-flat basin of about 1,900 square miles (4,900 square km). The lake is covered with water only in the lowest areas, except after periods of heavy rains. The lake forms, together with Shaṭṭ Al-Fijāi (Fedjadj) and Shaṭṭ Al-Gharsah (Rharsa) in Tunisia and Chotts Melrhir and Merouane in Algeria, a depression that was formerly an arm of the sea and that extends nearly 250 miles (400 km) westward from the Gulf of Gabes. This depression's floor reaches 52 feet (16 m) and 69 feet (21 m) below sea level in Jarīd and Gharsah lakes, respectively. The extensive salt flats of Shaṭṭ Al-Jarīd have been an important source of phosphates since discovery of the mineral there in 1949. Tawzar (Tozeur) and Nafṭah (Nefta), the main oases towns on the lake's periphery, are noted for their date-palm production.

Jarīr (ibn ʿAṭīyah ibn al-Khaṭafā) (b. *c.* 650, Uthayfīyah, Yamāmah region, Arabia [now in Saudi Arabia]—d. *c.* 729, Yamāmah), one of the greatest Arab poets of the Umayyad period, whose career and poetry show the continued vitality of the pre-Islāmic Bedouin tradition.

Jarīr's special skill lay in poems insulting personal rivals or the enemies of his patrons. After sharp verbal clashes in Arabia in defense of Kulayb, his tribe, Jarīr moved to Iraq. There he won the favour of the governor, al-Ḥajjāj, and wrote a number of poems in his praise. He also met the poet al-Farazdaq, with whom he had already begun a battle of poems that is said to have lasted 40 years. The results were collected in the following century as *naqāʾid* ("slanging-matches on parallel themes"). The governor's goodwill earned Jarīr entry at the Umayyad court in Damascus. Jarīr was not able, however, to dislodge the poet al-Akhṭal from the esteem of the caliph ʿAbd al-Malik, and another poetic battle ensued, also producing *naqāʾid.* Of the caliphs who succeeded ʿAbd al-Malik, only the pious ʿUmar II seems to have favoured Jarīr, and much of Jarīr's life was spent away from court in his native Yamāmah.

Many of Jarīr's satires and panegyrics are in the conventional qasida ("ode") form, usually a travel account sandwiched between a love-poem as prologue and a panegyric as conclusion. Jarīr also wrote elegies, wisdom poetry, and epigrams.

Jarmo, also called QALAT JARMO, prehistoric archaeological site located east of Kirkūk, in northeastern Iraq. The site is important for revealing traces of one of the world's first village-farming communities. The approximately dozen layers of architectural building and renovation yield evidence of domesticated wheats and barley and of the dog and goat, suggesting the achievement of a settled agricultural way of life. Other artifacts found at Jarmo, such as flint sickle blades, milling stones, and—in the uppermost layers only—pottery, hint at the technological innovations made in response to the new way of food production. The original occupation of the site is estimated to have occurred at about 7000 BC.

Jarnach, Philipp (b. July 26, 1892, Noisy, Fr.—d. Dec. 17, 1982, Börnsen, W.Ger.), German composer who was a follower of the pianist-composer Ferruccio Busoni.

The son of a noted Spanish sculptor, Jarnach studied piano under Edouard Risler and harmony under Albert Lavignac in Paris. In 1915 at Zürich he met Ferruccio Busoni, whose operas *Arlecchino* and *Turandot* he arranged for piano and under whose influence he wrote his *String Quintet,* Opus 10. In 1927 he was appointed professor of composition at the Cologne conservatory. He took German citizenship in 1931, and in 1949 he became director of the Hamburg conservatory. Among his chamber works, which show an affinity with the music of Paul Hindemith, are two sonatas for unaccompanied violin and the *String Quartet,* Opus 16 (1924), which established his reputation in Germany as a composer. His orchestral works include *Musik mit Mozart* and *Morgenklangspiel.* He completed Busoni's opera *Doktor Faust* after the composer's death.

Jarnés (y Millán), Benjamín (b. Oct. 7, 1888, Codo, Spain—d. Aug. 11, 1949, Madrid), Spanish novelist and biographer.

In 1910 Jarnés joined the army and began studies at the Zaragoza Normal School. In 1920 he resigned from the army and settled in Madrid. His first novel was *Mosén Pedro* (1924), but his reputation was established by his second, *El profesor inútil* (1926; "The Useless Professor"), a series of episodes with little narrative action that point out a professor's ineptitude and inability to tell reality from unreality. Similar motifs occur in *El convidado de papel* (1928; "The Paper Guest"), in which erotic pictures and writings smuggled into a seminary come to life. In 1929 Jarnés joined the editorial board of *La Gaceta Literaria* ("The Literary Gazette") and began to write biographies. He continued to write novels, such as the surrealistic *Teoría del zumbel* (1930; "Theory of the Top-Spinning String"). He was an officer in the medical corps of the Spanish Republic during the Civil War. After the Republic fell, he fled to Mexico. There, working as an editor and teacher, he continued to write fiction but devoted increasing attention to biographies, as of Stefan Zweig, Miguel de Cervantes, and Mexican literary figures. In 1948 he returned to Spain and found himself less known there than in Mexico. His literary reputation in Spain has since improved.

Jarrell, Randall (b. May 6, 1914, Nashville, Tenn., U.S.—d. Oct. 14, 1965, Chapel Hill, N.C.), American poet, novelist, and critic who is noted for revitalizing the reputations of Robert Frost, Walt Whitman, and William Carlos Williams in the 1950s.

Childhood was one of the major themes of Jarrell's verse, and he wrote about his own



Jarrell
© Philippe Halsman

extensively in *The Lost World* (1965). With an M.A. from Vanderbilt University (1938), he began his career as a teacher. In 1942 he joined the U.S. Air Force, and his first book of verse, *Blood for a Stranger,* appeared. Many of his best poems appeared in *Little Friend, Little Friend* (1945) and *Losses* (1948), both of which dwell on his wartime experiences.

Jarrell taught at Sarah Lawrence College, Bronxville, N.Y. (1946–47), and his only novel, the sharply satirical *Pictures from an*

Institution (1954), is about a similar progressive girls' college. He was a teacher at the University of North Carolina at Greensboro from 1947 until his death in a road accident. His criticism has been collected in *Poetry and the Age* (1953), *A Sad Heart at the Supermarket* (1962), and *The Third Book of Criticism* (1969). Jarrell's later poetry—*The Seven-League Crutches* (1951), *The Woman at the Washington Zoo* (1960), and *The Lost World*—restored an openness to emotion (some called it sentimentality) rarely found in works of "academic" poets of the period. His *Complete Poems* appeared in 1969.

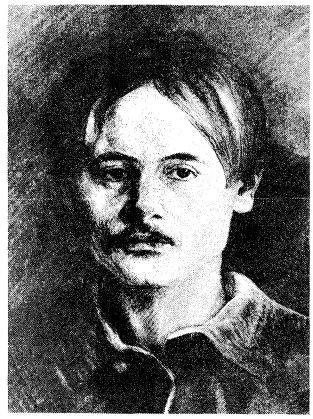
Jarres, Plain of, also called PLAIN OF JARS, French PLAIN DES JARRES, Laotian THÔNG HAIHIN, dissected inner region of the Plateau Xiangkhoang (*see* Xiangkhoang, Plateau) in north-central Laos. Drained principally by the Ngum River, a southward-flowing Mekong tributary, the plain is characterized by narrow river valleys and limestone and sandstone hills ranging from 3,000 to 3,600 feet (900 to 1,100 m) in elevation. The plain's name is derived from several hundred ancient carved stone funerary jars that were discovered in the region in the 19th century by the French. In the 1960s the region assumed international strategic importance as a base of operations in the Laotian civil war. Several airfields were established there to support the Laotian government's military operations against Pathet Lao communist insurgents. In 1969 the Plain of Jarres was a major battlefield between the North Vietnamese and Royal Lao government and was subjected to heavy bombing. Of little economic or agricultural value, the Plain of Jarres has grassy or scrub-covered hills and valleys that support subsistence agriculture by Khmu and Meo (Miao, or Hmong) peoples.

Jarrow, North Sea port, South Tyneside district, county of Tyne and Wear, England. It lies along the south bank of the River Tyne. Jarrow's St. Paul's Church (dedicated AD 685) is situated close to a ruined monastery that was begun in 681. The monastery was a religious centre in the Anglo-Saxon period and was the home of the Venerable Bede. In the mid-19th century the town developed around coal pits and the shipyards established by Sir Charles Palmer. Since the economic depression and high unemployment of the 1930s, when the community lent its name to a famous series of "hunger marches" that were made across England to London, Jarrow's industrial base has been expanded to include oil installations and ship-repair yards. The Tyne Tunnel (opened in 1967) runs under the River Tyne to connect Jarrow with Willington. Pop. (1981) 31,213.

Jarry, Alfred (b. Sept. 8, 1873, Laval, Fr.—d. Nov. 1, 1907, Paris), French writer mainly known as the creator of the grotesque and wild satirical force *Ubu roi* (1896; "King Ubu"), which was a forerunner of the Theatre of the Absurd.

A brilliant youth who had come to Paris at 18 to live on a small family inheritance, Jarry frequented the literary salons and began to write. His fortune was soon dissipated, and he lapsed into a chaotic and anarchic existence in which he met the demands of day-to-day life with self-conscious buffoonery. He died in a state of utter destitution and alcoholism.

On Dec. 10, 1896, at the Théâtre de l'Oeuvre, the director A.-F.-M. Lugné-Poe presented *Ubu roi,* a dramatic sketch first conceived by Jarry at 15, with some schoolmates, to caricature a pompous schoolmaster. The play's main character is Père Ubu, a grotesque and repulsive character who becomes the king of Poland. Ubu symbolizes the crass stupidity and avarice of the bourgeoisie as his lust for



Jarry, drawing by F.A. Cazals, 1897
H. Roger-Viollet

power drives him to abuse his authority and commit acts of cruelty in the name of questionable principles. The play's first production caused a scandal, and it closed after two nights. This inauspicious debut was partly due to the outrage felt by the audience at Ubu's speech, which was purposely deformed and vulgar, riddled with malapropisms and derisive absurdities. Jarry's sequels to *Ubu roi* include *Ubu enchaîné* (1900; *Ubu Enchained*) and *Ubu sur la butte* (1901; "Ubu on the Hillock"). The three plays were performed by Jean Vilar at the Théâtre National Populaire in 1958. Jean-Louis Barrault directed a composite production drawn from his works, *Jarry sur la butte,* in 1970.

Jarry also published stories, novels, and poems, but the brilliant imagery and wit of these works usually lapse into incoherence and a meaningless and often scatological symbolism. Jarry invented a logic of the absurd that he christened "*pataphysique*"; he presented this eccentric metaphysical scheme in *Gestes et opinions du docteur Faustroll, pataphysicien* (published 1911; "Deeds and Opinions of Doctor Faustroll, Pataphysician").

The epic grandeur with which Jarry in *Ubu Roi* depicted the human propensity for evil and irrationality had a lasting influence. His attempt to ridiculously highlight the grotesque and shocking side of human nature was taken up by later playwrights, and the founders of the Dada and Surrealist movements also hailed him as a forerunner.

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Järta, Hans, original name HANS HIERTA (b. Feb. 11, 1774, Husby, Swed.—d. April 6, 1847, Uppsala), Swedish political activist, administrator, and publicist who was a leader of the 1809 coup d'état that overthrew Gustav IV, king of Sweden; he was the main author of Sweden's constitution (1809).

In the 1790s Hans Hierta began his career as a publicist and a left-wing member of the noble estate of the Riksdag (estates general). In sympathy with the French Revolution and in protest against the absolutist Swedish regime, he changed his name to Järta and renounced his title in 1800. Järta conspired with other "men of 1809" to engineer the coup that succeeded on March 13, 1809. By this time, however, his earlier radicalism had already been moderated. As the chairman of the new constitution committee, he coauthored a document (still in force, though much modified) that preserved a strong monarchy and certain noble privileges while ignoring the disenfranchised rural and urban workers. The constitution did, however, restore the power of the Riksdag. He continued to move to the right as governor of Kopparberg (1812–22), as a publicist in the 1820s, and as an administrator of the state archives (1837–44). He ended his career as a leading spokesman of conservatism.

Jaruzelski, Wojciech Witold (b. July 6, 1923, Kurow, Pol.), Polish army general and politician, the chairman of the Council of Ministers (premier) from 1981 to 1985, first secretary of the Polish United Workers' (communist) Party (PUWP) from 1981 to 1989, and president of Poland from 1989.

When World War II broke out, the young Jaruzelski and his family were trapped by the invading Red Army, and Jaruzelski was deported to the Soviet Union. In 1943 he joined the Polish army formed in the Soviet Union under General Zygmunt Berling. After graduating from the Soviet cadet school at Ryazan, he joined the fight against Germany.

After the war Jaruzelski graduated with honours from the Polish Higher Infantry School and later from the General Staff Academy. He joined Poland's communist party (later renamed the Polish United Workers' Party) in 1947. He subsequently progressed through various staff appointments—with promotion to brigadier general at the early age of 33—to become chief of the central political board of the armed forces (1960–65), deputy minister of defense (1962–68), and chief of the general staff (1965–68). In March 1968 he was appointed Poland's minister of defense. Jaruzelski was elected a member of the party's Central Committee in 1964 and became a member of the Politburo in 1971.

Jaruzelski's rise to power in Poland was a direct result of the PUWP's disarray under the increasing pressures of the Solidarity movement. The party's Central Committee evidently concluded that Jaruzelski, whose communist orthodoxy was beyond doubt, was the only Politburo member capable of pulling the party from the quagmire and reinvigorating its role in the state. Accordingly, Jaruzelski was elected premier on Feb. 11, 1981, and first secretary of the party on Oct. 18, 1981, while retaining his post as minister of defense. In an effort to crush the Solidarity movement and restore Poland's economic stability, he declared martial law in Poland on Dec. 13, 1981; the move was accompanied by mass arrests of Solidarity leaders and political dissidents. With Solidarity suppressed, Jaruzelski lifted martial law in July 1983 but remained firmly in control of both the Polish government and the PUWP. In 1985 he relinquished the post of premier, simultaneously assuming the position of president of the Council of State.

Though adept at suppressing the political opposition, Jaruzelski proved less successful in his efforts to restore the functioning of Poland's stagnant economy, and his attempts to revitalize the dispirited PUWP met with only limited success. In 1988, with Poland's economy undergoing an alarming deterioration in the midst of labour unrest and high inflation, Jaruzelski changed course and approved negotiations between the government and the outlawed Solidarity movement. These talks culminated in April 1989 in an agreement providing for far-reaching reforms in Poland's political system, notably the legalization of Solidarity, the holding of free elections to a restructured Parliament, and the conversion of the hitherto largely ceremonial post of president into an office carrying strong executive powers. Jaruzelski was elected to the latter post by the Parliament in July 1989 and then resigned all his high posts in the PUWP. In August, after the communists were unable to form a new government because they had lost their legislative majority in the reconstituted Parliament, Jaruzelski nominated a Solidarity supporter to become the country's premier. The new government's Cabinet was dominated by Solidarity members or supporters, while Jaruzelski remained president.

Jarvis, Charles (painter): *see* Jervas, Charles.

Jarvis, John Wesley (b. 1781, South Shields, Durham, Eng.—d. Jan. 14, 1840, New York City), U.S. painter considered the leading portraitist of his time in New York City.

Growing up in Philadelphia, where he gained some knowledge of art from sign makers, Jarvis was apprenticed (1800) in New York City to an engraver named Edward Savage; later, in partnership with Joseph Wood, he painted profiles and miniatures. He travelled to major cities, such as Baltimore and Charleston, S.C., for commissions while maintaining headquarters in New York City, where, in 1815, he profitted from exhibiting Adolf Ulrik Wertmüller's controversial painting, "Danaë." While in Louisiana, he established an important studio, collaborating with, among others, Henry Inman, who had served Jarvis for seven years as apprentice and assistant, and John Quidor. By the time John James Audubon met him in 1821 at New Orleans, Jarvis was in his prime and had become a dandy of exotic bohemian proportions. After the War of 1812, the Common Council commissioned him to paint huge republican portraits for City Hall, New York City; among these is the famous "Oliver H. Perry."

Jarvis Island, formerly BUNKER ISLAND, VOLUNTEER ISLAND, JERVIS ISLAND, or BROOK ISLAND, coral atoll, unincorporated territory of the U.S., in the Northern Line Islands, in the west central Pacific Ocean, 1,000 mi (1,600 km) southwest of Honolulu. The atoll has an area of 1.6 sq mi (4.1 sq km). Sighted in 1821 by a Captain Brown in the British ship "Eliza Francis," the island was claimed in 1856 by the U.S. under the Guano Act, and the guano deposits were worked from 1857 to 1879. Britain annexed Jarvis in 1889 but did not exploit it. Claimed by the U.S. in 1935, it came under the jurisdiction of the U.S. Department of the Interior in 1936. Researchers visited the atoll during the International Geophysical Year (1957–58). There are no permanent inhabitants.

Jary River (South America): *see* Jari River.

Jashar, Book of, ancient Israelite collection of poems quoted in various books of the Old Testament. Of uncertain etymology, Jashar may mean "victorious" or "upright." The victory hymn that describes how the Sun and Moon stood still when the Israelites defeated the Amorites (Josh. 10:12–13) is ascribed to the *Book of Jashar,* as is the Israelite king David's lament over the deaths of the former king Saul and his son Jonathan (II Sam. 1:17–27). King Solomon's Temple dedication poem (I Kings 8:12–13) and the "Song of Deborah," a 12th-century-BC Israelite judge (Judg. 5), may be parts of the *Book of Jashar.*

Jashpur Pāts, physical region of eastern Madhya Pradesh state, central India, extending over Jashpur Tahsil (northeastern Raigarh district) and forming part of the Chota Nāgpur Plateau. The pāts is a complex of small, flat-topped plateaus and hills, separated from each other by fault scarps and river valleys. To the north, the Upper Pāts (known locally as Uparghāt) have an elevation of from about 2,500 ft (750 m) to 3,300 ft; to the south, the Lower Pāts (known locally as Nichghāt) have an elevation of from about 900 ft to 1,650 ft. The Jashpur Pāts form a divide between the Ganges and the Mahānadi drainage systems. The tops of the pāts are generally barren or covered with grasslands, and the slopes are forested with sal (*Shorea*), ebony, teak, and bamboo. Gash Pahār (3,241 ft) and Laki Hill (3,323 ft) are two of the higher peaks in the Jashpur Pāts. The Maini, Ib, Mānd, and Kuskal rivers have cut narrow, rock-strewn valleys. Cotton, rice, corn (maize), sugarcane, peanuts (groundnuts), rape and mustard seeds, millet, and fruits are grown. Bauxite, sandstone, building materials, clay, limestone, and dolomite are worked. Industries include the milling of rice, flour, and oilseeds; sawmills and timber seasoning; iron, brass, and aluminum tools and utensils; and shellac and tussur silk production. The Oraon, Kawar, Gonḍ, and Korwa peoples comprise most of the population; in the uplands, they are clustered in the few forest clearings. Roads are the primary means of access in the uplands except for a few railway trunk routes. Jashpurnagar is the only important town.

Jasmin, Jacques, pseudonym of JACQUES BOÉ (b. March 6, 1798, Agen, Fr.—d. Oct 4, 1864, Agen), French dialect poet who achieved popular fame for his touching verse portraits of humble people and places.

His father was a poor tailor, and Jasmin himself spent most of his life as a barber and wigmaker in his native part of southern France. His first collection of poems, *Charivari* (1825; "Tin-Kettle Music"), was followed, beginning in 1835, by 4 volumes of *Papillotos* ("Curlpapers"); in addition to a few poems written cautiously in French, they contained his better works, written in his native dialect, *la langue d'oc.* Included in this collection was a poem of great pathos—"L'Abuglo de Castel-Culié" ("The Blind Girl of Casterculier")—which captured the public imagination after Jasmin began public readings and singings in Toulouse and Bordeaux. Some of his major poems include "Souvenirs" (1835), "Franconnette" (1840), "Martha la folle" (1844; "Martha the Simple"), and "Les Deux Frères jumeaux" (1845; "The Twin Brothers").



Jasmin, detail of a lithograph by the Becquet brothers
Hachette—J.P. Ziolo

jasmine, also spelled JESSAMINE, any member of the genus *Jasminum* of the olive family (Oleaceae), which contains about 300 tropical and subtropical species of fragrant, flowering, woody shrubs. The plants are native to all continents except North America.

Many fragrant-flowered plants from other families are given the name jasmine, including the star, or Confederate, jasmine (*Trachelospermum jasminoides*), Cape jasmine (*Gardenia jasminoides*), Madagascar jasmine (*Stephanotis floribunda*), jasmine tobacco (*Nicotiana alata*), Carolina jasmine (*Gelsemium sempervirens*), Chilean jasmine (*Mandevillea suaveolens*), orange jasmine (various species of the genus *Murraya*), night or day jasmine (various species of *Cestrum*), and the nonfragrant pandorea jasmine (*Pandorea jasminoides*).

Most true jasmines have climbing branches without tendrils. The white, yellow, or rarely pink flowers are tubular with a flaring, lobed, pinwheel-like form. The leaves usually are composed of two or more leaflets, although some species have only one. The fruit in most species is a two-lobed black berry.

Common jasmine, or poet's jasmine (*J. officinale*), native to Iran, produces fragrant white flowers that are the source of attar of jasmine used in perfumery. It is widely cultivated for its shining leaves and clusters of flowers that bloom in summer. Winter jasmine (*J. nudiflorum*), a Chinese species with solitary yellow flowers, is used as a cover plant on hillsides. Primrose jasmine (*J. mesnyi*) is a similar plant with larger flowers that bloom during the winter. Italian jasmine (*J. humile*), a vinelike shrub with yellow flowers, has many cultivated varieties. The fragrant dried flowers of Arabian jasmine (*J. sambac*) are used to make jasmine tea.



Winter jasmine (*Jasminum nudiflorum*)
Valerie Finnis

Jason, in Greek mythology, leader of the Argonauts and son of Aeson, king of Iolcos in Thessaly. His father's half-brother Pelias seized Iolcos, and thus for safety Jason was sent away to the Centaur Chiron. Returning as a young man, Jason was promised his inheritance if he fetched the Golden Fleece for Pelias, a seemingly impossible task. After many adventures (*see* Argonaut) Jason abstracted the fleece with the help of the enchantress Medea, whom he married. On their return Medea murdered Pelias, but she and Jason were driven out by Pelias' son and had to take refuge with King Creon of Corinth. Later Jason deserted Medea for Creon's daughter; this desertion and its consequences formed the subject of Euripides' *Medea.*

Jason (Greek), Hebrew JOSHUA (fl. 2nd century BC), Hellenistic Jewish high priest (175–172 BC) in Jerusalem under the Seleucid king Antiochus IV Epiphanes. By promising greater tribute to Antiochus, he obtained the high priesthood and, scorning the traditional Jewish monotheism of the Pharasaic party, promoted Greek culture and religion throughout Judaea in Palestine. When Antiochus retired to Jerusalem after his expulsion from Egypt by the Romans and began a violent purge of all Judaic practices, Jason was displaced by Menelaus, another Hellenizing Jew. After an unsuccessful attempt to regain the high priesthood by capturing Jerusalem (*c.* 170 BC), Jason was forced to flee to Asia Minor.

Jaspar, Henri (b. July 28, 1870, Schaerbeek, Belg.—d. Feb. 15, 1939, Brussels), Belgian statesman and one of his country's chief negotiators in the peace conferences following World War I. As prime minister (1926–31), he resolved a serious financial crisis at the outset of his ministry.

Jaspar entered politics in the Catholic Party, was appointed minister for economic affairs in 1918, and helped to organize reconstruction of Belgian industries after World War I. As foreign minister (1920–24), he facilitated Belgium's entry into the League of Nations and also the country's representation at the Permanent Court of International Justice at The Hague. He helped create the customs union

of Belgium and Luxembourg in 1921, and in 1924 he took part in the Dawes Plan negotiations, which enabled Germany to resume reparations payments to the Allies.

Becoming prime minister of a coalition government in 1926, Jaspar implemented a series of financial policies designed by his finance minister, Émile Francqui, to remedy the economic crisis, including devaluation of the currency, creation of new taxes, conversion of the public debt, nationalization of the railroads, and financing of public works. These measures revitalized the Belgian economy, although it declined again after the onset of worldwide economic depression in 1929. Jaspar served as finance minister (1932–34) and foreign affairs



Jaspar, marble bust by Victor Rousseau; in the Chambre des Représentants, Brussels
© A.C.L., Brussels

minister (1934). He was asked to form a new government in 1939 but died soon thereafter.

Jasper, unincorporated place, western Alberta, Canada, at the confluence of the Athabasca and Miette rivers, near the British Columbia border; it is the headquarters of Jasper National Park. Jasper Hawes of the North West Company established a fur-trading post on nearby Jasper Lake about 1801. Since the conservation of the area (1907) as a national park and the building of the Jasper Park Lodge (1922) and the Jasper–Banff highway, the locality, overlooked by spectacular peaks, has become a popular Canadian Rocky Mountain resort. Maligne and Pyramid lakes, Miette Hotsprings, and the Columbia Icefield are among the local attractions. Jasper is also a divisional point on the Canadian National Railway. Pop. (1981) 3,269.

Jasper, city, seat (1824) of Walker County, in northwestern Alabama, U.S. Settled in 1822, it was named for Sgt. William Jasper, a defender of Ft. Moultrie during the Revolutionary War. It developed after the arrival of the Kansas City, Memphis and Birmingham Railroad in 1886. Coal, agriculture, and light manufacturing are its economic assets. William B. Bankhead, speaker of the U.S. House of Representatives (1936–40), and his actress-daughter, Tallulah, lived in Jasper. The William B. Bankhead National Forest is 15 mi (24 km) north. Jasper is the seat of Walker (junior) College (1938). Inc. 1840. Pop. (1980) 11,894.

jasper, common, widespread, opaque, fine-grained or dense variety of the silica mineral chert that exhibits various colours, but chiefly brick red to brownish red. It owes its colour to admixed hematite; but when it occurs with clay admixed, the colour is a yellowish white or gray, or with goethite, a brown or yellow. Jasper, long used for jewelry and ornamentation, has a dull lustre but takes a fine polish; other physical properties are those of quartz (*see* silica mineral [table]). It is mentioned in the Bible (Ex. 28:20; 39:13) as one of the 12 stones adorning the breastplate (*ḥoshen*) of



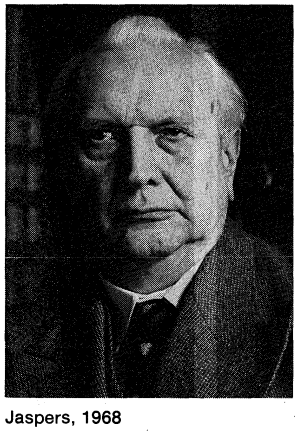
Orbicular jasper from Gilroy, Calif.
Emil Javorsky—EB Inc.

Yahweh's high priests. Medicinal values were long attributed to it, including a belief that wearing it strengthened the stomach. Typical occurrences are as veinlets, concretions, and replacements in sedimentary and metamorphic rocks, as in the Urals, North Africa, Sicily, Germany, and elsewhere. For thousands of years, black jasper (and also black slate) was used to test gold–silver alloys for their gold content. Rubbing the alloys on the stone, called a touchstone, produces a streak the colour of which determines the gold content within one part in one hundred.

Jasper OF HATFIELD: *see* Bedford, Jasper Tudor, duke of.

Jasper National Park, park in western Alberta, Canada. It was created in 1907 to preserve a scenic mountainous area and its wildlife and is located on the eastern slopes of the Rocky Mountains. The park encompasses about 4,200 sq mi (10,900 sq km), including the Athabasca Valley and the surrounding mountains. Part of the great Columbia Icefield, whose meltwaters feed rivers that flow to the Atlantic, Pacific, and Arctic oceans, lies within the park. Other attractions are waterfalls, lakes, canyons, and hot springs. Wildlife includes animals such as bears, elk, moose, caribou, and puma, or cougar. Birds, including eagles, hawks, and others, and fish, stocked by a hatchery, are abundant.

Jaspers, Karl (Theodor) (b. Feb. 23, 1883, Oldenburg, Ger.—d. Feb. 26, 1969, Basel, Switz.), German philosopher, one of the most important Existentialists in Germany, who approached the subject from man's direct concern with his own existence. In his later work, as a reaction to the disruptions of Nazi rule in Germany and World War II, he searched for a new unity of thinking that he called world philosophy.



Jaspers, 1968
Horst Tappe—EB Inc.

Early life and education. Jaspers was the oldest of the three children of Karl Wilhelm Jaspers and Henriette Tantzen. His ancestors on both sides were peasants, merchants, and pastors who had lived in northern Germany for generations. His father, a lawyer, was a high constable of the district and eventually a director of a bank. He was thus able to provide adequately for his family.

Jaspers was delicate and sickly in his childhood. As a consequence of his numerous childhood diseases, he developed bronchiectasis (a chronic dilation of the bronchial tubes) during his adolescent years, and this condition led to cardiac decompensation (the inability of the heart to maintain adequate circulation). These ailments were a severe handicap throughout his adult life.

During his early years of schooling, Jaspers never excelled in any subject, yet he was known for his independent spirit. His dislike for harsh discipline brought him into constant conflict with the school authorities, and, in fact, he was threatened with expulsion unless he complied with the demands of the authorities. He entered the University of Heidelberg in 1901, enrolling in the faculty of law; in the following year he moved to Munich, where he continued his studies of law, but without much enthusiasm. He spent the next six years studying medicine at the universities of Berlin, Göttingen, and Heidelberg. After he completed his state examination to practice medicine in 1908, he wrote his dissertation *Heimweh und Verbrechen* ("Nostalgia and Crime"). In February 1909 he was registered as a doctor. He had already become acquainted with his future wife, Gertrud Mayer, during his student years, and he married her in 1910.

Research in clinical psychiatry. In 1909 Jaspers became a volunteer research assistant at the University of Heidelberg psychiatric clinic, a position he held until 1915. The clinic was headed by the renowned neuropathologist Franz Nissl, who had assembled under him an excellent team of assistants. Because of his desire to learn psychiatry in his own way without being regimented into any particular pattern of thought by his teachers, Jaspers elected to work in his own time, at his own pace, and with patients in whom he was particularly interested. This was granted to him only because he agreed to work without a salary.

When Jaspers started his research work, clinical psychiatry was considered to be empirically based but lacking any underlying systematic framework of knowledge. It dealt with different aspects of the human organism as they might affect the behaviour of human beings suffering from mental illness. These aspects ranged from anatomical, physiological, and genetic to neurological, psychological, and sociological influences. A study of these aspects opened the way to an understanding and explanation of human behaviour. Diagnosis was of paramount importance; therapy was largely neglected. Aware of this situation, Jaspers realized the conditions that were required in order to establish psychopathology as a science: a language had to be found that, on the basis of previously conducted research, was capable of describing the symptoms of disease well enough to facilitate positive recognition in other cases; and various methods appropriate to the different spheres of psychiatry had to be worked out.

Jaspers tried to bring the methods of Phenomenology—the direct investigation and description of phenomena as consciously experienced, without theories about their causal explanation—into the field of clinical psychiatry. These efforts soon bore fruit, and his reputation as a researcher in the forefront of new developments in psychiatry was established. In 1911, when he was only 28 years old, he was requested by Ferdinand Springer,

a well-known publisher, to write a textbook on psychopathology; he completed the *Allgemeine Psychopathologie* (*General Psychopathology,* 1965) two years later. The work was distinguished by its critical approach to the various methods available for the study of psychiatry and by its attempt to synthesize these methods into a cohesive whole.

Transition to philosophy. In 1913 Jaspers, by virtue of his status in the field of psychology, entered the philosophical faculty—which included a department of psychology—of the University of Heidelberg. His academic advance in the university was rapid. In 1916 he was appointed assistant professor in psychology; in 1920 assistant professor in philosophy; in 1921 professor in philosophy; and in 1922 he took over the second chair in that field. The transition from medicine to philosophy was due in part to the fact that, while the medical faculty was fully staffed, the philosophical faculty needed an empirical psychologist. But the transition also corresponded to Jaspers' intellectual development.

In 1919 Jaspers published some of his lectures, entitled *Psychologie der Weltanschauungen* ("Psychology of World Views"). He did not intend to present a philosophical work but rather one aimed at demarcating the limits of a psychological understanding of man. Nevertheless, this work touched on the border of philosophy. In it were foreshadowed all of the basic themes that were fully developed later in Jaspers' major philosophical works. By investigating the legitimate boundaries of philosophical knowledge, Jaspers tried to clarify the relationship of philosophy to science. Science appeared to him as knowledge of facts that are obtained by means of scholarly methodological principles and that are apodictically certain and universally valid. Following Max Weber, a sociologist and historian, he asserted that scientific principles also applied to both the social and humanistic sciences. In contrast to science, Jaspers considered philosophy to be a subjective interpretation of Being, which—although prophetically inspired—attempted to postulate norms of value and principles of life as universally valid. As Jaspers' understanding of philosophy deepened, he gradually discarded his belief in the role of a prophetic vision in philosophy. He bent all his energies toward the development of a philosophy that would be independent of science but that would not become a substitute for religious beliefs. Though the resulting system presupposed science, it passed beyond the boundaries of science in an effort to illuminate the totality of man's existence. For Jaspers man's existence meant not mere being-in-the-world but rather man's freedom of being. The idea of being oneself signified for Jaspers the potentiality to realize one's freedom of being in the world. Thus, the task of philosophy was to appeal to the freedom of the individual as the subject who thinks and exists and to focus on man's existence as the centre of all reality.

The elaboration of these germinal ideas occupied Jasper's thought from 1920 to 1930. During this decade his brother-in-law, Ernst Mayer, himself a philosopher of repute, worked with him. During these years he also enjoyed the friendship of Martin Heidegger. Somewhat later, this friendship broke up because of Heidegger's entry into the National Socialist Party.

In the early years of the 1930s the fruits of his intellectual labour became evident: in 1931 *Die geistige Situation der Zeit* (*Man in the Modern Age,* 1933) was published; in 1932 the three volumes of *Philosophie* (*Philosophy,* 1969) appeared—perhaps the most systematic presentation of Existential philosophy in the German language. A book on Max Weber also appeared in 1932.

Conflict with the Nazi authorities. When Hitler came into power in 1933, Jaspers was taken by surprise, as he had not taken National Socialism seriously. He thought that this movement would destroy itself from within, thus leading to a reorganization and liberation by the other political forces active at the time. These expectations, however, did not materialize. Because his wife was Jewish, Jaspers qualified as an enemy of the state. From 1933 he was excluded from the higher councils of the university but was allowed to teach and publish. In 1935 the first part of his future work on logic, entitled *Vernunft und Existenz* (*Reason and Existenz,* 1955), appeared; in 1936 a book on Nietzsche; in 1937 an essay on Descartes; in 1938 a further work preliminary to his logic, entitled *Existenzphilosophie* (*Philosophy of Existence,* 1971). Unlike many other famous intellectuals of that time, he was not prepared to make any concessions to the doctrines of National Socialism. Consequently, a series of decrees were promulgated against him, including removal from his professorship and a total ban on any further publication. These measures effectively barred him from carrying on his work in Germany.

Friends tried to assist him to emigrate to another country. Permission was finally granted to him in 1942 to go to Switzerland, but a condition was imposed by the Nazis that required his wife to remain behind in Germany. He refused to accept this condition and decided to stay with his wife, notwithstanding the dangers. It became necessary for his friends to hide his wife. Both of them had decided, in case of an arrest, to commit suicide. In 1945 he was told by a reliable source that his deportation was scheduled to take place on April 14. On March 30, however, Heidelberg was occupied by the Americans.

Disillusioned by the events of these years, Jaspers withdrew more and more into himself. He revised the *General Psychopathology* in an effort to make it represent the high point of a free but responsible search for knowledge of man, as distinct from science, which had betrayed man. He also completed his work on logic, *Von der Wahrheit* ("Of Truth"), the first part of which was intended to throw the light of reason on the irrational teachings of the times. These works appeared in print in 1946 and 1947.

Postwar development of thought. After the capitulation of Germany, Jaspers saw himself confronted with the tasks of rebuilding the university and helping to bring about a moral and political rebirth of the people. He dedicated all of his energies in the postwar years toward the accomplishment of these two tasks. He also represented the interests of the university to the military powers. He gathered his thoughts on how the universities could best be rebuilt in his work *Die Idee der Universität* (1946; *The Idea of the University,* 1959). He called for a complete de-Nazification of the teaching staff, but this proved to be impossible because the number of professors who had never compromised with the Nazis was too small. It was only gradually that the autonomous university of the pre-Nazi years could once again assert itself in Germany. Jaspers felt that an acknowledgment of national guilt was a necessary condition for the moral and political rebirth of Germany. In one of his best political works, *Die Schuldfrage* (1946; *The Question of German Guilt,* 1947), he stated that whoever had participated actively in the preparation or execution of war crimes and crimes against humanity was morally guilty. Those, however, who passively tolerated these happenings because they did not want to become victims of Nazism were only politically responsible. In this respect, all survivors of this era bore the same responsibility and shared a collective guilt. He felt that the fact that no one could escape this collective guilt and responsibility might enable the German people to transform their society from its state of collapse into a more highly developed and morally responsible democracy. The fact that these ideas attracted hardly any attention was a further disappointment to Jaspers. In the spring of 1948 he accepted a professorship in philosophy in Basel, Switz. In spite of the apparent neglect of Jaspers' ideas of a moral regeneration of the German people, his departure for Basel was regarded as a betrayal by many of the German people. Jaspers himself hoped to find there a peace of mind that might enable him to work through and revise once again his whole approach to the entire field of philosophy.

This revision was guided mainly by the conviction that modern technology in the sphere of communication and warfare had made it imperative for mankind to strive for world unity. This new development in his thinking was defined by him as world philosophy, and its primary task was the creation of a mode of thinking that could contribute to the possibility of a free world order. The transition from existence philosophy to world philosophy was based on his belief that a different kind of logic would make it possible for free communication to exist among all mankind. His thought was expressed in *Der philosophische Glaube* (1948; The *Perennial Scope of Philosophy,* 1949) and *Der philosophische Glaube angesichts der Offenbarung* (1962; *Philosophical Faith and Revelation,* 1967). Since all thought in its essence rests on beliefs, he reasoned, the task confronting man is to free philosophical thinking from all attachments to the transient objects of this world. To replace previous objectifications of all metaphysical and religious systems, Jaspers introduced the concept of the cipher. This was a philosophical abstraction that could represent all systems, provided that they entered into communication with one another by means of the cipher. In other words, the concept of the cipher enabled a common ground to be shared by all of the various systems of thought, thus leading to a far greater tolerance than had ever before been possible. A world history of philosophy, entitled *Die grossen Philosophen* (1957; *The Great Philosophers,* 2 vol., 1962, 1966), had as its aim to investigate to what extent all past thought could become communicable.

Jaspers also undertook to write a universal history of the world, called *Vom Ursprung und Zeit der Geschichte* (1949; *The Origin and Goal of History,* 1953). At the centre of history is the axial period (from 800 to 200 BC), during which time all the fundamental creations that underlie man's current civilization came into being. Following from the insights that came to him in preparing this work, he was led to realize the possibility of a political unity of the world in a 1958 work called *Die Atombombe und die Zukunft des Menschen* (*The Future of Mankind,* 1961). The aim of this political world union would not be absolute sovereignty but rather world confederation, in which the various entities could live and communicate in freedom and peace.

Under the influence of these ideas, Jaspers closely observed, during the latter years of his life, both world politics and the politics of Germany. When the efforts toward democracy in Germany appeared to him to turn more and more into a national oligarchy of parties, he wrote a bitter attack on these tendencies in *Wohin treibt die Bundesrepublik?* (1966; *The Future of Germany,* 1967). This book caused much annoyance among West German politicians of all shades. Jaspers, in turn, reacted to their unfair reception by returning his German passport in 1967 and taking out Swiss citizenship.

At the time of his death in 1969, Jaspers had published 30 books. In addition, he had left 30,000 handwritten pages, as well as a large and important correspondence. (Ha.S.)

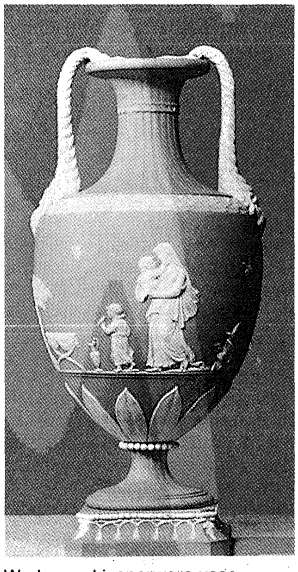
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jasperware, unglazed stoneware introduced by the English potter Josiah Wedgwood in 1775 as the result of a long series of experiments aimed at discovering the techniques of porcelain manufacture. White in its natural state, jasper is stained with metallic oxide colouring agents. The most common shade is pale blue, but dark blue, lilac, sage green, black, and yellow were also used. The earliest jasper was stained throughout and was



Wedgwood jasperware vase, Staffordshire, England, *c.* 1785; in the Victoria and Albert Museum, London
By courtesy of the Victoria and Albert Museum, London

known as "solid," whereas the later varieties were coloured only on the surface and were known as "dip." Decorations, in the Neoclassical style and usually white, were made in separate molds and applied to the body of the piece. Objects made of jasper were varied and included vases, plaques, tableware, cameos, furniture mounts, and portrait medallions. The finest examples of the medallions were modeled by the English sculptor John Flaxman and by Wedgwood's principal modeler, William Hackwood. Outstanding are Wedgwood's 1790 reproductions in jasper of the Portland Vase (excavated from a tomb outside Rome in the early 17th century), one of which is now in the British Museum, London. Jasperware is still produced in the 20th century.

Jassy (Romania): *see* Iaşi.

Jassy, Treaty of (Jan. 9, 1792), pact signed at Jassy (modern Iaşi), in Moldavia, at the conclusion of the Russo-Turkish War of 1787–92; it confirmed Russian dominance in the Black Sea.

The Russian empress Catherine II the Great had entered the war envisioning a partition of the Ottoman Empire between Russia and Austria and a revival of the Byzantine Greek Empire in Istanbul. Her plan failed, however, because of Austria's withdrawal from the war (Peace of Sistova, August 1791) and a lack of organized and massive support from Balkan Christians. The Treaty of Jassy confirmed the earlier Treaty of Küçük Kaynarca (1774) between the two states; it advanced the Russian frontier to the Dniester River, including the fortress of Ochakov, and restored Bessarabia, Moldavia, and Walachia to the Ottomans.

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Jastrun, Mieczysław (b. Oct. 29, 1903, Korolówka, near Tarnopol, Austria-Hungary—d. Feb. 23, 1983, Warsaw), Polish poet and essayist.

Jastrun received his doctorate in Polish literature at the Jagiellonian University of Kraków. The dozen volumes of poems that he published between the two world wars show his growth from an imitator of the poets of the Skamander group to an independent and mature poet with a mastery of form. He survived World War II by remaining in hiding in Warsaw. His wartime poems were published in 1944 under the title *Godzina strzeżona* ("A Curfew Hour"), but his best poems were written after the "thaw" of 1956, as, for instance, *Gorący popiół* (1956; "Hot Ashes") and *Genezy* (1959; "Genesis"). He was also the author of popular biographical novels on such great Polish poets as Adam Mickiewicz (1949) and Jan Kochanowski (1954).

Jastrzębie-Zdrój, city, Katowice *województwo* (province), southwestern Poland. With the cities of Racibórz, Rybnik, and Katowice, Jastrzębie-Zdrój constitutes a secondary industrial zone within Poland's Upper Silesian agglomeration bordering on the Czechoslovakian industrial region of Ostrava. Jastrzębie-Zdrój became popular in the 1860s as a thermal spa whose iodobromide waters were used to treat nervous disorders, rheumatism, and heart diseases. When it received city rights in 1963 its population was 3,000. The discovery of large coking-coal deposits near the city caused a dramatic surge in population within the decade. Pop. (1984 est.) 99,200.

Jászberény, city, located in the Jászberény district, but administratively separate from Szolnok *megye* (county), central Hungary. A market centre, it lies on the Zagyva River, a tributary of the Tisza. It has long been the cultural, economic, and administrative centre of the Jász (or Jazygen) peoples, a steppe tribe that settled there in the early 13th century and mixed with the Kipchaks. (Ten major settlements in the area carry the prefix "Jász"; the area itself is known as Jászság.) For their military services the Jász received special privileges from Béla IV (king of Hungary 1235–70), which were temporarily suspended in 1702 by Leopold I, Holy Roman emperor, who sold the land to the Teutonic Knights. But a few decades later, the Jász and Kipchaks paid a large ransom in gold gulden to redeem their territory, and the privileges continued until 1876. Jászberény preserves two interesting legends. There is a tradition that it was the seat of Attila, king of the Huns (died 453), and that his gold, silver, and iron coffin is sunk in the Zagyva River bed. Located about 40 mi (64 km) east of Budapest, the city's industries include production of machine tools, refrigerators, metals, furniture, textiles, and food processing. Pop. (1985 est.) 31,000.

Jāṭ, peasant caste of northern India and Pakistan. In the 1960s the Jāṭ constituted about one-fifth of the population of Punjab, nearly one-tenth of the population of Baluchistan, Rājasthān, and Delhi, and from 2 to 5 percent of the populations of Sind, Northwest Frontier, and Uttar Pradesh. The 4,000,000 Jāṭ of Pakistan are mainly Muslim by faith; the nearly 6,000,000 Jāṭ of India are mostly divided into two large castes of about equal strength: one Sikh, concentrated in Punjab, the other Hindu.

The Muslim Jāṭ in the western regions are organized in hundreds of groups tracing their descent through paternal lines; they are mostly camel herders or labourers. Those of India and of the Punjabi areas of Pakistan are more often peasant proprietors. The Jāṭ first emerged politically in the 17th century and afterward, having military kingdoms such as Mursān in Uttar Pradesh, Bharatpur in Rājasthān, and Patiāla in Punjab.

Jataí, town, southwestern Goiás state, south central Brazil, lying at the confluence of the Claro and São Pedro rivers at 2,323 ft (708 m) above sea level. Livestock raising is the principal source of income, and agriculture, particularly the cultivation of rice and coffee, is also important. Jataí is linked by highway to Goiânia, the state capital (254 mi [409 km] northeast), and to other cities in Goiás and neighbouring Mato Grosso and Minas Gerais states. Pop. (1980 prelim.) 40,957.

Jātaka (Pāli and Sanskrit: Birth), any of the extremely popular stories of former lives of the



Mṛga ("deer") *Jātaka* showing the Bodhisattva (Buddha-to-be) as a deer, stone bas-relief from Bhārhut, 2nd century BC; in the Indian Museum, Calcutta
By courtesy of the Indian Museum, Calcutta

Buddha that are preserved in all branches of Buddhism. Some *Jātaka* tales are scattered in various sections of the Pāli canon, including a group of 35 that were collected for didactic purposes. These 35 comprise the last book, the *Cariyā Piṭaka* ("Basket of Conduct"), of the *Khuddaka Nikāya* ("Short Collection"). Beyond this, a Sinhalese commentary of the 5th century that is questionably attributed to Buddhagosa and called the *Jātakaṭṭhavaṇṇanā,* or *Jātakaṭṭhakathā,* gathers together 547 *Jātaka* stories, some of which are quite brief while others are as long as novelettes.

Each tale begins by noting the occasion that

prompted its telling and ends with the Buddha disclosing his identity in the present lives of the characters in the narrative. There is humour in these stories and considerable variety. The future Buddha may appear in them as a king, an outcast, a god, an elephant—but, in whatever form, he exhibits some virtue that the tale thereby inculcates.

Many *Jātaka*s have parallels in the *Mahābhārata* ("Great Epic of the Bhārata Dynasty"), the *Pañca-tantra* (animal fables), the *Purāṇa*s (collections of legends), and elsewhere in non-Buddhist Indian literature. Some turn up again in such places as Aesop's fables. The *Jātaka* stories have also been illustrated frequently in sculpture and painting throughout the Buddhist world.

jāti, also spelled JĀT, in India, a Hindu caste. The term is derived from the Sanskrit *jāta,* "born" or "brought into existence," and indicates a form of existence determined by birth. In Indian philosophy *jāti* (genus) describes any group of things that have generic characteristics in common. Sociologically, *jāti* has come to be used universally to indicate a caste group within Hindu society.

Although the lawgivers of the traditional Hindu codes (*Dharma-śāstra*) themselves tend to treat *jāti*s as varṇas (social classes) and try to account on other occasions for *jāti*s as products of alliances between the four varṇas (Brahmans, Kṣatriyas, Vaiśyas, and Śūdras) and their descendants, a sharp distinction should be made between *jāti,* as a limited regional endogamous group of families, and varṇa, as a universal all-Indian model of social class. The official Hindu view gives second place to *jāti* as an aberration of varṇa.

In different parts of India, certain caste groups have sought respectability within the varṇa system by claiming membership in a particular varṇa. Typical and most successful was the claim of the Rājputs that they were the Kṣatriyas, or nobles, of the second varṇa, and, to reinforce their claim, they invented a new lineage (Agnikula, the dynasty of Fire) to coexist side-by-side with the Solar and Lunar lineages of ancient times. Untouchables have adopted caste habits of conduct and sought the status of Śūdra (the lowest class, or varṇa) to escape from their pitiable condition.

The very notion of *jāti* has been under attack by reform-minded Indians. They do not always ask for total abolition but frequently advocate a purification of the system by the reabsorption of the *jāti*s into the original, complementarily functioning varṇas. *See also* varṇa.

Jatki language: *see* Lahnda language.

Jatropha, genus of the spurge family (Euphorbiaceae), native in both New World and Old World tropics; it contains about 125 species of milky-juiced herbs, shrubs, and trees, some useful for their oils or as ornamental plants in tropical gardens. A garden curiosity is tartogo, or gouty jatropha (*J. podagrica*), from Guatemala and Honduras; it has a short trunk that is swollen at the base, erect red clusters of small flowers borne most of the year, and three- to five-lobed palmate (fanlike) leaves. Coral plant (*J. multifida*) from South America is outstanding for its huge, deeply cut, 11-lobed leaves on plants, 3 metres (10 feet) tall, bearing small, coral-red clusters of flowers. Peregrina (*J. integerrima*) from Cuba, about 5 m tall with spadelike leaves sharply lobed at the base, bears crimson flower clusters year-round. *J. berlandieri,* a perennial 30 centimetres (12 inches) tall distributed from Texas to Central America, has long-stalked, purple flowers. Barbados nut (*J. curcas*), with yellow-green flowers and three- to five-lobed leaves on trees 6 m tall from Mexico and Central America, produces seeds from which cooking oil, soap, and a strong purgative are obtained. The seeds themselves are eaten if thoroughly roasted to remove the poison. The lac (a resinous substance) produced by a scale insect that feeds on the leaves is used to make a fine varnish for guitars.



Peregrina (*Jatropha integerrima*)
Walter Dawn

The closely related genus *Cnidosculos* is distinguished from *Jatropha* by the absence of petals in the flowers, though the sepals form a corolla-like bloom.

Jaú, city, central São Paulo state, Brazil, on the Rio Jaú, a tributary of the Rio Tietê, at an altitude of 1,775 ft (541 m) above sea level. It was given town status and made the seat of a municipality in 1866. Coffee, *feijão* (beans), cotton, rice, sugarcane, and a variety of fruits are grown locally. Jaú processes these crops, distills liquor, and also manufactures shoes, ceramics, and electrical appliances. Goods are transported to São Paulo city, the state capital, 168 mi (270 km) southeast, and to neighbouring cities by rail, road, and air. Pop. (1980 prelim.) 59,522.

Jauf, al- (Yemen [San 'a']): *see* Jawf, al-.

Jaunde (people): *see* Yaunde.

jaundice, excess of bile pigments in the bloodstream and bodily tissues. There is a yellow to orange and, sometimes, even greenish discoloration of the skin, the whites of the eyes, and the mucous membranes. Jaundice is best seen in natural daylight and may not be apparent under artificial lighting. The degree of coloration depends on the concentration of bile pigment (bilirubin) in the blood, its rate of tissue diffusion, and the absorption and binding of bilirubin by the tissue. Bilirubin enters the tissue fluids and is absorbed more readily at sites of inflammation and edema (abnormal accumulation of fluids in the tissues). These pigments also seem to favour localization in elastic tissue fibres.

The most common mechanisms causing jaundice are an overproduction of bile by the liver, so that more is in the body than can be readily excreted; congenital defects, which may impair the removal of bile pigments or cause an overproduction; inability of liver cells to remove bile pigments from the blood because of liver disease; leakage of bilirubin removed by the liver back into the bloodstream (regurgitation); or obstruction of the bile ducts. Because the normal liver is capable of removing enormous quantities of bilirubin from the blood, a liver's inability to remove bilirubin indicates severe malfunction.

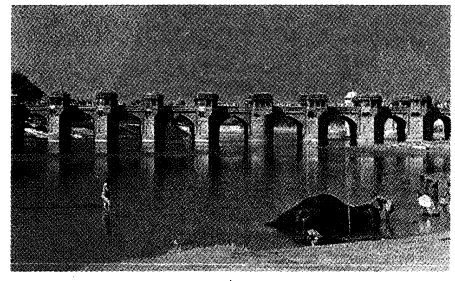
Jaundice is usually classified as either retention jaundice or regurgitation jaundice. In retention jaundice, the pigments are retained in the bloodstream because of some removal problem. Usually this can be clinically diagnosed by finding increased amounts of pigments in the fecal matter but finding none in the urine. With regurgitation jaundice, there is an abnormal leak of bilirubin back into the bloodstream, either after it has been removed from the blood by the liver or else directly from the bile ducts.

Some of the various diseases that can cause jaundice are anemia, congestion in the circulatory system, pneumonia, congenital liver abnormalities, degeneration of the liver cells by poisons or infectious organisms, scarring of the liver tissue (cirrhosis), and obstructions or tumours in the liver, bile ducts, and the head of the pancreas. In a type of jaundice of unknown cause, called idiopathic jaundice, there seems to be a metabolic error in the body. The liver cannot chemically transform bilirubin in the proper manner, resulting in a much darker pigmentation of the liver and body.

In most cases, jaundice is an important symptom of some inherent bodily disturbance, but the retention of bilirubin itself does not usually cause any greater damage than skin discoloration that lasts until the systemic problem is corrected. Regurgitation jaundice, on the other hand, can produce profound secondary disorders. This is generally due to the failure of bile salts to reach the intestinal tract. The bleeding that occurs in the intestines is directly related to the absence of bile salts, for without them the fat-soluble vitamin K cannot be absorbed by the body properly. Without this vitamin, blood clotting is impaired, so that there is a greater tendency for bleeding to occur.

jaundice, infectious: *see* leptospirosis.

Jaunpur, town, administrative headquarters of Jaunpur district, Uttar Pradesh state, northern India, straddling the Gomati River, northwest of Vārānasi (Benares). Jaunpur probably was originally founded in the 11th century but was washed away by Gomati floods. It was rebuilt in 1359 by Fīrūz Shāh Tughluq, whose fort still stands. The city was the capital of the independent Muslim kingdom of the Sharqī dynasty (1394–1479). It was conquered by Akbar in 1559 and fell under British rule in 1775. Jaunpur contains several old mosques, including the Aṭalā Masjid (1408) and the Jāmiʿ Masjid (1478). A splendid bridge, built in the 16th century, spans the Gomati.



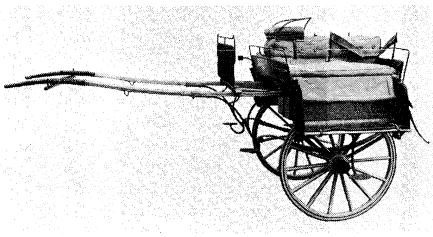
Shāhī Bridge over the Gomati River at Jaunpur, Uttar Pradesh, India
Christina Gascoigne

An important road and rail junction, it is an agricultural market with more than half of its own area devoted to gardening. Perfume is the principal industrial product. The town houses 13 colleges of Gorakhpur University.

Jaunpur district, 1,560 sq mi (4,040 sq km) in area, lies on the Ganges alluvial plain. Almost the entire district is under cultivation, much of it irrigated. Crops include rice, corn (maize), barley, and sugarcane; there is a sugar factory at Shāhganj. The district has suffered greatly from floods and droughts. Pop. (1981) town, 105,140; district, 2,532,734.

jaunting car, also called JAUNTY CAR, or SIDECAR, two-wheeled, open vehicle, popular in Ireland from the early 19th century. It was

unusual in having lengthwise, back-to-back or face-to-face passenger seats. The light, horse-drawn cart carried four passengers (although



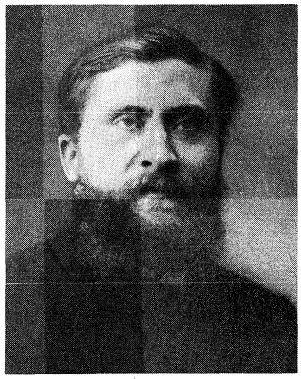
Jaunting car, early 19th century; in the Science Museum, London

By courtesy of the Science Museum, London, Crown copyright reserved

the earliest versions carried more). It usually had a narrow, forward-facing driver's seat.

Jauregg, Julius Wagner, Ritter von (knight of): *see* Wagner-Jauregg, Julius.

Jaurès, (Auguste-Marie-Joseph-)Jean (b. Sept. 3, 1859, Castres, Fr.—d. July 31, 1914, Paris), French socialist leader, cofounder of the newspaper *L'Humanité,* and member of the French Chamber of Deputies (1885–89, 1893–98, 1902–14); he achieved the unification of several factions into a single socialist party, the Section Française de l'Internationale Ouvrière. During the war fever of July 1914, he was assassinated by a young fanatic who believed that Jaurès's pacifism was playing into the hands of imperial Germany.



Jaurès

H. Roger-Viollet

Jaurès was born into a lower middle-class family that had been impoverished by business failures. He excelled in secondary school and was given a scholarship to attend the École Normale Supérieure in Paris. After passing his qualifying examination, Jaurès taught at the lycée of Albi from 1881 to 1883, and from 1883 to 1885 he was a lecturer at the University of Toulouse.

A convinced republican and a brilliant orator, Jaurès was more attracted to politics than to teaching and in 1885 was elected deputy from the Tarn. As he did not yet belong to any party, he took his seat in the centre of the Chamber. His election prompted the parents of the girl he loved, Louise Bois, to consent to their marriage. Madame Jaurès received as her dowry a handsome rural estate of 91 acres (37 hectares). Because his own political creed disclaimed the ownership of private property, Jaurès was often reproached for his possession of this estate.

Jaurès's untidy personal appearance provided his enemies with much material for ridicule. Short and obese, he was described as having the appearance of "a teacher who does not exercise or a fat merchant who overeats." Yet no one ever accused him of vulgarity.

Defeated in the 1889 elections, Jaurès returned to teaching at the University of Toulouse, and in 1891 he received his doctorate of philosophy. In 1892 he supported the striking miners of Carmaux, and that constituency elected him deputy to the Chamber in 1893. By this time he had become a socialist, though without accepting all of Karl Marx's ideas. Rather, of the five schools of French socialism, he chose the least revolutionary, the Independent Socialists, led by Alexandre Millerand.

During the campaign on behalf of Captain Alfred Dreyfus, who had been convicted of treason and given a life sentence at hard labour on the basis of what later turned out to be forged evidence, Jaurès joined those demanding a revision of the trial. His position was not approved by the Marxist socialists, who did not believe that a socialist should defend a man who was both an officer and a member of the middle class. His book *Les Preuves,* asking for Dreyfus' retrial and rehabilitation, caused his defeat in the elections of 1898. Temporarily retired from national politics, Jaurès began to compile his monumental *Histoire socialiste de la Révolution française* (1901–07; "Socialist History of the French Revolution"). This work, written "under the triple inspiration of Marx, Plutarch and Michelet," gave new impetus to studies on France's revolutionary period.

In spite of their dispute over the Dreyfus affair, the different socialist factions became reconciled and held their first joint congress in 1899. But, after Millerand agreed to join the leftist government dedicated to securing the republic headed by René Waldeck-Rousseau, the socialists divided into two groups: those who refused to cooperate with the government and advocated class war founded the Socialist Party of France (Parti Socialiste de France), and those who preached reconciliation with the state, headed by Jaurès, formed the French Socialist Party (Parti Socialiste Français). At this time Jaurès wrote many articles supporting Waldeck-Rousseau's policy of reform. After his reelection in 1902, he continued to support the leftist bloc within the Chamber of Deputies.

In 1904 Jaurès was cofounder of the newspaper *L'Humanité,* in which he continued to espouse the principles of democratic socialism. That same year, the congress of the Second International, held in Amsterdam, condemned socialist participation in bourgeois governments, thus rejecting Jaurès's position. He acquiesced in the decision, and in 1905 the two French socialist parties joined together to form the Section Française de l'Internationale Ouvrière (SFIO). This party remained in opposition to the government, with the result that the reform policies originally advocated by Waldeck-Rousseau were not carried out. Jaurès's authority continued to grow within the party, though, and, on the eve of World War I, the majority of the SFIO were won over to his reformist ideas.

He fought the supremacy of the German Social Democratic Party in the Second International and, in order to deprive it of its revolutionary reputation, confronted it at the Congress of Stuttgart in 1907 with his formula "insurrection rather than war." This statement, though, did not completely summarize the whole of his political thought; he strove for the adoption of a system that would ensure "peace through arbitration" and recommended a prudent policy of "limitation of conflicts." He therefore opposed colonial expansion, such as the French invasion of Morocco, because it provided a source of international conflicts.

Hostile to the Franco-Russian alliance and suspicious of the Franco-British alliance because it seemed to be directed solely against Germany, Jaurès became the champion of Franco-German rapprochement; as Germany was France's traditional enemy, his position earned him the hatred of French nationalists. His passion for reconciliation ultimately led to his tragic death. Up to the last moment, however, he was actively exhorting the European governments to avert a world war and to settle peacefully the conflict that followed the archduke Ferdinand's assassination at Sarajevo in June 1914. On the very day of his own assassination, Jaurès was considering an appeal to President Woodrow Wilson of the United States for help in solving this crisis.

Jaurès was a man of enormous literary, philosophical, and historical erudition, as well as of great eloquence. His capacity for self-sacrifice enabled him to put aside his own political beliefs in order to achieve the unification of factions into a single socialist party.

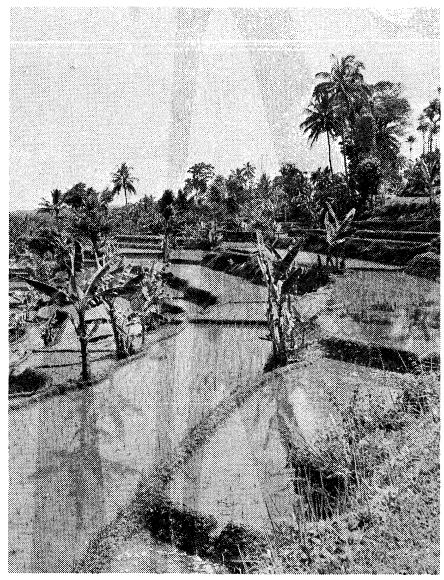
Aside from his gifts as a political organizer, Jaurès was well known for his personal generosity, intelligence, and tenacity of purpose. An excellent scholar and polemicist, he wrote throughout his entire career. Apart from *La Guerre franco-allemande 1870–1871* (1908; "The Franco-German War"), *L'Armée nouvelle* (1910; "The New Army"), which set forth an effective plan for organizing an armed nation and contained a famous study of the concept of the fatherland, and his two doctoral theses, the remainder of Jaurès's works are collections of articles and speeches.

(C.H.)

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Java, also spelled DJAWA, or JAWA, Indonesian island lying southeast of Malaysia and Sumatra, south of Borneo (Kalimantan), and west of Bali. Java is only the fourth largest island in the Republic of Indonesia but contains more than half of the nation's population and dominates it politically and economically. Java's area, including offshore Madura Island, is 51,038 square miles (132,187 square km). The capital of Java and of the republic is Jakarta (formerly Batavia), which is also Indonesia's largest city.

Administratively, Java is composed of three *provinsi* (provinces)—Jawa Barat (West Java), Jawa Tengah (Central Java), and Jawa Timur (East Java)—as well as Jakarta Raya (Greater Jakarta) *daerah khusus Ibukota* (special capital district) and Yogyakarta *daerah istimewa*



Terraced rice fields on the island of Java, Indon.

Waldo E. Austin—Black Star

(special district), both of which are administratively considered as provinces.

History. The site of Trinil on Java is famous for the discovery there in 1891 of fossilized remains of *Homo erectus,* or "Java man," and indicates that the island was the site of human activity as early as 800,000 years ago. The colonization of Java apparently took place from mainland Southeast Asia, and domestic agriculture is known to have been practiced there as early as 2500 BC. Indian traders began arriving in Java from about the 1st century AD, and the resulting Hindu Indian influence developed and flowered in the kingdom of Mataram in the 8th century AD. The Mataram kingdom was centred in south-central Java and was ruled by the Shailendra dynasty. Although originally followers of Śaivite Hinduism, the Mataram dynasty's later kings accepted Mahāyāna Buddhism. From this era, in the late 9th and early 10th centuries, date the great Buddhist monuments constructed at Borobuḍur, Mendut, and many other sites in Java.

As the power of Mataram declined, a state in eastern Java briefly gained prominence until it came into conflict with the powerful Śrivijaya empire of the island of Sumatra and was thus destroyed in 1006. The king Erlangga managed to reunite and reinvigorate this state during his reign (1019–49), however. During Erlangga's reign, literature and the arts flourished, and the Hindu epics were translated from Sanskrit into Javanese for the first time, thus opening the way for the diffusion of Hindu thought among the common people. Erlangga divided his kingdom between his two sons, of whom the ruler of Kediri (along the Brantas River) became the more powerful. This area remained the centre of Javanese culture until the 13th century (while western Java remained under Śrivijaya rule). The Kediri kingdom became an entrepôt for the spice trade, and Muslim traders from India as well as Chinese merchants visited its ports.

The political centre of Java then moved to the kingdom of Singhasāri, in the Malang Highlands of eastern Java. The greatest king of this dynasty was Kertanagara (*q.v.;* reigned 1268–92), who unified Java and extended his power to southern Borneo, Bali, and other eastern islands. Upon Kertanagara's inopportune death, his kingdom collapsed and was succeeded by the Majapahit empire of eastern Java, which was founded in 1293. The Majapahit dynasty gained control of most of the Indonesian archipelago, including even the former Śrivijayan territories in Sumatra. The architect of this mighty empire was the prime minister Gajah Mada (*q.v.;* reigned 1331–64). The Majapahit dynasty began to decline in the late 14th century, however, and it most likely fell early in the 16th century, when the last vestige of Indo-Javanese rule was destroyed by the followers of Islām.

Muslim traders had visited the Indonesian archipelago for centuries, but it was only in the 15th century that the Majapahit kingdom was seriously affected by competition from them. As the Muslim international trade network in the region grew, the coastal Javanese faced the choice of fighting or joining the Muslims, and many eventually did the latter. A number of Javanese ports in eastern Java thus broke away completely from the moribund Majapahit empire in the early 16th century. Several Muslim kingdoms were also established in central and western Java, in part because the Sundanese in western Java, less influenced by Hindu colonization in earlier times, adapted Islām more rapidly. Padjang, Mataram, Preanger, Cheribon, and Bantam all became independent Muslim states in Java in the 16th century. One of these states, Mataram, the last great Javanese kingdom, achieved dominance over eastern and central Java in the 1580s.

Dutch ships first visited Java in 1596, and the Dutch East India Company soon established trading posts on the coast, along with a headquarters at the town of Batavia (Jakarta), which came under Dutch control in 1619. Beginning in the 1670s, the Dutch East India Company began to assert its control over Java's various Muslim kingdoms; the states of western Java recognized the company's sovereignty in the last quarter of the 17th century, and the north-central and northeastern districts followed suit in 1743. In 1755, what remained of the Mataram kingdom was broken up into two Dutch vassal states, Surakarta and Jogjakarta. Java's peasantry grew rice, indigo, sugar, pepper, and coffee under a system of forced deliveries that the Dutch levied on the native aristocracy.

The Dutch East India Company ceased to exist in 1799, and the Dutch government took over the administration of Java. After a brief period of British rule in 1811–16, the island returned to Dutch rule. A serious Javanese revolt in 1825–30 against the Dutch was suppressed at great expense. Throughout the 19th century, Java was the most intensively developed and closely governed of all the islands of the Dutch East Indies, and it quite naturally became the focus of Indonesian nationalism in the early 20th century. Beginning in 1903, the Javanese were admitted to a steadily increasing part in local government, and in 1925 Indonesians were given a majority in the *volksraad* (people's council). Java was occupied by the Japanese from 1942 to 1945 during World War II. Java became part of the newly independent Republic of Indonesia in 1950.

The land. Java is 661 miles (1,064 km) long from east to west and ranges in width from about 60 miles (100 km) at its centre to more than 100 miles (160 km) near each end. A longitudinal mountain chain, surmounted by many volcanoes, runs east to west along the island's spine and is flanked by limestone ridges and lowlands. Java is highly volcanic, yet serious eruptions are few; only 35 of its 112 volcanoes are active. In the west the volcanic peaks are clustered together, becoming more widely spaced in the central and eastern parts of the island. The highest volcano is Mount Semeru, at 12,060 feet (3,676 m). A series of discontinuous plateaus lies south of the volcanic belt and reaches an elevation of about 1,000 feet (300 m).

Most rivers in Java run northward, since the central mountains that form their watershed lie somewhat closer to the southern than to the northern coast. Some rivers do run southward, however. The largest rivers on the island are the Solo and the Brantas, in Java's eastern portion. These and many smaller rivers are a source of water for irrigation but are navigable only in the wet season, and then only by small boats.

Java's climate is generally hot and humid throughout the year. Maximum temperatures are found in the plains along the northern coast, but in the mountains it is much cooler. The high humidity often makes the climate debilitating. The northwest monsoon season, from November to March, is rainy and cloudy, while the southeast monsoon, from April to October, brings some rain but generally is sunny. Annual rainfall at Jakarta averages about 69 inches (1,760 mm). The average daily maximum temperature at Jakarta is 86° F (30° C), and the minimum is 74° F (23° C). At Tosari (elevation 5,692 feet [1,735 m]) in the interior highlands, the highs and lows average 72° F (22° C) and 47° F (8° C). Java's soils are very fertile because of periodic enrichment by volcanic ash.

Java's rich vegetation is southern Asian, with Australian affinities; more than 5,000 species of plants are known. Dense rain forests abound on the damp slopes of the mountains, while thick bamboo woods occur in the west. The island's fruit trees include banana, mango, and various Asian species. Teak, rasamala, and casuarina trees and bamboo occur in forest stands, together with sago palms and banyan trees. Teakwood is one of Java's major exports.

Among the island's fauna are the one-horned rhinoceros, tiger, and banteng (wild ox), though these species are now restricted to the more remote areas. The island is also home to monkeys, wild pigs, and crocodiles; about 400 species of birds; 100 species of snakes; 500 species of butterflies; and many types of insects.

The people. Java's inhabitants belong to the oceanic, or southern, branch of the Mongoloid geographic race. The island is inhabited by three major ethnic groups, the dominant Javanese, the Sundanese, and the Madurese, and by two smaller groups, the Tenggerese and the Badui. The Javanese constitute approximately 70 percent of Java's population and live primarily in the central and eastern portions of the island. The Sundanese live mainly in the west, while the Madurese live in the east and on Madura Island. All three groups speak Malay languages, and most are Muslims.

Java is one of the world's most densely populated areas. The island averages nearly 2,000 persons per square mile (770 per square km) and has the majority of Indonesia's population on only 7 percent of the total land area of the republic. Java's rate of population growth has been and remains quite high; from an estimated 5 million people in 1815, the population had grown to about 100 million in the late 20th century. Most of Java's population remains rural, but its cities have nevertheless grown at a rapid rate. The chief cities are Jakarta, Bandung, Semarang, Surabaya, Surakarta, and Yogyakarta. The rural population density is highest in the south-central plains and the northern plain.

The economy. More than two-thirds of the island's land area is under cultivation, and the primary food crop is wet rice. An elaborate irrigation network of canals, dams, aqueducts, and reservoirs has greatly contributed to the island's rice-growing capacity over the centuries. Other crops, also mostly grown in lowland areas on small peasant landholdings, are corn (maize), cassava, peanuts (groundnuts), soybeans, and sweet potatoes. Terraced hillslopes and irrigated rice paddies are familiar features of the landscape. Kapok, sesame, vegetables, bananas, mangoes, durian fruits, citrus fruits, and vegetable oils are produced for local consumption. Tea, coffee, tobacco, rubber, and cinchona (the source of quinine, and grown in the highlands of western Java); sugarcane and kapok (raised in the eastern part of the island); and coconuts are exported. Several of these cash crops at a time are usually grown on large family estates. Livestock, especially water buffalo, is raised primarily for use as draft animals. Salted and dried fish are imported, and fish farming is carried on in ponds and rice fields of central and western Java. Java produces most of the world's supply of quinine.

Oil is drilled mainly in the Arjuna fields off the northwestern coast; a natural-gas pipeline links these fields with Cilegon. There are petroleum refineries at Cilacap, Jepu, and Surabaya; there is also limited mining of manganese, sulfur, phosphate, gold, and silver. Small-scale manufactures include batik printing, iron founding, silverwork, agricultural tools, tanning, and the production of tiles and other ceramics. Larger industries consist of textiles, rubber manufacturing, auto assembly, brewing, and factories producing shoes, paper, soap, cement, and cigarettes. The Jatiluhur Dam near Purwakarta is the largest in Indonesia. A well-developed rail and highway network links the principal cities. A govern-

ment-owned radio network is headquartered in Jakarta, which is also the site of an international airport. Surabaya and Tanjungpriuk (near Jakarta) are the principal ports.

Cultural heritage. Indo-Javanese architecture, which extends from the 3rd to the 16th century, includes such monuments as the gigantic stupa of Borobudur (*c.* 800) and the temple of Mendut; the Buddhist temple Sewu (9th century); the magnificent Śiva temple Prambanan (9th century); the holy bathing places of Jalatunda (late 10th century) and Belahan (mid-11th century); and the round Hindu temple of Jabung (*c.* 10th century). Pop. (1988 est.) 105,560,200.

Java cotton: *see* kapok.

Java jute (plant): *see* roselle.

Java kapok (fibre): *see* kapok.

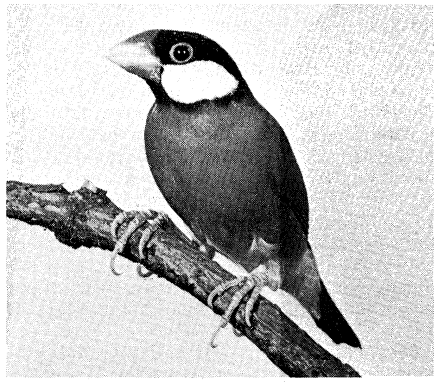
Java man, extinct hominid known from fossil remains found in Java. The skullcap and thighbone, discovered by E. Dubois in 1891 at Trinil, by the Solo River, were the first known fossils of the species *Homo erectus.* Dubois, however, originally classified his find as *Pithecanthropus erectus.* Other fossils from Sangiran and the remains of an infant from Modjokerto (found 1936) indicate that *H. erectus* occupied Java during the middle Pleistocene Epoch (about 1,000,000 to 500,000 years ago). Java man was characterized by a cranial capacity averaging 900 cubic centimetres (which is lower than those of later specimens of *H. erectus*), a skull flat in profile with little forehead, a sagittal ridge on top of the head for attachment of powerful jaw muscles, an occipital torus, very thick skull bones, heavy browridges, a large palate, and a massive jaw with no chin. The teeth are essentially human although with some simian characters, such as large, partly overlapping canines. Thighbones show that Java man walked fully erect, like modern man, and attained a height of about 5 feet 8 inches (1.72 m). The Modjokerto infant skull (age at death about five years) already shows large browridges and a retreating forehead. Java man predates Peking man (*q.v.*) and is usually considered somewhat more primitive.

Java Sea, Indonesian LAUT JAWA, portion of the western Pacific Ocean between the islands of Java and Borneo. It is bordered by Borneo (Kalimantan) on the north, the southern end of Makassar Strait on the northeast, Celebes and the Flores and Bali seas on the east, Java on the south, the Sunda Straits to the Indian Ocean on the southwest, Sumatra on the west, and the islands of Bangka and Billiton (bordering the South China Sea) on the northwest. The sea measures about 900 miles (1,450 km) east-west by 260 miles (420 km) north-south and occupies a total surface area of 167,000 square miles (433,000 square km). It covers the southern section of the 690,000-square-mile (1,790,000-square-kilometre) Sunda Shelf. A shallow sea, it has a mean depth of 151 feet (46 m). The almost uniform flatness of the sea bottom and the presence of drainage channels (traceable to the mouths of island rivers) indicate that the Sunda Shelf was once a stable, dry, low-relief land area (peneplain) above which were left standing a few monadnocks (granite hills that by virtue of their resistance to erosion form the present islands). During the glacial stages of low sea levels, at least parts of the shelf were exposed above the sea to serve as land bridges for Asiatic fauna to migrate into western Indonesia. From September through May surface currents in the sea flow west. For the rest of the year they trend eastward. The large discharge from rivers on the surrounding islands tends to lower salinity levels in the sea.

The southern section of the sea floor has long been considered to have geologic similarities with northern Java, in which oil fields occur. Successful exploratory wells have proved that these fields extend under the sea. Prospects are also favourable for oil fields in the waters off southeast Kalimantan.

The sea was the scene of a battle of World War II between the Allies and the Japanese. Fought on Feb. 27, 1942, the encounter resulted in a serious defeat for Allied naval forces; they lost five ships in the battle, and the next day Japanese forces were able to begin their invasion of the island of Java.

Java sparrow, also called RICEBIRD (species *Padda oryzivora*), bird of the mannikin group in the family Estrildidae (order Passeriformes), one of the best-known cage birds. It is an attractive pet that chirps and trills. Native to



Java sparrow (*Padda oryzivora*)
Horst Bielfeld—Bavaria-Verlag

Java and Bali, it has become established in the wild elsewhere in Asia. Also called paddy bird, it may form large flocks that damage grain. It is 14 cm (5.5 inches) long and mostly gray, with pinkish underparts, a large white ear patch, and a stout, red bill.

Java Trench, also called SUNDA DOUBLE TRENCH, deep submarine depression in the eastern Indian Ocean, located generally 190 miles (305 km) off the southwestern coasts of the islands of Sumatra and Java, Indonesia. The trench extends for more than 1,600 miles (2,600 km) from northwest to southeast. Its slopes exceed 10° and descend to a maximum depth of 24,440 feet (7,450 m), the deepest point in the Indian Ocean. Much of the Java Trench is at least partially filled by sediments, particularly the section paralleling the Sunda Island arc, a group of islands in an active volcanic zone. For about one-half its length, south of Sumatra, the trench is divided into two parallel troughs by an underwater ridge. To the northwest the Java Trench merges with a system of islands and continental shelves that eventually extend into the Ganges River delta.

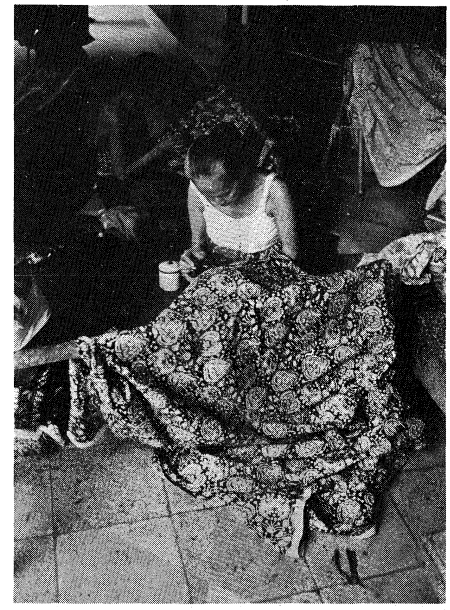
Javacheff, Christo: *see* Christo (Javacheff).

Javādi Hills, range of hills, one of the larger of the Eastern Ghāts, northern Tamil Nādu state, southeastern India. About 50 miles (80 km) wide and 20 miles (32 km) long, they are bisected into eastern and western sections by the Cheyyār and Agaram rivers, tributaries of the Pālār. They consist of bluish gray granites, with peaks averaging 3,600–3,800 feet (1,100–1,150 m). Their steep southeastern flanks are forested with sandalwood. The hills are sparsely populated; grains, legumes, and oilseeds are the chief crops.

Javanese, Indonesian ORANG DJAWA, largest ethnic group on the island of Java, Indonesia. Their language, spoken by more than 71 million people, belongs to the Austronesian (Malayo-Polynesian) family, as do those of neighbouring but different groups such as the Sundanese of southwest Java and the Madurese of northeast Java. The Javanese are Muslim, though Hindu traditions of an earlier era are still evident and relatively few Javanese carefully observe Muslim precepts. Belief in spirits is widespread.

Traditional Javanese social organization varied in structure from relatively egalitarian villages to the highly stratified society of the cities, with their complex court life. These differences found linguistic expression in styles of speech that vary according to status differences between the persons speaking: an informal style, a polite style, an extremely polite style, and several others. These styles are more elaborate in Javanese than in other languages of the area and are used habitually.

The growth of large cities in Java has produced an urban proletariat, mostly of rural origin, who live in makeshift huts in enclosed neighbourhoods called *kampongs.* Javanese villages are compact groups of single-family houses, generally built of bamboo, surrounding a central square. Though rice is the main food crop, a variety of others are produced, including corn (maize), cassava, peanuts (groundnuts), and soybeans.



Javanese woman embroidering cloth
Carl Purcell

The Javanese family is typically composed of parents and dependent children, though it may include other close relatives. Most first marriages are arranged by the parents; but divorce is easy, and women are relatively free to leave their husbands.

Javanese language, member of the Western, or Indonesian, branch of the Austronesian (Malayo-Polynesian) language family, spoken as a native language by more than 68 million persons living primarily on the island of Java. The largest of the Austronesian languages in number of speakers, Javanese has several regional dialects and a number of clearly distinct status styles. Of the latter the greatest difference is between the *ngoko* (informal) and the *krama* (deferential) styles. When neither of these is suitable, the *madya* (middle) style is used; other styles, less often used, are the *krama inggil* (highly deferential) and the *basa kedaton* (palace language).

Javanese has a written tradition dating from about 750, influenced by Indian and Islāmic literatures and in turn influencing Malay, Balinese, and other Indonesian literatures. It is written in an alphabet derived from the southern Pallava script. Little has been published in Javanese because of efforts to develop literature in Bahasa Indonesia (Malay), after its

adoption as the national language of the Republic of Indonesia, of which Java is a part.

Javanthropus, original genus name assigned to Solo man, now widely considered a subspecies of *Homo erectus*. *See* Solo man.

Javari River, Portuguese RIO JAVARI, Spanish RÍO YAVARÍ, river that rises on the border between Amazonas state, Brazil, and Loreto department, Peru. It flows northeast for 540 miles (870 km) to join the Amazon River near the Brazilian outpost of Benjamin Constant. The river follows a winding course through unbroken tropical rain forest in which there are only a few very small riverbank clearings. It is navigable for launches almost to its source. The old Brazilian spelling was Javary.

javelin, also called JAVELINA (mammal): *see* peccary.

javelin throw, athletics, or track-and-field, sport of throwing a spear for distance, included in the ancient Greek Olympic Games as one of five events of the pentathlon competition.

The javelin that is used in modern international men's competition is a spear of wood or metal with a sharp metal point. It is constructed in accordance with a detailed set of specifications published by the International Amateur Athletic Federation. Its overall length



Throwing the javelin (Franklin W. Held, U.S.)
Guillermo Guzman West

must be at least 260 cm (8 feet 6.25 inches) and its weight at least 800 gm (1 pound 12.25 ounces). The women's javelin is somewhat shorter and lighter—a minimum 220 cm long and 600 gm in weight.

After a short run, the javelin is thrown directly forward with an over-the-shoulder motion into a 29° sector marked on the field. It must land point first. The thrower's body may not rotate a full turn (360°) before the javelin is released, and he may not step on or beyond a line at the end of the runway.

Scandinavian athletes dominated the first 50 years of men's javelin competition. Sweden conducted the first national championship in the event in 1896, and Swedish and Finnish athletes held the world record until 1953. A women's javelin event was added to the Olympic program in 1932. In 1964 Terje Pedersen (Norway) became the first man to exceed 91 m (300 feet), and Elvira Ozolina (U.S.S.R.) the first woman to exceed 61 m (200 feet). *See* Sporting Record: *Athletics*. *See also* Olympic Games.

Javorníky, mountains in central Czechoslovakia, on the western fringe of the Carpathian Mountains and forming part of the boundary between Moravia and Slovakia. The ridge of the Javorníky peaks—the highest, at 3,514 feet (1,071 m), is Velký Javorník, overlooking the village of Velké Karlovice—divides the Bečva-Oder river systems to the north and west from the Váh River to the east. Climate and altitude encourage sheep raising, and winter sports thrive throughout the region.

jaw, either of a pair of bones that form the framework of the mouth of vertebrate animals, usually containing teeth and including a movable lower jaw (mandible) and fixed upper jaw (maxilla). Jaws function by moving in opposition to each other and are used for biting, chewing, and the handling of food.

The mandible consists of a horizontal arch, which holds the teeth and contains blood vessels and nerves. Two vertical portions (rami) form movable hinge joints on either side of the head, articulating with the glenoid cavity of the temporal bone of the skull. The rami also provide attachment for muscles important in chewing. The centre front of the arch is thickened and buttressed to form a chin, a development unique to man and some of his recent ancestors; the great apes and other animals lack chins.

The upper jaw is firmly attached to the nasal bones at the bridge of the nose; to the frontal, lacrimal, ethmoid, and zygomatic bones within the eye socket; to the palatine and sphenoid bones in the roof of the mouth; and at the side, by an extension, to the zygomatic bone (cheekbone), with which it forms the anterior portion of the zygomatic arch. The arched lower part of the maxilla contains the upper teeth. Inside the body of the bone is the large maxillary sinus.

In the human fetus and infant both the upper and lower jaws have two halves; these fuse at the midline a few months after birth.

Among the invertebrates, arthropods often have modified limbs that function in jaw action. In the subphylum Chelicerata (*e.g.*, pycnogonids, arachnids), the pincers (chelicerae) may be used as jaws and are sometimes aided by pedipalps, which are also modified appendages. In the subphylum Mandibulata (crustaceans, insects, and myriapods), the jaw limbs are the mandibles and, to some extent, the maxillae. Such limbs may be modified for other purposes, especially in insects. Horseshoe crabs (and perhaps the extinct trilobites) can chew food with toothed projections (gnathobases) at the bases of the walking legs, but these are not considered true jaws.

Other important examples of invertebrate jaw structures are: in rotifers, the mastax of the pharynx; in polychaete worms, the jaws of the proboscis; in brittle stars, the five triangular oral jaws; in leeches of the order Gnathobdellida, the three toothed plates in the pharynx; and in cephalopods (*e.g.*, octopuses), strong, horny, parrotlike beaks. For a depiction of the human jaw, shown in relation to other parts of the body, *see* the colour Trans-Vision in the PROPAEDIA: Part Four, Section 421.

Jawa (Indonesia): *see* Java.

Jawa Barat, English WEST JAVA, *provinsi* (province), western Java, Indonesia. It is bounded by Jawa Tengah (Central Java) province on the east, the Indian Ocean on the south, the Java Sea on the north, and the Sunda Strait on the west. It has an area of 17,877 square miles (46,300 square km) that includes a few small offshore islands.

The landscape of Jawa Barat is dominated by a chain of volcanoes, both active and extinct, that includes from west to east Mounts Sanggabuwana (6,596 feet [1,919 m]), Gede (9,705 feet), Pangrango (9,905 feet), Kendang (8,556 feet), and Tjereme (10,098 feet). A series of these volcanoes cluster together to form a great tangle of upland that also includes the Priangar Plateau, which has an elevation of about 1,000 feet (300 m), and consists of almost horizontal, gently folded limestone. The plateau extends for more than 100 miles (160 km) along the southern coast and fronts a relatively narrow strip of coastal lowlands. Along the northern shore of the province is a wider coastal plain of alluvium developed by the weathering of lava and ash into fertile soils; much of the province's population is concentrated here. The northern coastal lowlands are drained by the Manuk, Bekasi, and Berang rivers flowing into the Java Sea, and the southern coastal lowlands by the Wulan, Laki, Sadea, and Letuh rivers flowing into the Indian Ocean. Jawa Barat's original lowland forests have been entirely removed, leaving farmlands and patches of grassland, village woodlots, and scattered trees. The mountains and uplands have a dense growth of tropical rain forests comprising teak, sal (*Shorea*), eucalyptus, rhododendron, juniper, banyan, oak, ash, maple, and ironwood.

Agriculture dominates the economy of the province, and cultivated lands are extensively irrigated and double cropped. Rice, sugarcane, corn (maize), cassava, peanuts (groundnuts), and quinine (from cinchona bark) are produced; rubber is grown at elevations of from 300 to 1,500 feet (90 to 460 m). The province's industrial products include textiles, processed food, wood carving and furniture, paper, tanned goods, printing, chemicals, and the machinery for the manufacture of leather goods, metal goods, and transport equipment. A network of roads and railways links Bandung, the capital of the province, with Sukabumi, Bogor, Serang, Jakarta, and Cirebon. The Javanese are the largest ethnic group, followed by Sundanese and Badui, and almost all are Muslims. Pop. (1988 est.) 33,084,700.

Jawa Tengah, English CENTRAL JAVA, *provinsi* (province), central Java, Indonesia. It is bounded by Jawa Barat (West Java) province on the west, the Java Sea on the north, Jawa Timur (East Java) province on the east, the Indian Ocean on the south, and Yogyakarta *daerah istimewa* (special district) on the southeast. Jawa Tengah covers an area of 13,207 square miles (34,206 square km) and includes the Karimunjawa Islands in the Java Sea.

A chain of volcanic mountains runs west to east through the central part of the province and is surmounted by volcanic peaks including Mounts Slamat (11,247 feet [3,428 m]), Sundoro (10,285 feet), Sumbing (11,060 feet), and Merbabu (10,335 feet). A discontinuous series of plateaus flanks the widely spaced volcanic peaks and merges with the foothills and coastal lowlands (the latter as much as 20 miles [30 km] wide) to the north and south. The major streams include the Bodri, Serang, and Luri, flowing northward into the Java Sea, and the Seraju, Bogowonto, Elo, and Progo, flowing southward into the Indian Ocean. The hilly region has a luxuriant growth of casuarina, teak, pine, oak, maple, and ironwood. The broad valleys are covered with tropical rain forests of palm, sal (*Shorea*), and pandanus, together with orchids, mosses, and ferns.

The principal means of livelihood in Jawa Tengah is agriculture; rice, tobacco, sugarcane, corn (maize), rubber, tea, coffee, cinchona bark, sweet potatoes, and fruits and vegetables are grown or collected. Industries produce textiles, ceramics, footwear, tires, electric bulbs, processed food, beverages, nonmetallic mineral products, transport equipment, and paper. There are also printing, shipbuilding, and car-assembly plants. Roads and railways run parallel to the northern and southern seacoasts and connect Semarang, the provincial capital, with Tegal, Pekalongan, Magelang, Cilacap, and Surakarta. Muslim Javanese and Sundanese are the principal ethnic groups, and there also are many Indians and Chinese. Archaeological and historical remains, including

temples, stupas, monasteries, and sanctuaries of the early Buddhist and Hindu periods, are located at Kalasan, Dieng, Borabudur, Sewu, Sukuh, Sari, Plaosan, Pawon, and Mendut. Pop. (1988 est.) 27,961,700.

Jawa Timur, English EAST JAVA, *provinsi* (province), eastern Java, Indonesia. It is bounded by the province of Jawa Tengah (Central Java) on the west, the Java Sea on the north, the Indian Ocean on the south, and the Bali Strait on the east. It has an area of 18,503 square miles (47,922 square km) and includes the Madura, Kangean, Sapudi, Raas, Sepanjang, Bawean, and Masalembo-Besar islands in the Java Sea.

A series of great volcanic cones, including the highest one, Mount Arjuno, rising to 10,955 feet (3,339 m), runs lengthwise through Jawa Timur from west to east. The cones constitute an upland zone that acts as a barrier to communication. Broad valleys, roughly one every 20–30 miles (30–50 km) and mostly covered with volcanic debris, separate the volcanic peaks. Repeated replenishment of the fertility of the soil with lava and ash has occurred in the Surakarta, Madiun, Kediri, and Malang basins, which as a result are heavily populated and intensively cultivated. A discontinuous series of plateaus flanks the volcanic belt in the south, extends for more than 100 miles (160 km) along the coast, and becomes progressively more barren toward the drier east. The northern flank comprises the Kapur Utara Mountains; these are limestone highlands that extend eastward into Madura Island and stand in contrast to the province's highly fertile northern coastal plain.

Faulting and folding have caused most of the streams to drain northward toward the sheltered inner Java Sea. The Solo and Brantas rivers have extended their drainage basins deep into the southern uplands. The other major streams include the Baru, Puger, Madiun, Geneng, and Sampean. The uplands (barring their eastern margin) and the valley slopes are covered with teak, ebony, catechu, pine, oak, maple, and ironwood. The river basins are bordered by a dense growth of bamboo thickets, and the coastal lowlands are dotted with casuarina and herbaceous plants.

Agriculture is the main source of livelihood for most of the population. Rice is grown on terraced slopes; other crops, including tea, coffee, rubber, corn (maize), spices, tobacco, sugarcane, copra, cassava, and natural fibres, are raised on unterraced slopes and in coastal lowlands. Kapok and cinchona are grown on the highlands. Industries include shipbuilding, automobile assembly, textile milling, metalworking, petroleum, and the manufacture of machinery, glass, chemicals, leather and rubber goods, transport equipment, paper, processed food, and beverages. An oil refinery is located in Wonokromo, and a fertilizer plant is at Gresik. There is a network of roads and railways linking Surabaya (capital of the province), Pasuruan, Mojonerto, Kediri, Blitar, and Malang. The offshore island of Madura has a railway running parallel to the western half of the southern coast, as well as a network of roads. The Javanese and Madurese are the major ethnic groups and are Muslims. There are a large number of Balinese, Indians, and Chinese. Early Hindu and Buddhist bathing places, cave hermitages, temples, and images of gods are located at Jalatunda, Kediri, Balahan, Jago, Singosari, Panataran, Surawana, Trawulon, and Gunung Penanggungan. Pop. (1988 est.) 32,606,700.

Jawara, Sir Dawda Kairaba (b. May 16, 1924, Barajally, MacCarthy Island, The Gambia), politician and veterinarian who was The Gambia's prime minister from 1962 to 1970 and its president from the latter year.

The son of a Mande trader, Jawara was educated at a Methodist boys' school and completed a science course at Achimota College in Ghana in 1948. He studied veterinary medicine at the University of Glasgow in Scotland and qualified as a veterinary surgeon in 1953. Returning to The Gambia, he became principal veterinary officer of that British colony in 1957. Jawara had become interested in politics, and in 1959 he joined the Protectorate People's Party. He changed its name to the People's Progressive Party and became its leader. In the elections of 1960 he won a seat in the Gambian legislature and was appointed minister of education in the government. He resigned his ministerial post in 1961 when the British government picked a rival Gambian leader as the country's interim prime minister preparatory to new elections.

The People's Progressive Party won the general elections of 1962, and Jawara became The Gambia's prime minister. He led his country into independence from Great Britain three years later. Under his leadership, the tiny nation of The Gambia became one of Africa's few successful parliamentary democracies; Jawara's ruling People's Progressive Party won five successive elections (1966, 1972, 1977, 1982, 1987) under completely free conditions after independence in 1965. Jawara served as president from 1970, when a republican constitution was adopted to replace the former monarchy under the British sovereign. He was knighted in 1966.

Jawf, al-, town and oasis, northern Saudi Arabia. It lies at the northern edge of an-Nafūd desert near the source of the Wadi as-Sirḥān. Formerly considered a part of the Jabal Shammar region, the oasis now lies within the northern reaches of the Hejaz. The town is strategically located on an ancient caravan route between the Mediterranean Sea and the Indian Ocean, and it has long been an important caravan stop between the Syrian Desert and the Arabian Peninsula. It is also an agricultural centre, producing dates, cereals, fruits, and vegetables. Pop. (1974) 60,534.

Jawf, al-, also spelled AL-JAUF, oasis region, western Yemen. It is bordered by the far-southwest extension of the Rubʿ al-Khali, the great sandy desert of the Arabian Peninsula. The Wadi al-Jawf, an intermittent stream with headwaters in the mountains of the Yemen Highlands, crosses the area; its western and southern branches are small perennial streams.

Al-Jawf was the core area of one of the most ancient of the South Arabian kingdoms, the state of Maʿīn (*c.* 1000 BC–2nd century BC). From their capital, Qarnaw, the Minaeans of Maʿīn ruled over large sections of the southern Arabian Peninsula. The oases of al-Jawf were a fertile and densely populated area, with many towns. After the conquest of Yemen by the ʿAbbāsids in the 9th century AD, however, the power centres of Yemeni civilization moved to the west, and the region was neglected. In modern times al-Jawf was one of the last areas to remain under royalist control in the Yemeni civil war of 1962–70. The oases, now only sparsely settled, support nomadic tribes; camel raising and the pasturing of sheep and goats are the chief economic activities. Al-Jawf was once renowned for fine purebred Arabian horses.



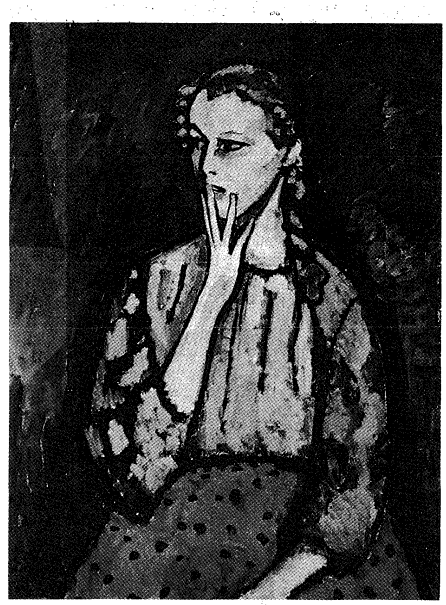
Yemenite soldier standing in the ruins of a Minaean temple near Maʿīn, al-Jawf, Yemen

Lynn Abercrombie

Jawlensky, Alexey von (b. March 13, 1864, Torzhok, Russia [now Russian S.F.S.R.]—d. March 15, 1941, Wiesbaden, Ger.), Russian painter noted for his Expressionistic portraits and the mystical tone of his late paintings of abstract faces.

In 1889 Jawlensky gave up an established career in the Russian Imperial Guard to study painting under the Russian historical painter Ilya Repin. In 1896, disenchanted with realism, he moved to Munich, where he met the Expressionist painter Wassily Kandinsky, who remained a lifelong influence. While in France in 1905, he worked with the Fauvist painter Henri Matisse, whose flat areas of vibrant colour exerted a further influence on his work.

Back in Munich, Jawlensky joined the Neue Künstlervereinigung ("New Artists' Association," known as the NKV), a loose affiliation of Expressionist artists. He was more sympathetic, however, to the NKV's splinter group,



"Portrait of a Girl," oil painting by Alexey von Jawlensky, 1909; in the Kunstmuseum, Düsseldorf, Ger.

By courtesy of the Kunstmuseum, Dusseldorf, Ger.

Der Blaue Reiter ("The Blue Rider"), led by Kandinsky. Jawlensky's association with Der Blaue Reiter led to such works as his "Mme. Turandot" (1912), in which flat areas of vibrant Fauve colour are outlined with simple, thickened contours to produce rich and daring colour harmonies.

During World War I Jawlensky painted his "Variations," numerous paintings of the view from his window, which exhibit a new calm, meditative mood that culminates in the semi-abstract faces he began to paint in 1917. A devout man, Jawlensky imbued these frontally viewed faces, such as his "Looking Within Night" (1923), with a mystical intensity that has led them to be compared to the icons of the Russian Orthodox church.

In 1924 Jawlensky joined Kandinsky, Paul Klee, and Lyonel Feininger in forming a short-lived association called Der Blaue Vier ("The Blue Four"). He exhibited with them for some years, but in the 1930s crippling arthritis forced him to abandon painting.

jawless fish, any of numerous primitive, fishlike, jawless vertebrates comprising the class Agnatha, which includes the lampreys, hagfishes, and some extinct groups. *See* hagfish; lamprey.

Jaworski, Leon (b. Sept. 19, 1905, Waco, Texas, U.S.—d. Dec. 9, 1982, Wimberly, Texas), American lawyer who rose to national prominence on Nov. 5, 1973, when he was sworn in as Watergate special prosecutor and made constitutional history when he convinced the U.S. Supreme Court that President Richard M. Nixon was bound to obey a subpoena and turn over 64 White House tapes needed for testimony in the trial of Watergate defendants. (*See* Watergate Scandal.) The release of the tapes revealed to the U.S. Senate investigators Nixon's long-standing involvement in the cover-up of the 1972 burglary at Democratic national headquarters by members of his reelection staff and led to Nixon's resignation.

The son of a Polish immigrant father and an Austrian immigrant mother, Jaworski graduated from high school at 15 and, on a scholarship, attended Baylor University, from which he took a law degree in 1925. In that year he became the youngest person ever to be admitted to the Texas bar, and over the years he became a prominent Texas attorney.

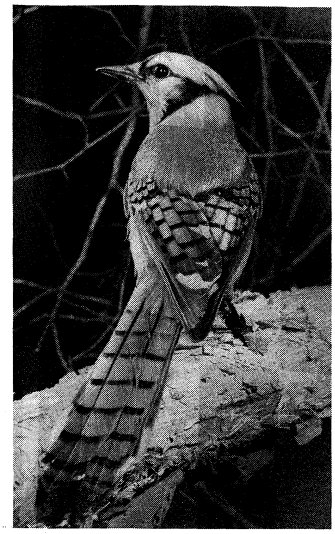
He served the government as a prosecutor in the 1945–46 Nürnberg trials of Nazi war criminals. In 1960 he handled the litigation that allowed Lyndon B. Johnson to run simultaneously for the Senate and the vice presidency. The highlight of Jaworski's career, however, was as the dauntless Watergate special prosecutor who resolutely pursued Nixon. Jaworski's controversial decision not to prosecute Nixon, however, angered much of the public and some members of the White House staff. Jaworski explained, if the "court asked me if I believed Nixon could receive a prompt, fair trial . . . I would have to answer, as an officer of the court, in the negative." Jaworski resigned as special prosecutor on Oct. 25, 1974, and never argued another court case after the landmark *United States* v. *Nixon*. He did, however, act as counsel to the government in the 1977–78 House investigation of the "Koreagate" bribery scandal.

Jaworzno, city, Katowice *województwo* (province), south-central Poland. It was founded in the 18th century when rich deposits of zinc and lead ore and beds of coal were discovered nearby. It is an important coal-mining and industrial city in eastern Upper Silesia, with large chemical factories and several massive electricity-generating stations, as well as a ceramic kiln and cement plant. Pop. (1987 est.) 96,800.

jaw's harp: *see* Jew's harp.

jay, any of about 35 to 40 bird species belonging to the family Corvidae (order Passeriformes) that inhabits woodlands and is known for its bold, raucous manner. Most are found in the New World, but several are Eurasian. Jays are nearly omnivorous; some are egg-stealers, and many store seeds and nuts for winter use. They make a twiggy, cuplike nest in a tree. After breeding, most species are gregarious.

The 30-centimetre (12-inch) blue jay (*Cyanocitta cristata*), blue and white with a narrow black neckline, is found in North America east of the Rockies; westward it is replaced by the dark-blue, black-crested Steller's jay (*C. stelleri*). Another conspicuous and abundant jay, found throughout western North America and in Florida, is the scrub jay (*Aphelocoma coerulescens*), locally called "blue jay" but lacking a crest. The Eurasian jay (*Garrulus glandarius*) occurs over most of the continental Old World except sub-Saharan Africa; about 33 cm (13 inches) long, it is pinkish brown, with blue-and-black-barred shoulders,



Blue jay (*Cyanocitta cristata*)
John H. Gerard

white rump, and white wing-patches. Among brightly coloured forms in tropical America is the green jay (*Cyanocorax,* sometimes *Xanthoura, yncas*).

For the "blue jay" of southern Asia, *see* roller.

Jay, John (b. Dec. 12, 1745, New York City—d. May 17, 1829, Bedford, N.Y., U.S.), a founding father of the United States who served the new nation in both law and diplomacy. He established important judicial precedents as first chief justice of the Supreme Court (1789–95) and negotiated the Jay Treaty of 1794, which settled major grievances with Great Britain and promoted commercial prosperity.

A successful New York attorney, Jay deplored the growing estrangement between the colonies and the mother country, fearing that independence might stir up violence and mob rule. Nevertheless, once the revolution was launched, he became one of its staunchest supporters. As a delegate to the First Continental Congress (1774) in Philadelphia, he drafted *The Address to the People of Great Britain,* stating the claims of colonists. He helped assure the approval of the Declaration of Independence (1776) in New York, where he was a member of the provincial Congress. The following year he helped draft New York's first constitution, was elected the state's first chief justice, and in 1778 was chosen president of the Continental Congress.

In 1779 Jay was appointed minister plenipotentiary to Spain, which had joined France in openly supporting the revolutionaries against Britain. His mission—to borrow money and to gain access to the Mississippi River—proved abortive, and he was sent in May 1782 to join Benjamin Franklin in Paris as



Jay, oil painting on wood by John Trumbull, 1793; in the Yale University Art Gallery
By courtesy of the Yale University Art Gallery

joint negotiator for peace with Great Britain. In undercover talks with the British he won surprisingly liberal terms, which were later included essentially intact in the Treaty of Paris (Sept. 3, 1783), which concluded the war.

On his return from abroad, Jay found that Congress had elected him secretary for foreign affairs (1784–90). Frustrated by the limitations on his powers in that office, he became convinced that the nation needed a more strongly centralized government than was provided for by the Articles of Confederation, and he plunged into the fight for ratification of the new federal Constitution, framed in 1787. Using the pseudonym Publius, he collaborated with Alexander Hamilton and James Madison by writing five essays for *The Federalist*—the classic defense of the new governmental structure. In 1789 President George Washington appointed Jay the country's first chief justice, in which capacity he was instrumental in shaping Supreme Court procedures in its formative years. His most notable case was *Chisholm* v. *Georgia,* in which Jay and the court affirmed the subordination of the states to the federal government. Unfavourable reaction to the decision led to adoption of the Eleventh Amendment, denying federal courts authority in suits by citizens against a state.

In 1794 Washington sent Jay as a special envoy to Great Britain to help avert war over accumulated grievances. The commercial agreement, called the Jay Treaty (November 19), aroused a storm of protest among the Jeffersonian Republicans, who denounced it as a sellout by pro-British Federalists. Mobs burned Jay in effigy, and opponents denounced him as a traitor. Before the negotiations, Jay at one time had been considered a leading candidate to succeed Washington, but the unpopular treaty ruined whatever chances he had for the presidency. New York Federalists, however, elected him governor (1795–1801), an office from which he retired to spend 27 years uneventfully on his farm.

BIBLIOGRAPHY. Frank Monaghan, *John Jay* (1935, reissued 1972), is a well-written biography. Richard B. Morris, *Witnesses at the Creation: Hamilton, Madison, Jay, and the Constitution* (1985), characterizes the three men and analyzes the events surrounding the writing of the *Federalist* papers.

jay-thrush (bird): *see* laughing thrush.

Jay Treaty (Nov. 19, 1794), agreement that assuaged antagonisms between the United States and Great Britain, established a base upon which America could build a sound national economy, and assured its commercial prosperity.

Negotiations were undertaken because of the fears of Federalist leaders that disputes with Great Britain would lead to war. In the treaty Britain, conceding to primary American grievances, agreed to evacuate the Northwest Territory by June 1, 1796; to compensate for its depredations against American shipping; to end discrimination against American commerce; and to grant the U.S. trading privileges in England and the British East Indies. Signed in London by Lord Grenville, the British foreign minister, and John Jay, U.S. chief justice and envoy extraordinary, the treaty also declared the Mississippi River open to both countries; prohibited the outfitting of privateers by Britain's enemies in U.S. ports; provided for payment of debts incurred by Americans to British merchants before the American Revolution; and established joint commissions to determine the boundaries between the U.S. and British North America in the Northwest and Northeast.

By February 1796 the treaty, with the exception of the article dealing with West Indian trade, had been ratified by the U.S. and Great

Britain. France, then at war with England, interpreted the treaty as a violation of its own commercial treaty of 1778 with the U.S. This resentment led to French maritime attacks on the U.S. and between 1798 and 1800 to an undeclared naval war. Finally, the commissions provided for by the Jay Treaty gave such an impetus to the principle of arbitration that modern international arbitration has been generally dated from the treaty's ratification.

Jaya, Mount, Bahasa Indonesia PUNCAK JAYA, formerly PUNTJAK SUKARNO, GUNUNG CARSTENSZ, or MOUNT CARSTENSZ, highest peak on the island of New Guinea, in the Sudirman Range, western central highlands. Located in the Indonesian part of New Guinea, known as Irian Jaya, the 16,500-ft (5,030-m) Ngga Palu summit is the highest in the southwestern Pacific and the highest island peak in the world. It marks the terminus of a glacier-capped ridge 8 mi (13 km) long that extends eastward from Ngga Pilimsit (formerly Mt. Idenburg). The ridge, which falls sheer for 10,000 ft on its northern and southern slopes, presents great walls of ice. Although the snowfield of Puncak Jaya was reached as early as 1909 by a Dutch explorer, Hendrik A. Lorentz, the peak was not climbed until 1962, by an expedition led by an Austrian mountaineer, Heinrich Harrer.

Jayadeva (fl. late 12th century, Bengal, India), Indian author of the celebrated Sanskrit poem *Gītagovinda* ("Song of the Cowherd"), which helped to popularize devotional Hinduism.

Born in the village of Kenduli, he was the son of Bhojadeva, a Brahmin, and married to Padmāvatī. He was attached to the court of King Lakṣmaṇasena (reigned *c.* 1178–*c.* 1205) at Navadvīpa.

The *Gītagovinda* describes the love of Krishna, the divine cowherd, for Rādhā, his favourite among the *gopīs* (wives and daughters of the cowherds). The poem presents in dramatic form the lovers' attraction, estrangement, yearning, and final reconciliation through the help of a *sakhī* (female confidant). The poem blends recitative stanzas with 24 short songs and leans heavily on alliteration, lyricism, and grace of image for its effect.

Jayadeva has for several centuries been honoured at an annual festival at his birthplace, during which his poem is recited. Songs from the *Gītagovinda* also continue to be sung in temples, during festivals, and at *kīrtana*s (communal worship through song).

Jayapura, also spelled DJAJAPURA, formerly SUKARNAPURA, or HOLLANDIA, city, *kabupaten* (regency), and capital of Irian Jaya *propinsi* (West Irian province), eastern Indonesia, on the northern coast of the island of New Guinea. It is a port on Teluk (bay) Jos Sudarso (Humboldt Bay) at the foot of the Pegunungan (mountains) Cycloop (7,087 ft [2,160m]). During World War II the Japanese established an air base there; U.S. forces took the area in 1944 and Hollandia became the headquarters of Gen. Douglas MacArthur. Industries now produce furniture, textiles, beverages, chemicals, and transport equipment. It has an airport and is the site of the Universitas Cenderawasih (founded 1962). Pop. (1980) city, 149,618; regency, 151,308.

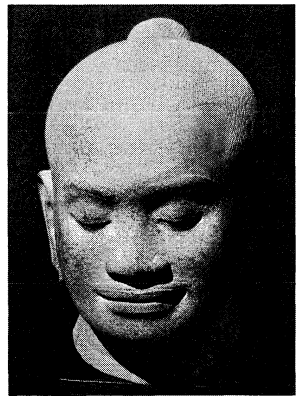
Jayavarman II, posthumous name PARAMESVARA (literally, Supreme Lord) (b. *c.* 770—d. 850, Hariharalaya, Cambodia), founder of the Khmer, or Cambodian, Empire and outstanding member of the series of rulers of the Angkor period (802–1431). Among Jayavarman II's accomplishments were the deification of the Cambodian monarchy, the establishment of the *devarāja* cult as the official state religion, and the reunification of the old kingdom of Chenla, which he expanded and formed into the Khmer Empire.

Possibly of Khmer descent, Jayavarman II came from Java, where he had been in captivity or exile, to succeed to the throne as Java's vassal around 800. An unwilling puppet, he defied the Javanese and asserted Khmer independence in 802, when he also was installed under Hindu rites as *devarāja* (*q.v.*), or god-king. He established a series of capitals, first at Indrapura, on the lower Mekong River east of Kâmpóng (Kompong) Cham; then, moving northwards, at Hariharalaya, southeast of present-day Siĕmréab (Siem Reap); and then at Mahendraparvata, in the region just north of the Tonle Sap (Great Lake), not far from Angkor, the next seat of the Khmer Empire, which remained its capital for 600 years.

Articles are alphabetized word by word, not letter by letter

Jayavarman VII (b. *c.* 1120/25—d. *c.* 1215/19), one of the most forceful and productive kings of the Khmer (Cambodian) Empire of Angkor (reigning 1181–*c.* 1215). He expanded the empire to its greatest territorial extent and engaged in a building program that yielded numerous temples (including Angkor Thom), highways, rest houses, and hospitals.

Early life. Jayavarman was born into the royal family of Angkor. He married a very



Jayavarman VII, sandstone sculpture found at Preah Khan, Kampong Svay, Cambodia, 12th century; in the Musée National, Phnom Penh

By courtesy of the Musee National de Phnom Penh, Cambodia; photograph, Guy Nafilyan

religious and strong-minded princess named Jayarajadevi, who exerted an important influence on him, both before he gained the throne and during the early years of his reign. Following her death he married her older sister, a very pious and learned woman whom he had previously installed as the head professor in an important Buddhist monastery.

Though practically nothing is known of Jayavarman's childhood and youth, it is clear that during his late 30s and early 40s he settled in the neighbouring kingdom of Champa, in what is now the central region of Vietnam. At the time of the death of his father, King Dharanindravarman II (ruled 1150–60), Jayavarman was engaged in a military campaign in Champa, and, after the accession of his brother (or possibly his cousin), Yasovarman II (ruled 1160–66), he chose to remain there, returning to Cambodia only when he received word that a palace rebellion was in progress. Although Jayavarman arrived at Angkor too late to prevent the murder of Yasovarman and the accession of the rebel Tribhuvanadityavarman (ruled 1166–77), he decided to remain in his homeland and to await an opportunity to assert his own claim to the throne.

Some 12 years later, when Jayavarman was in his late 50s, that opportunity came as a result of a Cham invasion, which brought about the demise of Tribhuvanadityavarman, the sacking of Angkor, and its subjection to foreign rule. In this situation Jayavarman organized a struggle for independence and in less than five years' time succeeded in driving out the invaders and establishing his hegemony over all his Cambodian rivals. Finally in 1181, at the age of 61, he was crowned king of a reconstituted Khmer Empire and began a brilliant reign of more than 30 years, during which he brought the empire to its zenith, both in terms of territorial expansion and of royal architecture and construction.

Jayavarman's building program. During his reign Jayavarman continued his military activities, bringing Champa, southern Laos, and portions of the Malay Peninsula and Burma under his control. But increasingly he devoted his energies and organizational capacities to the kind of religious and religio-political construction projects that had been carried on by his royal predecessors. He built a large number of awesome new temples, including the Bayon, a distinctively Mahāyāna Buddhist central pyramid temple designed to serve as the primary locus of the royal cult and also as his own personal mausoleum; personal funerary temples of the Mahāyāna type, which were dedicated to his mother and father; and a series of provincial temples, which housed reduced replicas of the Royal Buddha—*i.e.*, Jayavarman represented with the attributes of the Buddha, the original of which had been set up in the Bayon. He rebuilt the city of Angkor, now known as Angkor Thom, and rebuilt and extended the system of highways, which radiated outward from the Bayon and the royal palace and reached far into the provinces. In addition, he constructed more than 100 rest houses along these roads and built more than 100 hospitals, which he dispersed throughout his kingdom and placed under the protection of Baiṣajyaguru Vaiḍūryaprabhā, the Great Buddha of Healing.

Jayavarman seems to have been obsessed with the need for rapid and extensive construction. For example, the less than careful workmanship evident in the temples attributed to Jayavarman's reign vividly points to the great haste with which they were built. Some scholars have suggested that the almost frantic sense of urgency associated with Jayavarman's works derived from the fact that, having begun his reign at a relatively advanced age, he felt that his time was short and had to be utilized to the fullest. Others have suggested that Jayavarman's concern to carry through such a vast program of largely Buddhist-oriented construction was greatly encouraged by Jayarajadevi and her sister, both of whom dedicated a tremendous amount of energy toward gaining support for Buddhism and specifically for building Buddhist temples. And finally, if scholars are correct in their surmise that Jayavarman suffered from the dread disease of leprosy, his concern to mitigate his sin and suffering through the accumulation of great merit may have given a still further impetus to his piety and zealousness. Whatever his true motivations, Jayavarman succeeded during his lifetime in creating a legacy that few monarchs in history (Khmer or otherwise) have been able to equal; he was more than 90 years old when he died.

Modern reputation. Despite the importance of Jayavarman VII in the history of the Angkor kingdom, no memory of him was preserved in the later Cambodian chronicles. In modern times, however, as archaeological studies generated popular interest in his reign, Jayavarman VII became a kind of paradigmatic national hero, who was credited not only with establishing the full greatness of the Cambodian nation but also with bringing into being a welfare state that was motivated by Buddhism and dedicated to serving both the spiritual and the physical needs of the

Cambodian people. Scholars, however, have sought to maintain a more balanced view of Jayavarman, recognizing the obvious immensity of his accomplishments but also taking account of the fact that the overweening demands which he placed on the material and human resources of his kingdom were a major factor in its subsequent loss of creativity and its eventual demise. (F.E.R.)

BIBLIOGRAPHY. The classic treatment, which utilizes all of the available data concerning Jayavarman VII, is found in the chapter devoted to him in George Coedes, *Pour mieux comprendre Angkor*, 2nd rev. ed. (1947; abridged Eng. trans., *Angkor: An Introduction*, 1963). In addition, the role of Jayavarman and his work within the broader context of Khmer history are discussed in Lawrence Palmer Briggs, "The Ancient Khmer Empire," *Trans. Am. Phil. Soc.*, New Series, 41:11–295 (1951); and in Christopher Pym, *The Ancient Civilization of Angkor* (1968).

Jayawijaya Mountains, Bahasa Indonesia PEGUNUNGAN JAYAWIJAYA, or PEGUNUNGAN DJAJAWIDJAJA, formerly ORANGE RANGE, eastern section of the Maoke Mountains (*q.v.*), part of the central highlands of New Guinea. Located in the Indonesian part of New Guinea, known as Irian Jaya, the range extends for 230 mi (370 km) east of the Sudirman Range to the Star Mountains and the border with the Australian-administered part of the island. The range's highest point is Mt. Wilhelmina, 15,512 ft (4,728 m).

Jaza'ir, al- (city, Algeria): *see* Algiers.

Jazīrah, al- (Arabic: Island), the northern reaches of Mesopotamia, important as an ancient and medieval crossroads linking Iraq, Anatolia, Syria, Armenia, and Iran. It was valued for its agricultural products, local industrial goods, and commercial activity.

Al-Jazīrah, a rolling and irregular plateau (800–1,500 feet [240–460 metres] above sea level), lies between the Euphrates and Tigris rivers, defined in the north by the Jabal Sinjār (Mount Sinjār) and separated from Iraq proper along a line between Takrīt and Anbar. There were already numerous towns and markets along both rivers at the beginning of the Christian Era, when al-Jazīrah was divided between the Byzantine and Persian empires. Under both Umayyad and ʿAbbāsid tutelage, al-Jazīrah was a centre of conflict and uprisings. Such groups as the Shīʿīs (partisans of the fourth caliph ʿAlī, who agitated for the recognition of his descendants as the sole legitimate contenders for the caliphate) and the Khārijites (a militant moralistic group demanding that the caliphate be open to all qualified Muslims) fought the authorities in Damascus or Baghdad from al-Jazīrah. Late in the 9th century al-Jazīrah even attained semi-autonomy, acknowledging the suzerainty of the Ṭūlūnids of Egypt, but it was retaken by the ʿAbbāsids in 892. In the 10th century al-Jazīrah came under the rule of a succession of independent dynasties: the Ḥamdānids of Mosul (905–991); the Būyids of Baghdad (977–983); the Marwānids in Diyār Bakr (983–1085); the ʿUqaylids in Mosul (*c.* 992–1096). After a brief period as part of the Seljuq empire (1085–92), the districts of al-Jazīrah pursued separate existences.

The history of the largest district, Diyār Rabīʿah in eastern al-Jazīrah, henceforth became identical with that of its capital, Mosul. The Zangids, the Mamlūks, the Persian Il-Khans, the Jalāyirids, the Turkmen Kara Koyunlu and Ak Koyunlu, and the Persian Ṣafavids ruled the area in succession until it was finally absorbed into the Ottoman Empire in 1637. With the dissolution of the empire in 1918, Diyār Rabīʿah was divided between Syria and Iraq.

Diyār Muḍar, a frontier region in the west, briefly separated into two kingdoms late in the 11th century: the crusader Armenian state at Edessa in the north and the Turkish Muslim kingdom at Harran in the south. Zangī's capture of Edessa in 1144 returned Diyār Muḍar to Muslim control. In the 15th century Turkmen tribes made increasing inroads into Diyār Muḍar, and the Ak Koyunlu finally took it *c.* 1402. The district became part of the Ottoman Empire early in the 17th century and since 1918 has been divided between Turkey and Syria.

The chaotic state of the Seljuq empire in 1092 afforded several Turkmen tribes the chance to set themselves up in Diyār Bakr, the northernmost district. The Mongol invasion of the mid-13th century left the minor cities as Mongol vassals. After a brief period under the Persian Ṣafavids (1507–16), Diyār Bakr came under Ottoman rule (1516–1918). Its capital, Āmid (modern Diyarbakır, Tur.), flourished as a literary and scholarly centre. Upon the collapse of the Ottoman Empire, the district was absorbed into the Republic of Turkey.

In modern Iraq, al-Jazīrah is the uncultivated gypsum desert in the north, between the Tigris and Euphrates rivers, occupied almost entirely by the camel- and sheep-raising nomads of the Shammar and Dulaym tribes.

Jazīrah, al-, also spelled EL-GEZIRA, *mudīrīyah* (province), Central Region, central Sudan, covering an area of 13,536 sq mi (35,057 sq km). It is bounded by the provinces of al-Khartūm on the north, al-Baḥr al-Abyaḍ on the west, an-Nīl al-Azraq on the south, and Kassalā on the east; until 1975 it was the northeastern part of the former an-Nīl al-Azraq province. The Blue Nile runs northwestward through the central part of the province. It is joined by the Nahr (river) ad-Dindar at the southern border of al-Jazīrah and by the Nahr ar-Rahad east of Wad Madanī. The impervious clay soils of the plain limit irrigation and settlements to the river's edge. Water for the Jazīrah (Gezira) irrigation scheme is supplied from the Sennār and ar-Ruṣayris dams in an-Nīl al-Azraq province by a 2,700 mi (4,300 km) network of canals and ditches. Heavier rainfall in the east produces a dry savanna with a permanent cover of short grass, small thorny trees, and scattered large trees.

The Blue Nile historically was a route for trade with Asia and for invasion by Egypt, which occupied Nubia around 1550 BC. The area came under the control of the 25th, or Kushite Egyptian dynasty (*c.* 750) which became the kingdom of Meroe in about 590 BC. In the mid-4th century AD the area passed under Axumite rule and became largely Christianized. After 1504, when the region was conquered by the Funj dynasty of Sennār with Arab assistance, the populace converted to Islām. The Funj were conquered by Muḥammad ʿAlī's Egyptian Army in 1821. In 1881 al-Mahdī, a religious reformer and Sudanese political leader, rebelled and established a theocratic state with its capital at nearby Khartoum. The Mahdists were defeated (1898) by Anglo-Egyptian forces under General Kitchener. It remained part of the Anglo-Egyptian Condominium until Sudan's independence in 1956.

Most of the population of al-Jazīrah province engages in agriculture, and crops include cotton, cereals, oilseeds, peanuts (groundnuts), wheat, sesame, *durra* (sorghum), *dukhn* (millet), and vegetables. A hydroelectric plant is located at Wad Madanī. Industries produce ginned cotton, sesame seed and peanut oils, cigarettes, leather goods, soap, and processed foods. Wad Madanī, the provincial capital, is linked with al-Ḥuṣayḥiṣah and al-Kamītīn by road and railway. Most of the people are Arabs whose first language is Arabic; the Nubas are the only minority. Pop. (1976 est.) 1,978,000.

Jazīrat aṭ-Ṭawīlah (Iran): *see* Qeshm.

jazz, musical form, often improvisational, developed by Afro-Americans and influenced by both European harmonic structure and African rhythmic complexity. It also is often characterized by its use of blues and speech intonations.

A brief treatment of jazz follows. For full treatment, *see* MACROPAEDIA: Musical Forms and Genres.

Although it is not known exactly when jazz emerged, there were plantation brass bands as early as 1835, and minstrel troupes were touring by the 1840s. Ragtime, a syncopated music that took its formal structure from the march, developed in the 1890s and is considered the forerunner of jazz. Composed piano rags by Scott Joplin and others achieved wide popularity. (The "stride" style of pianists such as James P. Johnson and Fats Waller was a later East Coast development of ragtime.) The earliest jazz band style developed in New Orleans, a city with a long, racially mixed, cultural tradition. Starting in the late 1890s, Charles "Buddy" Bolden's band is thought to have played ragtime with improvised embellishments, and by the turn of the century many New Orleans bands were playing in a collective improvisational style. That music was copied by the Original Dixieland Jass Band, a white group that was the first to record (1917).

Leading early 1920s groups included the New Orleans Rhythm Kings and the Jelly Roll Morton and King Oliver bands, whose highly contrapuntal music was more smoothly flowing than ragtime. It included improvised solos, which in the playing of Louis Armstrong (trumpet) and others led to the development of the Chicago style in the later 1920s. Larger ensembles, often using written orchestrations, then appeared. Groups led by Fletcher Henderson (with scores by Don Redman), Paul Whiteman (with cornetist Bix Beiderbecke), Chick Webb, Jimmie Lunceford, and Benny Moten developed swing, characterized by a regular rhythm and the contrasting sounds of the sections of the band. Swing culminated in the music of groups led by Count Basie, Benny Goodman, Artie Shaw, and the Dorsey brothers. Through the activities of such men as Art Tatum (piano), Roy Eldridge (trumpet), and Lester Young (tenor saxophone), solo improvisation grew in influence during this period, which also produced Billie Holiday, generally considered to be the greatest singer in the history of jazz.

One of the most important of the late swing musicians was Duke Ellington, who, like Morton in the New Orleans style, shaped his musicians' improvisations on his original themes into strongly coloured, finely balanced compositions. The tradition of composing continued through later phases of jazz, in the work of Thelonius Monk, John Lewis, George Russell, and others.

Bebop, or bop, was the first major postwar style. Its chief developers were Charlie Parker (alto saxophone) and John Birks "Dizzy" Gillespie (trumpet), whose improvisations on chord changes, played against unpredictable accents and complex cross-rhythms, had a new intensity. Cool jazz, some of which, like the playing of Stan Getz (tenor saxophone) and the ensembles of Gerry Mulligan (saxophone), arose out of Young's music, developed partly as a reaction against bebop. Other post-bop developments included the music of Lennie Tristano (piano), the Modern Jazz Quartet, Gil Evans, who wrote orchestrations for the Claude Thornhill band, Miles Davis (trumpet), and the West Coast school. A less formal type of group interaction was evident in such bands as those of Horace Silver and Art Blakey, together with a stronger emphasis on the blues and greater prominence for the drums, in a music called hard bop.

Following initiatives by Russell, Tristano, and Charles Mingus, Davis introduced modal jazz in his recording *Kind of Blue* (1959). Ornette Coleman (alto saxophone), John Coltrane and Albert Ayler (tenor saxophone), and others developed a new emotional intensity in their playing, rejecting conventional jazz harmonies and melodies in favour of screeches, wails, and soaring cascades of notes played against irregular but driving rhythmic accompaniments. In moving away from European influences, jazz attained—with Don Cherry, Don Ellis, and others—fusions with music of other cultures, especially the music of India and the Arab world.

A counter-tendency during the 1970s was the use of devices, particularly rhythmic ones, taken from rock. This led jazz musicians to experiment with electronic instruments, most successfully in the groups Weather Report and the Mahavishnu Orchestra. A different trend was unaccompanied improvisation by melody instruments. The tradition of the "free-form" jazz of the 1960s was carried on by pianist Cecil Taylor and by groups such as the Art Ensemble of Chicago.

jazz dance, any dance to jazz accompaniments, composed of a profusion of forms. Paralleling the birth and spread of jazz itself from roots in U.S. black society, and popularized in ballrooms by the big bands of the swing era (1930s and 1940s), it radically altered the style of U.S. and European stage and social dance in the 20th century. The term is sometimes used more narrowly to describe (1) popular stage dance (except tap dance) and (2) jazz-derived or jazz-influenced forms of modern dance. It excludes social dances lacking jazz accompaniment; *e.g.,* the rumba and other Latin-American dances.

Jazz dance developed from both 19th- and 20th-century stage dance and traditional black social dances and their white ballroom offshoots. On the stage, minstrel show performers in the 19th century developed tap dancing from a combination of Irish jigging, English clog dancing, and African rhythmic stamping. Tap dance and also social dances, such as the cakewalk and shuffle, became popular vaudeville acts and appeared in Broadway revues and musical comedies as these replaced vaudeville early in the 20th century. In addition, comedy, specialty, and character dances to jazz rhythms became standard stage routines. By the 1940s elements of jazz dance had appeared in modern dance and in motion picture choreography.

Although the stage popularized certain social dances, many others developed and were transmitted mainly in social gatherings. The dances that gave rise to social forms of jazz dance developed from rural slave dances. In both early dances and 20th-century jazz dances, there is a noticeable continuity of dance elements and motions. The eagle rock and the slow drag (late 19th century) as well as the Charleston and the jitterbug have elements in common with certain Caribbean and African dances. In addition, the slow drag contributed to the fish of the 1950s; the ring shout, which survived from the 18th into the 20th century, in isolated areas, influenced the cakewalk.

Around 1900 the cakewalk, popularized through stage shows, became a craze in European and U.S. ballrooms. In its wake appeared other social dances such as the Charleston (1920s), the jitterbug (1930s and 1940s), the twist (1960s), and disco dancing. Some, like the fox-trot, borrowed European dance steps and fitted them to jazz rhythms. The growth of radio, television, and recording, which popularized black music among wide audiences, greatly aided the diffusion of these dances. Fusing ballet with jazz has led in recent years to the formation of such troupes as Canada's *Les Ballets Jazz.* The history of jazz dance was treated in Marshall and Jean Stearns' *Jazz Dance* (1968).

jazz-rock, also called FUSION, a popular form of jazz beginning in the 1970s, in which modern jazz solo improvisation is accompanied by the bass lines, drumming styles, and instrumentation of rock music with a strong emphasis on electronic instruments and dance rhythms. Although various jazz musicians began to include at least some jazz-rock in their performances and recordings—no matter what their basic style—a few who made significant contributions before the 1970s also created original styles within jazz-rock as well, notably former Miles Davis associates pianist-composer Herbie Hancock, Chick Corea, and Joe Zawinul; saxophonist-composer Wayne Shorter; and guitarist John McLaughlin.

The style gained one of the largest jazz audiences since the swing era ended in the mid-1940s. As with swing-era big bands, those jazz-rock groups presenting the least improvisation tended to enjoy the most acclaim. The style was also known as "cross over" because sales of the music crossed over from the jazz market to the popular music market. Jazz-rock provided a new musical vocabulary stemming, for some, in part from that offered by John Coltrane and, for some, from modern concert music as well as rock.

Jean (French personal name): *see under* John, except as below.

Jean DE MEUN, de Meun also spelled DE MEUNG (b. *c.* 1240, Meung-sur-Loire, Fr.—d. before 1305), French poet famous for his continuation of the *Roman de la rose* (*q.v.*), an allegorical poem in the courtly love tradition begun by Guillaume de Lorris about 1240.

De Meun's original name was Clopinel, or Chopinel, but he became known by the name of his birthplace. He probably owned a home in Paris and may have been archdeacon of the Beauce, a region between Paris and Orléans. Little is known of his life.

His works are satirical, coarse, at times immoral, but fearless and outspoken in attacking the abuses of the age. His strong antifeminism and censures on the vices of the church were bitterly resented.

He used the plot of the *Roman de la rose* (*c.* 1280) as a means of conveying a mass of encyclopaedic information and opinions on every topic likely to interest his contemporaries. At various times he relates the history of classical heroes, attacks the hoarding of money, and theorizes about astronomy and about the duty of mankind to increase and multiply. Many of his views were hotly contested, but they held the attention of the age. The allegory was of little importance to him; the famous "Confession" of Nature (one of the characters in the poem) digressed from the narrative for some 3,500 verses, yet it was such digressions that secured the poem's fame and success. Geoffrey Chaucer translated a segment of the poem.

Jean LE BEL (b. *c.* 1290, Belgium—d. Feb. 15, 1370, Liège, Lower Lorraine), the forerunner of the great medieval Belgian chroniclers and one of the first to abandon Latin for French.

A soldier and the constant companion of Jean, comte de Beaumont, with whom he went to England and Scotland in 1327, Le Bel wrote his *Vrayes Chroniques,* recounting the events of the reign of Edward III, at his request. Later he retired to Liège, where he had held a canonry at the cathedral since the age of about 23. His work was known only in fragments until 1861, and a complete edition was not published until 1863. Jean's value as a chronicler was to present events that he had witnessed with intelligence, accuracy, life, and colour. He was the first to use the technique of interviews as a basis for establishing historical fact. His methods were developed by Jean Froissart, who acknowledges his debt to Jean and often borrowed from his text.

Jean de Paris: *see* Perréal, Jean.

Jean Paul, pseudonym of JOHANN PAUL FRIEDRICH RICHTER (b. March 21, 1763, Wunsiedel, Principality of Bayreuth—d. Nov. 14, 1825, Bayreuth, Bavaria), German novelist whose works were immensely popular in the first 20 years of the 19th century. His pen name, Jean Paul, reflected his admiration for the French writer Jean-Jacques Rousseau. Jean Paul's writing bridged the shift in literature from the formal ideals of Weimar Classicism to the intuitive transcendentalism of early Romanticism. Thus his influence remained for such later 19th-century writers as the German Friedrich Hebbel and the English Thomas Carlyle.

Jean Paul, the son of a poor teacher and pastor, studied theology at Leipzig until lack of money forced him to support himself as a private tutor (1787–90) and schoolmaster (1790–94). His reputation began with the novels *Auswahl aus des Teufels Papieren nebst einem nöthigen Aviso vom Juden Mendel,* (1789; "Selections from the Devil's Papers together with a required notice from the Jew Mendel") and *Die unsichtbare Loge,* 2 parts (1793; *The Invisible Lodge,* 1883), and was established by *Hesperus, oder 45 Hundsposttage,* 3 issues (1795; *Hesperus; or Forty-five Dog-Post-Days,* 1865). He became a celebrity and was lionized by the critic Johann Herder and by a patron, Frau von Kalb, who brought him to Weimar. In 1801 he married Karoline Mayer and in 1804 settled in Bayreuth, his home for the rest of his life.

The second period in Jean Paul's work is marked by his attempts to reconcile the comic realist and the sentimental enthusiast in himself. The novels of this period include *Blumen-, Frucht-, und Dornenstücke,* 3 vol. (1796; *Flower, Fruit and Thorn Pieces,* 1845), commonly known for its hero as *Siebenkäs*; *Leben des Quintus Fixlein, aus funfzehn Zettelkästen gezogen,* (1796; Eng. trans. by Thomas Carlyle, 1827); *Titan,* 4 vol. (1800–03; Eng. trans. 1862), which he considered his classical masterpiece; and the unfiinished *Flegeljahre,* 4 vol. (1804–05).

The novels of his third period mirror his disillusionment with both Classicism and Romanticism. But his idyllic novels, always marked by humour, treat his predicament in a comic style. The forced figurative style of his earliest books had become second nature by this time; he thought, talked, and wrote wittily. *Dr. Katzenbergers Badereise,* 2 vol. (1809; "Dr. Katzenberger's Journey to the Spa") and *Des Feldpredigers Schmelzle Reise nach Flätz mit fortgehenden Noten,* (1809; *Army Chaplain Schmelzle's Journey,* 1827, trans. by Carlyle) were the last of his extremely popular novels.

In 1808 he received a pension from Prince Karl Theodore von Dalberg, later paid by the Bavarian government, which guaranteed him financial security. He continued to write novels and treatises on education and aesthetics. Although most of his work fell into obscurity in Germany, in the first few decades of the 19th century Jean Paul was widely imitated and revered for his progressive political views, and his popularity and reputation survived longer in the English-speaking world.

Jeanne (French personal name): *see under* Joan.

Jeannel, René (b. 1879, Toulouse, Fr.—d. 1965, Paris), French biologist best remembered for his work on the subterranean coleopterans of the family Anisotomidae. His exploration of the caves of the Pyrenees and Carpathian mountains yielded many species of these small, shiny, round fungus beetles

that were hitherto unknown. His fieldwork in Africa also resulted in the identification of various previously unstudied subterranean insects. Such efforts did much to stimulate speleological studies.

Jeannel also made significant contributions to biogeography, the study of the geographical distribution of living organisms, particularly in France. His books *La genèse des faunes terrestres* (1942; "The Origins of Terrestrial Fauna") and *Faune cavernicole de la France* (1940; "The Fauna of the Caves of France") remain standard references in this field of study. Jeannel's intimate knowledge of the fauna of France and its neighbouring regions enabled him to develop an outstanding vivarium (an enclosure for raising and observing animals indoors) and a diverse entomological collection at the Museum of Natural History in Paris, of which he served as director from 1945 to 1951.

Jeanneret, Charles-Édouard (architect): *see* Corbusier, Le.

Jeannin, Pierre (b. *c.* 1540, Autun, Burgundy, Fr.—d. 1622, Paris), statesman who served as one of King Henry IV's most influential advisers in the years after the French civil wars (ended 1598).

A pupil of the Humanist legal scholar Jacques Cujas at Bourges, Jeannin became an advocate in the Parlement (high court) of Burgundy in 1569 and president in 1579. He opposed



Jeannin, engraving by Robert Nanteuil
By courtesy of the Bibliotheque Nationale, Paris

in vain the extension into his province of the massacre of Protestants begun on St. Bartholomew's Day, 1572. As a Catholic, he supported Charles of Lorraine against Henry of Navarre (later Henry IV of France) and even went to Spain as an envoy for the Catholic League (1591). He worked, however, for the reconciliation of Lorraine and Henry, and he transferred his loyalty to Henry after the victory of Fontaine-Française (1595). By this time Henry, rightful king of France since 1589, had also abjured Protestantism, making Jeannin's switch easier. A member of the Conseil d'État (Council of State), he took a leading role in the politics of the new regime; for example, in negotiating the Treaty of Lyon with Savoy (1601) and as ambassador to the United Provinces (1607–09). After the assassination of Henry IV (1610), he was *contrôleur-général des finances* for Marie de Médicis and regent for her son, King Louis XIII, until his dismissal in 1616. He was recalled to the government after the disgrace of Marie de Médicis (1617).

jeans, also called BLUE JEANS, DUNGAREES, DENIMS, or LEVI'S, trousers originally designed in the U.S. by Levi Strauss in the mid-19th century as durable work clothes, with the seams and other points of stress reinforced with small copper rivets. They were eventually adopted by workingmen throughout the United States and then all over the world.

Jeans are particularly identified as a standard item of "Western" apparel worn by the American cowboy. After the mid-20th century, various adaptations became internationally a characteristic part of clothing for both men and women. *See also* denim; Levi Strauss & Co.

Jeans, Sir James (Hopwood) (b. Sept. 11, 1877, London—d. Sept. 16, 1946, Dorking, Surrey, Eng.), English physicist and mathematician who was first to propose that matter



Jeans
UPI/EB Inc.

is continuously created throughout the universe. He made other innovations in astronomical theory but is perhaps best known as a writer of popular books about astronomy.

Jeans taught at Cambridge (1904–05, 1910–12) and Princeton (1905–09) universities. In 1923 he became a research associate at Mt. Wilson Observatory, Pasadena, Calif., where he remained until 1944. In 1928, the year he was knighted, he proposed his continuous-creation theory.

His work included investigations of spiral nebulae, the source of stellar energy, binary and multiple star systems, and giant and dwarf stars. He also analyzed the breakup of rapidly spinning bodies under the stress of centrifugal force and concluded that the nebular hypothesis of Laplace, which stated that the planets and Sun condensed from a single gaseous cloud, was invalid. He proposed instead the catastrophic or tidal theory, first suggested by the American geologist Thomas C. Chamberlin. According to this theory, a star narrowly missed colliding with the Sun and, in its passing, drew away from the Sun stellar debris that condensed to form the planets.

Jeans applied mathematics to problems in thermodynamics and radiant heat and wrote on other aspects of radiation. Among his many popular books, perhaps his best were *The Universe Around Us* (1929) and *Through Space and Time* (1934). His important technical works include *The Dynamical Theory of Gases* (1904), *Theoretical Mechanics* (1906), *The Mathematical Theory of Electricity and Magnetism* (1908), and *Introduction to the Kinetic Theory of Gases* (1940).

Jebavý, Václav: *see* Březina, Otakar.

Jebb, John (b. Feb. 16, 1736, Ireland—d. March 2, 1786, London), British political, religious, and social reformer who championed humanitarian and constitutional causes far in advance of his time.

Educated at Trinity College, Dublin, and Peterhouse, Cambridge, he was ordained in 1763 and thereafter lectured on mathematics at Cambridge. His lectures on the Greek New Testament, begun in 1768, became controversial when he developed Unitarian views. His religious differences subsequently broadened to include opposition to mandatory clerical subscription to the Thirty-nine Articles and the Anglican liturgy and support for rational religion and religious toleration. Following the resignation of his ecclesiastical livings in 1775, Jebb studied medicine, receiving the M.D. from St. Andrews and membership in the London College of Physicians in 1777. Although elected to the Royal Society in 1779, his radical political views prevented him from admittance to the staff of a London hospital.

In politics Jebb advocated a reform program that embraced popular sovereignty, the secret ballot, equal single-member constituencies, and salaries but no property qualifications for members of Parliament. He began working actively for political reform in 1779, joining the Westminster Committee and helping establish the Society for Constitutional Information in 1780. He was convinced that parliamentary reform was possible only through an extra-parliamentary national organization based on local committees. A friend of John Adams and Benjamin Franklin, Jebb opposed the Quebec Act and supported the American Revolution; he also encouraged the Irish Volunteers in their reform endeavours. In 1783 he founded the Society for the Promotion of Scriptures. His concern for prison reform is reflected in his *Thoughts on the Construction and Polity of Prisons* (1786). Jebb also championed the use of juries in libel cases, female equality, educational reform at Cambridge, and medical education for laymen.

Jebba, town, Kwara State, western Nigeria, on the south bank and at the natural head of navigation of the Niger River, 550 mi (885 km) from the sea. It is populated by the predominantly Muslim Nupe people, whose kingdom, refounded by Tsoede, flourished in the region in the early 16th century. From this period date the noted Jebba bronzes. The island of Jebba in the Niger River still retains a traditional Nupe settlement.

The town was reached by the Scottish explorer Mungo Park, who was shipwrecked and drowned in the Bussa Rapids north of Jebba around 1806, and whose monument now stands on Jebba Island. From 1886 to 1900 Jebba was the northern limit of the territory governed by the Royal Niger Company. From 1898 to 1902 it served as headquarters for Sir Frederick Lugard's West African Frontier Force and was thus the first capital of the Protectorate of Northern Nigeria from 1900 to 1902.

The extension of the Lagos–Ibadan railway to Jebba in 1909 and its linkage to the Kano–Baro line made possible with the construction of the two-section railway bridge (with a total span of 1,795 ft [547 m]) over the Niger River in 1915 fostered the development of Jebba as a trade and transport centre. Yams, corn (maize), cassava, sorghum, rice, shea nuts, and cattle are the main agricultural products. Sugarcane is grown on the Bacita sugar estate (10 mi downriver) and refined at the nearby sugar factory. Jebba's local handicrafts include cotton weaving and pottery manufacture. There is also a pulp and paper factory located in the town. In the early 1980s a dam and hydroelectric power plant was under construction at Jebba as part of the Niger Dams Project, which includes Kainja Dam and provides much of Nigeria's hydroelectric power.

The town is served by a health clinic operated by the Nigeria Railways Corporation. Other health facilities are available at the Kainja Dam site. A four-lane highway bridge was constructed in the late 1970s to carry the south–north trunk highway from Lagos. Pop. (1972 est.) 7,674.

Jebeil (Lebanon): *see* Byblos.

Jedburgh, royal burgh and seat of the district of Roxburgh, Borders region, Scotland, situated on Jed Water, a tributary of the River Teviot, within 10 mi (16 km) of the English border. In the 9th century a church was built on the site of the present abbey. In 1118 the future king David I of Scotland founded a priory for Augustinian monks from Beauvais in France and elevated it in 1147 to the status of an abbey. The settlement was repeatedly damaged in border warfare with the English;

it was burned in 1523 and ruined again in 1544. The abbey was suppressed in 1559 and eventually purchased in 1637 by the 3rd earl of Lothian. In 1913 it was taken over by the National Monuments Commission.

Jedburgh Castle stood above the river at the southern end of the burgh. Also erected by David I, it was one of five fortresses ceded to England in 1174. It occasionally served as a royal residence but was so often captured by the English that it became a menace rather than a protection and was demolished in 1409. The site was occupied by the county prison, a Georgian building still known as the Castle.

In October 1566 Mary, Queen of Scots, stayed at a house in Queen Street which is now arranged as a museum, with many relics relating to the Queen. The proverbial "Jeddart justice," according to which a man was hanged first and tried afterward, seems to have been a hasty generalization from the solitary summary execution of a gang of rogues. The present town is a prosperous textile manufacturing centre, with electrical engineering industries, corn milling, tanning, and glove making. Pop. (1981 prelim.) 4,053.

Jeddah (Saudi Arabia): *see* Jidda.

jeep, outstanding light vehicle of World War II. It was developed by the U.S. Army Quartermaster Corps and was an important item in lend-lease shipments to the Soviet Union and other allies. The jeep weighed 1¼ tons, was powered by a four-cylinder engine, and was classed as a quarter-ton truck in carrying capacity. Exceptionally sturdy, it was capable of operating on rough terrain thanks to its high clearance and four-wheel drive, climbing 60 percent grades and fording shallow streams.

On the road the jeep had a top speed of 65 miles (105 kilometres) per hour. It had a great variety of military uses, as a command car; reconnaissance car; light weapons, ammunition, and personnel carrier; and for many other purposes. It was sometimes armoured for combat missions (weasel) and was produced with a waterproof hull and propeller, giving it amphibious capabilities. Its name came from its military designation: vehicle, G.P. (general purpose). After World War II the jeep found wide applications in civilian life.

Jeffara (Africa): *see* Jifārah, al-.

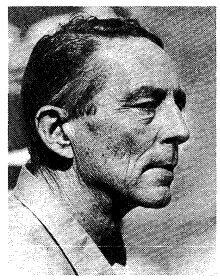
Jefferies, (John) Richard (b. Nov. 6, 1848, near Swindon, Wiltshire, Eng.—d. Aug. 14, 1887, Goring-by-Sea, Sussex), English naturalist, novelist, and essayist whose prophetic vision was unappreciated in his own Victorian age but has been increasingly recognized and admired since his death. By combining detailed observation with a mystic apprehension of nature, he was a master both of a straightforward descriptive style and of a sensuous, poetic prose.

The son of a yeoman farmer, Jefferies in 1866 became a reporter on the *North Wilts Herald*, seeking escape whenever possible in the open space of the Wiltshire Downs. From his experiences as a reporter came *Hodge and His Masters* (1880), a classic record of Victorian countrymen, from the landowner to the labourer. In 1872 he became famous for a 4,000-word letter to *The Times* about the Wiltshire agricultural labourer and his lot, containing such arresting detail that the London newspaper published it in full. Soon periodicals and papers (notably the *Pall Mall Gazette*) were publishing his sketches and articles.

In 1874 Jefferies married and in 1877 moved nearer to London—by this time supporting his wife and two children by writing. The years 1882 to his death in 1887 were his most creative, though he was both ill and poor. Outstanding are *Bevis: The Story of a Boy* (1882), one of the best boys' books in English, which includes memories of Coate Farm, his birthplace (now Richard Jefferies Museum), and its surrounding countryside; and *The Story of My Heart* (1883), his autobiography, which tells his dream of a fairer way of life than that he had seen in the slums of Swindon and London. In this late period also he wrote some moving essays in an introspective style, collected in *The Life of the Fields* (1884), *The Open Air* (1885), and *Field and Hedgerow* (1889). He also dictated a novel, *Amaryllis at the Fair* (1887), which is sometimes compared to Thomas Hardy's regional novels. Earlier novels by Jefferies include the beautiful *Dewy Morn*, 2 vol. (1884), and *Green Ferne Farm* (1880).

Jeffers, (John) Robinson (b. Jan. 10, 1887, Pittsburgh—d. Jan. 20, 1962, Carmel, Calif., U.S.), one of the most controversial U.S. poets of the 20th century, for whom all things except his pantheistically conceived God are transient, and human life is viewed as a frantic, often contemptible struggle within a net of passions.

Educated in English literature, medicine, and forestry, Jeffers inherited money that allowed



Jeffers
By courtesy of Occidental College, Los Angeles

him to write his poetry. His third book, *Tamar and Other Poems* (1924), which brought him immediate fame, revealed the unique style and eccentric ideas developed in such later volumes as *Cawdor* (1928), *Thurso's Landing* (1932), and *Be Angry at the Sun* (1941). The shorter lyrics as well as his sprawling narrative poems celebrate the coastal scenery near Carmel, where Jeffers and his wife moved in 1916. He made a brilliant adaptation of Euripides' *Medea* (produced in 1946).

M.B. Bennett's *The Stone Mason of Tor House* (1966) is a biography. A.N. Ridgeway edited his selected letters (1968).

Jefferson, Arthur Stanley (screen comedian): *see* Laurel, Stan; and Hardy, Oliver.

Jefferson, Blind Lemon, byname of LEMON JEFFERSON (b. July 1897, Couchman, Texas, U.S.—d. *c.* 1929, Chicago), U.S. country blues singer, guitarist, and songwriter, one of the earliest black folk-blues singers to achieve popular success.

Blind from early childhood and the youngest of seven children, Jefferson became an itinerant entertainer in his teens, learning a repertoire of prison songs, blues, moans, spirituals, and dance numbers. He worked in the streets and in brothels, saloons, and parties in Texas, Louisiana, Mississippi, Alabama, and Virginia. In the 1920s he went to Chicago.

Jefferson's high voice, shouting style, and advanced guitar technique, which used melodic lead lines, bent notes, and imitative effects, as well as his lyrics and themes, became staples of the blues through such disciples as Leadbelly (Huddie Ledbetter), who worked with Jefferson for a time, and through his recordings for the Paramount label (1925–29). Jefferson also recorded spiritual songs, using the pseudonym Deacon LJ Bates. Information on his death is vague; a grave marker was placed over his plot in the Wortham (Texas) Negro Cemetery by blues devotees on Oct. 15, 1967.

Jefferson, Joseph (b. Feb. 20, 1829, Philadelphia—d. April 23, 1905, Palm Beach, Fla., U.S.), U.S. actor whose name became identified with the character of Rip Van Winkle.

The third actor of this name in a family of actors and managers, Jefferson completely eclipsed his forebears. He made his stage debut at the age of three in Kotzebue's *Pizarro*, and, after years of struggle as a travelling actor and manager, Jefferson achieved his first important success in Tom Taylor's *Our American Cousin* (1858), a play that was the turning point in his career. Other plays acted by Jefferson in those years included Dion Boucicault's *Octoroon* (1859), but his Bob Acres in *The Rivals* by Richard Sheridan, although very successful, was more Jefferson's creation than the author's.

In 1859 Jefferson made a stage adaptation of Washington Irving's *Rip Van Winkle*, which was only moderately successful. While in England in 1865 he commissioned Boucicault to write another version, and this, along with minor improvements incorporated over the years, was the final one. As Rip, Jefferson delighted London audiences for 170 consecutive nights, and he brought the play to America in 1866. After 1865 he created no new roles, as his public never tired of the delightful and sensitive characterization of Rip. He did, however, revive earlier plays in which he had appeared. Through the last third of the 19th century Jefferson remained at a peak of popularity.

The friend of many leading figures in politics, art, and literature, Jefferson brought dignity to the stage. He was awarded the lifetime honour of the presidency of the Players' club, succeeding Edwin Booth and preceding John Drew. His first wife was the actress Margaret Clements Lockyer, and his second was Sarah Warren, niece of the actor William Warren. Jefferson's *Autobiography* (1890) is written with spirit and humour, and its judgments with regard to the art of the actor and the playwright place it beside Colley Cibber's *Apology*.

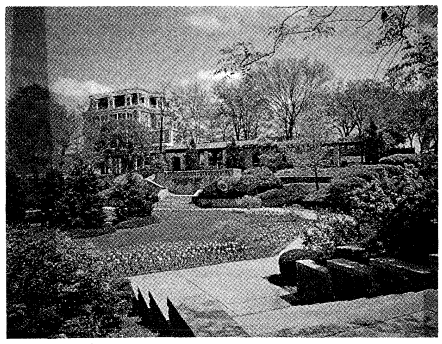
Jefferson, Thomas (b. April 13 [April 2, old style], 1743, Shadwell, Va.—d. July 4, 1826, Monticello, Va., U.S.), third president of the United States (1801–09) and first secretary of state (1789–94), who was the principal author of the Declaration of Independence and an influential political leader and philosopher.

A brief account of the life and works of Thomas Jefferson follows; for a full biography, *see* MACROPAEDIA: Jefferson.

Jefferson, a wealthy Virginia planter, began his political career as a member of the House of Burgesses (1769). He was sent to Philadelphia as a member of the Virginia delegation to the Second Continental Congress (1775) and in the following year was called on to draft the Declaration of Independence.

Returning to the Virginia legislature (1776), he instituted democratic reforms of the state's laws. He served as governor of Virginia (1779–81); published his only book, *Notes on Virginia*, and returned to the Continental Congress (1782); and served on diplomatic missions in Europe (1784–89). Jefferson became U.S. secretary of state and was embroiled in a political controversy with Alexander Hamilton. Assuming the office of the presidency in 1801, he acquired Louisiana for the United States (1803) and sought to avoid involvement in the Napoleonic Wars. Jefferson retired to his plantation, "Monticello," in 1809 and devoted himself to the establishment of the University of Virginia (1819). He was an extraordinarily learned man whose interests in the arts and sciences were wide ranging.

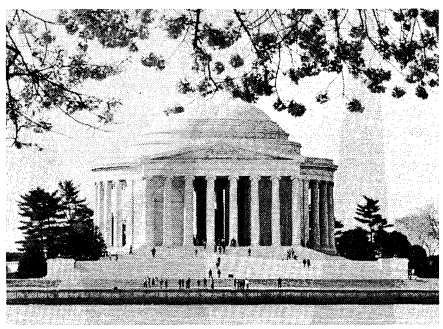
Jefferson City, capital of Missouri, U.S., and seat of Cole County, on the Missouri River, near the geographical centre of the state. The site for the state capital was selected in 1821. The land had been donated under an act of



Governor's mansion, Jefferson City, Mo.
Alan Pitcairn from Grant Heilman—EB Inc.

the U.S. Congress that specified it be within 40 miles (64 km) of the mouth of the Osage River. Named for President Thomas Jefferson, it was laid out by Daniel M. Boone, son of the Kentucky frontiersman. Loyalties were divided during the American Civil War, but the city remained in the Union. Jefferson City is the trading centre for surrounding farmlands and has diversified manufacturing (electric appliances and transformers, printing, cosmetics). The Capitol (1911–18), constructed of Carthage marble, contains celebrated murals by Thomas Hart Benton. The state prison (1833) prevented the city from becoming the site of the state university. Lincoln University, founded there in 1866 by Negro Federal Army veterans, is now racially integrated. Inc. town, 1825; city, 1839. Pop. (1987 est.) 36,474.

Jefferson Memorial, formerly THOMAS JEFFERSON MEMORIAL, monument on the south bank of the Tidal Basin, Washington, D.C., authorized in 1934 and dedicated April 13, 1943, the 200th anniversary of President Thomas Jefferson's birth. The memorial, set in 18 acres (7 hectares), is a unit of the National Capital Parks and a site in the five-point plan for central Washington, which includes also the Capitol, White House, Washington Monument, and Lincoln Memorial. The circular-colonnaded structure, designed by John R. Pope, Otto R. Eggers, and Daniel P. Higgins, was built in the classical style that Jefferson preferred. The pediment over the portico depicts Jefferson reading his draft of the Declaration of Independence. In the centre of the domed, marble-lined interior is a heroic bronze figure of Jefferson sculpted by Rudulph Evans; inscriptions of his writings appear on the four interior panels and frieze.



Jefferson Memorial, Washington, D.C.
Everett C. Johnson—De Wys Inc.

The memorial appears in its most picturesque setting in early spring when the Oriental cherry trees, encircling the Tidal Basin, are in bloom.

Jefferson River, river, most westerly of the Missouri River's three headstreams, rising in the Gravelly Range in southwestern Montana, U.S., near the Continental Divide and Yellowstone National Park (where it is known as Red Rock River). It flows west through Red Rock Pass and Upper and Lower Red Rock lakes, then north past Dillon (where it becomes Beaverhead River) to Twin Bridges, where it is joined by the Big Hole and Ruby rivers; it then continues northeast as the Jefferson River. After a course of 207 miles (333 km) to a point just northeast of Three Forks, the Jefferson joins the Madison and Gallatin rivers to form the Missouri River. It was named for President Thomas Jefferson.

Jeffersonian Republican, member of the early U.S. political party known as the Republican Party (*q.v.*), active mainly between 1801 and 1825.

Jeffersonville, city, seat (1802–10; 1873) of Clark county, southern Indiana, U.S., on the Ohio River (there bridged) at the head of the Falls of the Ohio, opposite Louisville, Ky. Built on land occupied by old Fort Steuben, it was laid out in 1802 according to a plan suggested by President Thomas Jefferson, for whom it was named. The city prospered in the 19th century as a steamboat (river packet) building centre, turning out many paddle-wheelers, including such famous vessels as the *Natchez* and the *J.M. White,* but in 1937 it was inundated by river floodwaters. Increasing industrialization after World War II throughout the Ohio River valley stimulated the city's economic growth. Located in an industrial and agricultural (grain, strawberries, tobacco) area, Jeffersonville is a barge terminal for river transportation and has shipyards. Fifty years after the last of the packet boats was built, Jeffersonville produced the largest river steamboat ever made, the 382-foot (116-metre) *Mississippi Queen,* commissioned in 1976 for luxury overnight cruises. The city also has foundries, chemical and aluminum plants, and a soap factory. Louisville Slugger baseball bats are made there. It is the site of the Howard Steamboat Museum. Inc. town, 1815; city, 1830. Pop. (1987 est.) 21,436.

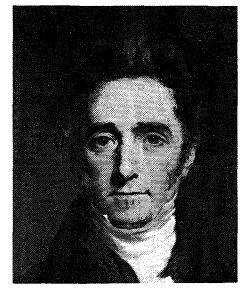
Jeffrey, Edward Charles (b. May 21, 1866, St. Catherines, Ont., Can.—d. April 19, 1952, Cambridge, Mass., U.S.), Canadian-American botanist who worked on the morphology and phylogeny of vascular plants.

While a lecturer at the University of Toronto (1892–1902), Jeffrey established his reputation with a series of articles published from 1899 to 1905 on the comparative anatomy and phylogeny of different vascular plant groups. Taking a leave of absence from Toronto, Jeffrey received his Ph.D. from Harvard (1899), where he would later serve as professor of plant morphology (1907–33).

Darwin's *Origin of Species* led Jeffrey to interpret the form and structure of plants historically and to use comparative morphology and anatomy to provide evidence of specific evolutions. In 1899 Jeffrey reclassified all vascular plants into Lycopsida and Pteropsida; while later classifications have refined plant groupings, the two divisions remain as classes of vascular plants. His work on Lycopsida furthered the investigation of the morphology and evolutionary trends in primitive vascular plants. *The Anatomy of Woody Plants* (1917), an anatomical evolutionary overview, was an important work in its field. In *Coal and Civilization* (1925) he demonstrated that coal has a vegetable origin.

Jeffrey, Francis Jeffrey, Lord (b. Oct. 23, 1773, Edinburgh—d. Jan. 26, 1850, Edinburgh), literary critic and Scottish judge, best-known as the editor of *The Edinburgh Review,* a quarterly that was the preeminent organ of English criticism in the early 19th century.

Educated at the universities of Glasgow and Edinburgh, from 1791 to 1792 he attended Queen's College, Oxford. Admitted in 1794 to the Scottish bar, he discovered that his liberal Whig politics hampered his professional advancement. In 1802, still struggling for success in law, Jeffrey joined with Sydney Smith and other friends to establish a critical periodical, *The Edinburgh Review.* Jeffrey served as editor from 1803 until 1829, after which he continued to contribute essays on criticism, biography, politics, and ethics. In 1830 the Whig Party, which *The Edinburgh Review* had powerfully supported, came into office; and Jeffrey, who had built up a reputation as an advocate, was appointed lord advocate. As a member of the House of Commons, he introduced the Scottish Reform Bill in 1831. In 1834 he was made a judge and assumed the title of Lord Jeffrey.

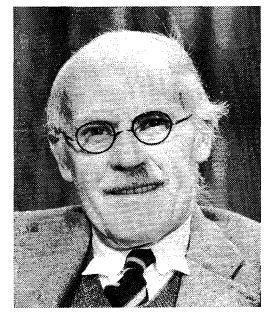


Jeffrey, detail of an oil painting by Colvin Smith, about 1830; in the Scottish National Portrait Gallery, Edinburgh
By courtesy of the Scottish National Portrait Gallery, Edinburgh

Jeffreys, Sir Harold (b. April 22, 1891, Fatfield, Durham, Eng.—d. March 18, 1989), British astronomer and geophysicist noted for his wide variety of scientific contributions.

Jeffreys was educated at Armstrong College, Newcastle-upon-Tyne (D.Sc., 1917), and St. John's College, Cambridge (M.A., 1917), and was a fellow at St. John's from 1914. He served in the Meteorological Office (1917–22), lectured in mathematics at Cambridge (1923–32), was reader in geophysics at Cambridge (1932–46), and was the university's Plumian Professor of Astronomy (1945–58). He was knighted in 1953.

In his work in astronomy, Jeffreys established that the four large outer planets (Jupiter, Saturn, Uranus, and Neptune) are very cold and devised early models of their planetary structure. His other astronomical work includes research into the origin of the solar system and the theory of the variation of latitude.



Sir Harold Jeffreys
Camera Press

In geophysics he investigated the thermal history of the Earth, was coauthor (1940) of the standard tables of travel times for earthquake waves, and was first to hypothesize that the Earth's core is liquid. He explained the origin of monsoons and sea breezes and showed how cyclones are vital to the general circulation of the atmosphere. Jeffreys also worked on probability theory and on methods of general mathematical physics.

Jeffreys' honours included the Gold Medal of the Royal Astronomical Society (1937) and the Royal Medal of the Royal Society of London (1948). Among his principal works are

The Earth: Its Origin, History and Physical Constitution (1924, 6th ed. 1976), *Scientific Inference* (1931, 2nd ed. 1957), *Earthquakes and Mountains* (1935, 2nd ed. 1950), and *Methods of Mathematical Physics*, with Bertha S. Jeffreys (1946, 3rd ed. 1962). The *Collected Papers of Sir Harold Jeffreys* was published in six volumes from 1971 to 1977.

Jeffreys (of Wem), George Jeffreys, 1st Baron (b. May 15, 1645?, Acton, Denbighshire, Wales—d. April 18, 1689, London), English judge notorious for his cruelty and corruption. He presided over the "Bloody Assizes" of 1685 following the failure of the



George Jeffreys, detail of an oil painting attributed to H. Claret; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

Duke of Monmouth's rebellion and was in charge of executing the unpopular religious policy of the Roman Catholic king James II.

Born into the Welsh gentry, Jeffreys was admitted to the bar in 1668, and in 1677 he obtained an appointment as solicitor general to Charles II's Roman Catholic brother James, duke of York (later James II). During the panic that followed Titus Oates's fabricated revelations (1678) of a popish plot against the government, Jeffreys served as a prosecuting counsel or judge in many of the trials of suspected Catholic conspirators. He earned notoriety by savagely ridiculing and bullying the defendants.

Despite his Protestantism and his role as a prosecutor of Catholics, Jeffreys became increasingly prominent in the court party of Charles and James. In 1680 he fought against the Exclusion Bill, which would have prevented James from succeeding to the throne, and in 1683 he became lord chief justice. Meanwhile, he served as prosecutor and judge, respectively, in the treason trials of Lord William Russell and Algernon Sidney. Although the evidence against these two Whig defendants was flimsy, Jeffreys had them convicted and executed. He sentenced Titus Oates to a severe flogging and imprisonment in May 1685, and in the same month James II made him Baron Jeffreys of Wem.

During the "Bloody Assizes" that followed the collapse (July 1685) of the insurrection of James Scott, duke of Monmouth, Jeffreys prosecuted the rebels with ferocity, executing perhaps 150 to 200 persons and ordering hundreds of others sold into slavery in the colonies. At the same time, he profited by extorting money from the victims. Nevertheless, James II made him lord chancellor in September 1685. As one of the most influential royal advisers, Jeffreys took charge of the ecclesiastical commission that forced the Church of England to accept James's pro-Catholic policies. When William of Orange, stadholder of Holland (later King William III), overthrew James's government in December 1688, Jeffreys tried to escape from the country disguised as a sailor, but he was arrested and died four months later in the Tower of London. G.W. Keeton's *Lord Chancellor Jeffreys* was published in 1965.

Jeffries, James Jackson, byname THE BOILERMAKER (b. April 15, 1875, Carroll, Ohio, U.S.—d. March 3, 1953, Burbank, Calif.), world heavyweight boxing champion from June 9, 1899, when he knocked out Robert Fitzsimmons in 11 rounds at Coney Island, New York City, until 1905, when he retired undefeated. He was 6 feet, 2½ inches tall and his fighting weight was 220 pounds. Among his six successful title defenses were two knockouts of former champion James J. Corbett and a second victory over Fitzsimmons. After several years in retirement, Jeffries as "The Great White Hope" attempted to regain the championship, but was knocked out by Jack Johnson in 15 rounds at Reno, Nev., July 4, 1910.

Jegorjevsk (Russian S.F.S.R.): *see* Yegoryevsk.

jehad (Islām): *see* jihād.

Jehangir (emperor of India): *see* Jahāngīr.

Jehoahaz (king of Judah): *see* Ahaz.

Jehoiachin, also spelled JOACHIN, Hebrew JOIACHIN, in the Old Testament (II Kings 24), son of King Jehoiakim and king of Judah. He came to the throne at the age of 18 in the midst of the Chaldean invasion of Judah and reigned three months. He was forced to surrender to Nebuchadrezzar II and was taken to Babylon (597 BC), along with 10,000 of his subjects. Nearly 40 years later Nebuchadrezzar died, and his successor released Jehoiachin.

Jehoiakim, also spelled JOAKIM, in the Old Testament (II Kings 23:34–24:17; Jer. 22:13–19; II Chron. 36:4–8), son of King Josiah and king of Judah (*c.* 609–598 BC). When Josiah died at Megiddo, his younger son, Jehoahaz (or Shallum), was chosen king by the Judahites, but the Egyptian conqueror Necho took Jehoahaz to Egypt and made Jehoiakim king. Jehoiakim reigned under the protection of Necho for some time and paid heavy tribute. When the new Chaldean Empire under Nebuchadrezzar II defeated Egypt at the Battle of Carchemish (605), however, Jehoiakim changed his allegiance from the Egyptian king to Nebuchadrezzar. He remained loyal for three years and then revolted against Nebuchadrezzar. After several battles and invasions, Nebuchadrezzar led the decisive invasion against Judah and besieged Jerusalem (598). Jehoiakim died at this time, but the circumstances of his death remain uncertain.

Jehol Uplands, Wade–Giles romanization CH'ENG-TE P'ING-YÜAN, Pinyin CHENGDE PINGYUAN, region of extremely complex and rugged topography in southwestern Liaoning and northeastern Hopeh provinces, China. The area is mostly composed of Precambrian granites, gneiss, and crystalline shales, with some later, Mesozoic, sedimentary rocks. Extensively folded along a northeast to southwest axis, the area is also extensively faulted along the same general structural lines, resulting in relatively recent outpourings of basalts and lavas, particularly in the upper part of the region. Generally, the upland descends in steplike formations from the high plateau area near Wei-ch'ang (Hopeh) and from the ranges forming the watershed of the interior drainage areas of the Inner Mongolian Autonomous Region (which reach altitudes of some 5,900–6,500 ft [1,800–2,000 m]), down to the Chien-sheng and Nu-lu-erh-hu mountain ranges (about 3,950 ft in height), and finally to the Sung Ling (range), running parallel to the coast of the Gulf of Chihli (Po Hai) at an average height of 1,600–1,700 ft. This general structure is complicated, especially in the southwest, by a number of minor ranges with a northwest to southeast orientation, and the whole area is deeply dissected by a complex river system. The topography is extremely rugged. Apart from the coastal region, the area falls into the drainage area either of the Luan Ho (river) or of the western tributaries (the Liao Ho, the Lao-ha Ho, and the Ta-ling Ho). Originally the area, which is rather dry, especially in the northwest, had a cover of mixed deciduous and coniferous forest gradually merging into steppe (grassy plains) in the northwest. Most of the forest cover, however, was long ago destroyed, leaving a barren landscape of grassland and scrub.

Jehoram, also called JORAM, Hebrew YEHORAM, or YORAM, one of two contemporary Old Testament kings.

Jehoram, the son of Ahab and Jezebel and king (*c.* 849–*c.* 842 BC) of Israel, maintained close relations with Judah. Together with Jehoshaphat, king of Judah, Jehoram unsuccessfully attempted to subdue a revolt of Moab against Israel. As had his father, Jehoram later endeavoured to recover Ramoth-gilead from Hazael, king of Damascus. In this matter he was aided by his nephew Ahaziah, then king of Judah. Wounded during the fighting at Ramoth-gilead, Jehoram retired to Jezreel in Judah. During his convalescence a revolution took place and Jehu was anointed king at Ramoth-gilead. Jehu then put to death all the members of Ahab's family including Jehoram, Jezebel, and Ahaziah.

Jehoram, son of Jehoshaphat and king (*c.* 849–*c.* 842 BC) of Judah, married Athaliah, daughter of Ahab, and was thus brother-in-law of the Jehoram of Israel. On ascending the throne Jehoram massacred his kinsmen. He had to face a successful revolt by Edom, a revolt by Libnak, and an invasion of Philistines and Arabs.

Jehoshaphat, also called JOSAPHAT, Hebrew YEHOSHAPHAT, king (*c.* 873–*c.* 849 BC) of Judah during the reigns in Israel of Ahab, Ahaziah, and Jehoram, with whom he maintained close political and economic alliances. Jehoshaphat aided Ahab in his unsuccessful attempt to recapture the city of Ramoth-gilead, joined Ahaziah in extending maritime trade, helped Jehoram in his battle with Moab, and married his son and successor, Jehoram, to Athaliah, a daughter of Ahab. In Judah he reorganized the army and attempted to centralize political power through a series of religious and legal reforms.

Jehovah, Judeo-Christian name for God, derived from Yahweh (*q.v.*).

Jehovah's Witness, an adherent of a millennialist sect that began in the United States in the 19th century and has since spread over much of the world; the group is an outgrowth of the International Bible Students Association founded in Pittsburgh, Pa., in 1872 by Charles Taze Russell (*q.v.*).

The name Jehovah's Witnesses was adopted in 1931 by Russell's successor, Joseph Franklin Rutherford (Judge Rutherford; 1869–1942), who sought to reaffirm Jehovah (*see* Yahweh) as the true God and to identify those who witness in this name as God's specially accredited followers. Rutherford equipped members with portable phonographs to play his "sermonettes" on the front porches and in the living rooms of prospective converts. Under his leadership, the democratic polity devised by Russell was replaced by a theocratic system directed from the society's headquarters in Brooklyn, N.Y.

Rutherford's policies were continued under his successor, Nathan Homer Knorr (1905–77), who established the Watch Tower Bible School of Gilead (South Lansing, N.Y.) to train missionaries and leaders, decreed that all the society's books and articles be published anonymously, and set up adult education programs to train Witnesses to deliver their own

apologetical talks. Under Knorr's direction a group of Witnesses produced a new translation of the Bible. Knorr was succeeded by Frederick W. Franz.

The Witnesses have little or no association with other denominations and maintain a complete separation from all secular governments. They regard world powers and political parties as the unwitting allies of Satan. For this reason they refuse to salute the flag of any nation or to perform military services and rarely take part in public elections. Their suspicion of Satan's wiles also extends to religious denominations, and for many years they disavowed the use of such terms as minister, church, or congregation in their organizational structure.

This attitude has changed, but they are still exclusive and insulated from the ecumenical movement of the 20th century. Their avowed goal is the establishment of God's Kingdom, the Theocracy, which they believe will emerge following Armageddon, their basis for this assumption being the apocalyptic books of the Bible, especially Daniel and the Book of Revelation. They regard these books as God's timetable for world affairs and as the only authentic insight into the destiny of man. According to apocalyptic calculation, Pastor Russell established 1874 as the year of Christ's "invisible return" and designated 1914 as the year of Christ's Second Coming and the end of the "times of the gentiles." Date setting and prophecy among the Witnesses have given way, however, to a more contemporary analysis of modern life based on world events and what they regard as signs of the times.

Theologically they hold that Jesus Christ is God's agent in establishing the Theocracy and that through the Christ sinful man may be reconciled to Jehovah God. The concept of a literal hell is rejected, as is the inevitability of eternal life. Death in certain instances can mean total extinction.

Witnesses faced active persecution in Germany and other Axis countries during World War II as well as in several Allied countries where their work was banned. In the postcolonial era, they have encountered hostility in a number of new African nations whose nationalism conflicts with the Watch Tower idea of theocracy.

The Witnesses meet in churches called Kingdom Halls, baptize by immersion, insist upon a high moral code in personal conduct, disapprove of divorce except on grounds of adultery, oppose blood transfusions on a scriptural basis, and have won many cases in the U.S. courts establishing their right to speak and to witness in accordance with their belief.

Most members of a local congregation, or "company," are kingdom publishers, who are expected to spend five hours a week at meetings in Kingdom Hall and spend as much time as circumstances permit in doorstep preaching. Pioneer publishers hold part-time secular jobs and try to devote 100 hours a month to religious service. Special pioneers are full-time, salaried employees of the society who should spend at least 150 hours a month in this work. Each Kingdom Hall has an assigned territory and each Witness a particular neighbourhood to canvass. The sect takes great pains to keep records of the number of visits, back calls, Bible classes, and books and magazines distributed.

Publishing activities include books, tracts, recordings, and periodicals, chief among which are a semimonthly magazine, the *Watchtower*, and its companion publication, *Awake!*, which during the early 1980s reached a circulation of more than 10,000,000 in some 80 languages.

Of the three corporations that direct the activities of Jehovah's Witnesses, the most powerful is the Watch Tower Bible and Tract Society of Pennsylvania founded by Russell in 1884. The other two corporations are the Watch Tower Bible and Tract Society, Inc., of New York and the International Bible Students Association.

Jehu, Hebrew YEHU, king (*c.* 842–815 BC) of Israel. He was a commander of chariots for the king of Israel, Ahab, and his son Jehoram, on Israel's frontier facing Damascus and Assyria. Ahad, son of King Omri, was eventually killed in a war with Assyria; during Jehoram's rule, Jehu accepted the invitation of the prophet Elisha, Elijah's successor, to lead a coup to overthrow the dynasty of Omri (II Kings 9–10). The prophetic party, headed by Elisha, was an old adversary of the royal house, as shown by the stories of Ahab and Elijah (I Kings 17–19). King Omri had built Samaria, and, thanks to an alliance with the Phoenicians, he and Ahab had brought the northern kingdom to the peak of its economic, political, and military strength. These advances came, however, at a price of religious syncretism and socioeconomic polarization the prophets considered fatal for the community's religious and human future.

Jehu's revolt, which extinguished the dynasty of Omri (including Jehoram and Ahab's wife, Jezebel), took place at a time when the dynasty was already in decline. The narrator in II Kings is clearly in favour of Jehu; his enthusiastic recital of the gruesome details of Jezebel's death (9:30–37) mirror the élan of a holy war. Within a century the prophet Hosea would cite the bloodbath in Jezreel, capital of the northern kingdom of Israel, as reason for the imminent end of the kingdom (1:4–5). Jehu's success ended the Phoenician alliance, and the spirit of fanaticism made its renewal impossible. Israel alone was no match for the incursions of Shalmeneser III, king of Assyria, who moved westward in 841 BC, investing Damascus and exacting tribute both from Jezebel's city of Sidon and from Jehu. The second scene in the famous Black Obelisk in the British Museum shows Jehu making his obeisance before the great king.

Jejsk (Russian S.F.S.R.): *see* Yeysk.

Jekri (people): *see* Itsekiri.

Jekyll, Gertrude (b. Nov. 29, 1843, London—d. Dec. 8, 1932), English landscape architect who was the most successful advocate of the natural garden and who brought to the



Gertrude Jekyll, oil painting by Sir William Nicholson, 1920; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

theories of her colleague William Robinson a cultivated sensibility he lacked.

Born of a prosperous family, Jekyll was educated in music and painting and travelled in the Greek islands, where she studied architecture and history. Her chief interest was in painting until 1891, when her sight gave her trouble, and she applied herself wholeheartedly to gardening instead. Her taste was for the simplicity and orderly disorder of cottage gardens. She worked journalistically with Robinson and wrote a number of successful books, but her great contribution to the art was in the gardens she designed in association with the architect Sir Edwin Lutyens. Together they produced a new type of architectural garden in which the skeleton planned by Lutyens was given softness and an added rhythm by her handling of colour and local forms.

Jelačić, Josip, Graf (Count) (b. Oct. 16, 1801, Petrovaradin, Croatia—d. May 19, 1859, near Zagreb), Croatian politician and soldier who, as ban, or provincial governor, of Croatia under the Austro-Hungarian Empire,



Jelačić, lithograph by Josef Kriehuber, 1849

By courtesy of the Bild-Archiv, Osterreichische Nationalbibliothek, Vienna

helped crush the Hungarian nationalist revolt against the empire in 1848.

As a young Austrian officer he served in Italy and Bosnia. In March 1848, when the nationalists were taking control of Hungary, the imperial government promoted Jelačić lieutenant general and appointed him ban and military commander in chief of Croatia. He immediately occupied the major Croatian port, Rijeka (Fiume). At his insistence, in support of the imperial government, the Croatian Diet proclaimed Croatia's independence from the nationalist government of Hungary. This separatism was condemned by the Austrian government, however, and on June 19 Jelačić was dismissed from office. As the imperial government gained power against the Hungarian nationalists, the emperor Ferdinand reinstated him, and Jelačić led imperial troops into Hungary in September. At Schwechat (now in Austria) in October 1848, the Ban defeated Artúr Görgey, leader of the nationalist troops, contributing much to putting down the revolution.

Jelačić was created count in 1855. He remained governor of Croatia, docilely accepting Habsburg absolutism.

Jelālī Revolts, Jelālī also spelled CELÂLI, rebellions in Anatolia against the Ottoman Empire in the 16th and 17th centuries. The first revolt occurred (1519) near Tokat under the leadership of Celâl, a preacher of Shīʿah Islām. Major revolts later occurred in 1526–28, 1595–1610, 1654–55, and 1658–59.

The major uprisings involved the *sekban*s (irregular troops of musketeers) and *sipahi*s (cavalrymen maintained by land grants). The rebellions were not attempts to overthrow the Ottoman government but were reactions to a social and economic crisis stemming from a number of factors: a depreciation of the currency, heavy taxation, a decline in the *devşirme* system (levy of Christian boys), admission of Muslims into the army, and an increase in the number and dominance of the Janissaries (elite troops) both in Istanbul and in the provinces.

With a decline of the *sipahi* cavalry the *sekban* troops, recruited from the Anatolian peasantry, formed the main provincial army. During wartime the *sekban*s served the provincial governors and drew regular pay. In peacetime, however, they were not paid, and they resorted to banditry, in which case

they were called Jelālīs. They were joined by *sipahis*, who had lost their land grants to court favourites, and by overtaxed peasants and Turkmen and Kurdish nomads.

In 1598 a *sekban* leader, Karayazici Abdülhalim (ʿAbd al-Ḥalīm), united the dissatisfied groups in Anatolia, forcing the towns to pay tribute and dominating the Sivas and Dulkadir provinces in central Anatolia. When Ottoman forces were sent against them, the Jelālīs withdrew to Urfa in southeastern Anatolia, making it the centre of resistance. Karayazici rejected offers of governorships in Anatolia and died in 1602. His brother Deli Hasan then seized Kutahya, in western Anatolia, but later he and his followers were won over by grants of governorships.

The Jelālī unrest, however, continued under the leadership of Janbuladoğlu in Aleppo and Yusuf Paşa and Kalenderoğlu in western Anatolia. They were finally suppressed by the grand vizier Kuyucu Murad Paşa, who by 1610 had eliminated a large number of Jelālīs.

During the rest of the 17th and the 18th century, Jelālīs continued their periodic depredations in Anatolia, representing a provincial reaction against the increasing power of the Janissaries.

Jelenia Góra, *województwo* (province), southwestern Poland, established 1975, comprising an area of 1,690 sq mi (4,378 sq km). It is bordered on the west by Germany, on the south by Czechoslovakia, and by the provinces of Wałbrzych on the east, Legnica on the northeast, and Zielona Góra on the north. Jelenia Góra is one of the smallest provinces in area; it is located in the heart of the Western Sudeten (Sudety) mountains. The Bóbr River flows from south to north in the eastern part of the province. The economy is based on the production of synthetic fibres, cellulose, chemicals, textiles, and paper. The province also has coal mines, timber mills, factories for the manufacture of electrical machinery, and glassworks producing crystal for export. The northern part of the province is covered by forests that supply wood pulp for local paper mills. Farmlands in its central and southern portions produce wheat, rye, and potatoes. Many vacation and health spas are in the southwest, one of them the largest spa in all of Lower Silesia, at Szklarska Poręba on the slopes of the Karkonosze and Izerskie mountains. The provincial capital is Jelenia Góra city. Pop. (1984 est.) 503,600.

Jelenia Góra, German HIRSCHBERG, city, capital of Jelenia Góra *województwo* (province), southwestern Poland, in the Sudeten (Sudety) mountains near the Czechoslovakian border at the confluence of the Bóbr and Kamienna rivers. Archaeological data indicate that the site was occupied by an ancient Slavic tribe. Permanent settlement was begun in the 11th century by Jelnik, a knight who built the castle Nowy Dwór. The surrounding settlement was known as Jelenia Góra. The town reached its economic zenith, mainly because of its weaving industry, in the 15th and 16th centuries but was devastated by the Thirty Years' War (1618–48) and, in 1640, by the plague. Rebuilt, it became the Baroque showplace of Silesia, only to wither again under 18th-century Prussian domination. Railroads made it a popular Silesian tourist centre in the 19th century, and interest in the nearby Karkonosze mountain range as a resort area again revitalized the town in the second half of the 20th century. The modern city has coal mining, metallurgy works, cellulose and synthetic fibre industries, engineering facilities, and timber production, as well as its traditional textile industry. There are also pharmaceutical, optical, and clothing factories. Parts of the town walls (built 13th and 16th centuries) remain, as does a 14th-century parish church. Pop. (1984 est.) 89,300.

Jelgava, German (formerly) MITAU, Russian (formerly) MITAVA, city, Latvian Soviet Socialist Republic, on the Lielupe River southwest of Riga. In 1226 the Brothers of the Sword built there the castle of Mitau; town status was conferred in 1376. In 1561, when the Brothers of the Sword were dissolved, it became the capital of the dukes of Courland, and in 1795 it passed to Russia in the Third Partition of Poland. The city suffered severe damage in fighting in both 1919 and 1944. Modern Jelgava is an important railway junction and industrial city, manufacturing agricultural and other machinery, locks, and linen and processing sugar, vegetables, and other foodstuffs. Pop. (1984 est.) 70,000.

Jellicoe, John Rushworth Jellicoe, 1st Earl, VISCOUNT JELLICOE OF SCAPA, VISCOUNT BROCAS OF SOUTHAMPTON (b. Dec. 5, 1859, Southampton, Hampshire, Eng.—d. Nov. 20, 1935, Kensington, London), British admiral of the fleet who commanded at the crucial Battle of Jutland (May 31, 1916) during World War I.

The son of a captain in the mercantile marine, Jellicoe was educated at Rottingdean and entered the Royal Navy as a naval cadet in 1872. He joined the Royal Naval College in 1883 and became a gunnery expert, and in 1888 he was appointed to the Admiralty as an assistant to the director of naval ordnance. In 1891 he was promoted to commander and shortly afterward was appointed to HMS *Victoria* of the Mediterranean fleet. In 1898 he was appointed to the command of HMS *Centurion,* of the China station, and took part in the expedition to relieve the legations in Peking during the Boxer Rebellion in 1900. From 1902 to 1914 he held a variety of posts in the Admiralty and in the fleet, during which time he improved and systematized the Royal Navy's methods for aiming the big guns of its warships.

On the eve of World War I, Jellicoe was sent to join the home fleet at Scapa as second in command under Adm. Sir George Callaghan and was soon appointed commander in chief with acting rank of admiral. He was confirmed in his rank in March 1915 and for two years organized and trained the grand fleet and kept it ready for action. His command was put to the test at the Battle of Jutland. His tactics were severely criticized at the time, but it is now accepted that he achieved a strategic victory that left the German high seas fleet ineffective during the remainder of the war. (*See* Jutland, Battle of.) Toward the end of 1916 Jellicoe left his last command afloat to become first sea lord. During the next year his efforts to combat the new German submarine campaign were not effective until the convoy system was adopted at the insistence of the prime minister, David Lloyd George, who was responsible for Jellicoe's retirement from the Admiralty at the end of 1917. After the Armistice, Jellicoe was sent on a special mission to visit the dominions and advise on the postwar organization of their navies. On this tour he flew his flag in HMS *New Zealand.* Promoted to admiral of the fleet in 1919, he became governor of New Zealand in 1920.

For his services in World War I Admiral Jellicoe received a grant of £50,000, and in 1918 he was raised to the peerage as Viscount Jellicoe of Scapa. On his return from New Zealand and in recognition of his services as governor, he was created an earl and Viscount Brocas of Southampton in 1925. He published *The Grand Fleet, 1914–16, Its Creation, Development and Work* (1919) and *The Crisis of the Naval War* (1921).

Jellinek, Adolf (b. June 26, 1821, Drslavice, Moravia—d. Dec. 29, 1893, Vienna), rabbi and scholar who was considered to be the most forceful Jewish preacher of his time in central Europe.

From 1845 to 1856 Jellinek preached in Leipzig and from 1856 to 1893 in Vienna. Because of his skillful incorporation into his sermons of those Midrashim (rabbinic commentaries on the Scriptures) that deal with Jewish lore, Jellinek was also an unusually appealing speaker. More than 200 of his sermons were published at various times (three volumes, 1862–66, and nine smaller collections, 1847–82), and these works measurably affected the development of the art of Jewish preaching.

Jellinek's scholarly activities chiefly comprised studies of the Kabbala (the highly influential body of Jewish mystical writings) and Midrashic literature. He was a prominent exponent of *Wissenschaft des Judentums* ("science of Judaism"), the analysis of Jewish literature and culture with the tools of modern scholarly research. He was the first to compare the *Sefer ha-Zohar,* the fundamental text of the Kabbalists, with the Hebrew texts of the 13th-century mystic Moses de León. Based on his deduction that Moses de León was the principal author of the *Zohar,* Jellinek also postulated that the *Zohar* was an attempt by Moses de León to counteract the rationalist trend among his educated contemporaries. In the Midrashic field, he edited hitherto unpublished treatises on ancient and medieval homilies and documents of messianic and apocalyptic thinking, such as *Bet ha-Midrash* (1853–77; "The House of Study").

Jellinek, Elvin M(orton) (b. Aug. 15, 1890, New York City—d. Oct. 22, 1963, Palo Alto, Calif., U.S.), American physiologist who was a pioneer in the scientific study of alcoholism.

Jellinek studied at several European universities and received his master's degree in 1914 from the University of Leipzig. He became a biometrician (*i.e.,* one concerned with the statistics of biological studies) and worked for various institutions and organizations in Budapest (1914–20), Sierra Leone (1920–25), Honduras (1925–30), and at the Worcester State Hospital, Mass. (1931–39). In 1939 he began directing that hospital's studies on the effects of alcohol, and in 1941 he became an associate professor of applied physiology at Yale University, where he directed the Yale University School of Alcohol Studies from 1941 to 1950. From 1962 until his death he taught and conducted research at the Institute for the Study of Human Problems at Stanford University.

Jellinek was a pioneer in research having to do with the nature and causes of alcoholism and in descriptions of its symptomatology. He was an early proponent of the disease theory of alcoholism, arguing with great persuasiveness that alcoholics should be treated as sick people. Jellinek gathered and summarized his own research and that of others in the important and authoritative works *Alcohol Explored* (1942) and *The Disease Concept of Alcoholism* (1960).

Where the same name may denote a person, place, or thing, the articles will be found in that order

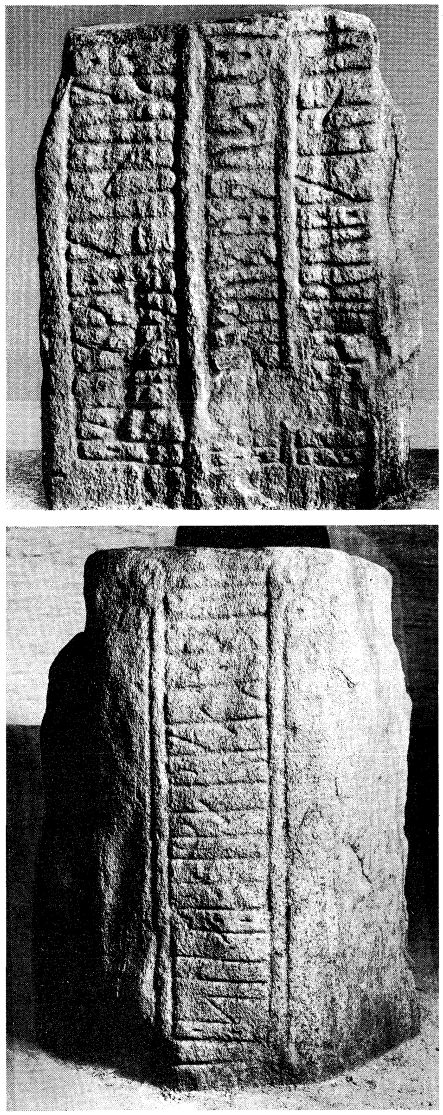
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Jellinek, Georg (b. June 16, 1851, Leipzig—d. Jan. 12, 1911, Heidelberg, Ger.), German legal and political philosopher who, in his book *Die sozialethische Bedeutung von Recht, Unrecht und Strafe* (1878; 2nd ed., 1908; "The Social-Ethical Significance of Right, Wrong, and Punishment"), defined the law as an ethical minimum—*i.e.,* as a body of normative principles essential to civilized existence. Differing from the influential school of legal positivists, Jellinek insisted that popular approval was necessary to convert social and psychological facts into juristic norms.

Jellinek, the son of the rabbinic scholar Adolf

Jellinek, became a convert to Christianity. At the universities of Vienna (1879–89), Basel (1890–91), and Heidelberg (1891–1911), he was a capable classroom teacher as well as a distinguished scholar. Internationally, probably his best-known book is *Die Erklärung der Menschen- und Bürgerrechte* (1895; *The Declaration of the Rights of Man and of Citizens*), in which he hypothesized that the French Revolutionary declaration (approved by the Constituent Assembly on Aug. 26, 1789) was derived not so much from the writings of Jean-Jacques Rousseau, as had been generally believed, but chiefly from Anglo-American political and legal history—especially from the theories invoked to support the U.S. struggle for independence. Jellinek synthesized his views in *Allgemeine Staatslehre* (1900; "General Theory of the State").

Jelling stones, two 10th-century royal gravestones found in Jutland, best known of all Danish runic inscriptions. The earlier stone, a memorial honouring Queen Thyre, was commissioned by her husband, King Gorm the



Jelling stones

By courtesy of the Royal Danish Ministry for Foreign Affairs, Copenhagen

Old, last pagan king of Denmark. The other, erected in memory of his parents by Harald Bluetooth, son of Gorm and Thyre, ruler of Denmark and Norway, and Christianizer of Denmark, is a three-sided pyramid, two sides bearing pictures and the third, an inscription. Its carvings depict ornamental animal forms, sophisticated interlacing linear patterns, and a Christian theme (the Crucifixion).

jelly, a semitransparent confection consisting of the strained juice of various fruits or vegetables, singly or in combination, sweetened, boiled, slowly simmered, and congealed, often with the aid of pectin, gelatin, or a similar substance.

The juices of most fruits and berries and many vegetables are suitable for processing into jelly. Juices high in pectin, such as those of citrus fruits and apples, congeal readily after cooking with sugar and may be added to the juices of low-pectin fruits, vegetables, and herbs, such as blueberries, green peppers, or mint, to promote gelling. Preserves, jams, conserves, and marmalades differ from jellies in their inclusion of whole fruit or fruit pulp.

In the United States and elsewhere, fruit and berry jellies are eaten on breakfast breads and in the perennially popular peanut butter and jelly sandwich. Jams and preserves are a ubiquitous accompaniment to the scones and other baked goods of the British tea meal. Vegetable and herb jellies, such as those cooked from peppers, tomatoes, or mint, traditionally complement lamb and other meat dishes.

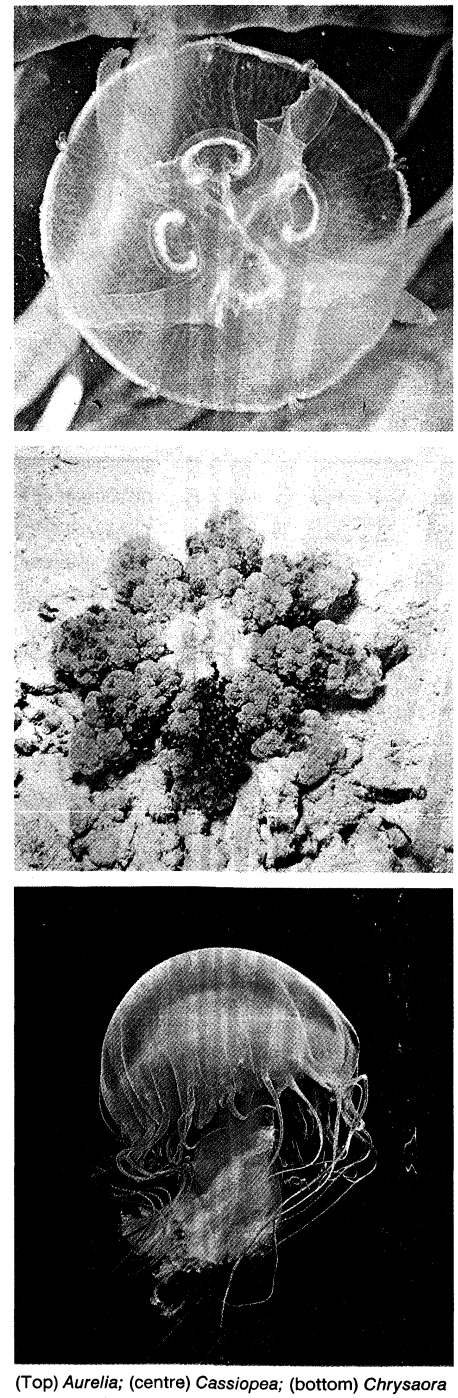
The stiff, chewy consistency of the popular gumdrop and jelly bean candies is imparted by various grain starches. Jellies made from the seaweed extract agar-agar, valued for their clarity and body, are used to coat various candy centres or to make colourful simulated fruit slices.

jellyfish, any planktonic marine member of the class Scyphozoa (phylum Cnidaria), a group of invertebrate animals composed of about 200 described species, or of the class Cubozoa, which was formerly considered an order of Scyphozoa. The term is also frequently applied to certain other cnidarians that have a medusoid (bell- or saucer-shaped) body form, as, for example, the hydromedusae and the siphonophores (including the Portuguese man-of-war), as well as to such unrelated forms as comb jellies and salps. Scyphozoan jellyfish can be divided into two types, those that are free-swimming medusae and those that are sessile (*i.e.,* stem animals that are attached to seaweed and other objects by a stalk). The sessile polyplike forms constitute the order Stauromedusae.

Free-swimming Scyphozoan jellyfish occur in all oceans and include the familiar disk-shaped animals that are often found drifting along the shoreline. Most live for only a few weeks, but some are known to survive a year or longer. The bodies of most range in size from about 2 to 40 cm (1 to 16 inches) in diameter; some species are considerably larger, however, with diameters of up to 2 m (6.6 feet). Scyphozoan medusae consist of almost 99 percent water as a result of the composition of the jelly that forms the bulk in nearly all species. Most feed on small animals that they catch in their tentacles, which have stinging cells (nematocysts). Some, however, simply filter feed, extracting minute animals and plants from the water. Like all cnidarians, their bodies are made up of two cellular layers, the ectoderm and the endoderm, between which lies the mesoglea, a layer of connective tissue composed of a gelatinous substance. In jellyfish the mesoglea is much enlarged to form the buoyant, transparent jelly.

The life cycle of free-swimming Scyphozoan jellyfish typically consists of three stages. A sessile polyp (scyphistoma) stage asexually buds off young medusae from its upper end, with each such ephyra larva growing into an adult. The adults are either male or female, but in some species they frequently change their sex. In many species, normal fusion of egg and sperm results in an embryo that is brooded in the gut of the adult until it becomes a planula larva; but in some this development takes place in the sea. After the planula larva leaves its parent, it settles, passing briefly through a so-called hydratuba stage until it grows into a new scyphistoma. Such a life cycle is characteristic of the order Semaeostomeae, which contains some 50 described species of mainly coastal-water jellyfish, several of which have very wide geographic ranges. Included among these are members of the genera *Aurelia* and *Chrysaora* (*qq.v.*).

The order Coronatae includes about 30 described species of mostly deep-sea jellyfish, often maroon in colour. A deep circular groove delimits the central part of the bell-shaped body from the periphery, which is divided into broad flaps, or lappets. The marginal tentacles are large and solid. Some species are known to have a scyphistoma stage, but the life cycle of most of the forms is unknown. The Coronatae are the most primitive of the present-day scyphozoans and are thought to be descended directly from the fossil form



(Top) *Aurelia;* (centre) *Cassiopea;* (bottom) *Chrysaora*

(Top) James H. Fraser; (centre) Douglas Faulkner; (bottom) William H. Amos—Helen Wohlberg, Inc.

Conulata, which flourished between about 180 and 600 million years ago. Some of the known sessile stages form branched colonies, which were once separately identified under the name *Stephanoscyphus.*

The order Rhizostomeae includes some 80 described species. In these jellyfish the frilly projections called mouth, or oral, arms that extend down from the underside of the body are fused, obliterating the mouth and forming a spongy area used in filter feeding. Marginal tentacles are lacking, and the gelatinous bell is firm and warty. In species whose life cycles are known, there is a typical benthic (bottom-dwelling) scyphistoma stage. Most members of the order are vigorous swimmers. Species of *Cassiopea* (*q.v.*), however, swim infrequently and sit inverted in tropical shallows, exposing their photosynthetic symbiotic algae to sunlight. The group Rhizostomeae is found mainly in shallow tropical to subtropical seas in the Indo-Pacific region, but the genus *Rhizostoma,* also called football jellyfish, often inhabits cooler waters, and *Cotylorhiza* is common in the Mediterranean.

The fourth order, Stauromedusae, formerly called Lucernariida, comprises some 30 described species of nonswimming, stalked jellies. These species occur chiefly in cooler waters. They are goblet-shaped and fixed by a basal stalk; the mouth is situated at the upper end. Ranging from 1 to 10 cm (0.4 to 4 inches) in diameter, the body has a tetradiate design and typically bears eight clusters of tentacles. Some species can detach and resettle. Stauromedusae usually feed on small marine animals and live for several years. Development is direct from a larva into an adult. The polyp stage, which it resembles, is suppressed.

The class Cubozoa contains only one order, Cubomedusae, which some biologists still place under the class Scyphozoa. Cubomedusae comprises about 50 described species. Although some reach a diameter of 25 cm (10 inches), most range between 2 to 4 cm (1 to 2 inches). The jelly is rather spherical but squared off along the edges, giving rise to the common name of box jellies. The genera *Chironex* and *Chiropsalmus,* commonly called sea wasps, occur widely from Queensland northward to about Malaya. These forms are dangerously venomous; a moderate sting can cause death within a few minutes. In all the box jellies so far studied, the polyp stage does not bud off but metamorphoses (*i.e.,* develops completely) into a single adult.

See also cnidarian; hydroid; medusa; Portuguese man-of-war.

Jemaa, town, Kaduna state, central Nigeria, near the Darroro Hills and on a road from Jos to Jagindi. A 2,000-year-old terra-cotta head discovered at Jemaa in 1944 proved to be vital to an understanding of the Nok culture, a civilization that probably flourished in the area between 900 BC and AD 200. Additional Nok sculptures were found in the 1960s at Jemaa and at Nok, the village 24 miles (39 km) northwest, where tin mining in the early 1930s led to the first Nok discoveries, which are now housed in the museum at Jos (48 miles [77 km] northeast).

The modern town originated about 1810, when Malam Usman, a Muslim preacher, assumed the leadership of Fulani herdsmen who had fled from Kajuru (75 miles [121 km] northwest) and founded the settlement of Jema'an-Darroro ("Followers of a Learned Man from Darroro"). He made Jemaa an emirate and a vassal state of the emir of Zaria. Although Usman (emir until 1833) and his son Musa (emir 1837–46 and 1849–50) enlarged the domain by conquering the Ayu, Kaje, Mora, Gwandara, Kagoro, and Kagoma peoples, Jemaa continued to pay tribute to Zaria until 1902, when it was incorporated by the British as a division of Nasarawa province. When Plateau province was created in 1926, the emirate's headquarters was moved from Jema'an-Darroro (now known as Old Jemaa) to Jema'an-Sarari; and in 1933 Emir Muhammadu selected Kafanchan, 11 miles [18 km] north-northwest, as the emirate capital. In 1959 Jemaa emirate was joined with Kagoro, Jaba, and Moroa to form the Jemaa Federation. Although the traditional ruler belonged to a Fulani family, the majority of its inhabitants are neither Fulanis nor Muslims.

Tin mining remains an important activity, but most of Jemaa's inhabitants are farmers, who cultivate cotton, peanuts (groundnuts), and ginger as cash crops and sorghum and millet for daily subsistence. A government dispensary serves the town. Pop. (latest est.) 6,436.

Jember, also spelled DJEMBER, city and *kabupaten* (regency), Jawa Timur *provinsi* ("province"), Java, Indonesia, located at the foot of Mount Argopuro, 95 miles (153 km) southeast of Surabaya, the provincial capital. Roads and railway link it with Banyuwangi to the east, Probolinggo to the northwest, and Bondowoso and Situbondo to the northeast. Jember is an intermediary centre of trade for agricultural commodities produced in the surrounding area, including sugar, tobacco, corn (maize), and peanuts (groundnuts). Industries include lumber mills and machine shops; processed food, beverages, and textiles are also produced. Crafts are wood carving, metalworking, plaiting, and mat and basket weaving. Most of the population is Javanese with an admixture of Tenggarese. Islām is the major religion. Jember University was founded in 1957. Pop. (1980) city, 122,712.

jen, in Confucian philosophy, one of the most fundamental of all virtues, variously translated as humaneness, warmheartedness, or benevolence. Before Confucius' time jen was understood as the kindness of rulers to their subjects. It was gradually broadened to mean benevolence, still a particular virtue but no longer restricted to rulers. Confucius changed it to connote perfect virtue, which includes all particular virtues and applies to all men. Mencius and the *Doctrine of the Mean* went on to say that "*jen* is *jen*"—that is, jen is the distinguishing characteristic of man. During the Han period, it was generally interpreted as love, and Han Yü in the T'ang period stressed it as love for all mankind.

Under the influence of Buddhism, which extended its compassion to include all things, the Neo-Confucianists of the Sung and Ming dynasties similarly extended jen to mean "forming one body with Heaven, Earth, and all things." This thought was common to both the rationalistic Ch'eng-Chu and the idealistic Lu-Wang schools. Some Sung Neo-Confucianists, however, took jen to be a state of consciousness. Chu Hsi called it "the character of the mind and the principle of love," and Wang Yang-ming equated it with the "clear character" of innate knowledge.

All these were too quietistic and too Buddhistic for the 17th- and 18th-century Neo-Confucianists, who went back to an early Han commentary on an ancient classic that defines jen as "people living together." The new emphasis was on the social and active aspects of jen. All Neo-Confucianists agreed, however, that jen, or humanity, is a moral quality imparted by Heaven, and, since the "great characteristic" of Heaven and Earth is to produce and to reproduce, so jen is characterized by production and reproduction; that is to say, it is life-affirming and life-giving, not only active but creative. Under the influence of Western science in the late 19th and early 20th centuries, modern Confucianists likened jen to electricity and ether, a dynamic force and an all-pervasive substance.

jen-min kung-she (Chinese agricultural unit): *see* commune.

Jen Tsung, Pinyin REN ZONG (temple name, or *miao-hao*), personal name (*hsing-ming*) CHAO CHEN (b. 1010, China—d. 1063, China), fourth emperor (reigned 1022–63) of the Sung dynasty of China, one of the most able and humane rulers in Chinese history. Under him the Sung government is generally believed to have come closer than ever before to reaching the Confucian ideal of just government.

During his reign, two political and philosophical groups developed into factions that bitterly disputed each other's policies as well as interpretations of the Confucian Classics. This led to the great disputes in later reigns between the conservatives and the reformers and prevented the development of solutions to the vast problems that began to confront the Sung after Jen Tsung.

Jen Tsung (1760–1820): *see* Chia-ch'ing.

Jena, city, Thuringia *Land* (state), east-central Germany, on the Saale River, east of Weimar. First mentioned in the 9th century as Jani, it was chartered in 1230 and belonged to the margraves of Meissen from the mid-14th century. The house of Wettin, which held the margraviate and (after 1423) the electorate of Saxony, was divided in 1485, and Jena fell to the dukes of the Ernestine branch. From 1672 to 1690 it was the centre of the duchy of Saxe-Jena, and it remained a ducal residence until 1918. Napoleon scored a notable victory over the Prussian army on the heights north of Jena in 1806.

The city's university, the Friedrich-Schiller University, was founded by the elector John Frederick the Magnanimous in 1548 as an academy and raised to university status in 1577. Its most brilliant period was under the duke Charles Augustus, patron of Johann Wolfgang von Goethe, from 1787 to 1806, when the philosophers Johann Fichte, Georg Hegel, and Friedrich von Schelling and the writers August von Schlegel and Friedrich Schiller were on its teaching staff. It was long in the forefront of German universities in liberal acceptance of new ideas. The evolutionist Ernst Haeckel was prominent there in the mid-19th century, and from there Karl Marx received a doctor's degree in absentia in 1841.

The city suffered severe damage in World War II, but it has been restored. Notable structures are the old university buildings, the 14th-century town hall, and St. Michael's Church (1438–1528). Numerous towers remain from the medieval fortifications. University buildings (1906–08) occupy the site of the old ducal palace where Goethe wrote his novel *Hermann und Dorothea.* There are several other higher-educational institutions, botanical gardens, civic and university museums, an optical school, meteorological institute, observatory, central institute for earthquake research, and a planetarium.

A rail junction, Jena is the home of the old, established Zeiss optical and precision instrument firm and the Schott glassworks. There is also a significant pharmaceutical industry. Pop. (1989 est.) 108,010.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Jena, Battle of, also called BATTLE OF JENA-AUERSTÄDT (Oct. 14, 1806), military engagement of the Napoleonic Wars, fought between 122,000 French troops and 114,000 Prussians and Saxons, at Jena and Auerstädt, in Saxony (modern Germany). In the battle, Napoleon smashed the outdated Prussian army inherited from Frederick II the Great, which resulted in the reduction of Prussia to half its former size at the Treaty of Tilsit in July 1807.

Frederick William III of Prussia prepared

for war after signing a secret alliance with Russia in July 1806. In early October the Prussian–Saxon Army, under Charles William Ferdinand, duke of Brunswick, moved slowly westward through Saxony in an attempt to threaten Napoleon's communications to the west. Napoleon advanced northward rapidly through the eastern end of the Thuringian Forest to cut the Prussians off from the Elbe River and engage them before their Russian allies could join them. The Prussians had to face about to meet this attack from their rear. Frederick William placed 63,000 men under Brunswick at Auerstädt and about 51,000 under Prince Friedrich Ludwig of Hohenlohe-Ingelfingen on a 15-mile (24-kilometre) front between Weimar and Jena.

Shortly after dawn on October 14, Napoleon, employing only about 54,000 of his 96,000 troops, struck Hohenlohe's 38,000 troops at Jena. By 3 PM he swept them and 13,000 reinforcements from the field. About 13 miles (21 kilometres) to the north, at Auerstädt, the secondary French force of 26,000, under Louis-Nicolas Davout, encountered Brunswick's main Prussian Army. Brunswick dissipated his vastly superior strength in piecemeal attacks, enabling Davout to stand firm for six hours. After Brunswick was mortally wounded, the King took command. The Prussians' attack slackened when they heard the news of the French victory at Jena. Davout moved up his artillery to rake the entire Prussian line, and by 4 PM the Prussian Army disintegrated. Davout was later made duc d'Auerstädt for his extraordinary victory. The double victory of the French cost them about 12,000 casualties to about 24,000 Prussian and Saxon casualties and about 20,000 more captured. Napoleon completed his conquest of Prussia within six weeks, before Russia could act to aid its ally.

Jena glass, fine-quality glass with improved resistance to heat and shock, suited for chemical ware. It was developed for thermometers and measuring vessels, optical ware, and scientific and industrial uses.

Jena glass was first produced by the German glass chemist Friedrich Otto Schott, who, with Ernst Abbe and Carl Zeiss, founded a glassworks in Jena, Ger., in 1884. The early Jena glass—a sodium–magnesium–aluminum–zinc borosilicate containing some boron trioxide in place of part of the silica of older glasses—foreshadowed later borosilicates, which include Pyrex.

Jena Romantics, poets of the first phase of Romanticism in German literature. Centred in Jena in 1798, the group was led by the versatile writer Ludwig Tieck. Two members of the group, the brothers August Wilhelm and Friedrich von Schlegel, laid down the theoretical basis for Romanticism in the circle's organ, the *Athenäum.* These Romantic critics maintained that the first duty of criticism was to understand and appreciate the right of genius to follow its natural bent.

The greatest imaginative achievement of this circle is to be found in the lyrics and fragmentary novels of Friedrich Leopold von Hardenberg. The works of Johann Gottlieb Fichte and Friedrich von Schelling expounded the Romantic doctrine in philosophy, whereas the theologian Friedrich Schleiermacher demonstrated the necessity of individualism in religious thought. By 1804 the circle at Jena had dispersed. A second phase of Romanticism was initiated two years later in Heidelberg.

Jenakijevo (Ukrainian S.S.R.): *see* Yenakiyevo.

Jenatsch, Georg (b. 1596, Samaden, Grisons, Switz.—d. Jan. 24, 1639, Chur), Swiss political and military leader of the Grisons (now Graubünden, the most easterly of Swiss cantons) during the complex struggles of the Thirty Years' War.

The son of the Protestant vicar of Samaden, Jenatsch became vicar of Scharans in 1617. Ambition and thirst for action led him into



Jenatsch, detail from a portrait by an unknown artist, 1636; in a private collection

Archiv fur Kunst und Geschichte, West Berlin

politics. The Grisons were loosely attached to the Swiss Confederation and at that time controlled the Valtellina with its roads and passes, a region over which the Spaniards (from their duchy of Milan), the Austrian Habsburgs, France, and Venice all sought paramount influence. Opposing the Spaniards, 15 of whom his "penal court" at Thusis executed, he narrowly escaped the bloodbath of July 19–23, 1620, in which over 300 Protestants perished. He left the priesthood, murdered (Feb. 25, 1621) the head of the Spanish party, Pompeius Planta, and had to flee abroad. In 1624 he achieved a French–Grisons alliance, which led to the expulsion of the Spaniards and Austrians from the Grisons. After the Franco-Spanish Treaty of Mozon (1626), however, the Valtellina was virtually abandoned to Spain; Jenatsch took service with Venice, while the Austrians reconquered the Grisons (1629–31). In 1631 Jenatsch successfully assisted Henri, duc de Rohan, dispatched to the Grisons by Richelieu, but then negotiated with Austria and Spain (he had turned Catholic in 1635) and established himself as a ruthless dictator in the Grisons. He resumed contact with the French when the Spaniards refused to cede the Valtellina. Suspected by all, he fell victim to a vendetta of the Planta family and was assassinated.

Jendouba (Tunisia): *see* Jundūbah.

Jenghiz Khan (Mongol ruler): *see* Genghis Khan.

Jenīn (Israeli-occupied Jordan): *see* Janīn.

Jenkin, (Henry Charles) Fleeming (b. March 25, 1833, near Dungeness, Kent, Eng.—d. June 12, 1885, Edinburgh), British engineer noted for his work in establishing units of electrical measurement.

Jenkin earned the M.A. from the University of Genoa in 1851 and worked for the next 10 years with engineering firms engaged in the design and manufacture of submarine telegraph cables and equipment for laying them. In 1861, his friend William Thomson (later Lord Kelvin) procured Jenkin's appointment as reporter for the Committee of Electrical Standards of the British Association for the Advancement of Science. He helped compile and publish reports that established the ohm as the absolute unit of electrical resistance and described methods for precise resistance measurements.

Jenkin, author of *Electricity and Magnetism* (1870) and professor of engineering at University College, London, and the University of Edinburgh, was also an influential critic of Charles Darwin's theory of evolution.

Jenkins, Roy (Harris) (b. Nov. 11, 1920, Abersychan, Monmouthshire, Eng.), British politician, a strong supporter of the North Atlantic Treaty Organization and the European Economic Community (Common Market). Formerly a Labourite, he was a leader of the Social Democratic Party from its founding in 1981.

Educated at Balliol College, Oxford, from which he graduated in 1941, he served in the Royal Artillery in World War II and first entered Parliament in 1948. He could claim family roots in the Labour movement: his father had been a miners' union official, a member of Parliament, and parliamentary private secretary to Clement Attlee, Labour prime minister from 1945 to 1951. Jenkins at one time considered giving up politics for writing, but in the formation of the 1964 government of Harold Wilson he joined the Cabinet as air minister (1964–65); he then became home secretary (1965–67) and chancellor of the exchequer (1967–70). He was deputy leader of the Labour Party in opposition from 1970 until 1972, when he resigned to protest Labour's decision to support a referendum on whether Britain should remain in the Common Market. He reentered the shadow Cabinet in 1973 as shadow home secretary and became home secretary after Labour's victory in 1974. In 1976 he resigned from the Cabinet and Parliament to become president of the European Commission, the executive branch of the European Economic Community, and remained in that post until 1981. In 1981 he and other dissidents from the increasingly leftist Labour Party formed the Social Democratic Party, and in 1982 he was elected to Parliament and became his party's "first leader," or head.

Jenkins wrote several books, including *Pursuit of Progress* (1953), *Mr. Balfour's Poodle* (1954), *Sir Charles Dilke: A Victorian Tragedy* (1958), *The Labour Case* (1959), *Asquith* (1964), *Afternoon on the Potomac?* (1972), *What Matters Now* (1972), and *Nine Men of Power* (1975).

Jenkins' Ear, War of, war between Great Britain and Spain that began in October 1739 and eventually merged into the War of the Austrian Succession (1740–48). It was precipitated by an incident that took place in 1738, when Capt. Robert Jenkins appeared before a committee of the House of Commons and exhibited what he alleged to be his own amputated ear, cut off in April 1731 in the West Indies by Spanish coast guards, who had boarded his ship, pillaged it, and then set it adrift. Public opinion had already been aroused by other Spanish outrages on British ships, and the Jenkins episode was swiftly exploited by members of Parliament who were in opposition to the government of Robert Walpole.

Jenkinson, Charles: *see* Liverpool, Charles Jenkinson, 1st earl of.

Jenkinson, Robert Banks: *see* Liverpool, Robert Banks Jenkinson, 2nd earl of.

Jenne (Africa): *see* Djénné.

Jenner, Bruce (b. Oct. 28, 1949, Mount Kisco, N.Y., U.S.), U.S. decathlon champion at the Olympic Games at Montreal in 1976, with a record score of 8,618 points, broken in 1980 by Daley Thompson of the United Kingdom (8,622 points) and by Guido Kretschmer of West Germany in the 1980 Olympic Games at Moscow (8,649 points).

Jenner began his athletic career at Newton (Connecticut) High School, where he was a letterman in football, basketball, and track, and on his own took up waterskiing, becoming East Coast all-over champion in 1966, 1969, and 1971. He entered Graceland College (Lamoni, Iowa) in 1969 on a football scholar-

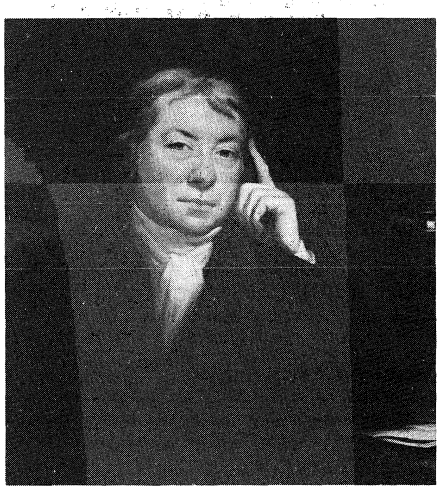
ship, but an injury to his knee restricted him to basketball and track. He competed in his first decathlon in 1971 and finished 10th in the decathlon at the 1972 Olympic Games at Munich.

Shortly thereafter he moved to California, where he trained with individual-event stars in the San Jose area rather than with other decathlon athletes.

After his Olympic triumph, Jenner became active as a network television sports commentator and made television commercials, lectured, and performed in films. Jenner's *Decathlon Challenge: Bruce Jenner's Story*, written with Philip Finch, was published in 1977. Other books include *Bruce Jenner's Guide to the Olympics* (1979, with Marc Abraham) and *The Olympics and Me* (1980, with R. Smith Kiliper). Jenner won the James E. Sullivan Trophy for athlete of the year (1976) in 1977.

Jenner, Edward (b. May 17, 1749, Berkeley, Gloucestershire, Eng.—d. Jan. 26, 1823, Berkeley), English surgeon and discoverer of vaccination for smallpox.

Jenner was born at a time when the patterns of British medical practice and education were undergoing gradual change. Slowly the division between the Oxford- or Cambridge-trained physicians and the apothecaries or surgeons—who were much less educated and who acquired their medical knowledge through apprenticeship rather than through academic



Edward Jenner, detail of an oil painting by J. Northcote, 1803; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

work—was becoming less sharp and hospital work was becoming much more important.

Jenner was a country youth, the son of a clergyman who died when he was only five. Brought up largely by an older brother who was also a clergyman, Edward acquired a love of nature that remained with him all his life. He attended grammar school and at the age of 13 was apprenticed to a nearby surgeon. In the following eight years Jenner acquired a sound knowledge of medical and surgical practice. On completing his apprenticeship at the age of 21, he went to London and became the house pupil of John Hunter, who was on the staff of St. George's Hospital and was soon to become one of the most prominent surgeons in London. Even more important, however, he was an anatomist, biologist, and experimentalist of the first rank; not only did he collect biological specimens but he also concerned himself with problems of physiology and function.

The firm friendship that grew between the two men lasted until the death of Hunter in 1793. From no one else could Jenner have received the stimuli that so confirmed his natural bent—a catholic interest in biological phenomena, disciplined powers of observation, sharpening of critical faculties, and a reliance on experimental investigation. From Hunter Jenner received the characteristic advice, "Why think, [*i.e.,* speculate]—why not try the experiment?"

In addition to his training and experience in biology, Jenner made progress in clinical surgery. At the end of two years in London he returned, in 1773, to country practice in Berkeley and enjoyed substantial success. He was capable, skillful, and popular. In addition to practicing medicine, he joined two medical groups for the promotion of medical knowledge and wrote occasional medical papers. He played the violin in a musical club, wrote light verse, and, as a naturalist, made many observations, particularly on the nesting habits of the cuckoo and on bird migration. He also collected specimens for John Hunter; many of Hunter's letters to Jenner have been preserved, but Jenner's letters to Hunter have unfortunately been lost. After one disappointment in love in 1778, Jenner married in 1788.

Smallpox was widespread in the 18th century, and occasional outbreaks of special intensity resulted in a very high death rate. The disease, a leading cause of death at the time, respected no social class, and disfigurement was not uncommon in patients who recovered. The only means of combatting the disease was the so-called inoculation—intentionally infecting a healthy person with the "matter" taken from a patient sick with a mild attack of smallpox. This practice, which originated in the East, depended on two distinct concepts: first, that one attack of smallpox effectively protected against any subsequent exposure; and second, that a person deliberately infected with a mild case of the disease would safely acquire such protection. It was, in present-day terminology, an "elective" infection—*i.e.,* one given to a person in good health. Unfortunately, the transmitted disease did not always remain mild, and mortality occurred. Furthermore, the inoculated person could disseminate the disease to others and thus act as a focus of infection.

Jenner, even as an apprentice, had been impressed by the fact that a person who had suffered an attack of cowpox—a relatively harmless disease that could be contracted from cattle—could not take the smallpox—*i.e.,* could not become infected whether by accidental or intentional exposure to the smallpox. Pondering this phenomenon Jenner concluded that cowpox not only protected against smallpox but could be transmitted from one person to another as a deliberate mechanism of protection.

The story of the great breakthrough is well known. In May 1796 Jenner found a young dairymaid, Sarah Nelmes, who had fresh cowpox lesions on her finger. On May 14, using matter from Sarah's lesions, he inoculated an eight-year-old boy, James Phipps, who promptly developed a slight fever and a low-grade lesion. On July 1 Jenner inoculated the boy again, this time with smallpox matter. No disease developed; protection was complete. Jenner, in 1797, sent to the Royal Society a short paper describing his results, but the paper was refused. Then Jenner, in 1798, having added further cases, published privately a slender book entitled *An Inquiry into the Causes and Effects of the Variolae Vaccinae, a Disease Known by the Name of Cow Pox.*

The reaction to the publication was not immediately favourable. Jenner went to London seeking volunteers for vaccination but, in a stay of three months, was not successful. In London, vaccination became popularized through the activities of others, particularly the surgeon Henry Cline, to whom Jenner had given some of the inoculant, and doctors George Pearson and William Woodville. Difficulties arose, some of them quite unpleasant; Pearson tried to take credit away from Jenner and Woodville, a physician in a smallpox hospital, contaminated the cowpox matter with smallpox virus.

The procedure rapidly proved its value, however, and Jenner became intensely active, promoting the cause of vaccination. The procedure spread rapidly to the Continent, then to America, and soon was carried around the world.

Complications were many. Vaccination seemed simple, but the vast number of persons who practiced it did not necessarily follow the procedure that Jenner had recommended, and deliberate or unconscious innovations often impaired the effectiveness. Pure cowpox vaccine was not always easy to obtain, nor was it easy to preserve or transmit. Furthermore, the biological factors that produce immunity were not yet understood; much information had to be gathered and a great many mistakes made before a fully effective procedure could be developed, even on an empirical basis.

Despite errors and occasional chicanery, the process of vaccination spread rapidly and the death rate from smallpox plunged. Jenner, although he received worldwide recognition and many honours, made no attempt to enrich himself through his discovery and actually devoted so much time to the cause of vaccination that his private practice and his personal affairs suffered severely. In 1802 Parliament voted him a sum of £10,000 and in 1806 a further sum of £20,000.

Jenner not only received honours but also aroused opposition and found himself subjected to attacks and calumnies, despite which he continued his activities in behalf of vaccination. His wife, ill with tuberculosis, died in 1815, and Jenner retired from public life.

(L.S.K.)

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Jenney, William Le Baron (b. Sept. 25, 1832, Fairhaven, Mass., U.S.—d. June 15, 1907, Los Angeles), U.S. civil engineer and architect whose technical innovations were of primary importance in the development of the skyscraper.

Jenney designed the Home Insurance Company Building, Chicago (1884–85; enlarged 1891; demolished 1931), generally considered to be the world's first tall building supported by an internal frame, or skeleton, of iron and steel rather than by load-bearing walls, and the first to incorporate steel as a structural material. The Home Insurance Company Building also set the pace for the Chicago School, many of whose chief exponents—including Louis Sullivan, Daniel Burnham, John Root, and William Holabird—served at one time in Jenney's office.

After studying architecture in Paris (1859–61), Jenney served in the U.S. Civil War (1861–65) as an engineering officer. Having left the Federal army with the rank of major, he practiced engineering and architecture in Chicago (1868–1905) and taught architecture



Home Insurance Company Building, Chicago, designed by Jenney, 1884–85
Chicago Architectural Photographing Co.

at the University of Michigan, Ann Arbor (1876–80).

In Jenney's design for the Leiter Building, Chicago (1879; enlarged 1888; later demolished), he made a tentative approach to skeleton construction, and the facade was prophetic of the glass curtain wall that became common in the 20th century. Among his other buildings in Chicago are the Manhattan Building (1889–90), said to be the first 16-story structure in the world and the first in which wind bracing was a principal aspect of the design; the Ludington Building (1891); the Fair Store (1891–92; later remodelled as the Loop store of Montgomery Ward); and the second Leiter Building (1889–90), which became Sears, Roebuck and Co.'s Loop store.

Jennings, Elizabeth (Joan) (b. July 18, 1926, Boston, Lincolnshire, Eng.), English poet whose works relate intensely personal matters in a plainspoken, traditional, and objective style and whose verse frequently reflects her devout Roman Catholicism and her love of Italy.

The daughter of a physician, Jennings was educated at Oxford High School and St. Anne's College, Oxford. Her first pamphlet, *Poems,* appeared in 1953, followed by *A Way of Looking* (1955), which won her a Somerset Maugham Award and enabled her to visit Italy. *Song for a Birth or a Death* (1961) marked a new development, with its confessional tone and more savage view of love. Some of the best of her later poems concern her nervous breakdown and its aftermath. *Collected Poems 1967* (1967) was followed by *The Animals' Arrival* (1969), *Lucidities* (1970), and *Relationships* (1972). A translation, *The Sonnets of Michelangelo* (1961), was revised in 1969. She published poetry for children and *Selected Poems* (1980).

Jennings, Herbert Spencer (b. April 8, 1868, Tonica, Ill., U.S.—d. April 14, 1947, Santa Monica, Calif.), U.S. zoologist, the first scientist to study the behaviour of individual microorganisms and one of the first to experiment with genetic variations in single-celled organisms.

Jennings graduated from Harvard University (1896). He wrote his doctoral thesis on the morphogenesis of rotiferans (microscopic aquatic organisms), an area of scientific interest he pursued for the next 10 years. The culmination of his research and his primary contribution to zoology was his *Behaviour of the Lower Organisms* (1906). In this study of the reactions of individual organisms and individual response to stimuli, Jennings reported new experimental evidence of the similarity of activity and reactivity in all animals, from protozoans to man.

For the next 40 years of his career Jennings studied the mechanisms of inheritance and variation in single-celled organisms. His works from this period include *Life and Death, Heredity and Evolution* (1920), *Genetics* (1935), and *The Biological Basis of Human Nature* (1930).

Jennings, Sarah: *see* Marlborough, Sarah Jennings, duchess of.

Jenolan Caves, series of caves constituting one of Australia's best known tourist attractions, in east central New South Wales, 70 mi (113 km) west of Sydney. They comprise a series of tunnels and caverns formed by two converging streams in a thick bed of limestone at an elevation of 2,600 ft (800 m) on the western margin of the Blue Mountains. The caves are on different levels and contain unique limestone formations, particularly stalactites. They were once used by Aborigines, and James McKeown, a bushranger (outlaw), is said to have been the first European to visit them in the 1830s. They have been a government reserve since 1866. Twelve of the caves are open to the public, attracting more than 150,000 visitors annually.

Jensen, Georg (b. Aug. 31, 1866, Raadvad, Den.—d. Oct. 2, 1935), Danish silversmith and designer who achieved international prominence for his commercial application of modern metal design. The simple elegance of his works and their emphasis on fine craftsmanship, hallmarks of Jensen's products, are recognized around the world.

Jensen was apprenticed to a goldsmith at age 14. His artistic talents were briefly focussed on sculpture, but he returned to metalwork, primarily jewelery and silver pieces, produced in the workshop he opened in Copenhagen in 1904. Jensen exhibited his works at several major foreign exhibitions (winning a gold medal at the Brussels Exhibition of 1910) and quickly built a reputation as an outstanding and highly original silversmith. He moved to a larger workshop in 1912 and acquired his first factory building in 1919.

Jensen's silverware achieved immediate popularity and commercial success. He was, in fact, the first silvermaker to realize a profit from the manufacture of modern silver. Until Jensen's time virtually all successful silverware producers had relied on a standard repertory of popular traditional designs. Jensen, however, found that the market for his sleek, simple pieces was larger than anyone had predicted. His firm grew rapidly, expanding throughout Europe and opening branches in London and New York City. On both continents Jensen's work set trends for contemporary tableware. He was among the first designers to fashion steel—formerly considered fit only for low-quality, inexpensive flatware—into handsome, serviceable cutlery.

By 1935 the firm had branches all over the world and carried more than 3,000 patterns in open stock. Out of fairness to his customers, Jensen refused to discontinue old patterns, a practice common among manufacturers of fine silver and tableware. After his death the business was carried on by his son, Søren Georg Jensen (b. 1917).

Jensen, Gerrit, English GERRARD JOHNSON (b. Low Countries?; fl. 1680–1715, London), royal cabinetmaker of Louis XIV-style furniture, who became one of the most fashionable and foremost designers and craftsmen of his time. Apparently the first cabinetmaker to earn individual distinction in England, he became famous for his technique of metal-inlaid furniture and is therefore sometimes called the English Boulle, after the renowned contemporary French cabinetmaker André-Charles Boulle, who had developed a distinctive style of inlay work.

It is known that Jensen settled in London before 1680, in which year he created furniture for King Charles II for a royal gift to the ruler of Morocco. The crown employed him considerably after 1688, and in 1693 he lived on St. Martin's Lane, later the district of fashionable furniture makers. Although the furniture he made for Charles is no longer extant, many of his creations for William and Mary have survived. A document of about 1689 confirms his position as royal cabinetmaker. For Queen Anne he supplied several pieces of furniture that were decorated with lacquer rather than with the more costly metal marquetry. Some of Jensen's greatest work was made around 1701 for the state drawing room at Windsor Castle.

Jensen, J(ohannes) Hans D(aniel) (b. June 25, 1907, Hamburg—d. Feb. 11, 1973, Heidelberg, W.Ger.), German physicist who was joint recipient, with the U.S. physicists Maria Goeppert Mayer and Eugene P. Wigner, of the Nobel Prize for Physics in 1963, for proposing the shell theory, which holds that an atomic nucleus should be thought of not as a random aggregation of neutrons and protons but rather as a structure of shells, or spherical layers, of differing radii, each of which is filled with neutrons and protons.



J. Hans D. Jensen, 1968
Bavaria-Verlag

Jensen served on the faculties of the University of Hamburg, the Institute of Technology in Hannover, and the University of Heidelberg. Mayer, Wigner, and he proposed their nuclear shell model in 1949. Jensen collaborated with Mayer in writing *Elementary Theory of Nuclear Shell Structure* (1955).

Jensen, Jens (b. Sept. 13, 1860, Dybbøl, Den.—d. Oct. 1, 1951, Ellison Bay, Wis., U.S.), highly original landscape architect whose public and private works, mostly in the U.S. Middle West, are marked by harmonious use of natural terrain and native flora.

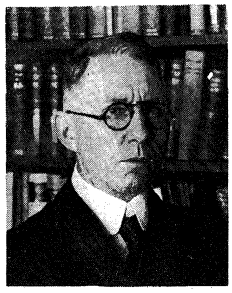
Jensen went to the U.S. in 1884 and settled in Chicago, where he was employed by the municipal West Side Park System (1890–1900, 1906–20). His most successful major park projects in Chicago were the redesigned Humboldt Park and the new Columbus Park. He was chiefly responsible for the establishment of the Cook County Forest Preserve, the most extensive system of nature parks instituted by any U.S. city or metropolitan area. In addition, he laid out the public park system in Racine, Wis., and the Lincoln Memorial Garden in Springfield, Ill. (1936–49).

Among Jensen's private clients were Avery Coonley, Riverside, Ill. (1907–09; house by Frank Lloyd Wright); Henry Babson, Riverside (1909–11; house by Louis Sullivan and

George Elmslie); and Henry Ford, Dearborn, Mich. (1916–20). From the middle 1930s he maintained an art colony, The Clearing, at Ellison Bay, Wis.

Leonard K. Eaton, *Landscape Artist in America: The Life and Work of Jens Jensen,* was published in 1964.

Jensen, Johannes V(ilhelm) (b. Jan. 20, 1873, Farsø, Den.—d. Nov. 25, 1950, Copenhagen), Danish novelist, poet, essayist, and writer of many myths, whose attempt, in his later years, to depict man's development in the



Johannes V. Jensen
Nordisk Pressefoto

light of an idealized Darwinian theory caused his work to be much debated. He received the Nobel Prize for Literature in 1944.

Of old peasant stock and the son of a veterinarian, Jensen went to Copenhagen to study medicine but turned to writing. He first made an impression as a writer of tales. These works fall into three groups: tales from the Himmerland, tales from Jensen's travels in the Far East (for which he was called Denmark's Kipling), and more than 100 tales published under the recurrent title *Myter* ("Myths"). His early writings also include a historical trilogy, *Kongens Fald* (1900–01; *The Fall of the King,* 1933), a fictional biography of King Christian II of Denmark. Shortly thereafter, as a result of his travels in the United States, came his *Madame d'Ora* (1904) and *Hjulet* (1905; "The Wheel"). In 1906 he published a volume of poems, and late in life he returned to poetry, his *Digte, 1901–43* being the result.

Jensen then worked on the six novels that are his best known work; they bear the common title *Den lange rejse,* 6 vol. (1908–22; *The Long Journey,* 3 vol., 1922–24). This story of the rise of man from the most primitive times to the discovery of America by Columbus exhibits both his imagination and his skill as an amateur anthropologist.

Jenson, Nicolas (b. *c.* 1420, Sommevoire, Champagne—d. 1480, Rome), publisher and printer who developed the roman-style typeface.

Apprenticed as a cutter of dies for coinage, Jenson later became master of the royal mint at Tours. In 1458 he went to Mainz to study printing under Johannes Gutenberg. In 1470 he opened a printing shop in Venice, and, in the first work he produced, the printed roman lowercase letter took on the proportions, shapes, and arrangements that marked its transition from an imitation of handwriting to the style that has remained in use throughout subsequent centuries of printing. Jenson also designed Greek-style type and black-letter type.

Although he composed his types in a meticulously even style, he did not always print them with the accuracy they deserved. Nonetheless, he published more than 150 titles, soundly edited by scholars of authority.

jeopardy, double (law): *see* double jeopardy.

Jephthah, a judge or regent (often a hero figure) of Israel who dominates a narrative in the Book of Judges, where he is presented as an exemplar of faith for Israel in its monotheistic commitment to Yahweh. Of the Israelite tribe in Gilead (present northwest Jordan), he was banished from his home and became the head of a powerful band of brigands. Oppressed by the rapacity of the non-Israelite peoples of Hauran and Ammon, the Gileadites implored Jephthah to avenge the injustice. He successfully overcame the enemy but at the cost, according to the story, of having to sacrifice his daughter to Yahweh in fulfillment of a vow setting the price of victory, a possible mythological basis for dedicating certain Israelite women to virginity. An incident in which Jephthah led the slaughter of the aggressor Israelite tribe of Ephraim (who were detected by their inability to pronounce the sound *sh* in the Hebrew word *shibboleth*) rests on weak historical grounds. Biblical scholars interpret the story of Jephthah as an expression of the Book of Judges' theological significance; *viz.*, Israel's fortunes fluctuated depending on the degree of their fidelity to Yahweh.

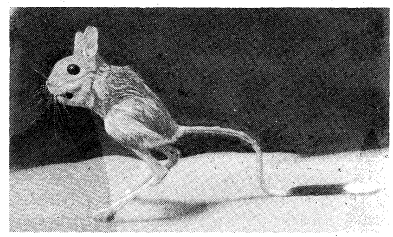
Jequié, city, southeastern Bahia state, northeastern Brazil, on the Arroio das Contas, at 653 ft (199 m) above sea level. It was elevated to city status in 1910. Jequié is the trade centre for a zone yielding mainly cacao and livestock. Goods are transported by railroad, highway, and air to other urban centres in Bahia and to Rio de Janeiro. Pop. (1980 prelim.) 84,792.

jequirity bean, also called ROSARY PEA, or INDIAN LICORICE (*Abrus precatorius*), plant of the pea family (Fabaceae), found in tropical regions. The hard, red and black seeds are attractive and are strung into necklaces and rosaries in India and other tropical areas, though they are highly poisonous. The seeds are also used as a unit of weight (*ratti*), equivalent to about one or two grains Troy, in India.

Jequitinhonha River, Portuguese RIO JEQUITINHONHA, river, eastern Brazil, rising in the Serra do Espinhaço, south of Diamantina, Minas Gerais state, and flowing northward and then east-northeastward across the uplands. At Salto da Divisa, it is interrupted by the Cachoeira (falls) do Salto Grande (140 ft [43 m] high). It descends to the coastal plain at the city of Jequitinhonha (beyond which it is also called Rio Grande do Belmonte) and empties into the Atlantic Ocean at Belmonte in Bahia state after a course of approximately 680 mi (1,090 km). The river is navigable in parts.

Jerba, Île de (island, Tunisia): *see* Jarbah, Jazīrat.

jerboa, any of the long-tailed, leaping rodents that constitute the family Dipodidae (order Rodentia). Jerboas inhabit deserts and dry plains in Asia and northern Africa. They are large-eyed animals with soft, sand-coloured



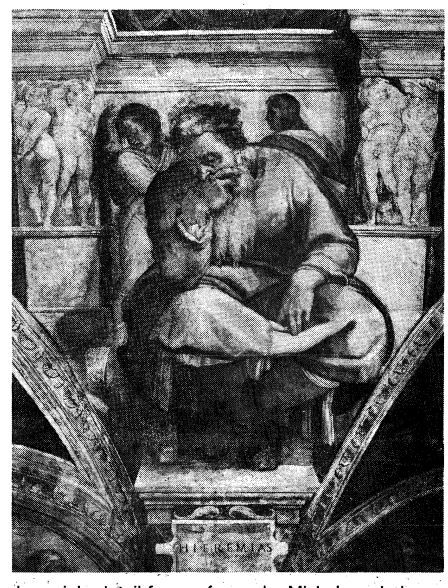
Egyptian jerboa (*Jaculus jaculus*)
By courtesy of the New York Zoological Society

fur, and are 5 to 15 centimetres (2 to 6 inches) long, excluding the 7- to 20-cm (3- to 8-in.) tail. They vary in certain features, such as size of ears (small to long and slender) and number of hind toes (three to five), but all have short forelegs, extremely long hind legs, and long, hairy, often tufted tails.

Jerboas usually travel only on their hind legs, using their tails to prop themselves up and to balance themselves when leaping. They are swift in flight and can cover up to 3 metres (10 feet) at a bound. They rest by day in burrows and emerge at night to forage for seeds, herbs, grasses, and insects. Some species keep the burrow entrances plugged with earth. Most hibernate over the winter. Jerboas breed one or more times a year; females bear about three young per litter.

There are 10 genera and about 25 species of jerboas. Better known forms include the hairy-footed jerboa (*Dipus sagitta*) of central and eastern Asia; the desert jerboas (*Jaculus*) of northern Africa, the Near East, and southwestern Asia; and the four- and five-toed jerboas (*Allactaga*) of Egypt and Asia.

Jeremiah, Hebrew YIRMEYAHU, Latin Vulgate JEREMIAS (b. probably after 650 BC, Anathoth, Judah—d. *c.* 570 BC, Egypt), Hebrew prophet, reformer, and author of an Old Testament book that bears his name. He



Jeremiah, detail from a fresco by Michelangelo in the Sistine Chapel, Rome, *c.* 1512
Alinari—Art Resource/EB Inc.

was closely involved in the political and religious events of a crucial era in the history of the ancient Near East; his spiritual leadership helped his fellow countrymen survive disasters that included the capture of Jerusalem by the Babylonians in 586 BC and the exile of many Judaeans to Babylonia.

Life and times. Jeremiah was born and grew up in the village of Anathoth, a few miles northeast of Jerusalem, in a priestly family. In his childhood he must have learned some of the traditions of his people, particularly the prophecies of Hosea, whose influence can be seen in his early messages.

The era in which Jeremiah lived was one of transition for the ancient Near East. The Assyrian Empire, which had been dominant for two centuries, declined and fell. Its capital, Nineveh, was captured in 612 by the Babylonians and Medes. Egypt had a brief period of resurgence under the 26th dynasty (664–525) but did not prove strong enough to establish an empire. The new world power was the Neo-Babylonian Empire, ruled by a Chaldean dynasty whose best known king was Nebuchadrezzar. The small and comparatively insignificant state of Judah had been a vassal of Assyria and, when Assyria declined, asserted its independence for a short time. Subsequently, Judah vacillated in its allegiance between Babylonia and Egypt and ultimately became a province of the Neo-Babylonian Empire.

According to the biblical Book of Jeremiah, he began his prophetic career in 627/626—the 13th year of King Josiah's reign. It is told there that he responded to Yahweh's (God's) call to prophesy by protesting "I do not know how to speak, for I am only a youth," but he received Yahweh's assurance that he would put his own words into Jeremiah's mouth and make him a "prophet to the nations." A few scholars believe that after his call Jeremiah served as an official prophet in the Temple, but most believe that this is unlikely in view of his sharp criticism of priests, prophets, and the Temple cult.

Jeremiah's early messages to the people were condemnations of them for their false worship and social injustice, with summons to repentance. He proclaimed the coming of a foe from the north, symbolized by a boiling pot facing from the north in one of his visions, that would cause great destruction. This foe has often been identified with the Scythians, nomads from southern Russia who supposedly descended into western Asia in the 7th century and attacked Palestine. Some scholars have identified the northern foe with the Medes, the Assyrians, or the Chaldeans (Babylonians); others have interpreted his message as vague eschatological predictions, not concerning a specific people.

In 621 King Josiah instituted far-reaching reforms based upon a book discovered in the Temple of Jerusalem in the course of building repairs, which was probably Deuteronomy or some part of it. Josiah's reforms included the purification of worship from pagan practices, the centralization of all sacrificial rites in the Temple of Jerusalem, and perhaps an effort to establish social justice following principles of earlier prophets (this program constituted what has been called "the Deuteronomic reforms").

Jeremiah's attitude toward these reforms is difficult to assess. Clearly, he would have found much in them with which to agree; a passage in chapter 11 of Jeremiah, in which he is called on by Yahweh to urge adherence to the ancient Covenant upon "the men of Judah and the inhabitants of Jerusalem," is frequently interpreted as indicating that the prophet travelled around Jerusalem and the villages of Judah exhorting the people to follow the reforms. If this was the case, Jeremiah later became disillusioned with the reforms because they dealt too largely with the externals of religion and not with the inner spirit and ethical conduct of the people. He may have relapsed into a period of silence for several years because of the indifferent success of the reforms and the failure of his prophecies concerning the foe from the north to materialize.

Some scholars doubt that Jeremiah's career actually began as early as 627/626 BC and question the accuracy of the dates in the biblical account. This view arises from the difficulty of identifying the foe from the north, which seems likely to have been the Babylonians of a later time, as well as the difficulty of determining the prophet's attitude toward the Deuteronomic reforms and of assigning messages of Jeremiah to the reign of Josiah. In the opinion of such scholars, Jeremiah began to prophesy toward the end of the reign of Josiah or at the beginning of the reign of Jehoiakim (609–598).

Early in the reign of Jehoiakim, Jeremiah delivered his famous "Temple sermon," of which there are two versions, one in Jeremiah, chapter 7, verses 1 to 15, the other in chapter 26, verses 1 to 24. He denounced the people for their dependence on the Temple for security and called on them to effect genuine ethical reform. He predicted that God would destroy the Temple of Jerusalem, as he had earlier destroyed that of Shiloh, if they continued in their present path. Jeremiah was immediately arrested and tried on a capital charge. He was acquitted but may have been forbidden to preach again in the Temple.

The reign of Jehoiakim was an active and difficult period in Jeremiah's life. That king was very different from his father, the reforming Josiah, whom Jeremiah commended for doing justice and righteousness. Jeremiah denounced Jehoiakim harshly for his selfishness, materialism, and practice of social injustice.

Near the time of the Battle of Carchemish, in 605, when the Babylonians decisively defeated the Egyptians and the remnant of the Assyrians, Jeremiah delivered an oracle against Egypt. Realizing that this battle made a great difference in the world situation, Jeremiah soon dictated to his scribe, Baruch, a scroll containing all of the messages he had delivered to this time. The scroll was read by Baruch in the Temple. Subsequently it was read before King Jehoiakim, who cut it into pieces and burned it. Jeremiah went into hiding and dictated another scroll, with additions.

When Jehoiakim withheld tribute from the Babylonians (about 601), Jeremiah began to warn the Judaeans that they would be destroyed at the hands of those who had previously been their friends. When the King persisted in resisting Babylonia, Nebuchadrezzar sent an army to besiege Jerusalem. King Jehoiakim died before the siege began and was succeeded by his son, Jehoiachin, who surrendered the capital to the Babylonians on March 16, 597, and was taken to Babylonia with many of his subjects.

The Babylonians placed on the throne of Judah a king favourable to them, Zedekiah (597–586 BC), who was more inclined to follow Jeremiah's counsel than Jehoiakim had been but was weak and vacillating and whose court was torn by conflict between pro-Babylonian and pro-Egyptian parties. After paying Babylonia tribute for nearly 10 years, the King made an alliance with Egypt. A second time Nebuchadrezzar sent an army to Jerusalem, which he captured in August 586.

Early in Zedekiah's reign, Jeremiah wrote a letter to the exiles in Babylonia, advising them not to expect to return immediately to their homeland, as false prophets were encouraging them to believe, but to settle peaceably in their place of exile and seek the welfare of their captors. When emissaries from surrounding states came to Judah in 594 to enlist Judah's support in rebellion against Babylonia, Jeremiah put a yoke upon his neck and went around proclaiming that Judah and the surrounding states should submit to the yoke of Babylonia, for it was Yahweh who had given them into the hand of the King of Babylonia. Even to the time of the fall of Jerusalem, Jeremiah's message remained the same: submit to the yoke of Babylonia.

When the siege of Jerusalem was temporarily lifted at the approach of an Egyptian force, Jeremiah started to leave Jerusalem to go to the land of the tribe of Benjamin. He was arrested on a charge of desertion and placed in prison. Subsequently he was placed in an abandoned cistern, where he would have died had it not been for the prompt action of an Ethiopian eunuch, Ebed-melech, who rescued the prophet with the King's permission and put him in a less confining place. King Zedekiah summoned him from prison twice for secret interviews, and both times Jeremiah advised him to surrender to Babylonia.

When Jerusalem finally fell, Jeremiah was released from prison by the Babylonians and offered safe conduct to Babylonia, but he preferred to remain with his own people. So he was entrusted to Gedaliah, a Judaean from a prominent family whom the Babylonians appointed as governor of the province of Judah. The prophet continued to oppose those who wanted to rebel against Babylonia and promised the people a bright and joyful future.

After Gedaliah was assassinated, Jeremiah was taken against his will to Egypt by some of the Jews who feared reprisal from the Babylonians. Even in Egypt he continued to rebuke his fellow exiles. Jeremiah probably died in about 570 BC. According to a tradition that is preserved in extrabiblical sources, he was stoned to death by his exasperated fellow countrymen in Egypt.

Prophetic vocation and message. This sketch of Jeremiah's life portrays him as a courageous and persistent prophet who often had to endure physical suffering for his fidelity to the prophetic call. He also suffered inner doubts and conflicts, as his own words reveal, especially those passages that are usually called his "confessions" (Jer. 11:18–12:6; 15:10–21; 17:9–10, 14–18; 18:18–23; 20:7–12, 14–18). They reveal a strong conflict between Jeremiah's natural inclinations and his deep sense of vocation to deliver Yahweh's message to the people. Jeremiah was by nature sensitive, introspective, and perhaps shy. He was denied participation in the ordinary joys and sorrows of his fellowmen and did not marry. He thus could say, "I sat alone," with God's hand upon him. Jeremiah had periods of despondency when he expressed the wish that he had never been born or that he might run away and live alone in the desert. He reached the point of calling God "a deceitful brook, . . . waters that fail" and even accused God of deceiving and overpowering him. Yet there were times of exaltation when he could say to God: "Thy words became to me a joy and the delight of my heart"; and he could speak of Yahweh as "a dread warrior" fighting by his side.

As a prophet Jeremiah pronounced God's judgment upon the people of his time for their wickedness. He was concerned especially with false and insincere worship and failure to trust Yahweh in national affairs. He denounced social injustices but not so much as some previous prophets, such as Amos and Micah. He found the source of sin to be in the weakness and corruption of the hearts of men—in what he often called "the stubbornness of the evil heart." He considered sin to be unnatural; he emphasized that some foreign nations were more loyal to their pagan (false) deities than Judah was to Yahweh (the real God), and he often contrasted nature's obedience to law with man's disobedience to God.

Jeremiah had more to say about repentance than any other prophet. He called upon men to turn away from their wicked ways and dependence upon idols and false gods and return to their early covenantal loyalty to Yahweh. Repentance thus had a strong ethical colouring, since it meant living in obedience to Yahweh's will for the individual and the nation.

In the latter part of his career Jeremiah had to struggle against the despair of his people and give them hope for the future. He expressed his own hope vividly by an action that he undertook when the Babylonians were besieging Jerusalem and he was in prison. He bought, from a cousin, a field in Anathoth, his native town. In the presence of witnesses he weighed out the money and made the contracts and said, "Thus says the Lord of hosts, the God of Israel: Houses and fields and vineyards shall again be bought in this land." In this and other ways he expressed his hope for a bright future for Israel in its own land.

Jeremiah's most important prophecy concerning the future is one regarding the New Covenant (Jer. 31:31–34). While the present literary form of the passage is probably not Jeremiah's, the thought is essentially his. He prophesied of a time when Yahweh would make a covenant with Israel, superseding the old Mosaic Covenant; Yahweh would write his law upon the hearts of men (rather than on tables of stone), and all would know God directly and receive his forgiveness. This New Covenant prophecy was very influential in

New Testament times. It is quoted in the Letter to the Hebrews and lies behind words attributed to Jesus at the Last Supper: "This cup is the new covenant in my blood."

Jeremiah is sometimes called "the father of personal religion." But this is true only in part, for there was religious individualism before his time, and Jeremiah himself did not abandon the view that Israel as a nation was chosen by God. Yet he did teach that genuine religion was not dependent upon worship at the Temple of Jerusalem or a physical rite, such as circumcision, but rather upon sincere personal seeking of God. His own life encouraged the ideal of individual religion, and his encounter with God found him struggling with God in a very personal way. (J.P.Hy.)

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Jeremiah, Book of, also called PROPHECY OF JEREMIAS, one of the major prophetical writings of the Old Testament. Jeremiah, a Judaean prophet whose activity spanned four of the most tumultuous decades in his country's history, appears to have received his call to be a prophet in the 13th year of the reign of King Josiah (627/626 BC) and continued his ministry until after the siege and capture of Jerusalem by the Babylonians in 586 BC. Many of his oracles concerned the turbulent events of his times.

The major parts of the book are usually delineated as follows: prophecies against Judah and Jerusalem (chapters 1–25), narratives about Jeremiah (chapters 26–45), prophecies against foreign nations (chapters 46–51), and a historical appendix (chapter 52). The prophecies in the first part of the book derive mostly from Jeremiah himself. The second part, which is mostly prose and usually speaks of Jeremiah in the third person, probably owes its composition to Baruch, the scribe who, according to chapter 36, wrote the prophecies against Israel and Judah and all the nations from Jeremiah's dictation. The prophecies against foreign nations may derive in part from Jeremiah; the appendix was largely taken from II Kings 24:18–25:30.

An unusual feature of this book is the "confessions" of Jeremiah, a group of individual laments reflecting the personal struggles precipitated by the prophet's role as the spokesman of a message so unpopular that it evoked imprisonments and threats to his life. These confessions make the personal history of Jeremiah more accessible than that of any other Old Testament prophet.

The literary history of the book is long and complex. Its basic stratum consists of Jeremiah's oracles against Judah and Jerusalem, some of which are probably identical with the words that Baruch wrote on the scroll from Jeremiah's dictation. Other collections of sayings and reports concerning Jeremiah (especially in chapters 26–45) were probably compiled by Baruch somewhat later. To these two blocks of material were added material from the latest period of Jeremiah's activity as well as from other sources (especially in chapters 46–51). The book, therefore, is the product of a long process of growth, with several redactors responsible for the inclusion and arrangement of materials.

Jeremiah, Lamentations of (biblical literature): *see* Lamentations of Jeremiah.

Jeremiah, Letter of, also called EPISTLE OF JEREMIAS, apocryphal book of the Old Testament, in the Roman canon appended as a sixth chapter to the book of Baruch (itself apocryphal in the Jewish and Protestant canons).

The work is supposedly a letter sent by Jeremiah to Jews exiled to Babylon by King Nebuchadrezzar in 597 BC, but it is not a letter, nor was it written by Jeremiah. It is a polemic against the worship of idols, developed around a verse in the Book of Jeremiah (10:11), stating that false gods shall perish. Possibly composed around 300 BC by a Jew living in Babylonia, the text suggests by its intensity that idolatry threatened fidelity to the God of Israel. The author's primary target was probably the Babylonian deity Tammuz, an agricultural god whose cult was associated with orgiastic fertility rites. Although the letter is extant only in Greek, certain linguistic and stylistic elements point to an original composition in Hebrew or Aramaic.

Jeremias: *see* Jeremiah.

Jeremias II (b. *c.* 1530, Anchialos, Tur.—d. 1595, Constantinople), patriarch of Constantinople and one of the most capable leaders of the Greek Orthodox Church.

Elected patriarch in 1572 by popular acclaim, Jeremias immediately instituted a reform by disciplining the clergy and prosecuting simony (the sale and purchase of ecclesiastical offices). Having irritated the Holy Synod, the council of bishops, by his zeal, he was deposed in 1579. Public clamour, however, returned him to office after nine months. In 1584 he was again deposed; but once again, after two years, his popularity, backed by the goodwill of the Ottoman sultan, secured his return, and he reigned until his death.

To collect funds for a new patriarchate (the Turks had transformed the patriarchal church into a mosque), Jeremias traveled to Poland and Russia, the first such trip by a reigning patriarch of Constantinople. In the Polish-dominated Ukraine he gave the support of his authority to the Orthodox resistance against Latin and Uniate pressures. In Moscow in 1589 he consecrated Job, Metropolitan of Moscow, as the first Russian patriarch. Upon his return, having received generous contributions, he held a council (1593), which confirmed the erection of the Moscow Patriarchate and organized a Patriarchal Academy in Constantinople that was to serve as an intellectual centre for Orthodoxy and to raise the educational level of the clergy.

From 1572 to 1581 Jeremias corresponded with German Lutheran theologians who sought Orthodox support for the Lutheran articles of faith contained in the 1530 Confession of Augsburg. Although he expressed some agreement with certain articles of the Lutheran creed, Jeremias repudiated the Lutheran beliefs on grace and sacramental worship. The proceedings of this Lutheran–Orthodox dialogue were published at Wittenberg, Ger., as *Acta et Scripta Theologorum Wirtembergensium et Patriarchae Constantinopolitani, D. Hieremiae* (1584; "Acts and Writings of the Württemberg Theologians and His Lordship Jeremias, Patriarch of Constantinople"). Jeremias' anti-Western spirit caused him even to reject the Gregorian calendar, the new style of chronological computation instituted in March 1582 by Pope Gregory XIII.

Jerevan (Armenian S.S.R.): *see* Yerevan.

Jerez de García Salinas, city, south-central Zacatecas state, north-central Mexico. Formerly known simply as Jerez, the city is on the Jerez River, 6,650 feet (2,027 m) above sea level and southwest of Zacatecas, the state capital. It is the commercial and manufacturing centre for an agricultural and pastoral hinterland in which beans, quince, and apples are the principal crops; and horses, pigs, sheep, and, most commonly, cattle, are raised. Tin and mercury are mined in the vicinity. Pop. (1980) 28,629.

Jerez de la Frontera, city, Cádiz province, in the *autónoma comunidad* ("autonomous community") of Andalusia, southwestern Spain. It lies northeast of Cádiz city and near the north bank of the Guadalete River. Of obscure origin but probably the Roman Asido Caesariana, the city was occupied by the Moors from the 8th century until it was recaptured by King Alfonso X of Castile in 1264. Several towns on the border near the Moorish territories were called *de la frontera* ("of the frontier"). Notable landmarks in the city include the 11th-century Moorish Alcázar (fortress palace), the Baroque 17th-century Colegiata (Collegiate Church), and the medieval Gothic churches of Santiago and San Miguel. The English word sherry comes from the 16th-century pronunciation of the name Jerez. The maturing of sherry wine in *bodegas* (wine sheds) is the city's chief occupation; sherry is produced for both domestic and export markets. Jerez horses, of mixed Arab, Spanish, and English stocks, are highly valued. Pop. (1984 est.) 138,700.

Jericho, Arabic ARĪḤĀ, town in the disputed West Bank area occupied by Israel since 1967, on the west side of the Jordan River Valley. It is one of the earliest continuous settlements in the world, dating perhaps from about 9000 BC.



Excavation of the Tall as-Sulṭān, Jericho
By courtesy of the Jericho Excavation Fund

Jericho is famous in biblical history as the first town attacked by the Israelites under Joshua after they crossed the Jordan River (Joshua 6). After its destruction by the Israelites it was, according to the biblical account, abandoned until Hiel the Bethelite established himself there in the 9th century BC (I Kings 16:34). Jericho is mentioned several other times in the Old and New Testaments. Herod the Great established a winter residence there, and he died there in 4 BC. The site of the Roman and New Testament Jericho is about one mile south of that of the Old Testament town.

Old Testament Jericho has been identified in the mound known as Tall as-Sulṭān (at the source of the copious spring 'as-Sulṭān), which rises 70 feet above the surrounding plain. A number of major archaeological expeditions have worked at the site, notably in 1952–58 under Kathleen M. Kenyon, director of the British School of Archaeology

in Jerusalem; one of the main objectives has been to establish the date of the destruction of the town by the Israelites—a matter of obvious importance for the chronology of the Israelite entry into Canaan. Evidence of this destruction was thought to have been found but proved to be an erroneous identification. Most of the town of the period, including the whole circuit of the town walls, has been removed by erosion; enough survives to show that there was a town of the period, but that is all. This may have been destroyed in the second half of the 14th century BC, but the evidence is too scanty for precision. The site was then abandoned until the Iron Age. Little trace has been found of the 9th-century-BC occupation attributed to Hiel, but there was a considerable settlement in the 7th century BC, ending perhaps at the time of the second Babylonian Exile in 586 BC. The site was then finally abandoned, and the later Jerichos grew up elsewhere.

Excavations have shown, however, that Jericho had a very long history before the biblical period, and the great importance of the site is that it provides evidence of the first development of permanent settlements and therefore of the first steps toward civilization.

Traces have been found of visits of Mesolithic hunters, dated by carbon-14 to *c.* 9000 BC, and of a long period of settlement by their descendants. By *c.* 8000 BC the inhabitants had developed into an organized community capable of building a massive stone wall around the settlement, strengthened at one point at least by a massive stone tower. The size of this walled settlement justifies the use of the term town and suggests a population of some 2,000–3,000 persons. Thus, in this 1,000 years there had been a development from a hunting way of life to full settlement. The development of agriculture can be inferred from this, and grains of cultivated types of wheat and barley have been found. Jericho is thus one of the places providing evidence of the development of agriculture. It is highly probable that, to provide enough land for cultivation, irrigation had been invented. This first Neolithic culture of Palestine was a purely indigenous development. These indigenous Neolithic occupants were succeeded *c.* 7000 BC by a second group, bringing a culture that was still Neolithic and still not manufacturing pottery, though it was not indigenous. This occupation probably indicates the arrival of newcomers from one of the other centres, possibly in northern Syria, in which the Neolithic way of life based on agriculture had developed.

This second Neolithic stage ended *c.* 6000 BC. For the next 1,000 years there is little evidence of occupation at Jericho. Only about 5000 BC did Jericho show the influences of developments that had been taking place in the north, where an ever-increasing number of villages had appeared, still Neolithic but marked by the use of pottery. The first pottery users of Jericho were, however, primitive compared with their predecessors on the site, living in simple huts sunk in the ground. They were probably mainly pastoralists. Over the next 2,000 years, occupation was sparse and possibly intermittent.

At the end of the 4th millennium BC, an urban culture once more appeared in Jericho, as in the rest of Palestine. Jericho became a walled town again, with its walls many times rebuilt.

About 2300 BC there was once more a break in urban life. The nomadic newcomers, consisting of a number of different groups, were probably the Amorites. Their successors, *c.* 1900 BC, were the Canaanites, sharing a culture found the whole length of the Mediterranean littoral. The Canaanites reintroduced town life, and excavations have provided evidence both of their houses and of their domestic furniture, which was found in their tombs as equipment of the dead in the afterlife. These discoveries have indicated the nature of the culture that the Israelites found when they infiltrated into Canaan and which they largely adopted.

Excavations in 1950–51 revealed something of Herodian Jericho. A magnificent facade on Wādī al-Qulṭ, a mile south of Old Testament Jericho, is probably part of Herod's palace; and its style, completely Italian, illustrates Herod's devotion to Rome. Traces of other fine buildings can be seen in this area, which became the centre of Roman Jericho.

Jericho of the Crusader period was on yet a third site, a mile east of the Old Testament site, and here the modern town grew up. An insignificant village in Turkish times, it became a winter resort after the British Mandate (1922). Its major expansion, however, came after its incorporation into Jordan in 1949. The establishment in the neighbourhood of two enormous camps of Arab refugees from Israel brought great activity to the town, which was largely rebuilt; the area of the oasis was expanded by irrigation.

The Arab–Israeli War of June 1967 resulted in the dispersal of much of the population. Pop. (1967) 6,829. (K.M.K./Ed.)

Jermyn, Henry: *see* Saint Albans, Henry Jermyn, earl of.

Jernberg, Sixten (b. Feb. 6, 1929, Sweden), Swedish skier who was the most outstanding competitor in the Nordic events (cross country and jumping).

Originally a lumberjack by trade, Jernberg first came to prominence as a skier in 1954. He won four Winter Olympic Games gold medals: for the 50-kilometre race (1956, 1964) and the 30-kilometre race (1960) and as a member of the Swedish 4 × 10 kilometre relay race (1964). He also won three silver and two bronze medals, and seven consecutive Swedish Nordic titles (1954–60). Jernberg retired after the Winter Olympic Games of 1964 and was proclaimed a Swedish national hero.

Jerne, Niels K(ai) (b. Dec. 23, 1911, London), British–Danish immunologist who in 1984, with César Milstein and Georges Köhler, received the Nobel Prize for Physiology or Medicine.

Jerne was born of Danish parents and grew up in Denmark. After his graduation from the University of Leiden, Neth., he worked at the Danish State Serum Institute from 1943 to 1955. He received his medical degree from the University of Copenhagen in 1951, and in 1956 he was appointed chief medical officer of the World Health Organization (WHO), a position he held until 1962. During the 1960s he taught at the universities of Geneva and Pittsburgh (Penn.) and was professor of experimental therapy at J.W. Goethe University in Frankfurt am Main, Ger. He helped to establish the Basel Institute for Immunology and served as its director from 1969 to 1980. After teaching for a year at the Pasteur Institute, Paris, Jerne retired to Gard, Fr.

Jerne was the first to suggest the now generally accepted explanation of the way in which antibodies are produced to match the invading bodies, or antigens. He also offered a comprehensive theory of the development of the immune system as a whole, and in 1974 he presented the so-called network theory, in which he detailed the complex system of interactions whereby the immune system is activated to respond to and counteract disease and then is shut down when it is not needed.

Jerobaal (biblical hero): *see* Gideon.

Jérôme (king of Westphalia): *see* Bonaparte, Jérôme.

Jerome, SAINT, Latin in full EUSEBIUS HIERONYMUS, pseudonym SOPHRONIUS (b. *c.* 347, Stridon, Dalmatia—d. 419/420, Bethlehem, Palestine; feast day September 30), biblical translator and monastic leader, traditionally regarded as the most learned of the Latin Fathers. He lived for a time as a hermit, became a priest, served as secretary to Pope Damasus, and around 389 established a monastery at Bethlehem. His numerous biblical, ascetical, monastic, and theological works profoundly influenced the early Middle Ages. He is known particularly for his Latin translation of the Bible, the Vulgate.

Early life. Jerome was born of well-to-do Christian parents at Stridon, probably near the modern Ljubljana, Yugos. His education, begun at home, was continued in Rome when he was about 12. There he studied grammar, rhetoric, and philosophy. A serious scholar, enamoured of Latin literature, he frequented the catacombs, and near the end of his Roman education was baptized (*c.* 366), probably by Pope Liberius.

He spent the next 20 years in travel and impermanent residences. At Treveris (now Trier), he was profoundly attracted to monasticism. Possibly as early as 369 he was back in the vicinity of Stridon. In Aquileia (Italy) he was linked with an ascetic elite—including Rufinus, a writer and scholar, who translated the 3rd-century Alexandrian theologian Origen—grouped around Bishop Valerianus. When the group disbanded (*c.* 373), for reasons that are unknown to historians, Jerome decided to go on a trip through the East. Fatigued by travel and by inner conflict, on reaching Antioch (374) he rested as guest of the priest Evagrius of Antioch and there may have composed his earliest known work, *De septies percussa* ("Concerning Seven Beatings"). There also, in mid-Lent 375, during a near-fatal illness, he had a celebrated dream. In that dream, in which he was dragged before a tribunal of the Lord, he was accused of being a Ciceronian—a follower of the 1st-century-BC Roman philosopher—rather than a Christian, and he was severely lashed; he vowed never again to read or possess pagan literature.

Long afterward, in controversy with Rufinus, he minimized the dream's importance, but for years it kept him from reading the classics for pleasure, and at the time it caused a genuine spiritual crisis. One result of the dream was his first exegetical (critical interpretive) work, an allegorical commentary on the biblical book Obadiah, disowned 21 years later as a youthful production of fervent ignorance.

In 375 Jerome began a two-year search for inner peace as a hermit in the desert of Chalcis. The experience was not altogether successful to him personally. A novice in spiritual life, he had no expert guide; speaking only Latin, he was confronted with Syriac and Greek; lonely, he begged for letters; a gourmet with a weak stomach, he found desert food a penance; desperate for peace, he was racked by passion. Yet, he claimed that he was genuinely happy. His response to temptation was incessant prayer and fasting; he learned Hebrew from a Jewish convert, studied Greek, had manuscripts copied for his library and his friends, and carried on a brisk correspondence.

The crisis came when Chalcis became involved with ecclesiastical and theological controversies centring on episcopal succession and Trinitarian (on the nature of the relationship of the Father, Son, and Holy Spirit) and christological (on the nature of Christ) disputes. Suspected of harbouring heretical views (*i.e.,* Sabellianism, which stressed God's unity at the expense of the distinct persons), Jerome insisted that the answer to ecclesiastical and theological problems lay in oneness with the Roman bishop. Pope Damasus did not respond, and Jerome quit the desert for Antioch.

In Antioch his host, Evagrius, won Jerome

over to the party of Bishop Paulinus, who was opposed by Basil, the great orthodox bishop of Caesarea and one of the three Cappadocian Fathers—the others being Gregory of Nazianzus and Gregory of Nyssa. Recognizing his importance—since Jerome was by now known as a scholar and a monastic figure of significance—Paulinus decided to ordain him. Jerome accepted (378) on two conditions: his monastic aspirations would not be prejudiced, and priestly functions would not be forced on him. He attended the exegetical lectures of Apollinaris of Laodicea and visited the Nazarenes (Jewish Christians) of Beroea to examine their copy of a Hebrew gospel purporting to be the original Gospel of Matthew.

Jerome spent almost three years (379–382) continuing his pursuit of scriptural studies. An enthusiastic disciple of Gregory of Nazianzus, Jerome also came to know Gregory of Nyssa and the theologian Amphilochius of Iconium at the Council of Constantinople (381). Under such influences he improved his knowledge of Greek and developed an admiration for Origen's exegesis. He translated 14 of Origen's homilies (sermons) on Old Testament books into Latin. Here too he translated the church historian Eusebius' *Chronicon* (*Chronicles*) and continued it to the year 378.

But the most decisive influence on Jerome's later life was his return to Rome (382–385) as secretary to Pope Damasus. There he pursued his scholarly work on the Bible and propagated the ascetic life. On Damasus' urging he wrote some short exegetical tracts and translated two sermons of Origen on the Song of Solomon. More importantly, he revised the Old Latin version of the Gospels on the basis of the best Greek manuscripts at his command, and made his first, somewhat unsuccessful, revision of the Old Latin Psalter based on a few Septuagint (Greek translation of the Old Testament) manuscripts. He held classes for a monastic-minded circle of noble Roman widows and virgins (*e.g.,* Marcella, Paula, and her daughters Blesilla and Eustochium). He taught them the Hebrew text of the Psalms, orally and in letters, he answered their biblical problems, and he was their master in spirituality as well. Under these conditions, he wrote a defense of the perpetual virginity of Mary, Jesus' mother (383), and attacked the view of those who espoused the equality of virginity and marriage. But his preaching in support of the monastic life and his relationship with the ascetic coterie, his castigation of Roman clergy, lax monks, and hypocritical virgins, and his correction of the gospel text provoked such a storm of criticism and calumny, especially after Damasus' death, in December 384, that in August 385 he left "Babylon" (Rome) in bitter indignation and made his way to the Holy Land.

In company with virgins led by Paula, Jerome made a religious and archaeological pilgrimage through all of Palestine and to the monastic centres of Egypt; he spent almost a month with the famed exegete Didymus in Alexandria.

The summer of 386 found him settled in Bethlehem. There, by 389, Paula finished a monastery for men under Jerome's direction, three cloisters for women (forming one convent) under her own supervision, and a hostel for pilgrims. Here Jerome lived, except for brief journeys, until his death.

Later literary works. The literary legacy of Jerome's last 34 years (in Palestine) is the outgrowth of contemporary controversies, Jerome's passion for Scripture, and his involvement in monastic life. The controversies were varied. An anti-Origen movement in the east, fanned by the anti-heretical bishop Epiphanius, turned Jerome not only against the views of Origen—whose 39 sermons on Luke he had translated *c.* 389–392—but against his friends Bishop John of Jerusalem and Rufinus. His petulance in early correspondence with St. Augustine, stemming from the African's strictures on Jerome's biblical efforts, imperilled their mutual respect. His catalog of Christian authors, *De viris illustribus* ("Concerning Illustrious Men"), was written in 392/393 to counter pagan pride in pagan culture. Against the monk Jovinian, who asserted the equality of virginity and marriage, he wrote a polemical diatribe *Adversus Jovinianum* (393) that was frequently brilliant but needlessly crude, excessively influenced by the 2nd- and 3rd-century theologian Tertullian, whose writings were at times unnecessarily harsh toward marriage. Against the priest Vigilantius, Jerome dictated in one night a defense of monasticism, clerical celibacy, and certain practices connected with the cult of martyrs (*Contra Vigilantium,* 406). The Pelagian problem—named for the heretical British monk Pelagius, who minimized the role of divine grace in man's salvation—was transplanted to Palestine from Rome with the personal appearance of the author of this heresy, and it called forth Jerome's finest controversial work, *Dialogi contra Pelagianos* (three books, 415), in which his use of fictitious interlocutors makes his arguments uncommonly impersonal.

Jerome's biblical production in Bethlehem includes two introductory works helpful to biblical scholars: *Liber locorum* ("Book of Places"), a useful translation and adaptation of Eusebius' work on Palestinian place-names; and *Liber interpretationis Hebraicorum nominum* ("Book of Interpretation of Hebrew Names"), an alphabetical list, with quite fanciful etymologies or origins, of Hebrew proper names in the Bible. Continuing his revision of the Old Latin version of the Septuagint based on Origen's *Hexapla* (an edition with the Hebrew text in Hebrew and Greek characters, and four different Greek versions arranged in six parallel columns), he revised Ecclesiastes, Proverbs, the Song of Solomon, Chronicles, and Job, and to his Roman revision of the Psalms added Origen's diacritical notes. Between 391 and 406 he produced a Latin translation of the Old Testament on the basis of the original text, a remarkable effort considering the slender instruments at his disposal and the opposition his project provoked. Jerome's Bethlehem commentaries suffer at times from hasty composition, excessive dependence on his predecessors, and a predilection for allegorical interpretation. The *Liber Hebraicarum quaestionum in Genesim* ("Book of Hebrew Questions on Genesis") gives an important place to geography, etymology, and rabbinic tradition (post-biblical Jewish scholarly views). He wrote short glosses (interpretations) on the Psalter and more scientific explanations of Psalms 10–16. His commentary on Ecclesiastes (*c.* 387) is a milestone in exegesis, because it is the first original Latin commentary that takes advantage of the Hebrew text. Perhaps Jerome's best commentaries are on the minor and major prophets of the Old Testament. As for the New Testament, he explained Matthew, accenting the literal sense; he interpreted four of the Apostle Paul's letters (Philemon, Galatians, Ephesians, Titus), with the stress on the allegorical interpretation; he recast the chiliastic commentary (on the view that Christ would return again and his followers would reign for 1,000 years) of Bishop Victorinus of Pettau (Austria), a Latin exegete martyred *c.* 304, on the Revelation to John. Many of his letters are tracts on exegetical problems, and he wrote homilies to monks under his direction on texts of Scripture.

Jerome's ascetical interests at Bethlehem are mirrored not only in his controversies but in his life of Malchus, the monk captured by Bedouins; a biography of Hilarion, with its miracles and journeyings; a translation of Coptic ascetical works (*e.g.,* the Rule of Pachomius); homilies to monks; and a significant segment of his correspondence.

Influence. Jerome is remembered for his extensive erudition, especially his understanding of the classics, the Bible, and Christian tradition. He was a learned scholar rather than a deep thinker, a sound traditionalist and not a speculative theologian, more competent as editor than as exegete. His career was a turbulent combination of scholarship and asceticism, and his correspondence is an exciting source for the historian, Scripture student, and theologian. His influence has been far-reaching and profound, on the early Middle Ages in particular: primarily through the Vulgate (the Latin version that he had translated), but importantly also through his work as an exegete and humanist and because he transmitted much of Greek thought to the West. (W.J.Bu.)

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Jerome OF PRAGUE (b. *c.* 1365, Prague—d. May 30, 1416, Constance), Czech philosopher and theologian whose advocacy of sweeping religious reform in the Western Church made him one of the first Reformation leaders in central Europe.

A student at the Charles University of Prague, Jerome came under the influence of the Czech Reformer Jan Hus, with whom he collaborated in criticizing the Roman Catholic Church and in debating theological issues throughout Bohemia, Poland, and Germany. After obtaining the bachelor's degree in 1398, he continued his studies at Oxford and adopted the philosophical theology of the English Reformer John Wycliffe. He returned to Prague in 1401 and, as a university professor, began spreading Wycliffe's teaching.

The Christian Church, according to Jerome's views, is the community of those chosen by God for salvation and is not defined in legal terms devised by a rigid, ministerial structure. He advocated, moreover, the need for poverty in the church and called for the expropriation of church lands. In the order of worship he insisted that the wine of Holy Communion be extended to the laity, as practiced by the early church, and asked for more freedom in preaching.

Continuing to propagate reform doctrine at various academic centres throughout Europe, Jerome taught at the Sorbonne (1405) and

at the universities of Heidelberg and Cologne (1406) but was forced to leave by ecclesiastical authorities in each city. Returning to Prague, he and Hus resumed public debates and proposed to reform the structure and customs of the church through a general council.

Extending his dissent to traditional sacramental theology and liturgy, Jerome was forced to leave Vienna in 1410 and was expelled from Poland after King Władysław II had invited him to reorganize the University of Kraków. Again at Prague, in 1412, he joined Hus in a famed public disputation in which he maintained that the faithful are not bound to obey papal commands that conflict with the laws of Christ. He then led a procession through the city, climaxed by burning Antipope John XXIII's decree authorizing the sale of indulgences (pardon from punishment for sin).

In April 1415, against the advice of his followers, Jerome went secretly to the Council of Constance in an unsuccessful attempt to defend the teaching of the imprisoned Hus. As he was leaving Constance, he was arrested and imprisoned. Confined for more than a year and ill, he disavowed the condemned doctrine of Wycliffe and Hus, after repeated interrogation by the conciliar tribunal. Accused of ambiguity and insincerity at his final appearance before the council (May 26, 1416), he then withdrew all earlier retractions of reform views and declared that his confession of Roman Catholic orthodoxy had come out of fear and weakness. Accordingly, he was judged a relapsed heretic and sentenced to burn at the stake. The Bohemian Hussite Church considers Jerome (with Hus) the first martyr for the Protestant Reformation.

Of Jerome's writings, all that remain are his university lectures and disputations and two treatises, *Positio de universalibus* ("A Position on Universals") and *Quaestio de universalibus* ("The Question of Universals").

Jerome, Chauncey (b. June 10, 1793, Canaan, Conn., U.S.—d. April 20, 1868, New Haven, Conn.), American inventor and clockmaker whose products enjoyed widespread popularity in the mid-19th century.

Learning the carpenter's trade early in life, Jerome spent his leisure time making dials for grandfather clocks and was employed in 1816 by a clockmaker at Plymouth, Conn. Later, he started his own business peddling clocks from farmhouse to farmhouse. The bronze looking-glass clock he designed in 1824 became popular; he then formed a company that soon became the leader in clock production, with branches in Virginia and South Carolina in addition to the main plant at Bristol, Conn.

About 1838 Jerome invented the one-day brass movement, an improvement over the wood clock. Applying the mass-production techniques of American inventor Eli Whitney, Jerome flooded the United States with low-priced brass clocks. His clocks quickly spread to Europe and so astonished the English that "Yankee ingenuity" became a byword.

In the 1850s Jerome became associated with unethical businessmen, and his company failed; he died in poverty.

Jerome, Jerome K(lapka) (b. May 2, 1859, Walsall, Staffordshire, Eng.—d. June 14, 1927, Northampton, Northamptonshire), English novelist and playwright whose humour—warm, unsatirical, and unintellectual—won him wide following.

Jerome left school at the age of 14, working first as a railway clerk, then as a schoolteacher, an actor, and a journalist. His first book, *On the Stage—and Off,* was published in 1885, but it was with the publication of his next books, *The Idle Thoughts of an Idle Fellow* (1886) and *Three Men in a Boat* (1889), that he achieved great success; both books were widely translated. From 1892 to 1897 he was a coeditor (with Robert Barr and George Brown Burgin) of *The Idler,* a monthly magazine that he had helped found, which featured contributions by writers such as Eden Phillpotts, Mark Twain, and Bret Harte.

Jerome's many other works include *Three Men on the Bummel* (1900) and *Paul Kelver* (1902), an autobiographical novel. He also wrote a number of plays. A book of Jerome's memoirs, *My Life and Times,* was published in 1926 and a biography by J. Connolly in 1982.

Jerrold, Douglas William (b. Jan. 3, 1803, London—d. June 8, 1857, London), English playwright, journalist, and humorist.

Jerrold achieved success in the theatre with *Black-Eyed Susan* (1829), a nautical melodrama based on an 18th-century ballad by John Gay. He also mastered a special brand of Victorian humour in a series of articles called "Mrs. Caudle's Curtain Lectures" (1845) for *Punch* magazine, to which he was a regular contributor. More plays with a nautical theme followed *Black-Eyed Susan,* but Jerrold was ambitious to write high comedy, at which he was less successful. A prolific journalist, he wrote much that is bitter and personal, in sharp contrast to the geniality of his "Curtain Lectures," which appeared in book form (1846) and were regularly reprinted.

Jersey, largest and southernmost of the Channel Islands, 12 miles (19 km) west of the Cotentin peninsula of France; its capital, St. Helier (*q.v.*), is 100 miles south of Weymouth, Eng. Jersey is about 10 miles across and 5 miles from north to south and has an area of 44 square miles (115 square km). The Ecrehous rocks (6 miles northwest) and Les Minquiers (12 miles south) are in the Bailiwick of Jersey (area 45 square miles [116 square km]).

The island is largely a plateau mantled with loess, with deeply incised valleys sloping from north to south. Picturesque cliffs reaching 485 feet (148 m) in height line the northern coast; elsewhere, rocky headlands enclose sandy bays bordered by infilled lagoons. Coasts are reef-strewn, but a breakwater in St. Aubin's Bay protects St. Helier harbour from southwest gales. Blown sand forms dunes at the northern and southern ends of St. Ouen's Bay on the western coast. The climate is less maritime and more sunny than Guernsey's. Mean annual temperature is 52° F (11° C). Frost is rare, but cold air spreading from France in spring occasionally damages the potato crop.

Prehistoric remains of Paleolithic man have been found at La Cotte de St. Brelade, and there is abundant evidence of the Neolithic and Bronze ages. The island was known to the Romans as Caesarea. Documents (11th century) show 12 parishes as part of the diocese of Coutances. In the 12th century, Norman landowners dominated the island, which was divided into three units for the collection of the king-duke's revenue.

Separation from Normandy in 1204 made reorganization necessary. Jersey kept its Norman law and local customs but, with the other islands, was administered for the king by a warden and sometimes by a lord. By the end of the 15th century, Jersey had its own captain, later called governor, an office abolished in 1854, when the duties devolved upon a lieutenant governor, who still performs them. In 1617 it was ruled that justice and civil affairs were affairs of the bailiff. The Royal Court, as it came to be called, took the same form as Guernsey's; the surviving court still reveals its medieval origin. The States of Jersey were separated from the Royal Court (1771) and assumed the court's residual powers of legislation. Parish deputies were first elected in 1857.

In the 17th century the De Carterets, seigneurs of St. Ouen, dominated the island, holding it for the king from 1643 to 1651. In the 18th and 19th centuries the island was torn by feuds—Magots versus Charlots, Laurels versus Roses—but it also prospered from the Newfoundland fisheries, privateering, and smuggling, and, later, from cattle, potatoes, and the tourist trade.

Jersey is now governed under the British monarch in council by the Assembly of the States, in which the royally appointed bailiff presides over 12 senators, 12 constables (connétables), and 29 deputies, all popularly elected. The lieutenant governor and crown officers have seats and may speak but not vote. The Royal Court consists of the bailiff as chief magistrate and 12 jurats chosen by an electoral college. Judicial and legislative functions of jurats were not separated until 1948, when other reforms excluded from the States the rectors of the 12 parishes. The proceedings are conducted in French, the official language, though English is everywhere understood.

The inhabitants are mainly of Norman descent with an admixture of Breton, although there was an influx of English after 1830, of political refugees from Europe after 1848, and, after World War I, of men seeking to avoid taxation. St. Helier, the adjoining parishes of St. Saviour and St. Clement, Gorey, and St. Aubin are the main population centres.

Farming concentrates on dairying (with ancillary cropping) and on breeding for export of Jersey milk cattle, the only breed allowed on the island since 1789. Many small farms grow early potatoes and outdoor tomatoes for export. Greenhouse production of flowers, tomatoes, and vegetables is significant. Soil is fertilized with vraic (French *varec,* "wrack," or "seaweed") fertilizer. The tourist trade is well established. Knitting of the traditional woolen jerseys has declined. Passenger and cargo ships connect Jersey with Guernsey and Weymouth, Eng., and with Saint-Malo, Fr., via the ports of St. Helier and Gorey; and there are cargo services to London and Liverpool. Air links are extensive. Jersey Zoological Park was founded in 1959 in Trinity Parish by Gerald Durrell, the naturalist and writer, to protect animals in danger of extinction. Pop. (1981) 72,970.

Jersey, breed of small short-horned dairy cattle originating on Jersey, one of the Channel Islands; it is believed to have descended from French cattle. The colour of the Jersey is usually a shade of fawn or cream, but darker shades are common. In the late 18th century measures were passed prohibiting the importation of cattle into Jersey except for immediate slaughter, and by the early 19th century the indigenous breed came to be recognized as pure. Jersey cattle have been introduced in large numbers into England, one of the earliest herds being formed in 1811. The first exportation of registered Jerseys to the United States was in 1850.

The Jersey is adaptable to a wide range of conditions, and its distribution is worldwide. Jersey milk is remarkably rich in butterfat, and for that reason animals of this breed are in demand for crossing with native stock to improve the butterfat percentage in milk. Jerseys are of great importance where butter is a major product, as in New Zealand and Denmark. Because of their small size and lack of muscular development as well as the yellow colour of body fat, Jerseys have lower beef value than the other major breeds. Their principal capacity lies in their efficient production of milk high in butterfat and milk solids.

Jersey Act, also called JERSEY LAW, resolution passed in 1913 by the English Jockey Club and named after its sponsor, Victor Albert George, 7th Earl of Jersey, one of the club stewards. It declared that the only horses and mares acceptable for registration in the General Stud Book would be those that could be traced in all their lines to sires and dams already registered therein. The Act effectively

disqualified as Thoroughbreds many horses bred outside England or Ireland, including the majority of North American horses. With the shutdown in 1911 and 1912 of racing in New York, the major American racing centre and bloodstock market, an invasion of American bloodstock into England became a threat, and the Act was ostensibly intended to protect the British Thoroughbred from infusions of American blood. The resulting complications of recognizing outstanding horses, however, caused ill feeling among U.S. and French breeders. In 1949, following a rash of victories in prestigious English races by French horses with "impure" American blood, the Law was modified to qualify animals on which eight or nine crosses of pure blood could be traced for at least a century and for which turf performances of the immediate family could be shown as a warrant of blood purity. Not all American Thoroughbreds then became qualified for registration in the General Stud Book, but the ill feeling was eliminated.

Jersey City, city, seat (1840) of Hudson county, northeastern New Jersey, U.S. It is situated on a peninsula between the Hudson and Hackensack rivers, opposite Manhattan Island, with which it is connected by the Holland Tunnel and the Port Authority Trans-Hudson rapid transit system. Its site, first visited by Henry Hudson in 1609, was settled by Dutch trappers in 1618 and became known as Paulus Hook (renamed Jersey City in 1836). Michael Pauw purchased it from the Delaware Indians in about 1630, and by 1660 a permanent settlement had been established. In 1664 the British seized it briefly, returned it to the Dutch, and then regained it in 1674 as part of the spoils in the Dutch War. On July 19, 1779, during the American Revolution, Henry ("Light-Horse Harry") Lee stormed the town, forcing the British to retreat.

Jersey City's emergence as a major transportation centre sharing a communications complex with New York City began with its dockside facilities (now part of the Port of New York complex) and the completion of railroads and the old Morris Canal in the 1830s. In 1908 the Hudson and Manhattan tubes (tunnels) connected it to lower Manhattan Island. Now highly industrialized, the city manufactures chemicals, containers, electrical equipment, petroleum products, cosmetics, clothing, and soap. It is the seat of Jersey City State College (1929), St. Peter's College (1872), and an extension of Rutgers University. Inc. town, 1804; city, 1820. Pop. (1988 est.) city, 218,492; PMSA, 542,200.

jersey stitch (knitting): *see* plain stitch.

Jersey Zoological Park, zoo on the island of Jersey, in the British Isles, primarily devoted to keeping and breeding endangered species, especially island forms and small mammals and reptiles. The zoo, situated on 14 hectares (35 acres) of rolling hills, was founded in 1959 by the British author Gerald Durrell. Its management was turned over to the Jersey Wildlife Preservation Trust in 1963. More than two-thirds of the zoo's 1,500 specimens, which represent about 100 species, were bred on the park grounds. The zoo does not maintain a monopoly of any rare species it breeds; all surplus animals are sent to other institutions to provide breeding stock if illness or disaster strikes a particular colony.

The Jersey Zoological Park breeds many rare primates, including seven species of marmosets, Mayotte brown lemurs, colobus monkeys, and gorillas. Other rare mammals bred there are spectacled bears, tenrecs, and Rodrigues fruit bats, the rarest species of bat in the world.

Jerubbaal (biblical judge): *see* Gideon.

Jerusalem, Hebrew YERUSHALAYIM, Arabic BAYT AL-MUQADDAS, or AL-QUDS, ancient city of the Middle East that since 1967 has been wholly in the possession of Israel. Since 1967 the city has been claimed by Israel as its capital. Jerusalem has been inhabited since 1800 BC and is one of the principal holy places of the three great monotheistic faiths of Judaism, Christianity, and Islām. After the 1948 Arab-Israeli war Jerusalem was divided between Transjordan (later Jordan), which annexed the Old City and the rest of East Jerusalem, and Israel, which held West Jerusalem. East Jerusalem was taken by Israel in the Six-Day War of 1967. Israel has declared Jerusalem to be its eternal and indivisible capital, and the status of the city has become a major point of contention between the Jewish state and its Arab neighbours.

A brief treatment of Jerusalem follows. For full treatment (including a map), *see* MACROPAEDIA: Jerusalem.

Jerusalem is located near the centre of Israel, about 15 miles (24 km) west of the Dead Sea and 35 miles (56 km) east of the Mediterranean Sea, in the watershed between the Mediterranean coastal plain and the Great Rift Valley of the Jordan River. The city has a mixed subtropical, semiarid climate with warm, dry summers and cool, rainy winters.

For Jews, Jerusalem is the repository of the holiest of memories, the focus of religious reverence and nationhood; for Christians, the scene of their Saviour's agony and triumph; and for Muslims, the goal of their Prophet's mystic night journey and the site of the third-most sacred shrine in Islām. The city was the capital of the ancient Hebrews and of their Jewish descendants until the 1st century AD. During that century the city witnessed the ministry and crucifixion of Jesus Christ. The Prophet Muḥammad is believed by Muslims to have ascended to heaven from a site in Jerusalem.

The main source of employment in modern-day Jerusalem is government and public service (including academic and clerical professions). The city is also a centre of banking, finance, and insurance. There is little heavy industry; the dominant light industries are diamond cutting and polishing, and printing and publishing.

Jerusalem's cultural climate is richly diverse. The Old City, still surrounded by a massive town wall from antiquity, contains Muslim, Jewish, Christian, and Armenian quarters. The Old City is dominated by the raised platform of the Herodian Temple Compound, the site of the First and Second Temples of the Hebrews and Jews; the compound includes the Islāmic holy places of the Dome of the Rock and al-Aqṣā Mosque. Its Western (Wailing) Wall is the most sacred of Jewish shrines. The Old City is distinguished by its many churches and mosques and by the ancient synagogues and study houses of the Jewish Quarter. The modern portion of Jerusalem, which spreads out from the Old City, includes residential neighbourhoods, commercial and governmental buildings, and several educational institutions.

The Hebrew University in Jerusalem is Israel's foremost institution of higher learning. The Hadassah Medical Centre is renowned for medical research and health care. Extensive archaeological research in the region has contributed material to the Near Eastern archaeology and ethnology collections of the Israel, Rockefeller, and Islāmic museums in the city.

The Old City is ringed by major avenues. Access roads link Jerusalem with Tel Aviv–Yafo and Lod Airport to the west; Nābulus and Jerusalem (International) Airport to the north; Amman, Jordan, to the east; and Beersheba, Hebron, and Bethlehem to the south. A rail line runs from Jerusalem to the coast at Tel Aviv–Yafo. Area city, 42 square miles (109 square km). Pop. (1987 est.) 468,900.

Jerusalem, Assizes of, French ASSISES DE JÉRUSALEM, a law code based on a series of customs and practices that developed in the Latin crusader kingdom of Jerusalem in the 12th century. It stands as one of the most complete monuments of feudal law.

The basis for the assizes was laid by Godfrey of Bouillon (died 1100), first ruler of the kingdom. He asked his leading men to query crusaders regarding customs and practices prevalent in the West. The customs that were adopted were primarily French and were intended to govern and guard a population surrounded by enemies and dependent upon military service to maintain itself. Deposited in the Church of the Holy Sepulchre in Jerusalem, the code was referred to as *Lettres du Sepulchre* ("Letters of the Sepulchre").

The assizes provided for such things as the king's officers, administration of justice, collection of taxes, granting of fiefs, provisions for military service, and regulation of trade. The original *Lettres du Sepulchre* perished at the capture of Jerusalem in 1187, but another compilation was made in the 13th century by a group of lawyers in the kingdom of Cyprus, where remnants of Frankish society in the Latin East settled after the Muslim reconquest of the Holy Land. Though the assizes were revised over the subsequent 300 years, they still elucidate the nature of the feudal state in the European Middle Ages.

Jerusalem, Council of, a conference of the Christian Apostles in Jerusalem in about AD 50 which decreed that Gentile Christians did not have to observe the Mosaic Law of the Jews. It was occasioned by the insistence of certain Judaic Christians from Jerusalem that Gentile Christians from Antioch in Syria obey the Mosaic custom of circumcision. A delegation, led by the apostle Paul and his companion Barnabas, was appointed to confer with the elders of the church in Jerusalem.

The ensuing apostolic conference (noted in Acts 15:2–35), led by the apostle Peter and James, "the Lord's brother," decided the issue in favour of Paul and the Gentile Christians. From this time onward Gentile Christians were not bound by the Levitical ceremonial regulations of the Jews, except for the provisions of the so-called apostolic decree: abstention "from what has been sacrificed to idols and from blood and from what is strangled and from unchastity" (Acts 15:29). The Council of Jerusalem thus demonstrates the willingness of apostolic leaders to make compromises on certain secondary issues in order to maintain peace and unity in the church.

Jerusalem, Kingdom of, a state formed in 1099 from territory in Palestine wrested from the Muslims by European Christians during the First Crusade and lasting until 1291, when the two surviving cities of the kingdom succumbed to attacks by Muslim armies.

The rulers of the neighbouring crusader states of Antioch, Edessa, and Tripoli were the king of Jerusalem's vassals; in return for their loyalty and military service, he provided them with aid and protection. The kingdom proper, which corresponded roughly to present Israel, southern Lebanon, and southwestern Jordan, included four great baronies: the county of Jaffa and Ascalon, the lordship of Krak or Montréal, the principality of Galilee, and the lordship of Sidon. Jerusalem and its surrounding territory plus the cities of Tyre (Ṣūr, Leb.) and Acre (ʿAkko, Israel) composed the royal domain. Though fiefs tended to become hereditary, kings often had to intervene to settle succession disputes and to enforce the Assizes of Jerusalem, the code of law upon which the government of the kingdom was based.

Economically, the kingdom was not wealthy, depending on trade with the Muslims, banking activities, and taxes on pilgrims to keep the government operating and to provide for defense. Though there were some fertile dis-

tricts, much was barren, and in bad years grain had to be imported from Syria to feed the Christians.

The early kings of Jerusalem, Baldwin I (reigned 1100–18) and Baldwin II (1118–31), secured the kingdom by capturing the coastal towns and building new fortifications to safeguard the interior of Palestine and the northern territories. Subsequently, the kings tried to expand into the south, abandoning the earlier policy and indirectly contributing to the Muslim conquest of Edessa (1144). When the Second Crusade (1147) failed, the Muslims began to strengthen their position. King Amalric I (reigned 1163–74) directed attacks against Egypt, and his failures contributed to the rise of the Muslim leader Saladin (reigned 1169–93), who succeeded in uniting the previously divided Muslim world in a massive attack on the Holy Land. Saladin's armies overran the city of Jerusalem in 1187, and, despite some territorial recovery made by the Third Crusade (late 12th century), the city remained in Muslim hands. With the fall of Jerusalem, the kings made Acre the capital of their kingdom, and there they watched the slow erosion of their territory throughout the 13th century, despite the efforts of new expeditions from Europe to regain lost ground.

Driven from the Asian mainland in 1291, the ruling house of Lusignan retreated to the island of Cyprus, which its members ruled until the late 15th century, still claiming the title king of Jerusalem.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Jerusalem, Synod of (1672), council of the Eastern Orthodox Church convened by Dosítheos, patriarch of Jerusalem, in order to reject the *Confession of Orthodox Faith* (1629), by Cyril Lucaris, which professed most of the major Calvinist doctrines. The synod rejected unconditional predestination (the doctrine that God has eternally chosen those whom he intends to save) and justification by faith alone, while it affirmed the essentially Roman doctrines of transubstantiation (the change of bread and wine into the body and blood of Christ in the mass) and of purgatory. Against Rome, however, it continued to affirm that the Holy Spirit proceeds from the Father alone. The synod also decreed that the church and Scripture are equally infallible, that there are seven sacraments, and that the books of Tobit, Judith, Ecclesiasticus, and Wisdom of Solomon are canonical books of the Bible.

Jerusalem, Temple of, either of two temples that were the centre of worship and national identity in ancient Israel.

In the early years of the Israelite kingdom, the Ark of the Covenant was periodically moved about among several sanctuaries, especially those of Shechem and Shiloh. After King David's capture of Jerusalem, however, the Ark was moved to that city. This action joined Israel's major religious object with the monarchy and the city itself into a central symbol of union of the Israelite tribes. As the site for a future temple, David chose Mt. Moriah, or the Temple Mount, where it was believed Abraham had built the altar on which to sacrifice his son Isaac.

The First Temple was constructed during the reign of David's son, Solomon, and completed in 957 BC. Other sanctuaries retained their religious functions, however, until Josiah (reigned *c.* 640–609 BC) abolished them and established the Temple of Jerusalem as the only place of sacrifice in the Kingdom of Judah.

The First Temple was built as an abode for the Ark and as a place of assembly for the entire people. The building itself, therefore, was not large, but the courtyard was extensive. The Temple building faced eastward. It was oblong and consisted of three rooms of equal width: the porch or vestibule (*'ulam*), the main room of religious service, or Holy Place (*hekhal*), and the Holy of Holies (*devir*) in which the Ark rested. A storehouse (*yaẓi'a*) surrounded the Temple except on its front (east) side.

The First Temple contained five altars: one at the entrance of the Holy of Holies, two others within the building, a large bronze one before the porch, and a large tiered altar in the courtyard. A huge bronze bowl, or "sea," in the courtyard was used for the priests' ablutions. Within the Holy of Holies, two cherubim of olive wood stood with the Ark; this innermost sanctuary was considered the dwelling place of the Divine Presence (*Shekhina*) and could be entered only by the high priest and only on the Day of Atonement (Yom Kippur).

The Temple suffered at the hands of Nebuchadrezzar II of Babylonia, who removed the Temple treasures in 604 BC and 597 BC and totally destroyed the building on the 9th of Av, 586. This destruction and the deportations of Jews to Babylonia in 586 and 582 were seen as fulfillments of prophecy and, therefore, strengthened Judaic religious beliefs and awakened the hope for the reestablishment of the independent Jewish state.

Cyrus II, founder of the Achaemenian dynasty of Persia and conqueror of Babylonia, in 538 BC issued an order allowing exiled Jews to return to Jerusalem and rebuild the Temple. Work was completed in 515 BC. There is no known detailed plan of the Second Temple, which was constructed as a modest version of the original building. It was surrounded by two courtyards with chambers, gates, and a public square. It did not include the ritual objects of the First Temple; of special significance was the loss of the Ark itself. Ritual, however, was elaborate and was conducted by well-organized families of priests and Levites.

During the Persian and Hellenistic (4th–3rd century BC) periods, the Temple generally was respected, and in part subsidized, by Judaea's foreign rulers. Antiochus IV Epiphanes, however, desecrated it by offering sacrifice to Zeus on the altar in 168 BC, touching off the Hasmonean revolt, during which Judas Maccabaeus cleansed and rededicated the Temple; the event is celebrated in the annual festival of Ḥanukka.

During the Roman conquest, Pompey entered (63 BC) the Holy of Holies but left the Temple intact. In 54 BC, however, Crassus plundered the Temple treasury. Of major importance was the rebuilding of the Second Temple begun by Herod the Great, king (37 BC–AD 4) of Judaea.

Construction began in 20 BC and lasted for 46 years. The area of the Temple Mount was doubled and surrounded by a wall with gates. The Temple was raised, enlarged, and faced with white stone. The new Temple square served as a gathering place and its porticoes sheltered merchants and money changers. A stone fence (*soreg*) and a rampart (*ḥel*) surrounded the consecrated area forbidden to Gentiles. The Temple proper began, on the east, with the Court of Women, each side of which had a gate and each corner of which had a chamber. This court was named for a surrounding balcony on which women observed the annual celebration of Sukkot. The western gate of the court, approached by a semicircular staircase, led to the Court of the Israelites, that portion of the Court of Priests open to all male Jews. Surrounding the inner sanctuary, the Court of Priests contained the sacrificial altar and a copper laver for priestly ablutions. This court was itself surrounded by a wall broken with gates and chambers. The Temple sanctuary building was wider in front than in the rear; its eastern facade had two pillars on either side of the gate to the entrance hall. Within the hall, a great gate led to the sanctuary, at the western end of which was the Holy of Holies.

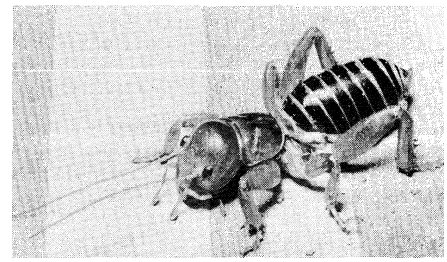
The Herodian Temple was again the centre of Israelite life. It was not only the focus of religious ritual but also the repository of the Holy Scriptures and other national literature and the meeting place of the Sanhedrin, the highest court of Jewish law during the Roman period. The rebellion against Rome that began in AD 66 soon focussed on the Temple and effectively ended with the Temple's destruction on the 9th/10th of Av, AD 70.

All that remained of the Second Temple was a portion of the Western Wall (*q.v.;* also called the Wailing Wall), which continues to be the focus of Jewish aspirations and pilgrimage. Made part of the wall surrounding the Muslim Dome of the Rock and al-Aqṣā Mosque in AD 691, it returned to Jewish control in 1967.

Jerusalem artichoke, also called GIRASOLE, sunflower (*Helianthus tuberosus*) of the Asteraceae family, native to North America, noted for its edible tubers. The aboveground part of the plant is a coarse, usually multibranched, frost-tender perennial, 2 to 3 metres (7 to 10 feet) tall. The numerous showy flowerheads, appearing in late summer or early autumn, have yellow ray flowers and yellow, brownish, or purplish disk flowers. The underground tubers vary from oblong to much elongated, regular to rough and branched, and from very small to 4 ounces (about 110 grams). Skin colours range from light buff, through yellowish, to brown, red, and purple. The tubers are very thin-skinned and soon shrivel on exposure to dry air; the flesh is white and crisp. The plant is propagated by planting the tubers.

Jerusalem artichoke is popular as a cooked vegetable in Europe and has long been cultivated in France as a stock feed. In the United States it is rarely cultivated, but small quantities are used in making pickles, relishes, and dietary preparations.

Jerusalem cricket, also called SAND CRICKET, any insect of the orthopteran family Stenopelmatidae of about 35 species. It is large, brownish, and awkward and is found in Asia, South Africa, and North and Central America.



Jerusalem cricket (*Stenopelmatus intermedius*)
E.S. Ross

The Jerusalem cricket is active at night and spends the day beneath rocks or sand. Its thick, heavily armoured front legs are used for digging.

Jerusalem Post, Israeli English-language daily newspaper established in 1932 to serve readers who did not speak Hebrew but did understand English. It is the largest English-language daily in the country. A morning paper appearing daily except Saturday, the *Post* has traditionally stressed foreign news, giving particular attention to Arab–Israeli relations. In the early 1980s its circulation was about 31,000 daily and 45,000 for its big Friday edition. The weekend edition is the basis for

an international edition called the *Jerusalem Post Weekly*, with a worldwide circulation of 50,000.

Essentially independent in its editorial policies, the *Jerusalem Post* has combined spare writing with economical headlines and careful editing to build a reputation for informative, objective, and thorough coverage. The paper carries little advertising.

Jervas, Charles, Jervas also spelled JARVIS (b. 1675?, Ireland—d. Nov. 2, 1739), Irish-born British portrait painter who also translated Cervantes' *Don Quixote.*

Moving to England, Jervas became an apprentice to the painter Sir Godfrey Kneller. He later studied drawing in Rome and then returned (*c.* 1709) to England. Succeeding Kneller, he became court painter to the English kings George I and George II. His home became a centre for literary figures, among them Alexander Pope and Jonathan Swift, whose portraits Jervas painted, as well as that of George II (1728).

Jervis, John Bloomfield (b. Dec. 14, 1795, Huntington, N.Y., U.S.—d. Jan. 12, 1885, Rome, N.Y.), U.S. civil engineer who made outstanding contributions in construction of U.S. canals, railroads, and water-supply systems.

Jervis was an engineer on the Erie Canal project, serving as chief engineer from 1821 to 1825, and in 1827 became chief engineer for the Delaware and Hudson Canal, a difficult work involving construction of numerous bridges and inclines in the mountains. He next became chief engineer of New York State's first railroads and in 1836 took charge of construction of the Croton Aqueduct, New York City's first water-supply system, which included erection of the Aqueduct Bridge, built on 15 stone arches, crossing the Harlem River. He was later a consultant during the building of a water-supply system for Boston and played a role in the extension of the railroads west to Chicago. One of Jervis' significant contributions was his introduction of careful consideration of all economic factors in planning an engineering project.

Jervis Bay, inlet of the Tasman Sea, southeastern New South Wales, Australia. A broad bay, 10 mi (16 km) by 6 mi, it is partly enclosed by Point Perpendicular on Beecroft Head on the northeast and Governor Head on the southwest. It was discovered in 1770 and named Long Nose by Capt. James Cook but was renamed in 1791 for the naval hero Adm. John Jervis, earl of St. Vincent. One of Australia's finest natural harbours (particularly the south section off the town of Jervis Bay), the bay and 28 sq mi (73 sq km) of shoreland were transferred in 1915 from the jurisdiction of New South Wales to the Australian Commonwealth to accord with the Seat of Government Act of 1908, which stipulated that the Australian Capital Territory (ACT) 110 mi west-southwest should have access to the sea. The proposed development of a commercial port and railroad from the bay to Canberra (ACT) has never been realized. The bay has, however, become a resort area served by such towns as Jervis Bay, Huskisson, and Sussex Inlet. The Royal Australian Naval College was established there in 1915, removed in 1930, and then returned to Jervis Bay in 1957.

Jervis Island (Galápagos Islands): *see* Rábida Island.

Jervis Island (Pacific Ocean): *see* Jarvis Island.

Jeseník Mountains, German ALTVATERGEBIRGE, mountain range, the eastern section of the Sudeten of Czechoslovakia, in northern Moravia, bordering the Polish frontier. The Hrubý (High) Jeseník, also known as Vysoký Jeseník, reaches the highest point at Praděd (4,895 ft [1,492 m]). The Nízký (Low) Jeseník, just to the east, has a lower profile. The Králický Sněžník Massif, named after its highest peak at 4,669 ft, is northwest of the Hrubý Jeseník group and extends into Poland. In common with the other components of the Sudeten ranges, the Jeseník Mountains are broken remnants of an ancient uplifted crystalline massif. The mountains are dotted with abandoned mines, principally for iron. Šumperk, Jeseník, and Karlova Studánka are focal points for tourists, while Dolní Lipová has a health resort.

Jesi, also spelled IESI, Latin AESIS, town and episcopal see, Ancona province, Marche region, central Italy, on the Esino River, just southwest of Ancona. The Roman colony of Aesis from 247 BC, it was destroyed by the Goths and Lombards and formed part of the Frankish king Pepin III's gift to the church in 756. In the early medieval conflicts between the Holy Roman emperors and the papacy, it supported the former until the Battle of Benevento (1266), after which it passed to the church. Jesi was the birthplace of Emperor Frederick II and of the 18th-century composer Giovanni Batista Pergolesi. The old quarter is completely enclosed by 14th-century walls. The Palazzo della Signoria (1486–98) houses the town hall, library, and art gallery.

An agricultural centre, Jesi manufactures agricultural machinery, soap, matches, silk, wool, and paper. Pop. (1981 prelim.) mun., 41,097.

Jespersen, (Jens) Otto (Harry) (b. July 16, 1860, Randers, Den.—d. April 30, 1943, Roskilde), Danish linguist and a foremost authority on English grammar, who helped to revolutionize language teaching in Europe, contributed greatly to the advancement of



Jespersen
By courtesy of Det Kongelige Bibliotek, Copenhagen

phonetics, linguistic theory, and the history of English, and originated an international language, Novial (*q.v.*).

As a boy he was inspired by the accomplishments of the famed Danish linguist Rasmus Rask, whose grammars he used to begin a study of Icelandic, Italian, and Spanish. Though intended for the law, he decided to explore language studies at a time when phonetics and reform in language teaching were prime concerns. In 1886, the year before receiving his master's degree in French from Copenhagen University, he published his first important paper, on phonetic laws, and helped to establish a Scandinavian association for the reform of language education. As professor of English at Copenhagen (1893–1925), he led a movement for basing foreign-language teaching on everyday speech and, in the course of his career, wrote a number of textbooks used in Denmark and other countries. He presented theoretical considerations of language teaching in *Sprogundervisning* (1901; *How to Teach a Foreign Language*, 1904). He published extensively on English; one of his most vital works, *Growth and Structure of the English Language* (1905), was reprinted in 1969. His great work in this area was the encyclopaedic *Modern English Grammar,* 7 vol. (1909–49).

Jespersen gave particular consideration to the relationship between sound and sense in language. Another major concern, linguistic progress, was influenced by Darwin's evolutionary theories and early reflected in *Progress in Language, with Special Reference to English* (1894). *Fonetik* (1897–99; "Phonetics") long remained the best scientific treatment of general phonetics. He made a highly original contribution to grammatical theory in *Sprogets logik* (1913; "The Logic of Language"). His principal work on linguistic evolution, and also probably his most brilliant achievement, was *Language: Its Nature, Development, and Origin* (1922). His belief in the efficiency of linguistic change was evidenced in *The Philosophy of Grammar* (1924). Long interested in international auxiliary languages, he helped to elaborate Ido, but his main achievement in this area was devising Novial, which he presented in *International Language* (1928). A Novial lexicon followed in 1930.

jessamine (shrub): *see* jasmine.

Jesse, also spelled ISAI, in the Old Testament, the father of King David. Jesse was the son of Ohed, and the grandson of Boaz and Ruth. He was a farmer and sheep breeder in Bethlehem. David was the youngest of Jesse's eight sons. The appellation "son of Jesse" served as a synonym for David both at Saul's court and, subsequently, when David became king. It became a standard poetic metaphor in the Bible. Phrases such as "root of Jesse" and "stump of Jesse" (Isa. 11:1,10) expand the metaphor. All evoke the figure of David. That the family of David would endure forever was an article of faith in monarchic circles (II Sam. 7), supported by the fact that his dynasty had occupied the throne on Mt. Zion in unbroken succession for over four centuries.

Because Jesus Christ belonged to one of the family branches descended from King David, it became customary for medieval artists to visually depict Jesus' genealogy as beginning with Jesse in such works as the stained glass windows known as Jesse windows.

Jessel, Sir George (b. Feb. 13, 1824, London—d. March 21, 1883, London), jurist considered one of the greatest English trial judges in equity. It is said that Jessel, as solicitor general (1871–73), was the first professing Jew to hold important governmental office in England. (Benjamin Disraeli, afterward earl of Beaconsfield, who had become chancellor of the exchequer in 1852 and prime minister in 1868, was born into Judaism but was baptized a Christian at the age of 12.)

The son of a London merchant, Jessel attended University College, London, and studied law at Lincoln's Inn. Called to the bar in 1847, Jessel was appointed a queen's coun-



Jessel, detail of an engraving
By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

sel in 1865 and was elected to the House of Commons as a Liberal in 1868. From 1873 he was master of the rolls, originally sitting

both as a judge of first instance in the Rolls Court and as a member of the Court of Appeal. Later, however, after statutes of 1875 and 1876 had made the master of the rolls the president of the Court of Appeal, he was exclusively an appellate judge.

Jessel's rapid and efficient work as a trial judge in equity contrasted sharply with the traditionally dilatory nature of English chancery proceedings (bitterly satirized by Charles Dickens in his novel *Bleak House,* 1852–53). The clarity of his judgments made them exceptionally useful as precedents; they were seldom appealed and very rarely reversed. He helped to effect the fusion of law and equity under the Supreme Court of Judicature acts (1873 *et seq.*).

Jessel, George (Albert) (b. April 3, 1898, New York City—d. May 24, 1981, Los Angeles), American comedian, actor, writer, composer, and producer, whose skill as a dinner speaker earned him the honorary title of Toastmaster General of the United States.

Jessel began his career at the age of nine, after his father's death. He toured vaudeville and variety theatres in the United States and England, developing a popular act that combined comedy, nostalgia, and sentimental songs. During the 1920s and '30s he concentrated on a stage career as a composer, writer, and producer and as the star of several plays, including the original 1925 production of *The Jazz Singer, The War Song* (1928), *Joseph* (1930), and *High Kickers* (1941), the last of which he coauthored with Bert Kalmar and Harry Ruby. In 1943 he moved to California, and for the next 10 years he produced Hollywood motion pictures, among them the musicals *The Dolly Sisters* (1945) and *Wait Till the Sun Shines, Nellie* (1952).

Although he appeared frequently on television in the '50s, Jessel devoted most of the remainder of his life to delivering eulogies and to serving as master of ceremonies and dinner speaker for numerous political and social causes. In 1970 he received a special Academy Award for his humanitarian work. Jessel's books include an autobiography, *So Help Me* (1943), several anecdotal memoirs, and guides to public speaking.

Jesselton (Malaysia): *see* Kota Kinabalu.

Jessentuki (Russian S.F.S.R.): *see* Yessentuki.

Jessner, Leopold (b. March 3, 1878, Königsberg, Ger.—d. Oct. 30, 1945, Los Angeles), theatrical producer and director associated with the German Expressionist theatre; his bold innovations in the 1920s gained him an international reputation.

Jessner worked as a touring actor in his youth. The first play he directed was Molière's *Tartuffe* in 1911. As director of the Berlin State Theatre (1919–25), he produced classic and contemporary plays on a bare, denaturalized stage on which graduated levels and flights of steps served in the place of scene changes as platforms for different actions. Memorable performances were Schiller's *Wilhelm Tell,* Shakespeare's *Richard III,* and a *Hamlet* in modern dress slanted to be a criticism of the Germany of the 1920s. He trained his actors to adopt an oversimplified, antinaturalistic manner, which was especially effective for interpretations of the possessed and frenzied characters in the plays of the early Expressionist Frank Wedekind. His most famous production, Wedekind's *Marquis von Keith* (1920), was performed at double speed. A Socialist and a Jew, Jessner was an active innovator in the theatre until 1933, when he emigrated from Nazi Germany to Hollywood, where he engaged anonymously in film work until his death.

Jessore, city, southwestern Bangladesh, on the Bhairab River. According to tradition its name is a corruption of *yaśohara* ("glory depriving"), as the town is said to have robbed Vikramāditya's 17th-century capital of Gaur of its preeminence. Ancient buildings include the Rajbāri of Chanchra and the shrines of the Muslim saints Bahrām Shāh and Gharib Shāh. Constituted a municipality in 1864, Jessore contains a stadium, a library, and four government colleges affiliated with the University of Rājshāhi.

The surrounding region occupies the central portion of the Gangetic Delta between the Hooghly (India) and Meghna estuaries. It consists of an alluvial plain intersected by watercourses that to the south spread out into large marshes. The chief crops of this region are rice, sugarcane, and dates. Pop. (1981) 149,426.

jester (comic entertainer): *see* fool.

Jesuit, member of SOCIETY OF JESUS (S.J.), a Roman Catholic order of religious men, founded by St. Ignatius of Loyola, noted for its educational, missionary, and charitable works, once regarded by many as the principal agent of the Counter-Reformation and later a leading force in modernizing the church. The Jesuits have always been a controversial group regarded by some as a society to be feared and condemned and by others as the most laudable and esteemed religious order in the Catholic Church.

The order grew out of the activity of Ignatius, a Spanish soldier who experienced a religious conversion during a period of convalescence from a wound received in battle. After a period of intense prayer, he composed the *Spiritual Exercises,* a guidebook to convert the heart and mind to a closer following of Christ. On Aug. 15, 1534, at Paris, six young men who had met him at the University of Paris and made a retreat according to the *Spiritual Exercises* joined him in binding themselves by vows to poverty, chastity, and a pilgrimage to Jerusalem. If this last promise did not prove possible, as it did not, they vowed to accept any apostolic work requested by the pope. In 1539 Ignatius drafted the first outline of the order's organization, which Pope Paul III approved on Sept. 27, 1540.

The society introduced several innovations in the form of the religious life. Among these were the discontinuance of many medieval practices—such as regular penances or fasts obligatory on all, a common uniform, and the choral recitation of the liturgical office—in the interest of greater mobility and adaptability. Other innovations included a highly centralized form of authority with life tenure for the head of the order; probation lasting many years before final vows; gradation of members; and lack of a female branch. Particular emphasis was laid upon the virtue of obedience, including special obedience to the pope. Emphasis was also placed upon flexibility, a condition that allowed Jesuits to become involved in a great variety of ministries in all parts of the world.

The society grew rapidly, and it quickly assumed a prominent role in the Counter-Reformation defense and revival of Catholicism. Almost from the beginning, education and scholarship became the principal work. The early Jesuits, however, also produced preachers and catechists who devoted themselves to the care of the young, the sick, prisoners, prostitutes, and soldiers; and they were often called upon to undertake the controversial task of confessor to many of the royal and ruling families of Europe. The society entered the foreign mission field within months of its founding as Ignatius sent Francis Xavier, his most gifted companion, and three others to the East. More Jesuits were to be involved in missionary work than in any other activity, save education. By the time of Ignatius' death in 1556, about 1,000 Jesuits were already working throughout Europe and in Asia, Africa, and the New World. By 1626 the number of Jesuits was 15,544; and in 1749 the total was 22,589.

The preeminent position of the Jesuits among the religious orders and their championship of the pope exposed them to hostility. By the middle of the 18th century a variety of adversaries, both lay and clerical, were seeking to destroy the society. The opposition can be traced to several reasons, primarily, perhaps, to the anticlerical and anti-papal spirit of the times. In 1773 Pope Clement XIV, under pressure especially from the governments of France, Spain, and Portugal, issued a decree abolishing the order. The society's corporate existence was maintained in Russia, where political circumstances—notably the opposition of Catherine II the Great—prevented the canonical execution of the suppression. The demand that the Jesuits take up their former work, especially in the field of education and in the missions, became so insistent that in 1814 Pope Pius VII reestablished the society.

After the restoration, the order grew to be the largest order of male religious. Work in education on all levels continued to involve more Jesuits than any other activity; but the number of Jesuits working in the mission fields, especially in Asia and Africa, exceeded that of any other religious order. They were also involved in a broad and complex list of activities, including work in the field of communications, in social work, in ecumenical groups, and even in politics.

Jesuit drama, program of theatre developed for educational and propagandist purposes in the colleges of the Society of Jesus during the 16th, 17th, and 18th centuries. Cultivated as a medium for disseminating Roman Catholic doctrine, drama flourished in the Jesuit schools for more than 200 years, evolving from modest student exercises to elaborate productions that often rivaled the contemporary public stage in polish and technical skill.

The earliest recorded performance of a Jesuit play was in 1551, at the newly founded Collegio Mamertino at Messina, in Sicily. In less than 20 years, plays were being performed at more than a dozen of the new Jesuit colleges springing up in cities across the Continent, including Rome, Seville, Córdoba, Innsbruck, Munich, and Vienna. By the mid-17th century there were nearly 300 Jesuit colleges in Europe, and in almost every one at least one play was given each year.

Originally plays were to be pious in nature, expressing true religious and moral doctrines; they were to be acted in Latin, decorously, and with little elaboration; and no female characters or costumes were to appear. All these rules were relaxed or revised as Jesuit drama evolved. Favourite subjects came from biblical histories, the lives of saints and martyrs, and incidents in the life of Christ, but Jesuit playwrights also drew upon material from pagan mythology, ancient history, and contemporary events, all reinterpreted in terms of Catholic doctrine. Dramas were frequently performed in the national languages or with vernacular prologues that explained the Latin text. Jesuit plays became increasingly elaborate, and their stagecraft kept pace with all the newest technical developments of European theatre.

Music was an important element in most of the plays, ranging from simple songs to works that called for a large orchestra and chorus. The elaborate musical productions of Austria and southern Germany reflected the influence of Italian opera as well as the long tradition of music in the church. The colleges of France even included ballet in their performances.

The extravagance and luxury of many of the Jesuit productions came under heavy attack. Many of the productions were enormously

expensive, and it was charged that students in some colleges did little more than prepare and perform plays. Opponents of the Jesuit order seized upon such charges and made them part of the wave of anti-Jesuit feeling that grew in the mid-18th century. Dramatic performances were prohibited or limited in many areas, and they ceased altogether in 1773, when the Society of Jesus was temporarily suppressed.

Jesuit Estates controversy, in Canadian history, dispute that arose between Protestants and Roman Catholics after the re-establishment of the Jesuit order.

When the Society of Jesus (the Jesuit order) was suppressed by the papacy in 1773, its extensive landholdings in Canada were transferred to the British government, with any revenues derived from them to be applied to educational programs. Popular demand for the educational and missionary services of the Jesuits forced Pope Pius VII to restore the order in 1814. In 1842 a number of Jesuits returned to Canada. The idea of granting them restitution was discussed for many years; finally the Jesuits' Estates Act of 1888 was passed, and they were given $400,000 in compensation for the loss of their estates.

The restitutionary measures aroused anti-Catholic feeling among Protestants in neighbouring Ontario, where in 1889 a motion was introduced into the House of Commons urging the Dominion government to disallow the measure on the grounds that its endowment of the Society of Jesus was a threat to civil and religious liberties. This motion and subsequent attempts were defeated.

Jesuit ware, Chinese porcelain decorated with European subject matter and made during the Ch'ing dynasty in the reign of Ch'ienlung (1736–96) for export to the West. The sources for the decoration were mainly European engravings brought to China by Jesuit missionaries. The most commonly used illustrations were of Christian subjects such as the Crucifixion, though mythological subjects and, occasionally, Masonic designs were used.

The designs were painted onto the white ware in black or sometimes sepia monochrome, to which thin gilding was often added. Coloured decoration is rare. Most surviving pieces date from 1730 to 1750. Despite the careful copying, the drawing can almost always be identified as Chinese; sometimes the contrast of Chinese brushwork with European subject matter creates an almost comic incongruity.

Jesus, Little Brothers and Little Sisters of: *see* Little Brothers of Jesus and Little Sisters of Jesus.

Jesus, Society of (religious order): *see* Jesuit.

Jesus Christ, also called JESUS OF GALILEE, or JESUS OF NAZARETH (b. *c.* 6 BC, Judaea—d. *c.* AD 30, Jerusalem), founder of Christianity, whose deeds and message are recorded in the New Testament.

A brief treatment of Jesus Christ follows. For full treatment, *see* MACROPAEDIA: Jesus.

According to the biblical Gospel accounts, miraculous events surrounded the conception and birth of Jesus. He was legally the son of Joseph, a carpenter of Nazareth, but is believed by his followers to have been miraculously conceived by his mother, Mary. Tradition has it that he was born in Bethlehem. He grew up in Nazareth and as a young man followed his father's trade. Only a few isolated incidents are recorded of the years that intervened before his public ministry. During his lifetime Palestine was experiencing great distress under the rule of three sons of Herod and oppressive Roman procurators. Jesus was baptized by John the Baptist. Wandering through settlements in Galilee and the neighbouring countryside in the company of 12 disciples, Jesus preached a message of religious reform and divine love. He was received with enthusiasm by common people because of his extraordinary healing powers, his effective teaching by parables, and his message of the redeeming love of God for every person. Many miracles were attributed to him. His teaching was strongly opposed by the Pharisees (a Jewish society of scholars and pietists) and the privileged classes because of his attacks on hypocrisy and his interest in the poor. His growing influence alarmed Jewish and Roman authorities alike; regarded by some of his followers as the long-expected Messiah, he was suspected by the Jewish and Roman authorities of having revolutionary aims. After a brief ministry in Galilee, Jesus went with his disciples to Jerusalem to observe Passover. There he taught in the Temple and drove out the money changers, arousing the ire of the priestly class. After the Last Supper with his disciples, he was betrayed by one of them, Judas Iscariot, and was arrested by Roman soldiers. Examined by the high priests and the Sanhedrin (a Jewish council with religious, political, and judicial functions), Jesus was condemned as a blasphemer deserving death. He was brought before Pontius Pilate, the Roman procurator, and then was sent to Herod Antipas, who sent him back to Pilate. Under Roman law he was crucified at Golgotha as a political rebel and was buried in the tomb of Joseph of Arimathea. Belief in his Resurrection from the dead became the focus of the religion that developed around his teachings.

The term Jesus Christ designates not only a historical person who lived in Palestine during the reigns of the Roman emperors Augustus and Tiberius but also one who has been the object of Christian faith and worship for almost 20 centuries. These two designations may be distinguished, but they cannot be separated, for almost everything known about the historical person comes from the reports of those who were his followers. It is therefore impossible to construct a life of Jesus in the conventional sense of biography. Rather, he can be described chiefly on the basis of the way he was remembered by the believing community that took his name.

Jesus Only, movement of believers within Pentecostalism who hold that true Baptism can only be "in the name of Jesus" rather than in the name of the Trinity. It began at a Pentecostal camp meeting in California in 1913 when one of the participants, John G. Scheppe, experienced the power of the name of Jesus. Many accepted his revelation, and they found support for their belief in "Jesus Only" Baptism in John 3:5 and Acts 2:38. This led to the denial of the traditional doctrine of the Trinity and to the assertion that Jesus is the one Person in the Godhead. The theological controversy split the Pentecostals and led to the establishment of new churches. *See also* Pentecostal Assemblies of the World, Inc.; United Pentecostal Church, Inc.

Jesus prayer, in Eastern Christianity, a mental invocation of the name of Jesus Christ, considered most efficacious when repeated continuously. The most widely accepted form of the prayer is "Lord Jesus Christ, Son of God, have mercy on me." It reflects the biblical idea that the name of God is sacred and that its invocation implies a direct meeting with the divine.

The tradition of the Jesus prayer goes back to the "prayer of the mind," recommended by the ancient monks of the Egyptian desert, particularly Evagrius Ponticus (d. 339). It was continued as the "prayer of the heart" in Byzantine Hesychasm, a monastic system that seeks to achieve divine quietness. Since the 13th century, mental prayer was frequently connected with psychosomatic methods, such as a discipline of breathing. In modern times the practice of the Jesus prayer was popularized by the publication of the *Philokalia* (1782), an anthology of texts by various authors on mental prayer.

jet engine, any of a class of internal-combustion engines that propel aircraft by means of the rearward discharge of a jet of fluid, usually hot exhaust gases generated by burning fuel with air drawn in from the atmosphere.

A brief treatment of jet engines follows. For full treatment, *see* MACROPAEDIA: Energy Conversion.

The only practical means of propulsion so far devised is to take advantage of Newton's third law of motion. In its simplest form, this law states that action and reaction are equal and opposite. It is observed in nature that forces (*e.g.,* "pushes" or "pulls") never occur singly but always in equal or opposite pairs. Thus the existence of a force on a body requires the coexistence of an equal and opposite force. If a pair of forces acts between two separate bodies (and provided that no other forces act), the bodies will be impelled to separate or come together depending on whether the force pair is repulsive (a push) or attractive (a pull). The combination of Newton's second and third laws shows that the resulting motion of the two bodies can be expressed by the statement that the change in momentum of the two bodies is equal and opposite and along the line of action of the force pair. Momentum is the product of mass and velocity, and, because (at aircraft velocities) the mass of any body remains constant, a force pair acting between two bodies produces a change in the velocity of each. It is clear that in order to propel a body it is necessary to find something to push against. All aircraft-propulsion devices push against the air itself. If the air is used as the propelling medium, it must experience a change in momentum—*i.e.,* it has to be accelerated toward the rear of the aircraft and discharged rearward with enough velocity that the reaction produces an appreciable thrust in the opposite direction.

From 1903 to the late 1930s the reciprocating internal-combustion engine with a propeller was the sole means used to propel aircraft. The first jet-powered airplane was finally introduced in 1939 in Germany. The jet engine, consisting of a gas-turbine system, significantly simplified the propulsion process and thereby opened the way to substantial increases in aircraft speed, size, and operating altitudes. Over the years, several types of jet engines have been developed. The principal varieties are (1) turbojets, (2) turbofans, (3) turboprops, (4) turboshafts, and (5) ramjets.

Turbojets. The basic idea of the turbojet engine is simple. Air taken in from an opening in the front of the engine is compressed to 3 to 12 times its original pressure in a centrifugal or axial compressor. Sufficient fuel is added to the air and burned in a combustion chamber to raise the temperature of the fluid mixture to about 600° to 700° C (1,100° to 1,300° F). The resulting hot air is passed through a turbine, the sole function of which is to drive the compressor. If the turbine and compressor are efficient, the pressure at the turbine discharge will be nearly twice atmospheric, and this excess pressure is utilized in a propelling nozzle to produce a high-velocity stream of gas and hence thrust.

Substantial increases in thrust can be obtained by employing an afterburner. This device capitalizes on the fact that less than one-third of the oxygen in the atmospheric air is consumed in the turbojet engine. It is a second combustion chamber positioned after the turbine and before the propelling nozzle. By means of this device the temperature of the gas ahead of the propelling nozzle can be increased considerably. The result of this increase in temperature is an increase of about

40 percent in thrust at take-off or a much larger percentage at high speeds.

Turbofans. In a turbojet all the air entering the intake passes through the gas generator, which is composed of the compressor, combustion chamber, and turbine. In a turbofan engine, by contrast, only a portion of the incoming air does so. The remainder passes through a fan, or low-pressure compressor, and is ejected directly as a "cold" jet or mixed with the gas-generator exhaust to produce a "hot" jet. The objective of this sort of bypass system is to increase thrust without increasing fuel consumption. It achieves this by increasing the total air-mass flow and reducing the velocity within the same total energy supply.

The fan is commonly placed at the front of the engine, and its size is determined by the bypass ratio. For large ratios only one or two fan stages are needed, but for smaller ratios a higher jet velocity and more compression are required.

Turboprops. Like the turbojet, the turboprop engine consists of a compressor, combustion chamber, and turbine, but in this case nearly the full pressure drop is used to run the turbine, which thus develops more than enough power to drive the compressor. The excess power is utilized to drive a propeller through reduction gearing. Compared with a turbojet engine, the turboprop has better propulsive efficiency at flight speeds below about 800 km per hour (500 miles per hour).

Modern turboprop engines are equipped with propellers that have a smaller diameter but a larger number of blades for efficient operation at much higher flight speeds than previously achieved. To accommodate the higher rotative and flight speeds, the blades are scimitar-shaped with swept-back leading edges at the blade tips. Engines featuring such propellers are called propfans.

Turboshafts. This is another form of gas-turbine engine that operates much like a turboprop system; however, instead of driving a propeller, it powers a helicopter rotor. The turboshaft engine is so designed that the speed of the helicopter rotor is independent of the rotative speed of the gas generator. This permits the rotor speed to be kept constant even when the speed of the generator is varied to modulate the amount of power produced.

Ramjets. The simplest of all aircraft propulsive devices is the ramjet. It is essentially a turbojet in which rotating machinery has been omitted. Its application is restricted by the fact that its compression ratio depends wholly on forward speed. The ramjet develops no static thrust and very little thrust in general below the speed of sound. As a consequence, a ramjet vehicle requires some form of assisted take-off, such as another aircraft. It has been used primarily in guided-missile systems.

jet stream, any of several long, narrow high-speed air currents that flow eastward in a generally horizontal zone in the stratosphere or upper troposphere. Jet streams are characterized by wind motions that generate strong vertical shearing action, which is thought to be largely responsible for the clear air turbulence so hazardous to aircraft. They also are associated with certain types of atmospheric disturbances and so have an effect on weather.

A brief treatment of jet streams follows. For full treatment, *see* MACROPAEDIA: Climate and Weather.

First discovered by airmen during World War II, the jet streams have speeds of up to 500 km per hour (310 miles per hour) along thousands of kilometres at their centres, but velocities fall off very sharply both laterally and vertically, so that the high speeds are limited to very narrow bands at heights between 10 and 50 km (32,800 and 164,100 feet), generally lying at breaks in the tropopause, where it changes suddenly in height. The kinetic energy contained in jet streams is the result of heat transport from the equator to the poles being deflected by the Coriolis force.

Jet streams encircle the Earth in meandering paths, shifting position as well as speed with the seasons. During the winter their positions are nearer the equator and their speeds higher than during the summer. There are often two, sometimes three jet-stream systems in each hemisphere. One is related to the discontinuous Polar Front, lying in mid-latitudes where the air-mass contrasts (the fronts) promote the formation of squalls, storms, and cyclones. The other distinct system, the Subtropical Jet Stream, lies above the subtropical high-pressure belt and is usually associated with fair weather. During summer a third system occurs over Southeast Asia, India, the Arabian Sea, and tropical Africa. This tropical jet stream affects the formation and duration of Indian and African summer monsoons.

jeté (French *jeté:* "thrown"), ballet leap in which the weight of the dancer is transferred from one foot to the other. The dancer "throws" one leg to the front, side, or back and holds the other leg in any desired position upon landing. Among the commonly seen forms of this step are the *jeté battu,* in which the legs are crossed in the air before the descent; the *grand jeté,* a broad, high leap with one leg stretched forward and the other back like a "split" in the air; and the *jeté en tournant,* or tour jeté ("flung turn"), in which



Grand jeté executed by Patricia Neary
Martha Swope

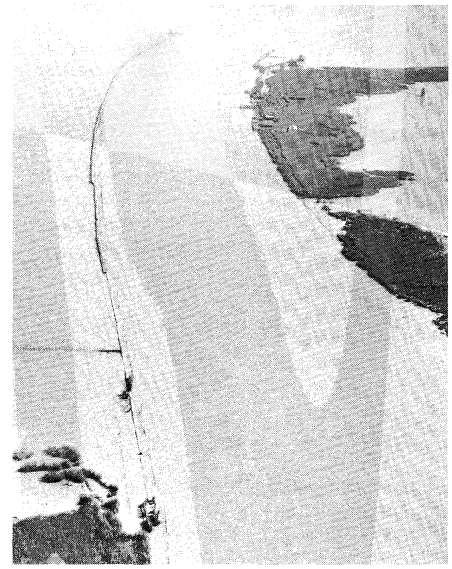
the dancer executes a half-turn in the air away from the forward leg before landing on it.

Jethro, also called REUEL, or HOBAB, in the Old Testament, priest of Midian of the Kenite clan, with whom Moses took refuge after he killed an Egyptian and whose daughter Moses married (Exodus 3:1).

After the Exodus, Jethro visited the Hebrews encamped at the "mountain of God" and brought with him Moses' wife and sons. There he officiated at a sacrifice to God that was attended by Aaron and the elders of Israel. He also suggested that Moses appoint able men to assist him in judging his people, thus founding the Hebrew judiciary (Exodus 18). Jethro's Kenite descendants settled in Judaean territory in the Negev and were on friendly terms with the Hebrews in the time of Deborah, Saul, and David.

On the basis of Exodus 18, some scholars have suggested that Yahweh was the god of the Kenites and was introduced to Moses and the Israelites by Jethro.

jetty, any of a variety of engineering structures connected with river, harbour, and coastal works designed to influence the current or tide or to protect a harbour or beach from waves (breakwater). The two principal kinds of jetties are those constructed at river mouths and other coastal entrances and those used for the berthing of ships in harbours and offshore where harbour facilities are not available. Jettylike structures may be built out at intervals from the banks of rivers where a wide channel must be narrowed to concentrate the current and thus help maintain a navigable channel. These structures—variously termed spurs, spur dikes, and groins—may also be projected from the concave side of a river to retard bank erosion.



The South Pass jetties at the mouth of the Mississippi River
By courtesy of the U.S. Army Engineers, District New Orleans

Jetties of open-pile or impervious-masonry construction may be built on each side of a navigation channel immediately outside the entrances to docks that must be entered through locks. These structures, sometimes called lead-in jetties, form a funnel-shaped entrance to or exit from the lock. They serve to protect vessels from river or tidal currents and to provide temporary mooring facilities; if of solid construction, they may serve also as breakwaters.

Entrance jetties are built at bay inlets, at entrances to harbours of the lagoon type, and at the mouths of rivers. They are also referred to as training jetties, because they "train," or confine and direct, the currents so as to maintain the channel by promoting scour and extend farther into deep water where currents slacken and deposit silt and other transported material; they also protect such entrances from the disturbing effects of littoral currents, sand drift, and wave action. Entrance jetties are usually constructed in pairs, either parallel or converging toward the seaward ends, and are of several structural types.

Jeune Afrique, in full JEUNE AFRIQUE, L'HEBDOMADAIRE INTERNATIONALE DE L'AFRIQUE (French: "Young Africa, International Weekly of Africa"), weekly news magazine in the French language that presents news and interpretative and editorial commentary on Africa, especially French-speaking Africa. It is published in Paris and is the preeminent news magazine covering African affairs in French and perhaps in any language. It was founded in 1960. *Jeune Afrique,* whose format resembles that of popular U.S. weekly news magazines, treats both domestic and foreign events in the countries it covers. The publisher also issues an encyclopaedia, *Jeune Afrique, ad seriatim,* in fascicles.

Jeune Belgique, La ("Young Belgium"), influential review (1881–97), edited by poet and novelist Max Waller; it gave its name to a literary movement (though never a formal "school") that aimed to express a genuinely Belgian consciousness and to free the litera-

ture of Belgium from outworn Romanticism. Among writers associated with the movement were Maurice Maeterlinck, Émile Verhaeren, and Max Elskamp—all poets of international stature.

Jevons, William Stanley (b. Sept. 1, 1835, Liverpool—d. Aug. 13, 1882, near Hastings, Sussex, Eng.), British logician and economist who expounded in his book *Theory of Political Economy* (1871) the "final" (marginal) util-



Jevons, engraving
BBC Hulton Picture Library—Globe Photos

ity theory of value. Jevons' work, along with similar discoveries made by Karl Menger in Vienna (1871) and by Léon Walras in Switzerland (1874), marked the opening of a new period in the history of economic thought.

Jevons broke off his studies of the natural sciences at University College, London, in 1854 to take a post as assayer in Sydney, Australia. There he acquired an interest in political economy and social studies. When he returned to England in 1859, he soon completed two of his most original and seminal papers, "General Mathematical Theory of Political Economy" (1862) and "A Serious Fall in the Value of Gold" (1863). In the first he outlined what subsequently came to be known as the marginal utility theory of value. In the second he set out to measure the rise in prices in the period following the Californian and Australian gold discoveries and made one of the greatest contributions to the theory of index numbers ever published. But it was not until the publication of *The Coal Question* (1865), in which he called attention to the gradual exhaustion of Britain's coal supplies, that he received public recognition.

In 1866 Jevons was appointed to a chair of political economy at Owens College, Manchester. He moved to University College in 1876. Of his works on logic and scientific methods, the most important is his *Principles of Science* (1874). His other notable works include *The Theory of Political Economy* (1871) and *The State in Relation to Labour* (1882).

Jevpatorija: *see* Yevpatoriya.

Jew, Hebrew YEHUDI, any person whose religion is Judaism (*q.v.*). In the broader sense of the term, a Jew is any person belonging to the worldwide group that constitutes, through descent or conversion, a continuation of the ancient Jewish people, who were themselves descendants of the Hebrews of the Old Testament. In ancient times, a Jew was originally a member of Judah—*i.e.*, either of the tribe of Judah (one of the 12 tribes that took possession of the Promised Land) or of the subsequent Kingdom of Judah (in contrast to the rival Kingdom of Israel to the north). The Jewish people as a whole, initially called Hebrews ('Ivrim), were known as Israelites (Yisre'elim) from the time of their entrance into the Holy Land to the end of the Babylonian Exile (538 BC). Thereafter, the term Yehudi (Latin Judaeus, Old French Gyu, modern French Juif, German Jude, and English Jew) was used to signify all adherents of Judaism, because the survivors of the Exile (former inhabitants of the Kingdom of Judah) were the only Israelites who had retained their distinctive identity. (The 10 tribes of the northern kingdom of Israel had been dispersed after the Assyrian conquest of 721 BC and were gradually assimilated by other peoples). The term *Jew* is thus derived through the Latin *Judaeus* and the Greek *Ioudaios* from the Hebrew *Yehūdhī*. The latter term is an adjective occurring only in the later parts of the Old Testament and signifying a descendant of Yehudhah (Judah), the fourth son of Jacob, whose tribe, together with that of his half brother Benjamin, constituted the Kingdom of Judah.

In the modern world, a definition of "Jew" that would be satisfactory to all is virtually impossible to construct, for it involves ethnic and religious issues that are both complex and controversial. In daily life, for example, those who consider themselves Jews are generally accepted as such by Jews and non-Jews alike, even though such persons may not observe religious practices. While all Jews agree that a child born of a Jewish mother is Jewish, Reform Judaism goes beyond Orthodoxy in affirming that a child is Jewish if either one of the parents is a Jew.

From a purely religious standpoint, Gentile converts to Judaism are accepted as Jewish in the fullest sense of the word, but in Israel the rabbinate has often placed obstacles in the registration of Jews who were not converted under the supervision of Orthodox rabbis. For this reason the chief rabbinate of Israel has been confronted in recent years with perplexing problems regarding the religious status of certain immigrants. The Supreme Court of Israel, however, has been making incursions into rabbinic interpretations of personal status. Citizens of the State of Israel are called Israelis, a term carrying no ethnological or religious connotations.

Jewel, John (b. May 24, 1522, Buden, Devon, Eng.—d. Sept. 23, 1571, Monkton Farleigh, Wiltshire), Anglican bishop of Salisbury



Jewel, portrait by an unknown artist; in the National Portrait Gallery, London
By courtesy of the National Portrait Gallery, London

and controversialist who defended Queen Elizabeth I's religious policies opposing Roman Catholicism.

During the reign of the Protestant king Edward VI (1547–53), Jewel was influenced by the work of the Italian scholar and Reformer Peter Martyr Vermigli (1500–62) to become a leader of the Reformists in England. For self-protection Jewel signed a set of anti-Protestant statements on the accession of the Catholic queen Mary I (1553), who repealed laws establishing Protestantism in England. Finding it prudent also to flee the country, he traveled throughout Europe, visiting Zürich, Padua, and Strassburg, where he met Vermigli.

When Protestantism once again was protected by law under Elizabeth I, Jewel returned to England and in 1559 disputed with the Romanists at the Westminster Conference. In a sermon given that same year, he challenged Catholics to produce scriptural and other traditional sources in support of their position on various issues dividing Anglicans and Romanists, including matters of clerical garb and worship ritual. At first preferring to deemphasize liturgical elaboration in accord with Puritan views, he soon came to accept Elizabeth's attitude of moderation.

Having become bishop of Salisbury in 1560, Jewel pursued the controversy in a series of polemics. In 1562 he published his celebrated *Apologia pro Ecclesia Anglicana* ("Defense of the Anglican Church"), described by Mandell Creighton as "the first methodical statement of the position of the Church of England against the Church of Rome." When Thomas Harding, who had been deprived of the title of prebendary (honorary canon) of Salisbury, published his *Answer* to Jewel in 1564, Jewel wrote his *Reply* in 1565, which evoked a *Confutation* from Harding the next year. Jewel in turn responded a year later with his *Defense of the Apology*.

The works produced by Jewel during the 1560s defined and clarified points of difference between the churches of England and of Rome, thus strengthening the ability of Anglicanism to survive as a permanent institution.

jewel beetle: *see* metallic wood-boring beetle.

Jewel Cave National Monument, national monument in southwestern South Dakota, U.S., 15 mi (24 km) west of Custer. Established in 1908, it occupies an area of 1,274 ac (516 ha). The principal attractions are its limestone caverns, a series of chambers joined by narrow passages. The known length of the caverns is 73 mi (117 km).

Jewel Companies, Inc., major American retailer, specializing in the sale of food, drugs, and general merchandise for personal and household use. The company's headquarters are in Chicago.

The company traces its origins to 1899 when Frank Vernon Skiff and Frank Ross founded the Jewel Tea Company to supply condiments to the Chicago area from horse-drawn wagons. As the automobile gained in importance, the firm moved from wagons to motorized trucks to deliver its goods across the Middle West. It incorporated in Illinois in 1903 and assumed its present name in 1966.

The enactment of the "Green River Ordinance," an anti-peddler law in the 1930s, encouraged the company to move into the retail food business, and in 1932 it formed Jewel Food Stores, Inc., to acquire the grocery store business formerly owned by Loblaw Groceterias. The Jewel company flourished with a strong consumer-service image. In 1961 the company expanded into the retail drugstore business with the acquisition of the Osco Drug, Inc., drug chain. The company operates on a decentralized basis under a number of different names, including Jewel supermarkets, Osco drugstores, White Hen Pantry, and Jewel T Discount. It also operates ice cream, candy, and sandwich shops and home improvement centres; and it provides school meals. Internationally, Jewel has expanded its operations into Mexico and Japan.

jewel orchid, any member of several closely related genera of orchids, family Orchidaceae, cultivated as ornamentals because of their striking leaf patterns.

Downy rattlesnake plantain (*Goodyera pubescens*), native to eastern North America, has dark-green leaves with silver and white veins. Its small, white flowers are borne on a spike, as are those of the Southeast Asian species *Anoectochilus roxburghii, A. sikkimensis, Dossinia marmorata, Ludisia discolor,* and *Zeuxine strateumatica* (also found in southeastern North America). The first four have wide, green or brownish-green leaves with red or gold veins borne near the base of the plant. The leaves of *Zeuxine* are arranged



Downy rattlesnake plantain (*Goodyera pubescens*)
B.M. Shaub

along the stem and may or may not be patterned.

jewelers' borax (mineral): *see* tincalconite.

jewelry, decorative objects made for the adornment of the body, usually, but not always, of materials such as gold and precious stones that have a high intrinsic value. The art of jewelry-making originated in prehistoric times when primitive people used objects from the animal world—such as horn, shell, and feathers—to adorn themselves. Cave paintings and carvings show figures decorated with bracelets, necklaces, and headdresses. Since then many forms of jewelry have evolved, so that there is hardly a part of the body for which an ornamental form has not been created. Arms and legs have been festooned variously with bracelets, rings, shoe buckles, and ankle bracelets; the head with tiaras, earrings, and combs; and the chest and neck with brooches, necklaces, belts, and breastplates.

A brief treatment of jewelry follows. For full treatment, *see* MACROPAEDIA: Dress and Adornment.

Traditionally jewelry has been a sign of social rank and a symbol, often of luck or good fortune. During pagan times, jewelry was often buried with the dead—the Egyptian tomb of King Tutankhamen yielded a rich treasure of jewelry when it was opened. During Roman times, jewelry, which had been worn exclusively by the nobility, began to be worn by people of lower social classes. With the rise of Christianity, the custom of burying the dead with jewelry was ended. Though little jewelry was made during the Middle Ages, by the 12th century the art of making things of gold was developing, and by the Renaissance, especially in Florence in the 15th century, jewelry-making reached the status of a fine art. Many of the major Florentine sculptors and architects trained first as goldsmiths.

Probably the most widely used and highly prized material for jewelry-making is gold. Its malleability, value, and colour make it ideal for a wide range of uses. Gold sheets can be embossed, engraved, pressed, or pierced into decorative forms, and gold wire can be used to join jewels together or to make chains. Other metals commonly used for jewelry-making are silver, also very malleable and less expensive than gold, and platinum, which began to be widely used in the 19th century. Nonprecious metals such as copper and steel have also been used, especially by 20th-century modern craftsmen.

Precious and semiprecious stones are the other most commonly used components of jewelry. Diamonds have traditionally been the most highly prized of such gems, varying in colour from yellow to bluish white and sometimes reaching enormous size. The brilliant-cut, which with its myriad facets best shows the characteristic sparkle of a diamond, was invented in the 17th century. By the 18th century diamonds had become so popular that imitation stones began to appear.

Rubies, emeralds, and sapphires are other precious stones used for jewelry, as are the less costly chrysoberyl, topaz, and zircon. Semiprecious stones include amethyst, garnet, opal, aquamarine, jade, turquoise, lapis lazuli, and malachite. Amber, a fossil tree resin, is a highly valued stone. Pearls and coral, though animal in origin rather than mineral, are also usually considered gemstones. Both range in colour from black to pink to white.

Common techniques used to decorate pieces of jewelry include enamelling and stonecutting. Stones may be cut to create intaglio (engraved or incised) designs on the stones themselves (the scarab is an example), or they may be cut to make cameos. Cameos are cut from stones, such as onyx or agate, where different colours occur in layers. The background material is cut away, leaving the cameo design in relief.

From the 17th century onward the decorative qualities of jewelry gained importance over its symbolic, social, or religious significance. The nobility and the more affluent among the middle classes bought and wore jewelry. By the 19th century, industrialization put jewelry within the reach of even greater numbers. New techniques were developed to make cheaper materials—such as gold-plated metals, cultured pearls, and imitation gems—available. A number of large commercial firms—including Fabergé in Russia, Cartier in Paris, and Tiffany in New York City—rose to prominence by making and selling fine jewelry for the wealthier classes.

Jewelry has been important in other cultures as well. The gold objects of pre-Columbian civilization and the turquoise and silver jewelry of the Navajo and Pueblo Indians in the southwestern United States are two notable examples. Since early times in India, jewelry-making has been a dazzling art. The use of coloured stones was widespread, no doubt because of the great natural deposits of such stones in India, Ceylon, Thailand, and Burma.

Jewett, Frank Baldwin (b. Sept. 5, 1879, Pasadena, Calif., U.S.—d. Nov. 18, 1949, Summit, N.J.), U.S. electrical engineer and first president of the Bell Telephone Laboratories, Inc., who directed research in telephony, telegraphy, and radio and television communications.

After receiving the B.A. in 1898 from Throop Polytechnical Institute (now the California Institute of Technology) and the Ph.D. in 1902 from the University of Chicago, Jewett taught at the Massachusetts Institute of Technology, Cambridge. In 1904 he began work with the American Telephone and Telegraph Company, where he designed long-distance telephone lines, including a transcontinental line from New York to San Francisco. He also worked on telephone repeaters and directed the research that led in 1915 to the first transatlantic telephone call.

During World War I Jewett was commissioned in the U.S. Signal Corps and worked on telephone systems and the first tests for aircraft radiophones. After the war, as president of the Bell Telephone Laboratories and vice president of American Telephone and Telegraph, he directed early work on the dial telephone, sound motion pictures, the transmission of pictures over telephone wires, the electric phonograph, and submarine telephone cables. This work helped establish the Bell laboratories as a major industrial research centre.

From 1933 until 1935 Jewett served on Pres. Franklin Roosevelt's Science Advisory Board, and in 1939 he was elected president of the National Academy of Sciences. After the Second World War he advocated civilian rather than military control of scientific research.

Jewett, Sarah Orne (b. Sept. 3, 1849, South Berwick, Maine, U.S.—d. June 24, 1909, South Berwick), U.S. writer of regional fiction.

The daughter of a successful doctor, she was mainly educated at home because of her delicate health. Early in her teens Jewett determined to write about the rapidly disappearing traditions of provincial life about her, and by the age of 28 she was an established writer. Outstanding among her 20 volumes are *Deephaven* (1877) and *The Country of the Pointed Firs* (1896), the latter often regarded as her finest achievement. These books contain realistic sketches of aging Maine natives, whose manners, idioms, and pithiness she recorded with pungency and humour, sympathetically but without sentimentality.

In 1901 she became the first woman to receive an honorary degree from Bowdoin College. A disabling accident virtually ended her writing career in 1902.

jewfish, any of several large fishes of the sea bass (*q.v.*) family (Serranidae), especially *Epinephelus itajara,* found on the Atlantic coast of tropical America. This species sometimes attains a length of 2.5 metres (8 feet) and a weight of about 320 kilograms (700 pounds). The adult is dull olive-brown with faint spots and bands. Adult jewfish are usually solitary and typically remain in the same area for extended periods. The related south Pacific jewfish (*E. lanceolatus*) may reach 3.75 metres in length.

The Warsaw grouper (*E. nigritus*), living in the Atlantic between South Carolina and Brazil, and the giant sea bass (*Stereolepis gigas*) from the Pacific, off California and Baja California, are both occasionally called jewfish. They grow to about 2.2 metres and 220 kilograms.

In Australia the name jewfish is given to *Johnius antarctica* and *J. diacanthus* on the east coast and to *Glaucosoma hebraicum* on the west coast.

Jewish Agency, in full JEWISH AGENCY OF ISRAEL, Hebrew HA-SOKHNUT HA-YEHUDIT EL-ERETZ YISRA'EL, international body representing the World Zionist Organization, created in 1929 by Chaim Weizmann, with headquarters in Jerusalem. Its purpose is to assist and encourage Jews worldwide to help develop and settle Israel.

Zionists needed financial backing for their project of creating a Jewish national home in Palestine. The Jewish Agency became an external arm of the Zionists, seeking to elicit aid from non-Zionist Jews, overseeing the settlement of Jewish immigrants in Palestine, and helping set up a Jewish economy. It also negotiated with the Palestine mandatory government and Great Britain and represented Jewish interests at the League of Nations. After the anti-Semitic Nazi regime came to power in Germany (1933), the agency was instrumental in increasing the legal quota of immigrants to Palestine; it also set up the Youth Aliyah program to care for and resettle orphaned Jewish children from Nazi Germany.

In May 1942, David Ben-Gurion, representing the Jewish Agency at a Zionist conference at the Biltmore Hotel in New York City, gained support for a program, later termed the Biltmore Resolution, demanding unrestricted Jewish immigration to Palestine, the creation of a Jewish army, and the establishment of Palestine as a Jewish commonwealth. This

position drove the non-Zionist members from the agency, which emerged as spokesman for the Jewish cause in the post-war United Nations deliberations that led to the partition of Palestine (Nov. 29, 1947).

Upon the establishment of an Israeli state in 1948, the agency devoted itself primarily to problems of immigration, settlement, the Youth Aliyah, propaganda, and the cultural education of Jews outside Israel. These functions were retained even after 1951, when the Jewish Agency became legally identified with the World Zionist Organization.

Jewish autonomous oblast (Russian S.F.S.R.): *see* Yevreyskaya autonomous oblast.

Jewish Bund: *see* Bund.

Jewish calendar, religious and civil dating system based on both lunar and solar cycles.

A brief treatment of the Jewish calendar and its cycle of festivals follows. For full treatment, *see* MACROPAEDIA: Judaism.

In the Jewish calendar in use today, a day is counted from sunset to sunset, a week comprises seven days, a month contains 29 or 30 days, and a year has 12 lunar months and about 11 days, or 353, 354, or 355 days. In order to bring the calendar in line with the annual solar cycle, a 13th month of 30 days is intercalated in the 3rd, 6th, 8th, 11th, 14th, 17th, and 19th years of a 19-year cycle. Therefore, a leap year may total from 383 to 385 days. The Jewish Era in use today, popularly accepted about the 9th century CE, is based on biblical calculations placing the creation in 3761 BCE. (The abbreviations BCE [Before the Common Era] and CE [Common Era] correspond to BC and AD, respectively.)

The names of the months of the year are derived from Babylonian terms. The months are ordered according to religious usage and are: Nisan (March–April of the Western Gregorian calendar), Iyyar (April–May), Sivan (May–June), Tammuz (June–July), Av (July–August), Elul (August–September), Tishri (September–October), Ḥeshvan or Marḥeshvan (October–November), Kislev (November–December), Ṭevet (December–January), Shevaṭ (January–February), and Adar (February–March). The 13th month of the leap year, Adar Sheni (or ve-Adar), is intercalated before Adar and so contains the religious observances normally occurring in Adar.

The civil calendar begins with the month of Tishri, the first day of which is the holiday of Rosh Hashana (New Year).

The Sabbath, the only Jewish holiday enjoined by the Ten Commandments, is observed on the seventh day of the week (Saturday) in commemoration of the seventh day on which God rested after completing the creation, of God's role in history, and of God's covenant with the Jewish people. Jews are obligated to sanctify the Sabbath at home and in the synagogue, to avoid work on that day, and to engage in worship and study.

The annual cycle of the religious calendar begins with the celebration of Pesaḥ (Passover) on Nisan 15–22. It is one of the so-called major holidays during which work is proscribed, and it is one of the three Pilgrim Festivals that, in ancient times, required all males to attend religious observances at the Temple. Pesaḥ is celebrated in remembrance of the Israelites' servitude in Egypt and the subsequent Exodus. The holiday is so named because, on the eve of the Exodus, the homes of the Israelites were "passed over" as God delivered the final of 10 plagues on Egypt.

The next major holiday of the year is that of Shavuot (Feast of Weeks, or Pentecost), celebrated on Sivan 6–7. The second of the Pilgrim Festivals, it commemorates the revelation of the Torah (Law) at Sinai. It is named for the seven weeks of grain harvest that separated Pesaḥ from Shavuot in ancient times.

The Ten Days of Penitence—beginning with Rosh Hashana (New Year) on Tishri 1–2 and ending with Yom Kippur (Day of Atonement) on Tishri 10—are considered the Days of Judgment for all mankind. Strict observance of the prohibition against work and other rules is expected on Rosh Hashana, but celebration is also an element of the holiday, as indicated by the blowing of the *shofar* (ram's horn) during the synagogue service. Yom Kippur is the most solemn and holiest day of the Jewish year. Virtually all of the holiday is spent in prayer and fasting; sins are confessed and mankind and God are reconciled. The final prayer service concludes with the sounding of the *shofar*.

The last of the major holidays, and the third of the Pilgrim Festivals, is Sukkot (Tabernacles, or Booths), which is celebrated on Tishri 15–21 in remembrance of the Israelites' wanderings after the Exodus. It is named for the booths in which the Israelites lived during that period. The concluding day of the holiday, Shemini Atzeret, is considered a separate celebration held on Tishri 22. The annual completion of the cycle of public readings from the Torah is marked by Simḥat Torah (Rejoicing of the Law), which is celebrated on Shemini Atzeret or the following day. This period is marked by joyous celebration and ritual.

The Jewish religious calendar also includes a series of minor holidays—so called because they are not accompanied by the proscription of work—and fasts. Ḥanukka (Feast of Dedication) commemorates the revolt against the Seleucid ruler Antiochus IV Epiphanes and the rededication of the Temple in 164 BCE. The holiday is celebrated for eight days, beginning on Kislev 25, and is marked by the lighting of candles, feasting, songs, and the giving of gifts to children. Purim (Feast of Lots) celebrates the deliverance of Persian Jews from persecution in the 5th century BCE. During this holiday, the Book of Esther is read in the synagogue and feasts, masquerades, and Purim plays are common.

The five fast days commemorate tragic events in Jewish history. They are Shiva' 'Asar be-Tammuz (Fast of Tammuz 17); Tisha be-Av (Fast of Av 9), which commemorates the destruction of the First and Second Temples in 586 BCE and 70 CE, respectively; Tzom Gedaliahu (Tishri 3); 'Asara be-Ṭevet (Fast of Ṭevet 10); and Ta'anit Esther (Fast of Esther; Adar 13). Also celebrated are Lag ba-Omer (Iyyar 18), usually observed as a school holiday, and Tu bi-Shevat (Shevat 15), in modern times associated with the planting of trees in Israel.

Since the establishment of the modern state of Israel in 1948, three other holidays have been added to the Jewish calendar. They are Holocaust Day (Nisan 27), Remembrance Day (Iyyar 4), and Independence Day (Iyyar 5).

Jewish Daily Forward, Yiddish VORWÄRTS, Yiddish-language newspaper published in New York City and in regional centres in the United States.

It was founded in 1897 by the Jewish Socialist Press Federation as a civic aid and a cohesive device for Jewish immigrants from Europe. From its early days the *Forward* strove for variety. It carried columns on government and politics and such other subjects as education and etiquette. There were cartoons, letters to the editor, and reports from its correspondents in various countries of Europe and Asia. It also carried short stories and novels in serial form, most notably those of Isaac Bashevis Singer, as well as current news items. Its reporting occasionally verged on the sensational, and from time to time it carried articles in English.

At the height of its influence, the *Forward* had a daily circulation of more than 100,000 in six regional editions, but in the early 1980s, readership was greatly reduced and the paper was published as a weekly.

Jewish Revolt, either of two major uprisings (AD 66–70; AD 132–135) against Roman rule by the Jews of Judaea. The First Jewish Revolt was the result of a long series of clashes in which small groups of Jews offered sporadic resistance to the Romans, who responded with severe countermeasures. In AD 66 the Jews combined in revolt, expelled the Romans from Jerusalem, and overwhelmed in the pass of Beth-Horon a Roman punitive force under Gallus, the imperial legate in Syria (autumn, AD 66). A revolutionary government was then set up, which extended its influence throughout the whole country. Vespasian was sent by the Roman emperor Nero to crush the rebellion. He was joined by Titus, and together the Roman armies entered Galilee, where the historian Josephus headed the Jewish forces. Josephus' army was confronted by that of Vespasian and fled. After the fall of the fortress of Jatapata, Josephus gave himself up, and the Roman forces swept the country. On the 9th of the month of Av (August 29) in AD 70, Jerusalem fell; the Temple was burned, and the Jewish state collapsed.

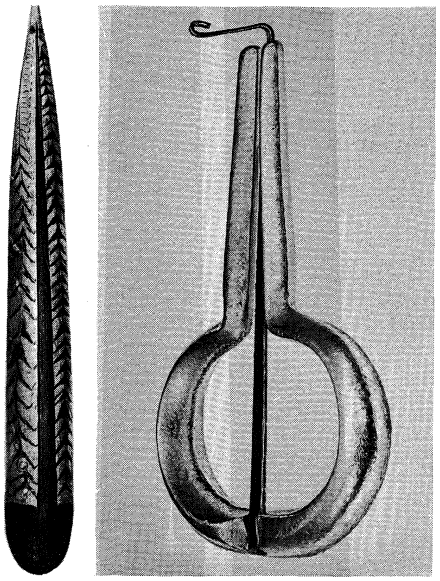
Clashes between Jews and Romans continued during the next several decades. Finally, in AD 132, the misrule of Tinnius Rufus, the Roman governor of Judaea, combined with the emperor Hadrian's intention to found a Roman colony on the site of Jerusalem and his restrictions on Jewish religious freedom and observances, roused the last remnants of Palestinian Jewry to revolt. A bitter struggle ensued. Bar Kokhba (*q.v.*) became the leader of this Second Jewish Revolt; although at first successful, his forces proved no match against the methodical and ruthless tactics of the Roman general Julius Severus. With the fall of Jerusalem and then Bethar, a fortress on the seacoast south of Caesarea, the rebellion was crushed in 135. Jews were thenceforth forbidden to enter Jerusalem.

Jewish Theological Seminary of America (JTSA), the academic and spiritual centre of Conservative Judaism in the United States. Founded in New York City in 1886 as the Jewish Theological Seminary Association, the institution was first headed by Rabbi Sabato Morais, whose declared goal was to educate rabbis in modern research and critical methods.

The school name was modified and its charter revised in 1902 under the seminary's second president, Solomon Schechter, whose reputation for outstanding scholarship attracted other distinguished scholars to the faculty. Since that time the seminary has grown steadily, and its present library holdings are considered to be one of the finest collections of Hebraica in the world.

The seminary grants degrees in five of its departments: the rabbinical department, the University of Judaism (a Los Angeles branch of the seminary), the Teachers Institute–Seminary College of Jewish Studies, the Cantors Institute, and the Seminary College of Jewish Music. The seminary also operates the Shocken Institute for Jewish Research in Jerusalem and, among its many projects, sponsors the Jewish Museum in New York City.

Jew's harp, also called JAW'S HARP, or GUIMBARDE, musical instrument consisting of a thin wood or metal tongue fixed at one end to the base of a two-pronged frame. The player holds the frame to his mouth, which forms a resonance cavity, and plucks the instrument's tongue. The notes produced are limited to the fourth through tenth tones of the harmonic series (in relative pitch, c–e–g–b♭ [approximately]–c′–d′–e′). The tongue produces only one pitch; altering the shape of the mouth cav-



(Left) Oceanian Jew's harp, bamboo, from New Guinea, in the Horniman Museum, London; (right) European Jew's harp with metal frame and tongue

(Left) By courtesy of the Horniman Museum, London; (right) photograph, EB Inc.

ity isolates the individual harmonics that are components of the tongue's sound. In 18th-century Europe virtuoso players used instruments with two or more tongues of different pitch, thus allowing a complete musical scale.

Jew's harps are widely distributed in Oceania and Asia, especially in tribal cultures, and in Europe, where they were introduced from Asia by the 14th century. The characteristic European form, also found elsewhere, is a pear-shaped metal frame with a metal tongue affixed. Many non-European forms are narrow instruments cut from a single piece of bamboo or wood. In some cases the tongue is vibrated by jerks on a cord attached to its end.

The delicate, barely audible sound of the Jew's harp led in Asia to its frequent association with contemplation and to its use in 19th-century Austria as an instrument for lover's serenades. The Jew's harp is one of several idiophones (instruments whose sounding parts are resonant solids) vibrated by plucking rather than by percussion.

Jex-Blake, Sophia Louisa (b. Jan. 21, 1840, Hastings, Sussex, Eng.—d. Jan. 7, 1912, Mark Cross), British physician who successfully sought legislation (1876) permitting women in Britain to receive the M.D. degree and a license to practice medicine and surgery. Through her efforts a medical school for women was opened in London in 1874, and in 1886 she established one in Edinburgh.



Sophia Jex-Blake, etching by Samuel Lawrence, 1922

By courtesy of the Bruntsfield Hospital, Edinburgh

Jex-Blake attended Queen's College, London, and then studied for three years in Boston and New York, returning to England in 1868. She was admitted to classes in medicine at the University of Edinburgh but was not allowed to take a degree. In 1877 she obtained the M.D. of the University of Bern and, through the King's and Queen's College of Physicians, Dublin, a license to practice in Great Britain.

Jezebel, also spelled JEZABEL (d. *c.* 843 BC), in the Old Testament (Kings I and II), the wife of King Ahab, who ruled the kingdom of Israel; by interfering with the exclusive worship of the Hebrew god Yahweh, disregarding the rights of the common man, and defying the great prophets Elijah and Elisha, she provoked the internecine strife that enfeebled Israel for decades. She has come to be known as an archetype of the wicked woman.

Jezebel was the daughter of the priest-king Ethbaal, ruler of the coastal Phoenician cities of Tyre and Sidon (modern Ṣaydā, Lebanon). When Jezebel married Ahab (ruled *c.* 874–*c.* 853), she persuaded him to introduce the worship of the Tyrian god Baal-Melkart, a nature god. A woman of fierce energy, she tried to destroy those who opposed her; most of the prophets of Yahweh were killed at her command. These cruel and despotic actions provoked the righteous wrath of Elijah; according to I Kings 17, he accurately prophesied the onset of a severe drought as divine retribution. Some time later, Elijah had the Baal priests slain after they had lost a contest with him to see which god would heed prayers to ignite a bull offering, Baal or Yahweh. When Jezebel heard of the slaughter, she angrily swore to have Elijah killed, forcing him to flee for his life (I Kings 18:19–19:3).

The last vicious act attributed to Jezebel is recorded in I Kings 21:5–16. Adjacent to Ahab's palace was a vineyard, which he coveted; it belonged to a commoner, Naboth of Jezreel (an ancient city at the foot of Mt. Gilboa, probably the site of the modern Israeli settlement of the same name). When Naboth refused to part with his vineyard ("the inheritance of my fathers"), Jezebel falsely charged him with blaspheming "God and the king," which led to Naboth's death by stoning. Elijah confronted Ahab in the vineyard, predicting that he and all his heirs would be destroyed and that dogs in Jezreel would devour Jezebel.

A few years later, Ahab perished in battle with the Syrians. Jezebel lived on for approximately another ten years. Elijah's successor, Elisha the prophet, equally determined to end Baal worship, had a military commander named Jehu anointed to be king of Israel, an act that provoked civil war, for Jezebel's son Jehoram (Joram) then ruled. Jehu killed Jehoram at the site of Naboth's property and then went to Jezebel's palace. Expecting him, she adorned herself for the occasion. Looking down from her window, she taunted him, and Jehu ordered her eunuchs to throw her out the window. Later, when he commanded that she be properly buried as a king's daughter, it was discovered that dogs had eaten most of her body.

Jezreel, Hebrew YIZRE'EL (May God Give Seed), ancient city of Palestine, capital of the northern kingdom of Israel under King Ahab, located on a spur of Mt. Gilboa in Israel. King Saul was slain there in a battle with the Philistines. It was called Esdraelon in the book of Judith; to the crusaders it was Parvum Gerinum, or Le Petit Gerin, to distinguish it from Le Grand Gerin (Jenin).

The Valley of Jezreel ('Emeq Yizre'el), or Plain of Esdraelon, was an ancient trade route between the Jordan Valley and the coastal plain. Modern excavation in the area uncovered a distinctive gray-burnished pottery, which archaeologists now call Esdraelon ware.

Jezreel was also the name of a town in the territory of Judah; Khirbet Tarrama, near Hebron, has been suggested as the site. The first son of the prophet Hosea was named Jezreel, as a reminder of the bloodshed at Jezreel by which King Jehu (ruled 842–815 BC) came into power.

Jezreel, Valley of (Israel): *see* Esdraelon, Plain of.

Jhābua, town, administrative headquarters of Jhābua district, Madhya Pradesh state, central India. Located on Bahadur Sāgar (lake), it was founded in the 16th century by a Labhana freebooter and served as the capital of the former Jhābua princely state. It is a local agricultural and timber market connected by road with Dhār. There is a government college affiliated with Vikram University.

Jhābua district (about 2,600 sq mi [6,800 sq km]), constituted in 1948, consists of the former Jhābua and several other princely state areas. It comprises a region traversed by the forested Rāth, the northern ridges of the Vindhya Range (*q.v.*). Cultivated land lies chiefly along the Anās and Mahi (*q.v.*) rivers and their tributaries. Wheat, corn (maize), millet, and cotton are major crops; manganese deposits are worked. Pop. (1981) town, 16,777; district, 795,168.

Jhālawār, town, administrative headquarters of Jhālawār district, Rājasthān state, northwestern India. The town—sometimes called Jhālrapātan, Jhālrapātan Chhaoni (cantonment), or Brijnagar—is a major road junction and agricultural market centre. The old town of Jhālrapātan (Pātan) was founded in 1796. The new town, including the palace and cantonment, lies just to the north. Jhālawār, the capital of the former princely state of the same name, has a government college affiliated with the University of Rājasthān. Nearby is the site of the ancient city of Candrāvati (*c.* 1st century AD).

Jhālawār district (2,400 sq mi [6,216 sq km]), part of the Mālwa Plateau, consists of a fertile undulating plain in the north and a hilly tract toward the south. Cotton, wheat, oilseeds, corn (maize), and jowar (sorghum) are the chief crops; iron-ore and sandstone deposits are worked.

Formerly a princely state named after the ruling Jhāla Rājputs (the warrior rulers of the historic region of Rājputāna), Jhālawār was created from the partition of the original Kota princely state in 1838. In 1897, when the greater part was restored to Kota, the present boundaries were created. Jhālawār became part of the state of Rājasthān in 1948. Pop. (1981) town, 29,257; district, 784,998.

Jhalore (India): *see* Jālor.

Jhang Maghiāna, city consisting of twin towns, headquarters of Jhang Maghiāna District, Sargodha Division, Punjab Province, Pakistan, just east of the Chenāb River. Maghiāna lies on the edge of the highlands overlooking the alluvial valley, while Jhang occupies the lowlands at its foot. They are connected by two roads and by the Grand Trunk Road with Peshāwar and Lahore. Maghiāna, founded by Megha, ancestor of the Maghiāna Siāls, has become more important than Jhang, originally founded in AD 1462 and reestablished in 1688 after a flood destroyed the original settlement. Maghiāna is a wool-collecting centre, with handloom industries; its manufactures include soap, leather, locks, and brass work. In Jhang is a government blanket-manufacture centre, and there are other textile industries as well. The twin towns, constituted a municipality in 1867, contain a hospital, public garden, and government college affiliated with the University of the Punjab.

The area in which Jhang and Maghiāna are situated is primarily agricultural. Irrigation by means of the Chenāb Canal system is used to grow wheat and cotton. Chiniot, northeast of Jhang Maghiāna, produces woodcarving and marquetry. The Shorkot ruins, south of Jhang Maghiāna, may be a city captured by Alexander the Great in 325 BC. Pop. (1981) city, 195,558.

Jhānsi, town, southwestern Uttar Pradesh state, northern India, at a major road and rail junction. The main city, which is enclosed by a wall, arose around a fort built in 1613 by the ruler of Orchha. The area fell to the Marāṭhās in 1732 and was acquired by the British in 1853. A massacre of British officers and civilians occurred at Jhānsi during the 1857 Indian Mutiny. In 1886 Jhānsi came under British rule in exchange for British evacuation of Gwalior. An agricultural marketplace, the town also has a steel-rolling mill and some manufacturing. Bundelkhand University is located there, as are a railway colony and workshops. Pop. (1981) town, 246,172; metropolitan area, 284,141.

Jharia, also spelled JHERRIA, town and coalfield in southern Bihār state, eastern India. The coalfield lies in the Dāmodar Valley, covers about 110 square miles (280 square km), and produces bituminous coal suitable for coke. Most of India's coal comes from the Jharia and Rānīganj fields in the valley. The coal is easily worked from open pits, but wages and safety conditions are generally poor. The miners are usually from local groups that also work their crops at harvesttime. Pop. (1981) 57,496.

Jhelum, town, Punjab province, northeastern Pakistan. The town lies just west of the Jhelum River (there bridged by both road and rail) and is connected by rail and the Grand Trunk Road with Peshāwar and Lahore. The old town, across the river, may have been Bucephala, founded by Alexander the Great in the 4th century BC. Although once a salt-trade centre, Jhelum is now a major timber market. Industries include textile mills, sawmills, newsprint plants, glassworks, and cigarette factories. It was constituted a municipality in 1867. The town has several government colleges affiliated with the University of the Punjab. The ruined temples of Katas, southwest of Jhelum, are possibly of Buddhist origin (8th–9th centuries AD). Pop. (1981) town, 106,462.

Jhelum River, river, westernmost of the five rivers in the Punjab that ultimately drain into the Indus River in Pakistan. The Jhelum rises from a deep spring at Vernāg, in the Indian-held sector of Jammu and Kashmir state. The river meanders northwestward from the northern slope of the Pīr Panjāl Range through the Vale of Kashmir to Wular Lake, which controls its flow. Emerging from the lake, the Jhelum crosses the Pīr Panjāl in a 7,000-foot (2,100-metre) gorge with almost perpendicular sides. At Muzaffarābād, the capital of Azad Kashmir in the Pakistani-held sector of Jammu and Kashmir, it joins the Kishanganga River and then bends southward, forming part of the border between Azad Kashmir (east) and Northwest Frontier province, Pakistan (west). The river then flows southward into Pakistan proper. Near Mangla, the Jhelum breaks through the Siwālik Range into broad alluvial plains. At Jhelum town the river turns southwestward along the Salt Range to Khushāb, where it again bends south to join the Chenāb River near Trimmu. The total length of the Jhelum is about 450 miles (725 km).

The lower course of the Jhelum has been developed for irrigation and the production of hydroelectric power. The Mangla Dam and Reservoir irrigates about 3,000,000 acres (1,200,000 hectares) and has an installed hydroelectric capacity of at least 300 megawatts. The Upper Jhelum Canal leaves the river at Mangla and runs eastward to the Chenāb River at Khānki, while the Lower Jhelum Canal starts at Rasūl. Both canals are used for



The Jhelum River at Srīnagar, Jammu and Kashmir state, India
Richard Abeles—Artstreet

irrigation. The Jhelum River is believed to be the Hydaspes mentioned by Arrian, Alexander the Great's historian, and the Bidaspes mentioned by Ptolemy.

Jhering, Rudolf von, Jhering also spelled IHERING (b. Aug. 22, 1818, Aurich, Hanover [Germany]—d. Sept. 17, 1892, Göttingen), German legal scholar, sometimes called the father of sociological jurisprudence. He developed a philosophy of social utilitarianism that, in emphasizing the needs of society, differed from the individualist approach of the English utilitarian Jeremy Bentham.

Jhering taught Roman law at Giessen (1852–68), at Göttingen (from 1872), and at four other universities for briefer periods. In his most ambitious book, *Geist des römischen Rechts* . . . , 4 vol. (1852–65; "The Spirit of the Roman Law . . . "), he elaborated the relation of law to social change. Perhaps more influential in the 20th century was his *Der Zweck im Recht*, 2 vol. (1877–83; *Law As a Means to an End*). In his view as expressed in this work, the purpose of law is the protection of individual and societal interests by coordinating them and thus minimizing occasions for conflict. If interests clash, he would give precedence to those of society.

Jhind (India): *see* Jind.

Jhūnjhunu, town, northeastern Rājasthān state, northwestern India. It is a local trade centre for wool, cattle, hides, and gram (chickpea). The town's major industries include a dye factory and woolen mills. Jhūnjhunu houses the mausoleum of Qamar-ud-Dīn Shāh, patron saint of the Kamkhani sect, as well as a 10th-century Jaina temple. The town also contains a hospital and a college affiliated with the University of Rājasthān.

The area in which Jhūnjhunu is situated consists of a semiarid sandy plain. Bajra (pearl millet), gram, mung (the green or yellow edible seeds of an Asian bean), and barley are among the region's chief crops. Pop. (1981) town, 47,177.

jia (Chinese vessel): *see* chia.

jiaguwen (script): *see* chia-ku-wen.

Jiajing (Chinese emperor): *see* Chia-ching.

Jiamusi (China): *see* Chia-mu-ssu.

Ji'an (China): *see* Chi-an.

jian (Chinese vessel): *see* chien.

Jiang Qing, Wade-Giles romanization CHIANG CH'ING, stage name LAN P'ING, original name LUAN SHU-MENG (b. 1914?, Chu-ch'eng, Shantung province, China), third wife of Chinese Communist leader Mao Zedong and the most influential woman in the People's Republic of China until her downfall in 1976, after Mao's death. As a member of the Gang of Four (*q.v.*) she was convicted in 1981 of "counter-revolutionary crimes" and imprisoned.

Reared by her grandfather, she became a member of a theatrical troupe in 1929. Her activity in a Communist front organization in 1933 led to her arrest and imprisonment. Upon her release she went to Shanghai, where she played minor roles for the left-wing Tien Tung Motion Pictures Company.

When the Japanese attacked Shanghai in 1937, Jiang fled to the Chinese Nationalist wartime capital at Chungking, where she worked for the government-controlled Central Movie Studio until she crossed the Nationalist lines to join the Communist forces in Yen-an. As a drama instructor at the Lu Hsün Art Academy, she met Mao for the first time when he gave a talk at the school. Their subsequent marriage was criticized by many party members, especially since the woman Mao divorced (one of the few women to survive the Communists' Long March of 1934–35) was then hospitalized in Moscow. Party leaders agreed to the marriage on condition that Jiang Qing stay out of politics for the next 30 years.

After the establishment of the People's Republic of China in 1949, Jiang Qing remained out of public view except to serve as Mao's hostess for foreign visitors or to sit on various cultural committees. In 1963, however, she became more politically active, sponsoring a movement in the Peking opera and ballet aimed at infusing traditional Chinese art forms with proletarian themes. Jiang's cultural reform movement gradually grew into a prolonged attack on many of the leading cultural and intellectual figures in China and culminated in the Cultural Revolution (*q.v.*) that by 1966 had begun to sweep the country.

Jiang Qing reached the height of her power and influence in 1966, winning renown for her fiery speeches to mass gatherings and her involvement with the radical young Red Guard groups of the Revolution. One of the few people whom Mao trusted, she became the first deputy head of the Cultural Revolution and acquired far-reaching powers over China's cultural life. She oversaw the total suppression of a wide variety of traditional cultural activities during the Revolution. As the Revolution waned in the late 1960s, however, so did Jiang's prominence. She reemerged in 1974 as a cultural leader and spokeswoman for Mao's new policy of "settling down."

Mao died on Sept. 9, 1976, and the radicals in the party lost their protector. A month later, wall posters appeared attacking Jiang Qing and three other radicals as the Gang of Four and grew progressively more hostile. Jiang and the other members of the Gang of Four were soon afterward arrested. She was expelled from the Communist Party in 1977. At her public trial as a member of the Gang of Four in 1980–81, Jiang was accused of fomenting the widespread civil unrest that had gripped China during the Cultural Revolution, but she refused to confess her guilt; instead, she denounced the court and the country's leaders. She received a suspended death sentence, but in 1983 it was commuted to life imprisonment.

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Jiang Zemin, Wade-Giles romanization CHIANG TSE-MIN (b. 1926, Yang-chou, Kiangsu province, China), Chinese official who became general secretary of the Chinese Communist Party (CCP) in 1989.

Jiang joined the CCP in 1946 and graduated from Chaio-t'ung University in Shanghai the following year with a degree in electrical engineering. He worked in several factories as an engineer before receiving further tech-

nical training in the Soviet Union in about 1955. He subsequently headed technological research institutes in various parts of China. In 1980 he became vice-minister of the state commission on imports and exports. In 1982 he became vice-minister of the electronics industry, and from 1983 to 1985 he was its minister. He had meanwhile become a member of the Central Committee of the CCP in 1982. He was named mayor of Shanghai in 1985, and he became a member of the Politburo in 1987.

Jiang supported the government's forcible suppression of massive pro-democracy student demonstrations in the summer of 1989. This won him the favour of China's paramount leader, Deng Xiaoping, and of the premier, Li Peng, when the Chinese leadership was reshuffled following the suppression of the democracy movement. Jiang thus succeeded Zhao Ziyang as general secretary of the CCP in June of that year. Jiang was reportedly a compromise choice who combined ideological toughness with a pragmatic commitment to China's continued economic reform and modernization.

Jiangmen (China): *see* Chiang-men.

Jiangxi (China): *see* Kiangsi.

Jiangzu (China): *see* Chiang-tzu.

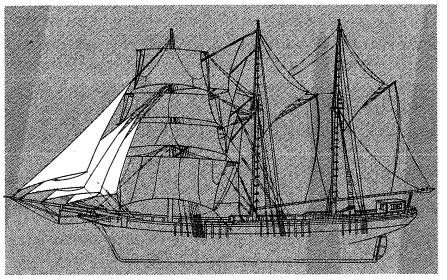
Jianwen (Chinese emperor): *see* Chien-wen.

Jiaozuo (China): *see* Chiao-tso.

Jiaqing (Chinese emperor): *see* Chia-ch'ing.

Jiaxing (China): *see* Chia-hsing.

jib, in sailing ships, triangular sail rigged to a stay extending from the foremast, or foretopmast, to the bowsprit or to a spar, the jib boom, that is an extension of the bowsprit. The jib is first known to have been used on one-masted vessels. Its use began to spread about 1600 and extended to larger war vessels around 1700. Jibs proved handy in helping to steer and were much valued, *e.g.,* on the square-rigger, as a means of better close-hauled sailing and of setting extra sail with comparatively little labour demand. In some ships the number of jibs reached five or more, and often the jib boom itself required an extension, the flying jib boom, to carry them.



French fishing vessel with jib sails indicated in white

From Bjorn Landstrom, *The Ship,* illustration copyright 1961 by Bjorn Landstrom; reproduced by permission of Doubleday & Company, Inc.

Most modern sailboats lack a bowsprit or a jib boom, and the lower corner of the jib is attached to a fitting on the hull near the bow.

Jīb, al- (Israel): *see* Gibeon.

Jibran, Khalil: *see* Gibran, Khalil.

Jibrīl, also spelled JABRĀ'ĪL, in Islām, the archangel who acts as intermediary between God and man and as bearer of revelation to the prophets, most notably, to Muḥammad. In biblical literature Gabriel is the counterpart to Jibrīl.

Muḥammad himself could not at first identify the spirit that possessed him, and the Qur'ān mentions him by name only three times. Jibrīl, however, became Muḥammad's constant helper. He and the archangel Mīkāl purified Muḥammad's heart in preparation for the Prophet's ascension to heaven (*mi'rāj*), and then Jibrīl guided him through the various levels until they reached the throne of God.



Jibrīl reassuring Muḥammad that God has not forsaken him, miniature from a manuscript in the Topkapı Saray Museum, Istanbul (MS. Hazine 1222, folio 382)

By courtesy of the Topkapı Saray Museum, Istanbul

When Muḥammad recited a supposed revelation acknowledging the pagan goddesses al-Lāt, al-'Uzzā, and Manāt, Jibrīl chastised him for presenting as divine a message inspired by the devil. Jibrīl also helped Muḥammad in times of political crises, coming to his aid at the Battle of Badr (624) with thousands of angels, then telling him to attack the Jewish tribes of Banū Qaynuqā' and Banū Qurayẓah.

Muḥammad generally only heard the voice of his inspiration, but, according to 'Ā'ishah, his wife, he saw Jibrīl twice "in the shape that he was created" and on other occasions as a man resembling Diḥyah ibn Khalīfah al-Kalbī, an extraordinarily handsome disciple of Muḥammad. Others have described the archangel as having 600 wings, each pair so enormous that they crowd the space between East and West. Jibrīl has also been depicted as sitting on a chair suspended between heaven and earth. The popular image of Jibrīl is of an ordinary, turbaned man, dressed in two green garments, astride a horse or a mule.

Muslim traditions concerning Jibrīl largely concur with biblical accounts of Gabriel, but his special relationship with Muḥammad has inspired a mass of mythical detail. Jibrīl is said to have appeared at Adam's side after his expulsion from paradise and shown him how to write and work iron and raise wheat. Jibrīl later appeared in Egypt to help Moses and to deceive the Egyptians into entering the Red Sea in pursuit of the Jews. Jibrīl also announced the birth of St. John the Baptist to his father Zacharias. The name of Jibrīl figures in the preparations of charms and appears with the names of the other archangels on the sides of magic squares.

jícama, also called YAM BEAN (*Pachyrrhizus erosus* or *tuberosus*), leguminous vine native to Mexico and Central and South America, grown for its edible tuberous root. The plant's irregularly globular, brown-skinned tubers are white-fleshed, crisp, and juicy; some varieties (*jícama de aqua*) have clear juices, and some (*jícama de leche*) have milky juice. Both types of tubers are mild-flavoured and usually are eaten raw in salads or sprinkled with lime juice and powdered chili peppers as a snack. Jícama can also be cooked. Although the very young seedpods of the plant are sometimes eaten, the mature seeds contain rotenone, a chemical used as an insecticide, and are highly toxic.

Jicaque, Indians of the northwest coast of Honduras. Little is known about the early history of the Jicaque, but their present-day culture is similar to that of the Sumo and Miskito of northeastern Nicaragua. The Jicaque are an agricultural people, growing sweet manioc (yuca), bitter manioc, beans, and corn (maize) as staples. Fishing and hunting provide other food; domesticated animals are now common. Their houses are built of poles and thatch. Clothing is semitraditional; commercial cloth and shirts, trousers, and dresses are becoming common. Crafts include weaving, basketry, the making of metates (for grinding corn), and the manufacture of bows and arrows. The Jicaque practice polygyny. Religion centres around two benevolent male deities and an evil female deity; offerings are made only to the evil goddess, in order to avoid ill fortune.

Jicarilla Apache, North American Indian tribe of the Eastern Apache group (*see* Apache). In the late 20th century about 2,300 Jicarilla Apache lived on or adjacent to the Jicarilla federal reservation in north-central New Mexico.

The early Jicarilla were one of several loosely organized, autonomous bands of Apache living in the Southwest. Their ancient lands included parts of present-day Colorado, Oklahoma, and New Mexico. The Jicarilla lived in wickiups (portable dwellings made of reeds or grass applied to an elliptical frame) and spoke an Eastern Apachean language. Their name, a Mexican Spanish word meaning "little basket," came from the small sealed baskets they used as drinking vessels.

In 1716 the Jicarilla were driven from their lands by the Comanche. They settled in what is now northeastern New Mexico, where they learned to supplement their traditional occupations of hunting and raiding with farming. Their relatively extensive farming practice required a more settled existence, and the Jicarilla engaged in warfare less frequently than did other Eastern Apache. They continued, however, to suffer the depredations of the Comanche: fighting in 1724 left most of the Jicarilla men dead and many women and children taken prisoner.

The surviving Jicarilla later tried to avoid warfare with white settlers. They engaged in some hostilities, however, after the early 1850s. They were subdued by the U.S. Army in 1880, and in 1887 they were settled on land reserved for them in New Mexico. Modern Jicarilla tribal organization is governed by an elected president and council, and tribal income is derived primarily from mineral leases.

Jiddah, also spelled JIDDA, JEDDAH, or JUDDAH, city and major port in central Hejaz region, western Saudi Arabia. It lies along the Red Sea west of Mecca. The principal importance of Jiddah in history is that it constituted the port of Mecca and was thus the site where the majority of Muslim pilgrims landed who were journeying to the holy cities of Mecca and Medina. The city in fact owes its commercial foundations to Caliph 'Uthmān, who in 646 made it the port for Muslim pilgrims crossing the Red Sea. In 1916 Jiddah and its Turkish garrisons surrendered to British forces. It then formed part of the Kingdom of the Hejaz until 1925, when it was captured by Ibn Sa'ūd. In the 1927 Treaty of Jiddah

the British recognized Saudi sovereignty over the Hejaz and Najd regions. Jiddah eventually was incorporated into Saudi Arabia. In 1947 the city walls were demolished, and rapid expansion followed. The city takes its name (which means "ancestress," or "grandmother") from the location there of the reputed tomb of Eve, which was destroyed by the Saudi government in 1928 in the belief that it encouraged superstition.

After World War II, Jiddah was completely modernized and expanded with the new wealth acquired by Saudi Arabia from oil royalties. Its harbour was deepened and enlarged to accommodate large vessels, and a desalinization plant was constructed in the early 1970s, thought to be the largest in the world at its completion. The city's economy, once dependent on pilgrim expenditures and fishing, was diversified to include steel-rolling mills, oil refineries, and the manufacture of cement, clothing, and pottery. Other activities include cattle raising and dairying and many small industries. One of Saudi Arabia's largest cities and busiest seaports, Jiddah is also the diplomatic capital of the country and the location of the Saudi ministry of foreign affairs and of the embassies and missions of foreign governments. Advanced education in economics and administration is offered by King Abdul Aziz University, founded in 1967. Jiddah is served by highways to Mecca and Medina and by King Abdul Aziz International Airport. Pop. (1983 est.) 1,500,000.

Jien, posthumous name JICHEN (b. May 17, 1155, Kyōto, Japan—d. Oct. 28, 1225, Ōmi province [now Shiga prefecture], near Kyōto), learned Buddhist monk and poet who became the first great Japanese historian.

Born into the highest order of the powerful, aristocratic Fujiwara family, he early in life entered a monastery of the Tendai Buddhist sect, first taking the priestly name Dōkai and later the name Jien. He soon began his historical writings designed to "enlighten people who find it hard to understand the vicissitudes of life." In his great work, the *Gukanshō* (literally, "Jottings of a Fool")—completed around 1220—he attempted to analyze the facts of Japanese history.

The *Gukanshō* reflects the pessimistic *mappō* Buddhist doctrine, which saw the feudal period in which its author lived as one of religious decline and of disintegration of Japanese civilization, a view also held by modern historians. Jien believed that changes in the feudal structure were necessary and defended the shogun's assumption of power.

Jieng (people): *see* Dinka.

Jifārah, Al-, also called JEFFARA, DJEFFARA, or GEFARA, coastal plain of northern Africa, on the Mediterranean coast of extreme northwestern Libya and of southeastern Tunisia. Roughly semicircular, it extends from Qābis (Gabes), Tunisia, to about 12 miles (20 km) east of Tripoli, Libya. Its maximum inland extent is approximately 80 miles (130 km), and its area of 14,300 square miles (37,000 square km) is about equally divided between the two countries.

Al-Jifārah slopes southward from the Mediterranean coast up to the tableland of the Sahara in three distinct regions. In the north is a narrow, low, coastal strip characterized by sandy beaches and many small hollows covered with *sabkhah* (saline plains with small lakes in the rainy season). South of this is a gently rolling area of steppe vegetation, varying in elevation from about 160 feet to 650 feet (50 to 200 m) above sea level. The southernmost region is a piedmont at the foot of the Saharan upland, known in Libya as the Nafūsah Plateau. In Tunisia this tableland sends out a long north–south spur that forms the western border of the coastal plain and is called aẓ-Ẓahr, or Dahar (Arabic: "the back").

Most of the area has 5–10 inches (125–250 mm) annual rainfall, except for the coastal area around Tripoli, which has about 15 inches (380 mm). The coastal strip supports many palm groves; some fruit and grain crops are grown. The central region of the Jifārah, with a much lower water table, supports only nomadic herding of sheep and goats. The narrow piedmont area of Al-Jifārah (up to about 1,000 feet [300 m] above sea level), a desert region with scattered oases, is everywhere separated from the Saharan upland by pronounced scarp ridges, or cuestas.

jig, folk dance, usually solo, that was popular in Scotland and northern England in the 16th and 17th centuries and in Ireland since the 18th century. It is an improvised dance performed with rapid footwork and a rigid torso.

In England jigs were sometimes danced across crossed flails and clay pipes; they were occasionally danced by performers wearing clogs and were akin to the modern clog dances of northern England. At the court of Elizabeth I, the northern jigs became fashionable in the



"The Last Jig, or Adieu to Old England," print by Thomas Rowlandson, 1818

By courtesy of the Metropolitan Museum of Art, New York, Whittelsey Fund, 1959

16th century, and the name was also loosely applied to other dances of folk origin. In the 16th and 17th centuries, jigs appeared as stage dances and as stylized keyboard compositions by such composers as William Byrd, John Bull, and Giles Farnaby. The jig soon spread to France and, in modified form as the gigue (*q.v.*), became fashionable at the court of Louis XIV.

Irish jigs are performed by one or more soloists or by couples dancing the solo dance. The music is in $\frac{6}{8}$ time. The hop, or slip, jig is a similar step dance (solo dance) in $\frac{9}{8}$ time. When set dances, or figure dances for several couples, are danced to music in jig time, they are also called jigs. The few English Morris dances for solo dancers are also called jigs. Related to the jig is the Italian *giga,* a lively couple dance still popular in the folk tradition.

Jigoku, in Japanese Buddhism, hell, a region popularly believed to be composed of a number of hot and cold regions located under the Earth. Jigoku is ruled over by Emma-ō, the Japanese lord of death, who judges the dead by consulting a register in which are entered all of their sins. He is assisted in his examination of the dead by two disembodied heads, which rest on pillars on either side of him. The female head, Miru-me, has the power of perceiving the sinner's most secret faults, while the male head, Kagu-hana, can detect any misdeed. Damnation is not eternal; the dead are sentenced to fixed periods of time in one region or to several regions in succession. The sentences can be shortened by the intervention of bodhisattvas (those destined to become enlightened) in response to the prayers of the living.

The *Jigoku-zōshi,* a late 12th-century scroll, depicts the 8 great hells and the 16 lesser hells in both text and paintings.

jigsaw puzzle, any set of varied, irregularly shaped pieces that, when properly assembled, form a picture or map. The puzzle is so named because the picture, originally attached to wood and later to paperboard, was cut into its pieces with a jigsaw, which cuts intricate lines and curves. Jigsaw puzzles may be very complicated vis-à-vis the number of pieces and the number of different cuts and thus take many hours to complete.

The puzzles originated as educational devices to teach geography (dissected maps) in 18th-century England. Dissected pictures followed, covering such subjects as history, alphabets, botany, and zoology. The use of popular pictures began in the 1860s and '70s, in both Great Britain and the United States. The puzzles became extremely popular in the early 1900s and had a revival in the Great Depression of the 1930s as an inexpensive, reusable amusement. Another revival began after World War II, and jigsaw puzzles have remained a popular entertainment since that time. Shmuzzles, first marketed in 1978, are exceptionally difficult puzzles, having 168 identical laser-cut pieces with only one correct solution, although the pieces will fit otherwise.

Jih-k'a-tse, also spelled SHIGATSE, Pinyin RIKAZE, or XIGAZÊ, city in the south-central part of the Tibet autonomous *ch'ü* (region), China. Situated on a well-defended height (elevation 12,800 feet [3,900 m]) overlooking the confluence of two rivers in one of the most fertile valley areas of Tibet, it is the traditional capital of the area known as Hou-tsang on the Nepal border. It was formerly a small town near one of the largest monasteries in Tibet, the Tashilhunpo, traditional seat of the Paṇchen Lama. The area was brought under the control of Lhasa, capital of Tibet, in the 1920s, when the Paṇchen Lama fled to China after a disagreement with the Dalai Lama. Since 1951 the area around the city has been intensively cultivated (wheat and barley), and communications have been improved. Pop. (latest est.) 10,000–50,000.

jihad, also spelled JEHAD, Arabic JIHĀD ("fight," or "battle"), a religious duty imposed on Muslims to spread Islām by waging war; jihad has come to denote any conflict waged for principle or belief and is often translated to mean "holy war."

Islām distinguishes four ways by which the duty of jihad can be fulfilled: by the heart, the tongue, the hand, and the sword. The first consists in a spiritual purification of one's own heart by doing battle with the devil and overcoming his inducements to evil. The propagation of Islām through the tongue and hand is accomplished in large measure by supporting what is right and correcting what is wrong. The fourth way to fulfill one's duty is to wage war physically against unbelievers and enemies of the Islāmic faith. Those who professed belief in a divine revelation—Christians and Jews in particular—were given special consideration. They could either embrace Islām or at least submit themselves to Islāmic rule and pay a poll and land tax. If both options were rejected, jihad was declared.

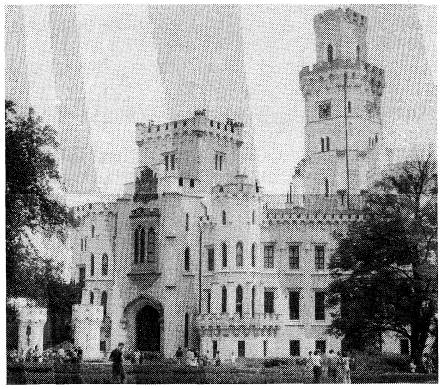
Modern Islām places special emphasis on waging war with one's inner self. It sanctions war with other nations only as a defensive measure when the faith is in danger.

Throughout Islāmic history, wars against non-Muslims, even though with political overtones, were termed jihads to reflect their religious flavour. This was especially true in the 18th and 19th centuries in Muslim Africa south of Sahara, where religiopolitical conquests were seen as jihads, most notably the jihad of Usman dan Fodio, which established the Sokoto caliphate (1804) in what is now northern Nigeria.

Jihān Shāh (Turkmen leader): *see* Jahān Shāh.

Jihlava, German IGLAU, city, Jihomoravský *kraj* (region), Czechoslovakia, in the Bohemian-Moravian Highlands, on the Jihlava River. From about 1240, its prosperity rested on its silver mines. A royal mint operated there from about 1260, and a codified town mining law (Ius Regale Montanorum) served as a model for other central European mining laws. Hussite Utraquists and representatives of the Council of Basel signed a treaty at Jihlava in 1436. In 1523 the town was almost entirely destroyed by fire; reconstruction, around the great town square, was mostly in Renaissance style. By 1600 the cloth trade replaced silver as the town's economic basis, and a tobacco factory was introduced in the late 19th century. Today, vehicles and precision instruments are manufactured as well. Pop. (1987 est.) 53,791.

Jihočeský, also called JIŽNÍ ČECHY, English SOUTHERN BOHEMIA, *kraj* (region), southeastern Czech Socialist Republic, south-central Czechoslovakia. Bordered on the north by Středočeský and Východočesky *kraje,* on the east by Jihomoravský *kraj,* on the south by Austria, on the southwest by Germany, and on the west by Západočeský *kraj,* it has an area of 4,380 square miles (11,345 square km). The Šumava Mountains dominate the southern part of the region, while the remainder consists of the Středočeská Pahorkatina, a broad, hilly plateau, cut by the valleys of the northward-flowing Vltava (Moldau) River and its tributaries.



The castle of Hluboká nad Vltavou, site of the Aleš South Bohemian Gallery, Jihočeský, Czechoslovakia
M. Susta—ORBIS Fotoarchiv

Agriculture and forestry each account for slightly more than one-third of land use. The main crops raised are corn (maize) for animal fodder, hay, potatoes, flax, oats, barley, wheat, clover, and rye; apples, plums, cherries, pears, and walnuts are grown. Hogs, cattle, and poultry are the primary livestock reared; dairying accounts for about two-fifths of the cattle, and it is concentrated around the capital, České Budějovice, Strakonice, Protivín, and Český Krumlov.

About four percent of Jihočeský *kraj*'s area is water, and fish-farming is an important industry. Most of the lakes, some natural, some man-made, are found in the southern highlands along the Lužnice and Vltava rivers; the fishing industry is centred at Třeboň on the Lužnice, and it dates back to the Middle Ages. The Rožmberk fishpond (built 1584–90 and covering 1,790 acres [724 hectares]), the largest in Czechoslovakia, is known for carp and is still impounded behind its original oaken dam, which measures 8,530 feet (2,600 m) long, 262 feet (80 m) wide, and 39 feet (12 m) high. Modern dams with their reservoirs have enlarged the industry; the Lipno Dam on the Vltava, in the Šumava Mountains, impounds a 12,350-acre (5,000-hectare) reservoir, provides hydroelectric energy, and helps regulate water levels on the Vltava for navigation and in the fishponds as well. The reservoir of the Orlík Dam in Středočeský *kraj* covers 80,640 acres (32,635 hectares), mostly in Jihočeský *kraj*. There are additional dams on the Blanice River at Husinec and on the Malše River at Římov.

Forests consist mainly of fir, spruce, pine, oak, beech, and some maple and ash; they occur mainly in the southern mountain and lake district and in the valleys of the Vltava and the Lužnice rivers. The main lumbering and paper-milling centres are: České Budějovice, Větřní, Loučovice, Písek, Tábor, Soběslav, Pelhřimov, Lišov, and Suchdol nad Lužnicí.

The relatively few mineral resources include graphite, mined at Vyšný-Lazec, Domoradice, Koloděje, and Bližná; peat, extracted at Lenora, Třebon, Příbraz, and along the Lužnice River; limestone, quarried at Český Krumlov and Chýnov; asbestos at Borovany; feldspar at Písek and Halamky; and brick and fire-retardant clays, extracted along the riverbanks.

České Budějovice is the chief industrial centre; it has steelworks and electronics, transport-equipment, furniture, pencil, and food-processing plants, as well as several breweries. After Plzeň it is Czechoslovakia's second-best-known beer centre; České Budějovice is where Budvar-style beer (German *Budweiser*) originated. In the industrial area of Tábor-Sezimovo Ústí-Planá and Lužnicí are chemical, metalworking, transport-vehicle, electronics, paper, clothing, and food-processing plants. Other larger centres are Písek, which manufactures machinery, textiles, and musical instruments; Strakonice, producing motorcyles, machinery, and clothing; and Vimperk, with glass works, lumber, and textile plants.

Tourism is concentrated on water sports, particularly on the reservoir lakes behind the Lipno and Orlík dams, and the Svět fishpond; on boat tours along the Vltava and Lužnice rivers; and on tours of numerous towns and memorials of the Hussite movement, which arose in this region. Husinec, 4 miles (6 km) north of Prachatice, is Jan Hus's birthplace (July 6, 1369), and parts of his house serve as a memorial museum. Tábor, the seat of the Hussite movement (1420), is the site of the Museum of the Hussite Revolutionary Movement; another museum in Kotnov Castle is devoted to Tábor's history. Trocnov, 19 miles (31 km) southeast of České Budějovice, is the birthplace of Jan Žižka, the charismatic military leader of the Hussite army. Chelčice is the birthplace of Petr Chelčický, the founder of the Bohemian Brotherhood in the 15th century; nearby Vodňany is the site of the School of Fishery.

České Budějovice is the region's cultural centre; it contains the Museum of South Bohemia, the State Scientific Library, and a teacher-training college; it is also a city under National Trust, with many buildings of the Hussite period. Hluboká nad Vltavou, 6 miles (10 km) northwest of České Budějovice, is the site of the Aleš South Bohemian Gallery, exhibiting Gothic and Baroque art. Bechyně is the location of the School of Ceramics, and is noted for its spa with mud baths. Písek also is a health resort and contains a local municipal museum.

The districts south and west of České Budějovice contain between 2 and 3 percent Slovak population and a small minority of Germans. Pop. (1988 est.) 696,097.

Jihomoravský, also called JIŽNÍ MORAVA, English SOUTHERN MORAVIA, *kraj* (region), southeastern Czech Socialist Republic, south-central Czechoslovakia. Bordered by Jihočeský *kraj* to the west, Východočeský and Severomoravský *kraje* to the north, Stredoslovenský and Západoslovenský *kraje* to the east, and Austria to the south, it has an area of 5,802 square miles (15,028 square km).

The hilly Českomoravská Vrchovina (Bohemian-Moravian Highlands) covers the northwestern part of the region, while in the northeast the Biele Karpaty (White Carpathian) mountains range along the border with Západoslovenský *kraj*. The main river system, the Morava (March), flows southward between these uplands, forming a broad, fertile valley comprising the Haná and Podluží areas.

The Haná valley produces wheat, barley, sugar beets, corn (maize), rye, and vegetables. The surrounding hill country is Czechoslovakia's greatest producer of plums and apricots and also is important for apples, cherries, pears, and walnuts. Podluží has numerous vineyards and is noted for its wines, as well as for its plum brandy, Slivovice. The hilly areas in the northwest of Jihomoravský *kraj* are major potato producers, but flax, rye, and oats are also grown. Cattle, hogs, sheep, goats, and poultry are raised, and dairying is an important industry in the Haná and Podluží areas.

Most of Czechoslovakia's oil and natural gas is found in small deposits clustered around Břeclav and Hodonín in Podluží; there are isolated small fields near Brdo in the northeast and Mikulov in the south. An important bituminous coal field is worked at Zbýšov, and brown coal (lignite) mining began in Mikulčice (Podluží) in 1980. Uranium is mined at Ostrov nad Oslavou. Kaolin clay is quarried at Únanov, near Znojmo, and limestone is quarried around Brno, the region's capital, near Mikulov. Jihlava, Malonín, the area of Velké Meziříčí, Polná, and Brno have quarry stone. Feldspar is quarried at Dolni Bory.

Spruce and oak forests are found north and west of Brno and around Gottwaldov; lumbering and paper milling are centred in these areas, mainly at Brno, Třebíč, Třešť, Tišnov, Rousínov, Bučovice, Holešov, and Bystřice pod Hostýnem. Hydroelectric power for industry is generated by power stations at four major dams, at Vír on the Svratka, Oslavany on the Jihlava, Knínice near Brno, and Vranov nad Dyjí on the Dyje.

Brno and Gottwaldov are the major industrial centres; Brno is noted for engineering works, machinery, electro-technical products, tractors, cement, wood, paper products, textiles, and food processing. Gottwaldov, a centre of shoemaking and leather work, also produces machinery and synthetic rubber. Other important centres are Třebíč, producing leather goods and machinery; Jihlava, manufacturing electronics ware, transport equipment, machinery, and textiles; Prostějov, with steelworks and beer-production, tool, and clothing plants; Otrokovice, an aircraft-building centre; and Znojmo, producing ceramics, leather goods, and textiles and processing fruits and vegetables. An annual industrial fair is held at the Brno Fair Grounds; the region's capital also contains the track for the running of the annual Grand Prix of Czechoslovakia, a motorcycle race.

Jihomoravský *kraj*'s main cultural centre, Brno is the site of the Purkyně University, colleges of agriculture and veterinary medicine, the Central Library for Veterinary Colleges, and the Moravian Museum, Gallery, and Library. Home of the noted composer Leoš Janáček (1854–1928), it also has the Janáček Opera House and the Janáček Academy of Music and Dramatic Art. Other cities with cultural institutions include Gottwaldov, which has the Regional Museum of Southern Moravia; Znojmo, where the South Moravian Museum is located; Kralice, a traditional printing centre, containing the Bible Museum; and Slavkov, site of the Napoleonic battle of Austerlitz (1805), where the Slavkov Historical Museum is located. Tourists are also drawn to the prehistoric excavation site of Dolní Věstonice, near Mikulov; the Slavic historic site of Mikulčice; and the Moravian Karst formations at Blansko, the best-known

of which is the Punkva Cave. Other attractions are the Podluží and Haná cultural areas, noted for folk festivals, and the region's natural and man-made lakes, which have watersports facilities. Although classed as Czech, much of the population has Slovak admixture and speaks a Czech dialect (Moravian). Pop. (1988 est.) 2,057,645.

Jijel, formerly DJIDJELLI, town and roadstead port, northeastern Algeria, on the Mediterranean seacoast and the western edge of the Kabylie de Collo region. The city of Jijel, originally a Phoenician trading post, passed successively to the Romans (as Igilgili), the Arabs, and, in the 16th century, to the pirate Khayr ad-Dīn (Barbarossa). It remained a corsair stronghold until captured by the French in 1839. Strong local resistance, finally subdued in 1851, resulted in the construction of three forts along its southern fringe and minimal colonization. The original town was devastated by an earthquake in 1856. Surrounded by dense cork-oak forest and protected by a peninsula and citadel to the north, Jijel was replanned along modern lines, with wide streets shaded by plane trees. The main industries are cork processing, leather tanning, and steel making. There is an active export trade in agricultural products. Jijel is also a seaside resort with fine sand beaches and a casino.

The surrounding region supports commercial fishing and the production of citrus fruits and cereal grains. Its population includes both Arabs and Kabylies, a Berber group. Pop. (1987 prelim.) mun., 69,274.

jījīm (weaving): *see* cicim.

Jīlī, al-, in full ʿABD AL-KARĪM QUṬB AD-DĪN IBN IBRĀHĪM AL-JĪLĪ (b. 1365—d. *c.* 1424), mystic whose doctrines of the "perfect man" became popular throughout the Islāmic world.

Little is known about al-Jīlī's personal life. Possibly after a visit to India in 1387, he studied in Yemen during 1393–1403. Of his more than 30 works, the most famous is *Al-Insān al-kāmil fi maʿrifat al-awākhir wa al-awā ʾil* (partial Eng. trans., *Studies in Islamic Mysticism*), which contains his complex doctrine of the perfect man. The work shows clearly the influence of the pantheistic Spanish mystic Ibn al-ʿArabī (d. 1240).

Al-Jīlī maintained that the perfect man can achieve unity with the Divine Being. This unity is experienced not only by the prophets, from Adam to Muḥammad, but also by others who reach the highest level of being (*wujūd*) and become, as it were, the most select of the select. At this level, all contradictions, such as being with non-being, and vengeance with mercy, are resolved. Al-Jīlī also maintained that in every age the perfect man manifested the outward appearance and inner essences of the Prophet Muḥammad. The perfect man was thereby a channel through which the community could enjoy contact with the Divine Being. Al-Jīlī claimed that, in the town of Zabīd in Yemen in 1393, he had met the Prophet Muḥammad, who then manifested himself through al-Jīlī as sheikh, or spiritual leader.

Al-Jīlī's doctrine of the perfect man later degenerated into a belief that all holy men and mystics were able to achieve contact and unity with God.

Jilin (China): *see* Chi-lin.

jill (unit of measure): *see* gill.

Jim Crow Law, any of the laws that enforced racial segregation in the U.S. South between the end (1877) of the formal Reconstruction period and the beginning of a strong civil-rights movement (1950s). "Jim Crow" was the name of a minstrel routine (actually "Jump Jim Crow") performed beginning in 1828 by its author, Thomas Dartmouth ("Daddy") Rice, and by many imitators, including Joseph Jefferson. The term came to be a derogatory epithet for blacks and a designation for their segregated life.

From the late 1870s, Southern state legislatures, no longer controlled by carpetbaggers and freedmen, passed laws requiring separation of whites from "persons of colour" in public transportation. Generally, anyone of ascertainable or strongly suspected black ancestry in any degree was for this purpose a "person of colour"; the pre-Civil War distinction favouring those whose ancestry was known to be mixed—particularly the half-French "free persons of colour" in Louisiana—was abandoned. The segregation principle was extended to schools, parks, cemeteries, theatres, and restaurants in an effort to prevent any contact between blacks and whites as equals. In 1954 the Supreme Court declared segregation in public schools unconstitutional and in subsequent decisions ruled similarly on other kinds of Jim Crow legislation. *See also* black code; racial segregation.

Jim River (North Dakota–South Dakota, U.S.): *see* James River.

Jim Thorpe, borough, seat of Carbon county, eastern Pennsylvania, U.S., on the Lehigh River, in a valley of the Pocono Mountains, 21 miles (34 km) northwest of Allentown. It was created in 1954 with the merger of the boroughs of Mauch Chunk (inc. 1842) and East Mauch Chunk (inc. 1853) and was named for Jim Thorpe (1888–1953), the famous American Indian athlete. Thorpe's remains were brought from Oklahoma and interred in a nearby mausoleum (the Jim Thorpe Memorial).

Following the local discovery of anthracite coal in 1791, the Lehigh Coal and Navigation Company laid out the site and there built the first industrial railroad in the United States (1828), a gravity switchback line that hauled coal to the Lehigh Canal. Asa Packer, a coal baron, founded the Lehigh Valley Railroad to replace the canal in 1855. Mining has given way to the manufacture of textiles, clothing, handbags, and furniture. Flagstaff Mountain Park and Glen Onoko are nearby scenic spots. Pop. (1984 est.) 5,318.

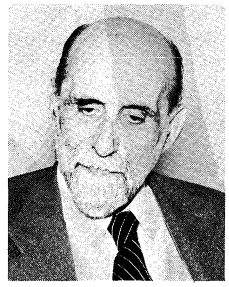
Jima, also spelled JIMMA, town, southwestern Ethiopia, 220 miles (353 km) by road southwest of Addis Ababa. It lies at an elevation of 5,740 feet (1,750 m) in a forested region known for its coffee plantations. Jima serves as the commercial centre for the region, handling coffee and other products. An agricultural school and an airport serve the town. Potassium and sodium nitrates are mined to the northeast. Pop. (1984 prelim.) 60,992.

Jimaní, city, southwestern Dominican Republic, situated between the western shore of Lake Enriquillo and the Haitian border. The city is now a trade centre for the coffee, fruits, and timber produced in the region. Jimaní is accessible by secondary highway from communities in both the Dominican Republic and Haiti. Pop. (1981) 3,327.

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Jiménez, Juan Ramón (b. Dec. 24, 1881, Moguer, Spain—d. May 29, 1958, San Juan, P.R.), Spanish poet awarded the Nobel Prize for Literature in 1956.

After studying briefly at the University of Salamanca, Jiménez went to Madrid (1900) at the invitation of the poet Rubén Darío. His first two volumes of poetry, *Almas de violeta* ("Souls of Violet") and *Ninfeas* ("Waterlilies"), came out that same year. The two books, printed in violet and green, respectively, so embarrassed Jiménez in his later years by their excessive sentiment that he destroyed every copy he could find. A man of frail constitution, he left Madrid for reasons of health.



Juan Ramón Jiménez, 1956
AP/Wide World Photos

His published volumes of that period, including *Pastorales* (1911), *Jardines lejanos* (1905; "Distant Gardens"), and *Elegías puras* (1908; "Pure Elegies"), clearly reflect the influence of Darío, with their emphasis on individuality and subjectivity expressed in free verse.

Jiménez returned to Madrid in 1912 and, for the next four years, lived at the Residencia de Estudiantes and worked as an editor of that educational institution's periodicals. In 1916 he traveled to New York City, where he married Zenobia Camprubí Aymar, the Spanish translator of the Hindu poet Rabindranath Tagore. Shortly after his return to Spain, he published *Diario de un poeta recién casado* (1917; "Diary of a Poet Recently Married"), which was issued in 1948 under the title *Diario de un poeta y mar* ("Diary of a Poet and the Sea"). That volume marked his transition to what he called "*la poesía desnuda*" ("naked poetry"), an attempt to strip his poetry of all extraneous matter and to produce it in free verse, without formal metres, of a purer nature. During the Spanish Civil War (1936–39), he allied himself with the Republican forces, until he voluntarily exiled himself to Puerto Rico, where he spent most of the rest of his life.

Although primarily a poet, Jiménez achieved popularity in America with the translation of his prose work *Platero y yo* (1917; *Platero and I*), the story of a man and his donkey. He also collaborated with his wife in the translation of the Irish playwright John Millington Synge's *Riders to the Sea* (1920). His poetic output during his life was immense. Among his better-known works are *Sonetos espirituales 1914–1915* (1916; "Spiritual Sonnets, 1914–15"), *Piedra y cielo* (1919; "Stones and Sky"), *Poesía, en verso, 1917–1923* (1923), *Poesía en prosa y verso* (1932; "Poetry in Prose and Verse"), *Voces de mi copla* (1945; "Voices of My Song"), and *Animal de fondo* (1947; "Animal at Bottom"). A collection of 300 poems (1903–53) in English translation by Eloise Roach was published in 1962.

Jiménez, Marcos Pérez: *see* Pérez Jiménez, Marcos.

Jiménez de Cisneros, Francisco, CARDENAL (Cardinal) (b. 1436, Torrelaguna, Castile [now in Spain]—d. Nov. 8, 1517, Roa, Spain), prelate, religious reformer, and twice regent of Spain (1506, 1516–17). In 1507 he became both a cardinal and the grand inquisitor of Spain, and during his public life he sought the forced conversion of the Spanish Moors and promoted crusades to conquer North Africa.

Jiménez was the son of a poor hidalgo (lower nobility) tax collector and was christened Gonzalo. He studied at the University of Salamanca and, after taking holy orders, spent a number of years in Rome (1459–66), where he disliked the humanists at the papal court but was impressed by their learning. Pope Paul II gave him an "expective letter" for the first



Jiménez de Cisneros, engraving after a bust by Felipe Vigarny
By courtesy of the Hispanic Society of America

vacant benefice in the Archdiocese of Toledo. The archbishop, Alfonso de Carillo, refused to accept the letter and, in 1473, when Jiménez insisted on his rights, threw him into prison. Refusing release at the price of giving up his claims, Jiménez remained in prison until 1479, when Carillo gave way. In 1482 Cardinal Pedro González de Mendoza, impressed by Jiménez' ability and strength of character, made him vicar general of the Bishopric of Sigüenza. In 1484 Jiménez gave up this post and, apparently, a brilliant career and became a monk in the Franciscan monastery of San Juan de los Reyes at Toledo, taking the name of Fray (Brother) Francisco.

In 1492, on Mendoza's recommendation, Isabella I the Catholic, of Castile, appointed him her confessor. From then on his influence grew rapidly. In 1495 he succeeded Mendoza as archbishop of Toledo. This position gave Jiménez the opportunity to initiate the reform of the Spanish clergy. At synods of Alcalá (1497) and Talavera (1498) he promulgated a series of orders: the clergy had to give up the common practice of concubinage; they were required to reside in their parishes, to go to frequent confession, and to preach and explain the gospel to their parishioners every Sunday. A simple catechism was published with the decrees. The monks, first of Jiménez' own order of the Franciscans and then of the other orders, were required to observe their traditional rules. Aristocratic ecclesiastics resented this interference with their life-style and appealed to Isabella and to Rome; 400 monks from Andalusia even fled to North Africa with their "wives" and became Muslims. But gradually the reforms became effective, at least in the monastic orders.

Against the advice of Hernando de Talavera, archbishop of Granada (who wanted to convert the Moors of Granada slowly by education), Jiménez introduced forced mass conversions. The Moriscos, although now nominally Christians, were neither willing to be assimilated to the Christian Spaniards nor were they accepted as equals by the latter. Jiménez' intervention was the direct cause of a Moorish revolt in 1499–1500, and he must be held largely responsible for making the Morisco problem insoluble. In 1609 the Moriscos were finally expelled from Spain.

Appointed grand inquisitor. Jiménez spent the last years of Isabella's reign mostly at her court as her principal religious and political adviser. Upon her death, in 1504, he supported the claims of Ferdinand II the Catholic, of Aragon, against his son-in-law, Philip of Burgundy, but helped to mediate the Agreement of Salamanca, which left Philip as king of Castile. On Philip's death (1506) Jiménez set up a regency government for Ferdinand, who was in Naples at the time, and stopped the intrigues of a group of high nobles who wanted to make over the regency to the emperor Maximilian I. Ferdinand made him grand inquisitor and obtained for him the cardinal's hat in 1507. As grand inquisitor, Jiménez insisted that the inquisitors observe the inquisitorial rules strictly, but he also extended the authority of the Supreme Council of the Inquisition (the "Holy Office") over the local inquisitorial courts. It was said that he offered from his own resources to pay Ferdinand the sum of 600,000 ducats, which the *conversos* (converted Jews) had offered the King for the abolition of the Inquisition.

Jiménez was the guiding spirit behind the Spanish campaigns in North Africa (1505–10), which he helped finance from his archiepiscopal revenues. But, because of a greater interest in Italy, Ferdinand was content with the capture of Oran and other ports and refused to support Jiménez' plan for a crusade to conquer all North Africa.

Jiménez knew that the reform of the morals and pastoral work of the clergy could not be effective without a parallel intellectual reform of the church. He thus began planning the foundation of a new university at Alcalá de Henares in 1498. It opened in 1508. Apart from the usual chairs in Thomist theology, Jiménez also established chairs in Scotist and Nominalist theology, as well as in Oriental languages. He attracted some of the finest contemporary scholars to Alcalá (although Erasmus refused his invitation). These scholars cooperated in the production of the famous Complutensian Polyglot Bible (completed in 1517 and published *c.* 1522).

At the death of Ferdinand (1516) Jiménez once more became regent of Castile. The old antagonisms between the nobility and the cities and between the Castilians and the Aragonese broke out again. Some of Ferdinand's Castilian opponents had previously gone to the court in Brussels. They were now joined by Ferdinand's Aragonese ministers, who tried to secure their position with the prospective new ruler, Ferdinand's grandson, Charles of Burgundy (later Charles I of Spain and Emperor Charles V). They were bitterly resented by those who remained in Spain. A group of Castilian nobles plotted to place Charles's young brother Ferdinand on the throne, but Jiménez forestalled them and obtained the general recognition of Charles in Castile. It was due largely to the Cardinal's efforts that Charles could take over his new kingdom without open opposition (September 1517). But Jiménez died without seeing the new king. (H.G.K.)

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Jiménez de Quesada, Gonzalo (b. *c.* 1495, Córdoba or Granada, Spain—d. Feb. 16, 1579, Mariquita, New Granada), Spanish conquistador who led the expedition that won New Granada (Colombia) for Spain.

Trained as a lawyer in Granada, Quesada sailed to the New World in 1535 to serve as the chief magistrate for the colony of Santa Marta, on the northern coast of South America. The following year, although he had no military experience, Quesada led an expedition of 900 men up the Magdalena River into the interior of New Granada. After eight months of marching through tropical forests and struggling with hostile Indians, the expedition succeeded in penetrating the great central plain of Colombia—the land of the Chibcha Indians, a group of tribes that had attained a relatively high state of culture. The ruler of the Chibchas, the Zipa of Bogotá, fled as Quesada's army approached, and the conquest appeared to be accomplished. Toward the end of 1538, however, two rival conquistadores—Sebastián de Belalcázar from Quito and Nikolaus Federmann from Venezuela—challenged Quesada's claim to the New Granada triumph. The three rivals agreed to submit their case to Madrid. In July 1539 Quesada sailed from Cartagena to Spain to plead before the crown his right of conquest, but he succeeded only in winning for himself an honorary title.

On his return to New Granada, he became at once the most influential person in the colony, protecting the colonists from the severity of officials and restraining the rapacity of the *comenderos* (large landholders). Yet his own thirst for conquest (and for gold) was not yet quenched. In 1569 he set out with 500 men to search for the mythical Eldorado but returned after two years' wanderings with only 25 of his original company. The least contentious of the great conquistadores, he retired to La Suesca, his country house, where he wrote a book about his campaigns, which has been lost. He died of leprosy.

Jimeta, town, Gongola State, eastern Nigeria, on the south bank of the Benue River, and on the highway between Zing and Girei. Merged with Yola in 1935 by the Fulani administration, Jimeta regained independent town status with its own council in 1955. With the construction of a spur road to Yola (5.5 mi [9 km] south-southeast), the town became a river port for Yola, gradually taking over most of the river-borne traffic along the Benue River. From mid-July to mid-October, when the Benue has deep water, boats carry peanuts (groundnuts) and cotton (both mainly from Cameroon), and hides and skins (from the hinterland of Yola–Jimeta) to the Niger Delta ports for export. Local trade handles sorghum, millet, yams, shea nuts, onions, peppers, indigo, cattle, sheep, goats, and poultry.

Jimeta is linked by road to Bombi, Mubi, Bama, and Maiduguri; a ferry service in the town crosses the Benue River. Educational and social services are available in nearby Yola. Pop. (1972 est.) 45,327.

Jimma (Ethiopia): *see* Jima.

Jimmu, in full JIMMU TENNŌ, original name KOW-YAMATO-IWARE-HIKO NO MIKOTO, legendary first emperor of Japan and founder of the Imperial dynasty.

Japanese chronicles record his expedition eastward from Hyuga in 607 BC along the inland sea, subduing tribes as he went and ending in Yamato, where he established his centre of power. Although modern historians do not accept such details as a 7th century date, preferring a date in the Early Christian era, they affirm the tradition of an aggressive movement of peoples from the west.

Jimmu Tennō (the posthumous reign name by which he is generally known), is said to be a descendant of the sun goddess Amaterasu through her celestial grandson Ninigi, whom she sent down to govern earth, and he married a descendant of the storm god Susanoo. Despite Jimmu's importance as a link between the ruling family of Japan and the divine ancestors, he has never had much of a cult following in Japan. A Shintō shrine was erected by the Japanese government in 1890 at the site of what is believed to be his burial place at Unebi.

jimsonweed, annual, herbaceous, tropical plant (*Datura stramonium*) of the potato fam-

ily (Solanaceae) that has become an introduced weed throughout much of the Northern Hemisphere. Its juices are poisonous, and it has a fairly unpleasant odour.



Jimsonweed (*Datura stramonium*)
J. Klimas—Photo Trends

Jimsonweed grows to a height of 1 to almost 2 m (up to 6½ feet), has large, white or violet, trumpet-shaped flowers, and produces a large, spiny fruit to which the common name thornapple is sometimes applied. Commercially, it is the source of the alkaloidal drug hyoscyamine.

Jin DYNASTY (China): *see* Chin dynasty.

Jina (in Jainism): *see* Tīrthaṅkara.

Jinan (China): *see* Chi-nan.

jinbi shanshui (Chinese painting): *see* chin-pi shan-shui.

Jīnd, also spelled JHIND, city, central Haryāna state, northwestern India, on road and rail routes to Delhi, 70 miles (110 km) southeast. Another rail line connects it eastward to Pānīpat. Jīnd is said to have been founded by the Pāṇḍavas of the *Mahābhārata* epic, who built a temple, around which the town of Jaintapuri (Jīnd) grew. A local grain-trade centre, it also possesses cotton-ginning factories. Several colleges are affiliated with Kurukshetra University.

The surrounding region—with the exception of low, outlying hills of the Arāvalli Range in the south—is composed of level plains broken only by shifting sand hills. Irrigated by the Sirhind Canal system, the region's chief crops include grains, gram (a leguminous plant grown for its seeds), and cotton. Jīnd was formerly one of the princely Phulkian states of the Punjab; it was founded in the 18th century by Sutlej Sikh chieftains. Pop. (1981) town, 56,748.

Jing Di (Chinese emperor): *see* Ching-ti.

Jing Hao: *see* Ching Hao.

Jingdezhen (China): *see* Ching-te-chen.

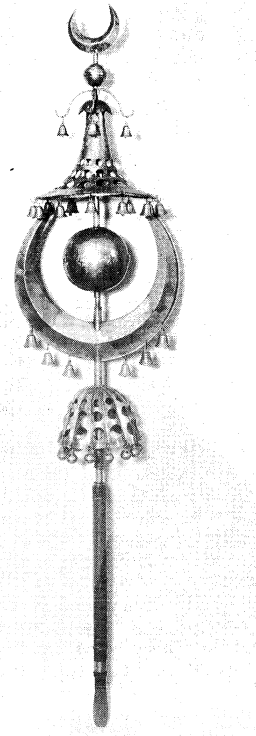
Jinghis Khan (Mongol ruler): *see* Genghis Khan.

Jinghong (China): *see* Ching-hung.

jingle shell, also called SADDLE OYSTER, any of several marine invertebrates of the class Bivalvia belonging to the family Anomiidae. In most species of these oysterlike bivalves, one valve (*i.e.,* half) of the shell is closely appressed to a rock surface and has a large hole or embayment in its wall through which a calcified byssus (tuft of horny threads) attaches to the rock and thus anchors the animal. The shell's upper valve, though it is more convex than the lower, is usually irregular in shape and follows the configuration of the rock surface.

The shells are often translucent and have pearly interiors. They also jingle when touched; hence the name jingle shell. They are much used in the manufacture of lampshades, chimes, and other ornaments.

jingling Johnny, also called TURKISH CRESCENT, French CHAPEAU CHINOIS, or PAVILLON CHINOIS, musical instrument consisting of a pole ornamented with a canopy (*pavillon*), a crescent, and other shapes hung with bells and metal jingling objects, and often surmounted by horsetails. It possibly originated as the staff of a Central Asian shaman, and it was part of the Turkish military Janissary band that stimulated the late 18th-century European vogue for Turkish music. The jingling Johnny was



Belgian jingling Johnny, *c.* 1800; in the Museum of Fine Arts, Boston
Leslie Lindsay Mason Collection of Musical Instruments (formerly the Galpin Collection), Museum of Fine Arts, Boston

used in European military bands in the 19th century and survives, somewhat altered, in Germany. Similar instruments occur in ancient Chinese music, probably diffused from the same Central Asian sources.

Jingō (empress of Japan): *see* Jingū.

jingoism, an attitude of belligerent nationalism, the English equivalent of the term chauvinism. The term apparently originated in England during the Russo-Turkish War of 1877–78 when the British Mediterranean squadron was sent to Gallipoli to restrain Russia and war fever was aroused. Supporters of the British government's policy toward Russia came to be called jingoes as a result of the phrase "by jingo," which appeared in the refrain of a popular song:

> We don't want to fight, yet by jingo, if we do,
> We've got the ships, we've got the men,
> And got the money, too!

Compare chauvinism.

Jingozaemon (Japanese military strategist): *see* Yamaga Sokō.

Jingtai (Chinese emperor): *see* Ching-t'ai.

jingtian (China): *see* well-field system.

Jingū, also spelled JINGŌ, in full JINGŪ KŌGŌ, also called OKINAGATARASHI-HIME NO MIKOTO (b. AD 170?, Japan—d. 269?, Japan), semilegendary empress-regent of Japan who is said to have established Japanese hegemony over Korea.

According to the traditional records of ancient Japan, Jingū was the wife of Chūai, the 14th sovereign (reigned 192–200), and the regent for her son Ōjin. Aided by a pair of divine jewels that allowed her to control the tides, she is said to have begun her bloodless conquest of Korea in 200, the year in which her husband died. According to legend, her unborn son Ōjin, later deified as Hachiman, the god of war, remained in her womb for three years, giving her time to complete the conquest and return to Japan.

Although the traditional chronology of the period is doubtful and many of the deeds ascribed to Jingū are undoubtedly fictitious, it is certain that by the 4th century AD the Japanese had established some control over southern Korea.

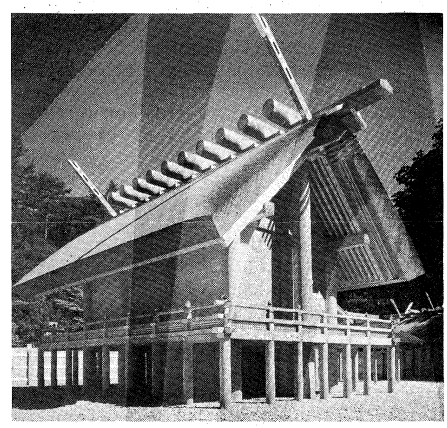
There is no way of verifying the existence of a specific empress named Jingū, but it is thought that a matriarchal society existed in western Japan during this period. Chinese and Korean records, considered to be more accurate than contemporary Japanese accounts, refer to the Japanese country of Wa as the Queen Country and place it in close contact with China and Korea.

Jinhua (China): *see* Chin-hua.

Jining (China): *see* Chi-ning.

Jinja, town, southeastern Uganda, eastern Africa, where the Nile flows out of Lake Victoria, at 3,740 feet (1,140 m) above sea level. The second largest town in Uganda, it was founded in 1901 as a British administrative centre and became a municipality in 1957, when construction began on the Owen Falls Dam, 3 miles (5 km) downstream. The hydroelectric power thus provided was instrumental in Jinja's development as the country's main industrial centre. Industries include the first steel-rolling mill of eastern Africa, a copper smeltery, plywood and tobacco factories, and a grain-conditioning plant. Nearby are a brewery, a textile factory, and large sugar plantations. Products are transported by lake steamer, as well as by rail and road. Jinja has rail links with Kampala (50 miles [80 km] southwest) and the port of Mombasa, Kenya. Pop. (1980 prelim.) 45,060.

jinja, in the Shintō religion of Japan, the place where the spirit of a deity is enshrined or to which it is summoned. Historically, *jinja* were located in places of great natural beauty; in modern times, however, urban shrines have become common. Though they may vary from large complexes of buildings to small, obscure roadside places of prayer, they generally consist of three units: (1) the *honden* (also called *shinden*), the main sanctuary, where the spirit of the deity is enshrined, normally approached only by the priests; (2) the *heiden* (hall of offerings), or *norito-den* (hall for reciting prayers), where religious rites are performed by the priests; here are offered the prayers which "call down" the *kami* (deity, or sacred power) and subsequently send it away; and (3) the *haiden* (hall of worship),



Main building of the Inner Shrine at Ise
By courtesy of Kokusai Bunka Shinkokai, Tokyo

where the devotees worship and offer prayers. Large shrines may have additional structures, such as the *kagura-den* (stage for ceremonial dance), *shamusho* (shrine office), *temizu-ya* (ablution basin for washing hands and mouth before worshiping), and also *komainu* (statues of guardian animals) and *tōrō* (stone or bronze lanterns given as offerings). The sacred compound is demarcated by an entrance gateway, or torii.

Some of the most famous Shintō shrines, such as the Inner Shrine (Naikū) at the Ise Shrine, are rebuilt at regular intervals, retaining through each reconstruction original elements of great antiquity, such as frames, floors, or roof beams. A distinctive feature of Shintō architecture is the *chigi,* a scissors-shaped finial formed by the projecting ends of the bargeboards at the front and rear of the roof.

From the Meiji Restoration in 1868 to the end of World War II, Shintō shrines were governed by the home ministry and subsidized by government funds. Following the disestablishment of State Shintō, and the constitutional prohibition of subsidies, the shrines have depended for support on the offerings of their parishioners and other worshipers and on revenue from tourism and local services such as kindergartens. Many priests work at second jobs to maintain themselves and their families. Most of the more than 97,000 shrines in Japan belong to the Jinja Honchō (Association of Shintō Shrines); its membership includes the majority of Japan's 107,000,000 Shintō worshipers. Each shrine is managed by its own shrine committee, made up of priests and parishioners or their representatives.

Articles are alphabetized word by word, not letter by letter

Jinjī, also spelled GINGI, site of an almost inaccessible fortress constructed by the Hindu rulers of the Vijayanagar Empire (*c.* 1347–1642). It is located about 80 miles (130 km) southwest of Madras in the Indian state of Tamil Nadu.

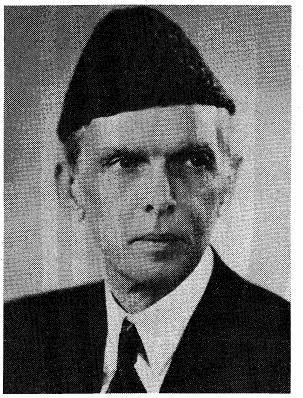
In 1638 the fortress was captured from the Maratha chief Shāhjī by the Muslims of Bijāpur. In 1677 Shāhjī's son, the famous Śivājī, recaptured the fort. From 1690 it was besieged by the Mughals, only surrendering in 1698. A large Mughal army was thus immobilized for eight years, the fortress's chief claim to fame. It was passed to the nawabs of the Carnatic under the Mughals and was captured by the French in 1750 and the British in 1761. It surrendered to Hyder (Haidar) Ali of Mysore in 1780 and thereafter played no part in history.

Jinling Bajia (artists): *see* Eight Masters of Nanking.

Jinnah, Mohammed Ali, also called QĀ'ID-E A'ẒAM (Arabic: "The Great Leader") (b. Dec. 25, 1876, Karāchi, India [now in Pakistan]—d. Sept. 11, 1948, Karāchi), Indian Muslim politician, founder and first governor-general (1947–48) of Pakistan.

Early years. Jinnah was the first of seven children of Jinnahbhai, a prosperous merchant. After being taught at home, Jinnah was sent to the Sind Madrasasah High School in 1887. Later he attended the Mission High School, where, at the age of 16, he passed the matriculation examination of the University of Bombay. On the advice of an English friend, his father decided to send him to England to acquire business experience. Jinnah, however, had made up his mind to become a barrister. In keeping with the custom of the time, his parents arranged for an early marriage for him before he left for England.

In London he joined Lincoln's Inn, one of the legal societies that prepared students for the bar. In 1895, at the age of 19, he was called to the bar. While in London Jinnah



Jinnah
By courtesy of the Pakistan Embassy, Washington, D.C.

suffered two severe bereavements—the deaths of his wife and his mother. Nevertheless, he completed his formal studies and also made a study of the British political system, frequently visiting the House of Commons. He was greatly influenced by the liberalism of William E. Gladstone, who had become prime minister for the fourth time in 1892, the year of Jinnah's arrival in London. Jinnah also took a keen interest in the affairs of India and in Indian students. When the Parsi leader Dadabhai Naoroji, a leading Indian nationalist, ran for the English Parliament, Jinnah and other Indian students worked day and night for him. Their efforts were crowned with success, and Naoroji became the first Indian to sit in the House of Commons.

When Jinnah returned to Karāchi in 1896, he found that his father's business had suffered losses and that he now had to depend on himself. He decided to start his legal practice in Bombay, but it took him years of work to establish himself as a lawyer.

It was nearly 10 years later that he turned toward active politics. A man without hobbies, his interest became divided between law and politics. Nor was he a religious zealot: he was a Muslim in a broad sense and had little to do with sects. His interest in women was also limited to Ruttenbai—the daughter of Sir Dinshaw Petit, a Bombay Parsi millionaire—whom he married over tremendous opposition from her parents and others. The marriage proved an unhappy one. It was his sister Fatima who gave him solace and company.

Entry into politics. Jinnah first entered politics by participating in the 1906 Calcutta session of the Indian National Congress, the party that called for dominion status and later for independence for India. Four years later he was elected to the Imperial Legislative Council—the beginning of a long and distinguished parliamentary career. In Bombay he came to know, among other important Congress personalities, Gopal Krishna Gokhale, the eminent Maratha leader. Greatly influenced by these nationalist politicians, Jinnah aspired during the early part of his political life to become "a Muslim Gokhale." Admiration for British political institutions and an eagerness to raise the status of India in the international community and to develop a sense of Indian nationhood among the peoples of India were the chief elements of his politics. At that time, he still looked upon Muslim interests in the context of Indian nationalism.

But, by the beginning of the 20th century, the conviction had been growing among the Muslims that their interests demanded the preservation of their separate identity rather than amalgamation in the Indian nation that would for all practical purposes be Hindu. Largely to safeguard Muslim interests, the All-India Muslim League was founded in 1906. But Jinnah remained aloof from it. Only in 1913, when authoritatively assured that the league was as devoted as the Congress to the political emancipation of India, did Jinnah join the league. When the Indian Home Rule League was formed, he became its chief organizer in Bombay and was elected president of the Bombay branch.

"Ambassador of Hindu–Muslim unity." Jinnah's endeavours to bring about the political union of Hindus and Muslims earned him the title of "the best ambassador of Hindu–Muslim unity," an epithet coined by Gokhale. It was largely through his efforts that the Congress and the Muslim League began to hold their annual sessions jointly, to facilitate mutual consultation and participation. In 1915 the two organizations held their meetings in Bombay and in 1916 in Lucknow, where the Lucknow Pact was concluded. Under the terms of the pact, the two organizations put their seal to a scheme of constitutional reform that became their joint demand vis-à-vis the British government. There was a good deal of give and take, but the Muslims obtained one important concession in the shape of separate electorates, already conceded to them by the government in 1909 but hitherto resisted by the Congress.

Meanwhile, a new force in Indian politics had appeared in the person of Mohandas K. Gandhi. Both the Home Rule League and the Indian National Congress had come under his sway. Opposed to Gandhi's Non-cooperation Movement and his essentially Hindu approach to politics, Jinnah left both the League and the Congress in 1920. For a few years he kept himself aloof from the main political movements. He continued to be a firm believer in Hindu–Muslim unity and constitutional methods for the achievement of political ends. After his withdrawal from the Congress, he used the Muslim League platform for the propagation of his views. But during the 1920s the Muslim League, and with it Jinnah, had been overshadowed by the Congress and the religiously oriented Muslim Khilāfat committee.

When the failure of the Non-cooperation Movement and the emergence of Hindu revivalist movements led to antagonism and riots between the Hindus and Muslims, the league gradually began to come into its own. Jinnah's problem during the following years was to convert the league into an enlightened political body prepared to cooperate with other organizations working for the good of India. In addition, he had to convince the Congress, as a prerequisite for political progress, of the necessity of settling the Hindu–Muslim conflict.

To bring about such a rapprochement was Jinnah's chief purpose during the late 1920s and early 1930s. He worked toward this end within the legislative assembly, at the Round Table Conferences in London (1930–32), and through his 14 points, which included proposals for a federal form of government, greater rights for minorities, one-third representation for Muslims in the central legislature, separation of the predominantly Muslim Sind region from the rest of the Bombay province, and the introduction of reforms in the North-West Frontier Province. But he failed. His failure to bring about even minor amendments in the Nehru Committee proposals (1928) over the question of separate electorates and reservation of seats for Muslims in the legislatures frustrated him. He found himself in a peculiar position at this time; many Muslims thought that he was too nationalistic in his policy and that Muslim interests were not safe in his hands, while the Indian National Congress would not even meet the moderate Muslim demands halfway. Indeed, the Muslim League was a house divided against itself. The Punjab Muslim League repudiated Jinnah's leadership and organized itself separately. In disgust, Jin-

nah decided to settle in England. From 1930 to 1935 he remained in London, devoting himself to practice before the Privy Council. But when constitutional changes were in the offing, he was persuaded to return home.

Soon preparations started for the elections under the Government of India Act of 1935. Jinnah was still thinking in terms of cooperation between the Muslim League and the Hindu Congress and with coalition governments in the provinces. But the elections of 1937 proved to be a turning point in the relations between the two organizations. The Congress obtained an absolute majority in six provinces, and the league did not do particularly well. The Congress decided not to include the league in the formation of provincial governments, and exclusive all-Congress governments were the result. Relations between Hindus and Muslims started to deteriorate, and soon Muslim discontent became boundless.

Creator of Pakistan. At this point, Jinnah emerged as the leader of a renascent Muslim nation. Events began to move fast. On Dec. 22, 1939, soon after the resignation of the provincial Congress ministries, Jinnah called upon the Muslims to observe "the Day of Deliverance." Three months later, on March 22–23, 1940, in Lahore, the league adopted a resolution to form a separate Muslim state, Pakistan. The Pakistan idea was first ridiculed and then tenaciously opposed by the Congress. But it captured the imagination of the Muslims. Pitted against Jinnah were men of the stature of Gandhi and Jawaharlal Nehru. And the British government seemed to be intent on maintaining the political unity of the Indian subcontinent. But Jinnah led his movement with such skill and tenacity that ultimately both the Congress and the British government had no option but to agree to the partitioning of India. Pakistan thus emerged as an independent state in 1947.

Jinnah became the first head of the new state. Faced with the serious problems of a young nation, he tackled Pakistan's problems with authority. He was not regarded as merely the governor-general; he was revered as the father of the nation. He worked hard until overpowered by age and disease in Karāchi, the place of his birth, in 1948. (M.Hu.)

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Consult the INDEX *first*

jinnī, plural JINN, English GENIE, in Arabic mythology, a supernatural spirit below the level of angels and devils. *Ghūl* (treacherous spirits of changing shape), *'ifrīt* (diabolic, evil spirits), and *sī'lā* (treacherous spirits of invariable form) constitute classes of *jinn.* Beings of flame or air, *jinn* are capable of assuming human or animal form and are said to dwell in all conceivable inanimate objects—stones, trees, ruins—underneath the earth, in the air, and in fire. They possess the bodily needs of human beings and can even be killed, but they are free from all physical restraints. *Jinn* delight in punishing humans for any harm done them, intentionally or unintentionally, and are said to be responsible for many diseases and all kinds of accidents; however, those human beings knowing the proper magical procedure can exploit the *jinn* to their advantage.

Belief in the existence of *jinn* was common in early Arabia, where they were thought to inspire poets and soothsayers. Even Muḥammad originally feared that his revelations might be the work of *jinn.* Their existence was further acknowledged in official Islām, which indicated that they, like human beings, would have to face eventual salvation or damnation. *Jinn,* especially through their association with magic, have always been favourite figures in North African, Egyptian, Syrian, Persian, and Turkish folklore and have become the centre of an immense popular literature, appearing notably in *The Thousand and One Nights.* In India and Indonesia they have entered local Muslim imaginations by way of the Qur'ānic descriptions and Arabic literature. *See also* ghoul; 'ifrīt.

Jinotega, city, north-central Nicaragua. It is situated in the central highlands just south of Lake Apanás. The surrounding area is rugged, but its fertile soils produce coffee, tobacco, corn (maize), beans, potatoes, other vegetables, fruits, and wheat. Jinotega's industrial activities include flour milling, tanning, coffee processing, and the manufacturing of hats and mats. The city is linked by road with the Matagalpa highway, giving it access to the Pan-American Highway. Pop. (1985 est.) 18,488.

Jinotepe, city, southwestern Nicaragua. It is situated in the Diriamba Highlands at an elevation of 1,867 feet (569 m) above sea level. Given city status in 1883, it was a scene of heavy fighting in 1979 between Sandinista guerrillas and government troops. Jinotepe is a major commercial and manufacturing centre. The hinterland is known primarily for its coffee, but rice, sugarcane, and sesame also are grown. Livestock raising is widespread, and there is some lumbering. Limestone quarries and saltworks are located in the vicinity. Jinotepe lies along the Pan-American Highway south of Managua, the national capital, and on a branch of the Pacific Railway. The city's colonial church has a reliquary of precious metals and gems, and an annual festival honours the patron saint, St. James the Great. Pop. (1985 est.) 23,538.

jinrikisha (vehicle): *see* ricksha.

Jinsha Jiang (China): *see* Chin-sha River.

Jinshi (China): *see* Chin-shih.

Jinshin-no-ran (Japanese: "War of the Year of the Monkey"), English CIVIL WAR OF AD 672, in Japanese history, war of imperial succession that brought an emperor with a secure military base to the Japanese throne for the first time in history. The war strengthened the power of the imperial family at the expense of powerful associated clans, such as the Nakatomi and Soga.

The conflict erupted following the death of the emperor Tenji in AD 672, when Prince Ōtomo was elevated to the throne as the emperor Kōbun through the efforts of the aristocratic clans that had resisted Tenji's centralization measures. Prince Ōama, son of the deceased emperor, gathered together his own military forces and defeated Ōtomo at his capital in Ōmi province (modern Shiga prefecture). Ōama then succeeded to the throne as the emperor Temmu, making his new capital at Asuka in Yamato province (modern Nara prefecture), which was removed from the influence of the Nakatomi and Soga clans.

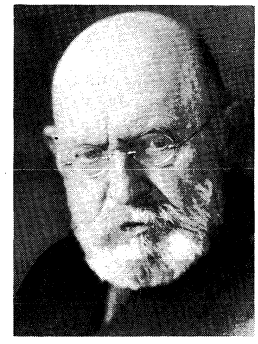
Jinxian (China): *see* Chin-hsien.

Jinzhou (China): *see* Chin-chou.

Jirajara, also called JIRARA, Indians of northwestern Venezuela who were extinct by the mid-17th century. The little known about them suggests that they were very similar culturally to the Caquetío (*q.v.*).

Jirásek, Alois (b. Aug. 23, 1851, Hronov, Bohemia, Austrian Empire [now in Czechoslovakia]—d. March 12, 1930, Prague), the most important Czech novelist in the period before World War I, as well as a great national figure.

Jirásek was a secondary-school teacher until his retirement in 1909. He wrote a series of historical novels imbued with faith in his nation and in progress toward freedom and justice. He was particularly attracted by the Hussite period of Bohemian history (15th century), to which he devoted his most famous work, the trilogy *Mezi proudy* (1891; "Between the Currents"), *Proti všem* (1894; "Against All the World"), and *Bratrstvo* (1899–1908; "Brotherhood"). Perhaps of greater artistic significance is his portrayal of the 19th-century Czech national revival in *F.L. Věk* (1888–1906),



Jirásek
Telepress, Prague

and his best work is probably his last major novel, *Temno* (1915; "Darkness"), in which he painted a vivid picture of Bohemia in the grip of the Counter-Reformation. Jirásek's novels are founded upon careful historical reading, and his rich and detailed descriptive passages contribute to his work a colour and individuality that offset the conventionality of the characterizations.

During World War I Jirásek publicly expressed the desire for national independence, notably when he read out the "national oath" at a demonstration in Prague on April 13, 1918. His literary output also included plays and short stories.

Jirgalanta (Mongolia): *see* Hovd.

Jiří (Czech personal name): *see under* George.

Jirjā, also spelled GIRGA, town, Sawhāj *muḥāfaẓah* (governorate), Upper Egypt. It is situated on the west bank beside the Nile, which encroached considerably on the town in the 18th and 19th centuries. In pharaonic times it was probably the town of This (Tny), ancestral home of the 1st dynasty (*c.* 2925–*c.* 2775 BC), which unified Egypt. Its present name derives from the ancient Coptic monastery of Mar Girgis, dedicated to St. George. In the 14th century AD it became a centre of the Hawwārah, an Arabized Berber tribe; in about 1576 they were conquered by the Ottoman governor of Egypt, who then made Jirjā the seat of the governor of Upper Egypt. During the reign of Muḥammad 'Alī (1805–48), it was absorbed into a larger territorial unit. In 1859 Sawhāj replaced Jirjā as the provincial capital.

Possessing several fine mosques and known for its quality pottery, Jirjā also has cotton weaving, sugar refining, and dairying industries. The sugar refinery was enlarged in the early 1980s to a capacity of 75,000 tons per year. The valley on the west bank produces cotton, cereals, dates, and sugarcane. With a considerable Coptic minority, it is the seat of a Coptic bishop. A Roman Catholic monastery outside the town is reputedly the second oldest in Egypt. About 10 mi (16 km) south are the ruins of ancient Abydos. Across the river on the narrow east bank, the tombs of the nobles of ancient This line the limestone cliff face. Pop. (1983 est.) 61,300.

Jirobei (artist): *see* Suzuki Harunobu.

jitō, in feudal Japan, land steward appointed by the central military government, or shogunate, whose duties involved levying taxes and maintaining peace within the manor. First appointed at the beginning of the 12th century, the *jitō* enforced the edicts of the shogunate and ensured that taxes were correctly apportioned and collected. In return for his services, the *jitō*'s position was made hereditary, and he received a share of the produce of the estate. He also served as the local judge and was entitled to levy a special "commissariat-rice" (*hyōrō-mai*) tax for his own use.

In any emergency the *jitō* were expected to provide military service to the shogun, or hereditary military dictator of Japan. It was from the *jitō* that the military governors of a province were appointed. By the 14th century the power of these military governors, or *shugo*, had increased tremendously, while the lower levels of the *jitō* merged with the regular landowning class.

jitterbug, exuberant teenage dance popular in the 1930s and 1940s, originating in the United States and spread internationally by U.S. armed forces during World War II. Its original freewheeling acrobatic swings and lifts were modified for more conservative ballroom versions. Couples did most versions while holding one or both hands. Step patterns varied widely and included such dances as the lindy hop (*c.* 1927, named for Charles Lindbergh's transatlantic flight), in which dancers usually did two slow "dig" steps (ball of the foot, then the heel) and two quicksteps (one foot back, one in place), and the jive, in which dancers took a step to each side and then executed two "shuffles" (side step, almost close other foot, side step). Jitterbug music—also called jive or jump—is in $\frac{4}{4}$ time with syncopated rhythm.



Jitterbug
By courtesy of the Arthur Murray Franchised Dance Studios

Jiu Defile, also called JIU PASS (Romania): *see* Surduc Pass.

Jiu River, river formed south of Petroşani, southwestern Romania, with the joining of two headstreams rising in the Vîlcan and Parîng mountains. It then flows south, cutting a wild, deep gorge, the Surduc Pass in the Transylvanian Alps (Southern Carpathians), before flowing onto the Danube Plain and into the Danube. The length of the river is about 205 mi (330 km). The upper Jiu Basin forms the Petroşani Depression and coalfield.

Jiu-Zhuji (Taoist monk and traveller): *see* Ch'ang-ch'un.

Jiujiang (China): *see* Chiu-chiang.

Jiuling Shan (China): *see* Chiu-ling Mountains.

Jiulong Jiang (China): *see* Chiu-lung River.

Jiuquan (China): *see* Chiu-ch'üan.

jīva, according to the Jaina philosophy of India, "living substance" or "souls," as opposed to *ajīva,* or "nonliving substance." Souls are eternal and infinite in number and are not the same as the bodies that they inhabit. In a pure state (*mukta-jīva*), souls rise to the top of the universe, where they reside with other perfected beings and are never again reborn. Most souls are, however, *saṃsārin,* that is, covered with a thin veil of good or bad *karman* (the effects of past deeds), which is conceived as a kind of matter, accumulated by the emotions in the same way that oil accumulates dust particles.

*Jīva*s are divided according to the number of sense organs they possess. Men, gods, and demons possess the five sense organs plus reason. Even the four elements (earth, air, water, fire) are inhabited by minute clusters of invisible souls, called *nigoda*s. They belong to the lowest class of *jīva,* possess only the sense of touch, share common functions such as respiration and nutrition, and experience intense pain. The whole space of the world is said to be packed with *nigoda*s. They are the source of souls to take the place of the infinitesimally small number that have until now been able to attain *mokṣa,* or release from the cycle of rebirths.

Jívaro, South American Indian people living in the Montaña (the eastern slopes of the Andes), in Ecuador and Peru north of the Marañón River. They speak a language of the Jebero-Jivaroan group. An aboriginal population was once about 30,000 but now numbers less than 20,000.

The Jívaro have a tropical forest agriculture (*see* South American Tropical Forest Cultures). They grow cassava, corn (maize), sweet potatoes, and other crops supplemented by the gathering of wild fruits, fishing, and hunting. The blowgun and poisoned darts are their chief weapons. Related families live in a single large community house rather than in a village.

Like other peoples of the Montaña, the Jívaro are warlike. Although influenced by Jesuit missionary efforts, they remain proud of the fact that they were never really conquered. The Jívaro are known for their technique of shrinking human heads to the size of an orange. These shrunken heads (*tsantsa*s) are prepared by removing the skin and boiling it; hot stones and sand are then put inside the skin to shrink it further. Headhunting was motivated by a desire for revenge and by the belief that a head gave the taker supernatural power.

Jixi (China): *see* Chi-hsi.

Jiyangze (Tibet): *see* Chiang-tzu.

Jiyū-Minshutō (Japan): *see* Liberal-Democratic Party.

Jīzah, al-, *muḥāfaẓah* (governorate) of Upper Egypt, on the west bank of the Nile, extending toward the southwest into the Western (Libyan) Desert as far as al-Wādī al-Jadīd governorate. It is bordered on the north by al-Minūfīyah governorate and on the south by Banī Suwayf and al-Fayyūm governorates. It includes al-Baḥrīyah and part of al-Farāfirah oases.

The settled portion of the governorate in the Nile Valley is about 409 sq mi (1,059 sq km). Aside from the capital, al-Jīzah (*see* Jīzah, al-), most of this portion is agricultural. Crops include corn (maize), cotton, wheat, millet, berseem (clover), and market vegetables grown for use in Cairo. The area produces dates, and there is a date-packing factory at al-Badrashayn, near the west bank of the Nile. Al-Jīzah is the largest industrial centre. Mineral resources include iron ore and coal found at al-Baḥrīyah oasis. A railway transports the ore to the steel plant at Ḥulwān, in Cairo governorate.

Historical sites in the governorate include the al-Jīzah pyramids and sphinx of the 4th dynasty (*c.* 2613–2494 BC), and the ruins of Memphis, the ancient capital of Egypt, and its cemetery, Ṣaqqārah, just to the west. The governorate has an airport at Imbābah, north of al-Jīzah, near Cairo. It is served by the Cairo–Aswān railway, which has a station in al-Jīzah, and also by highway. The population includes a small number of oasis and desert dwellers. Pop. (1983 est.) 2,965,000.

Jīzah, al-, also spelled GIZA, GIZAH, or EL-GIZA, city, capital of al-Jīzah *muḥāfaẓah* (governorate) of Upper Egypt, located on the west bank of the Nile just south-southwest of Cairo. It is a suburb of the national capital with a distinctive character enriched by several archaeological and cultural sites.

The district was settled in prehistoric times; Neolithic objects have been found there. Southwest of the city are the three great pyramids of the pharaohs: Khufu (Cheops), Khafre (Chephren), and Menkaure (Mykerinos), all 4th dynasty: *c.* 2613–*c.* 2494 BC. Because of their tremendous size and precise construction, they have been visited by travellers for millennia (*see* Giza, Pyramids of). Other monuments include the Sphinx, smaller pyramids, tombs, and temples. In earliest Muslim times al-Jīzah formed a defense line with the island of Roda (al-Jazira; now Jazīrat ar-Rawḍah) and, later, Cairo, against incursions up the river from the sea. In AD 643 its defenses were completed by ʿAmr ibn-al-ʿĀṣ, general of the caliph ʿUmar ibn al-Khaṭṭāb; they were restorations of earlier Byzantine fortifications. In the time of Caliph al-Ma'mūn (ruled 813–833), al-Jīzah was linked to Cairo by a bridge of boats and then by successive permanent bridges. Later, a chief mosque was added (961) and al-Jīzah became the chief town of a *kūrah* (district) and later of its province. The six present bridges link both banks with Jazīrat ar-Rawḍah and Jazīrat az-Zamālik.

The city has modern housing, government offices, embassies, research institutes, hotels, parks, a zoo, and a well-known entertainment district. The University of Cairo, founded in 1908, was reestablished in al-Jīzah in 1924. The city also has an ophthalmic research institute, the Academy of the Arabic Language, the Higher School of Applied Arts, and offices of the Ministry of Agriculture. Most of Egypt's motion-picture industry is also concentrated there. Other industries produce cement, iron products, wood products, automobile parts, cotton and polyester textiles, footwear, and beer. The Cairo–Aswān railway has a station in the city. Pop. (1983 est.) 1,509,600.

Jīzān, also called QIZĀN, formerly AT-TIHAMEH, town, port, and *minṭaqah* (province), Asir region, southwestern Saudi Arabia, on the Red Sea opposite the Farasān Islands. It is bounded by the *manāṭiq* (provinces) of Makkah and Asir on the north, and is bordered by Yemen (Ṣanʿā') on the south. Jīzān is fronted by the Red Sea on the west. The province is comprised of the Tihāmat Asīr

plain (west) and the Asir plateau (east). Defined by the 1934 Treaty of aṭ-Ṭā'if as belonging to Saudi Arabia, the town has been claimed by Yemen (Ṣan'ā') since the Yemeni civil war of the 1960s. Jīzān is the principal town of the Tihāmah coastal plain and the exporting and shipping centre of Asir region.

The *minṭaqah* is well cultivated because of irrigation projects undertaken by the government, and has become one of the main agricultural regions of Saudi Arabia. Crops include wheat, rice, barley, millet, and sorghum. Exports include grain sorghum, sesame, dried fish, dates, and salt; other economic activities are fishing, shipbuilding, and salt mining. Ṣabyā and Abū 'Arīsh were old capitals of the region. The local architecture displays Ottoman and Yemeni influences. Roads link the port to its fertile hinterland, and an airport provides connections to other parts of Saudi Arabia. Pop. (1974) town, 32,812; *minṭaqah*, 403,000.

Jizang (Buddhist philosopher): *see* Chi-tsang.

Jizera Mountains, Czech JIZERSKÉ HORY, German ISERGEBIRGE, part of the Sudeten mountain ranges in northern Bohemia, Czechoslovakia, extending into Poland. It comprises a small group of peaks, though it has the highest point in Czechoslovakia, at Jizera (3,681 ft [1,122 m]); Wysoka Kopa in Poland is slightly higher (3,698 ft [1,127 m]). The Jizera Mountains group is separated from the Lužice Mountains (Lužické hory) by the Neisse (Nisa) River. Liberec lies in this valley, and its northern suburbs extend up the Jizera slopes. The mountains are a major source of granite for building.

Jizera River, German ISER, tributary of the Elbe (Labe) River in northwestern Czechoslovakia. It rises at the southern base of Smrk Mountain on the Polish border, in the Giant Mountains, and flows generally south past Turnov and Mladá Boleslav. It reaches the Elbe northeast of Prague after a course of 106 mi (171 km).

Jižní Čechy (Czechoslovakia): *see* Jihočeský kraj.

Jižní Morava (Czechoslovakia): *see* Jihomoravský kraj.

jizyah, also spelled JIZYA, head or poll tax that early Islāmic rulers demanded from their non-Muslim subjects.

Islāmic law made a distinction between two categories of non-Muslim subjects—pagans and *dhimmīs* ("protected peoples," or Peoples of the Book; *i.e.,* those peoples who based their religious beliefs on sacred texts, such as Christians, Jews, and Zoroastrians). The Muslim rulers tolerated the *dhimmīs* and allowed them to practice their religion. In return for protection, and as a mark of their submission, the *dhimmīs* were required to pay a special poll tax known as the *jizyah.* The rate of taxation and methods of collection varied greatly from province to province, and were greatly influenced by local pre-Islāmic customs. In theory the tax money was to be used for charitable purposes and the payment of salaries and pensions. In practice, however, the revenues derived from the *jizyah* were deposited in the private treasuries of the rulers. The Ottomans usually used the proceeds of the *jizyah* to pay their military expenses.

A convert to Islām, in theory, was no longer required to pay the *jizyah.* The Umayyad caliphs (661–750), however, faced with increasing financial difficulties, demanded the *jizyah* from recent converts to Islām as well as from the *dhimmīs.* This discrimination against converts was a cause of the Abū Muslim rebellion (747) in Khorāsān and precipitated the downfall of the Umayyads.

jñāna (Sanskrit: "knowledge"), in Hindu philosophy, knowledge that is a total experience of its object, particularly the supreme being or reality, as contrasted with *vijñāna,* "knowing one thing from another, practical knowledge." The nature of *jñāna* depends importantly on that of its object, but all schools of Hindu philosophy agree that the total cognitive experience of the supreme object sets the soul free from the transmigratory life and the polarities this imposes upon thought. Its opposite, *ajñāna* (also called *avidyā*), therefore becomes important, because it is the false apprehension of reality that keeps the soul from attaining release. While literally meaning "ignorance," *ajñāna* conveys more the sense of mistaken knowledge, which has a large measure of validity as far as the realities of the present world are concerned but conceals the truth of a reality outside it.

jñāna-mārga (Hinduism): *see* mārga.

Jñānadeva, also called JÑĀNEŚVARA (b. 1275, Alandi, Yādavas, India—d. 1296, Alandi), foremost of the Indian Mahārāshtrian mystical poets, author of the highly acclaimed *Jñāneśvarī,* a commentary in Marathi verse on the *Bhagavadgītā* ("The Lord's Song").

Jñānadeva was a founder of the devotional school of mysticism known as Vārakarī (Pilgrim), so called because of the emphasis it places on pilgrimages to the shrine of Viṭthala (or Viṭhobā, a local manifestation of the Hindu god Vishnu [Viṣṇu]) at Pandharpur. His celebrated commentary, the *Jñāneśvarī,* was written *c.* 1290. He also wrote the *Amṛtānubhava,* a work on Upaniṣadic philosophy, and a number of devotional hymns.

There is a tradition—not fully accepted by scholars—that Jñānadeva and his two brothers, Nivṛttinātha and Sopānadeva, and his sister, Muktābāī, were excommunicated by their Brahmin caste fellows and persecuted because they were the children of a *sannyāsin,* or ascetic (their father, who had renounced the world without the consent of his wife, was asked by his guru to return to the life of a householder). All four children were highly respected as saints and poets, and all four voluntarily ended their lives when they were in their early 20s, believing their work was completed.

JNR: *see* Japanese National Railways.

Jo-erh-kai Marsh, Pinyin ZOIGÊ ZHAOZE, large marsh lying mostly in the A-pa Tibetan Autonomous Prefecture (*tzu-chih-chou*), Szechwan Province (*sheng*), on the Tsinghai–Tibet plateau and extending across the border of north central Szechwan into southeastern Tsinghai Province, China. It comprises 1,000 sq mi (2,600 sq km) of the southwestern part of the Tibetan Highlands at an altitude of 11,800 ft (3,600 m) above sea level. The marsh, formed by abundant rain and snow, is in a region of restricted drainage with a long frost period (fewer than 20 frost-free days annually). It is bordered on the northeast by the Min Shan (mountains) and on the west by the A-ni-ma-ch'ing Shan; the Huang Ho (river) runs through the western part of the marsh from south to north. Beneath its uneven surface lies a layer of peat generally 7–10 ft thick but increasing to as much as 20–23 ft deep in some places. Crossed by the Chinese Communists during the Long March (1934–35), the marsh was then a wilderness area. In the 1970s ditches were dug, parts of the marsh drained, and cattle, sheep, and horses pastured on the reclaimed grasslands.

Joab (fl. 1000 BC), in the Old Testament (II Sam.), a military commander under King David, his mother's brother. He led the commando party that captured Jerusalem for David and as a reward was appointed commander in chief of the army. He played a leading part in many of David's victories and led the loyal force that crushed the rebellion of David's son Absalom. Believing he knew David's interests better than David himself did, he killed Absalom, although David had commanded that his life be saved. Joab showed his characteristic ruthlessness in the treacherous murder of two of his potential rivals, Abner and Amasa. During David's last days Joab supported the abortive bid for the throne by David's son Adonijah and was executed by the successful Solomon.

Joachim, SAINT: *see* Anne and Joachim, Saints.

Joachim OF FIORE, Fiore also spelled FLORIS, Italian GIOACCHINO DA FIORE (b. *c.* 1130/35, Celico, Kingdom of the Two Sicilies—d. 1201/02, Fiore), Italian mystic, theologian, biblical commentator, philosopher of history, and founder of the monastic order of San Giovanni in Fiore. He developed a philosophy of history, according to which history develops in three ages of increasing spirituality: the ages of the Father, the Son, and the Holy Spirit.

The known facts about the life of Joachim of Fiore are few. Legends about his parentage and youth are of little historical significance, but from an autobiographical reference it seems certain that he went on a pilgrimage to the Holy Land that reputedly had an effect on his conversion to the religious life. He became a Cistercian monk at Sambucina and in 1177 abbot of Corazzo (Sicily). About 1191 he broke away from the distracting duties of administration and retired into the mountains to follow the contemplative life. Although claimed as a fugitive by the Cistercians, he was allowed by Pope Celestine III to form the disciples who gathered around him at San Giovanni in Fiore (a town in present-day Cosenza province in Calabria) into the Order of San Giovanni in Fiore in 1196. He died in 1201/02.

Far more significant is the evidence for the inner development of a man who came to believe that spiritual understanding would be given to one who wrestled with the "letter" of the Scriptures to get at the "spirit." Three moments of special illumination are indicated, but the first is only known in legendary form, connected with either his pilgrimage or his novitiate at Sambucina. The second, recorded by himself, took place one Easter eve, after a period of frustrated study of the biblical book of Revelation when he felt himself "imprisoned" by difficulties. In the midnight silence, suddenly his mind was flooded with clarity and his understanding released from prison. The third was an experience at Pentecost, when, after a time of agonizing doubt on the doctrine of the Trinity, Joachim had a vision of a psaltery with 10 strings, in a triangular form, that clarified the mystery through a visual symbol and called forth paeans of praise from him. He expresses this experience of illumination given after mental striving in terms of the city seen intermittently by the approaching pilgrim or of the spirit breaking through the hard rind of the letter.

He was summoned by Pope Lucius III in 1184 and urged to press on with the biblical exegesis he had begun. This probably refers to the *Liber concordie Novi ac Veteris Testamenti* ("Book of Harmony of the New and Old Testaments"), in which Joachim worked out his philosophy of history, primarily in a pattern of "twos"—the concords between the two great dispensations (or Testaments) of history, the Old and the New. But already Joachim's spiritual experience was creating in his mind his truly original "pattern of threes." If the *spiritualis intellectus* springs from the letter of the Old and New Testaments, then history itself must culminate in a final age of the spirit that proceeds from both the previous ages. Thus was born his trinitarian philosophy of history in which the three Persons are, as it were, built into the time structure in the three

ages or *status* of the Father, Son, and Holy Spirit.

The third *status* was to be won by the church only after arduous pilgrimage and great tribulation, like the Israelites marching through the wilderness and crossing the Jordan River into the Promised Land. As guides through this crucial stage, Joachim prophesied the advent of two new orders of spiritual men, one of hermits to agonize for the world on the mountaintop and one a mediating order to lead men on to the new spiritual plane. Although the third age belongs par excellence to contemplatives, secular clergy and laymen are not shut out of it. In a strange diagram, a "ground plan" of the New Jerusalem, various categories of monks are grouped around the seat of God, but below, secular clergy and tertiaries (lay members) live according to their rule.

In the *Expositio in Apocalypsim* ("Exposition of the Apocalypse"), Joachim seeks to probe the imminent crisis of evil, as pictured in the apocalyptic symbols of Antichrist, and the life of the spirit to follow. His third main work, the *Psalterium decem chordarum* ("Psaltery of Ten Strings"), expounds his doctrine of the Trinity through the symbol of his vision of the 10-stringed psaltery. Here and in a lost tract he attacked the doctrine of "quaternity" (an overemphasis on the "one essence" of the Godhead that seems to separate it from the three Persons of the Trinity and so create a fourth), which he attributed to Peter Lombard, a 12th-century theologian. Besides this trilogy, written concurrently, Joachim left minor tracts and one uncompleted major work, the *Tractatus super quattuor Evangelia* ("Treatise on the Four Gospels").

Joachim was a poet and artist. His lyricism breaks through the biblical exegesis that he chose as his medium and the turgid Latin of his style. Above all, his visual imagination is expressed in the unique *Liber figurarum* ("Book of Figures"; discovered in 1937), a book of drawings and figures thought to be a genuine work by most Joachim scholars today. Here his vision of the culminating age of history is embodied in trees that flower and bear fruit luxuriantly at the top; his doctrine of the Trinity is expressed in remarkable geometric figures; his kaleidoscopic vision fuses images in some strange shapes, such as the tree that becomes an eagle, which may have influenced Dante. Joachim's figures probably carried his ideas in exciting and popular form far more widely than his indigestible writings.

In his lifetime Joachim was acclaimed as a prophet, gifted with divine illumination, and this is how he was seen by the first chroniclers after his death. The condemnation of his tract against Peter Lombard by the fourth Lateran Council in 1215 dimmed his reputation for a time, but the appearance of the Franciscan and Dominican mendicant orders, hailed as Joachim's new spiritual men, reestablished him as a prophet. The Spiritual Franciscans at mid-13th century and various other friars, monks, and sects down to the 16th century appropriated his prophecy of a third age. But Joachim has always had a double reputation, as saint and as heretic, for cautious Christian thinkers and leaders have seen his writings as highly dangerous. The debate as to whether he was orthodox or heretic continues today.

(M.E.R.)

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Joachim, Joseph (b. June 28, 1831, Kittsee, near Pressburg, Austria-Hungary—d. Aug. 15, 1907, Berlin), Hungarian violinist known for his masterful technique and his interpretations of works of Bach, Mozart, and Beethoven.

Joachim first studied at Budapest, and at age seven he appeared with his teacher S. Serwaczyński. In 1844 he visited London, where he was sponsored by Mendelssohn and achieved an outstanding success. In 1849 he led the



Joseph Joachim
F. Bruckmann Verlag Bildarchiv

orchestra at Weimar, and in 1853, the orchestra at Hannover. In 1868 he became director of the Hochschule für Ausübende Tonkunst (Berlin), where he acquired a reputation as a fine teacher, attracting pupils from all of Europe. In 1869 he founded the Joachim Quartet, which became renowned for its performances of the late string quartets of Beethoven.

In his playing, Joachim subordinated technical virtuosity to aesthetic values, and he thus brought about a reform in program making that turned away from the spectacular. His close friend Johannes Brahms consulted with him on his violin concerto and dedicated it to him, and Schumann's *Phantasy for Violin and Orchestra* was written for him. Joachim's own compositions, influenced by Brahms and Schumann, comprise chiefly works for the violin, notably the *Hungarian Concerto in D Minor.*

Joachim I Nestor (b. Feb. 24, 1484—d. July 11, 1535, Kölln an der Spree, Brandenburg), elector of Brandenburg, an opponent of the Habsburg emperors, yet a devout Roman Catholic who prevented the spread of Protestantism in his lands during his lifetime.

Joachim at first supported Francis I of France at the imperial election of 1519 and at one point even hoped to attain the title himself, but he finally backed Charles I of Spain, who became Charles V. Relations between the Emperor and the Elector were never cordial, however, for Joachim remained a French sympathizer. In domestic affairs, he reformed the legal code and settled his warlike nobles by granting them lands and positions. Interested in humanistic studies, he founded a university at Frankfurt an der Oder in 1506. Joachim remained an implacable enemy of the Reformation and even forced his sons, who sympathized with the reformers, to pledge that



Joachim I, detail from an oil painting by Lucas Cranach the Elder, 1529; in Monbijou Palace, Berlin
Foto Marburg—Art Resource/EB Inc.

Brandenburg would remain Catholic after his death. In his will, he divided Brandenburg between his two sons.

Joachim II Hektor (b. Jan. 13, 1505, Kölln an der Spree, Brandenburg—d. Jan. 3, 1571, Jagdschloss Köpenick, Brandenburg), elector of Brandenburg who, while supporting the Holy Roman emperor, tolerated the Reformation in his lands and resisted imperial efforts at re-Catholicization.

The elder son of Joachim I, Joachim II was given the Old (Altmark) and Middle Marks of Brandenburg on his father's death in 1535. Although he remained a Catholic, he sympathized with the Reformation and tolerated Protestantism in his lands from 1539 on. His religious liberalism was rewarded when the Brandenburg estates twice paid his considerable debts. In the disputes between the Emperor and Germany's Protestant princes, Joachim tried to reconcile the two parties. He sided with Charles V during the wars against the Schmalkaldic League of Protestant princes. After the Protestant defeat at the Battle of Mühlberg (1547), he persuaded Philip the Magnanimous, landgrave of Hesse, to surrender and was instrumental in securing a pardon for John Frederick I the Magnanimous of Saxony, who had been condemned to death. Joachim supported the Augsburg Interim (1548) and played a major role at the negotiations leading to the Peace of Augsburg



Joachim II, detail from an oil painting by Lucas Cranach the Younger, *c.* 1570; in Monbijou Palace, Berlin
Foto Marburg—Art Resource/EB Inc.

(1555), which reestablished peace in Germany between the warring religious factions. Finally, in 1569, two years before his death, he received the duchy of Prussia as a fief from King Sigismund II Augustus of Poland.

Joachim Frederick, German JOACHIM FRIEDRICH (b. Jan. 1, 1546, Kölln an der Spree, Brandenburg—d. July 28, 1608, on road between Storkow and Rüdersdorf), elector of Brandenburg (1598–1608), eldest son of Elector John George.

Joachim established the rule of primogeniture for the Hohenzollern electorate by a family agreement known as the Gera Bond (1598), which confirmed the practice begun by Albert III Achilles whereby Brandenburg formed the inheritance of the elector's eldest son. By the death of George Frederick of Prussia, Joachim became regent of the duchy of Prussia, ruled nominally by the mentally retarded Albert Frederick, but he had some difficulty in asserting his position (the position being established more firmly by his son and heir John Sigismund, who eventually became duke of Prussia). In Brandenburg he made concessions to the nobles at the expense of the peasantry and admitted the right of the estates to control taxation.

Joachin (king of Judah): *see* Jehoiachin.

Joad, C(yril) E(dwin) M(itchinson) (b. Aug. 12, 1891, Durham, Durham County, Eng.—d. April 9, 1953, London), Irish-born philosopher, author, teacher, and radio personality; one of Britain's most colourful and controversial intellectual figures of the 1940s. A pacifist and an agnostic until the last years of his life, a champion of unpopular causes and a writer of popular philosophical works, he became widely known to the British public as an agile participant in the BBC "Brains Trust" program from 1941 to 1947.

As a student at Balliol College, Oxford, Joad formed the pacifist and socialist views that led to his conscientious objection during World War I and to his vigorous promotion of pacifism early in World War II. After 16 years in the Civil Service, he retired in 1930 to become head of the department of philosophy and psychology at Birkbeck College, University of London.

A staunch rationalist, cast in the mold of Wells and Shaw, he had no particular philosophical originality; but in some 40 books he set forth the ideas of others with great clarity, in addition to his own prickly opinions. Among his works are: *Guide to Philosophy* (1936) and *Guide to the Philosophy of Morals and Politics* (1938). In his last work, *Recovery of Belief* (1952), he outlined his new-found faith in a theistic system.

Joakim (king of Judah): *see* Jehoiakim.

Joan, name of rulers grouped below by country and indicated by the symbol •.

Foreign-language equivalents:
French ..... Jeanne
Italian ..... Giovanna
Spanish ..... Juana

NAPLES

• **Joan I,** Joan also spelled JOANNA (b. 1326—d. May 22, 1382, Lucania, Kingdom of Naples), countess of Provence and queen of Naples (1343–82) who defended her claim as well as that of the House of Anjou to the throne of Naples, only to lose it to Charles of Durazzo (Charles III of Naples). Beautiful and intelligent, she was also a patron of the poets and scholars of her time.

Joan I succeeded her grandfather, King Robert, in 1343, after her marriage to her cousin Andrew, brother of Louis I of Hungary (1342–82); her accession was intended to reconcile the Hungarian and Angevin claims on Naples. The swarm of Hungarians who



Joan I praying, detail of a miniature from the *Golden Book, c.* 1350; in the Austrian National Library, Vienna

By courtesy of the Bild-Archiv, Osterreichische Nationalbibliothek, Vienna

followed Andrew to Naples, however, antagonized many of the Angevins at court, including Joan herself. Consequently, when Andrew was assassinated (Sept. 18, 1345), Joan was accused of having been privy to the crime.

Joan married Louis of Taranto in 1347 but fled to Avignon when Louis I invaded Naples in 1348, seeking to avenge Andrew's assassination. During her exile, she sold Avignon to the papacy on condition that she be declared innocent of the assassination. She was able to return to Naples permanently in 1352, thanks to the intervention of Pope Innocent VI.

After Louis of Taranto's death (1362), Joan married James III, king of Majorca, who, whether fearing for his life or attempting to recover his own kingdom, was almost continuously absent from Naples until his death in 1375. Meanwhile, Joan had consolidated her rule somewhat and had recognized Frederick III as king of Sicily, thereby ending an ancient Sicilian dispute between the Angevins and the Aragonese.

In 1376 Joan married the military adventurer Otto of Brunswick and later recognized as her heir to the throne Louis, duc d'Anjou, brother of the French king Charles V. In 1378 she also recognized the antipope Clement VII. Charles of Durazzo, whom Joan had previously recognized as her heir, secured the aid of Pope Urban VI, who crowned him king of Naples in Rome (1381). Charles captured Naples in June, declaring himself king. He imprisoned Joan in the castle of Muro, where he had her suffocated.

• **Joan II,** Joan also spelled JOANNA (b. 1371, Naples—d. Feb. 2, 1435, Naples), queen of Naples whose long reign (1414–35) was marked by a succession of love affairs, by continual intrigues, and by power struggles over her domain between the French House of Anjou and that of Aragon, in Spain.

After her first husband, William of Austria, died in 1406, Joan is reported to have led a promiscuous life. When her brother Ladislas died in 1414, she became queen and appointed her lover Pandolfello Alopo grand chamberlain. Alopo temporarily removed from power the condottiere Muzio Attendolo Sforza, an important figure in the previous regime. On July 14, 1415, Joan married Jacques de Bourbon, comte de la Marche, who, confident of his power, soon had Alopo executed (1415), usurped the Queen's power, and demanded the death of a Neapolitan baron who led the opposition to the increasing French influence in Naples. The barons, who had arranged the marriage in the first place, rebelled, forcing Jacques to leave Naples.

Joan appointed her next lover, Giovanni Caracciolo (called Sergianni), as grand seneschal; he made peace with Sforza and appointed him grand constable. Nevertheless, Sforza supported Louis III of Anjou's claim to the Neapolitan throne. Joan thereupon called on Alfonso V the Magnanimous of Aragon for aid, adopting him as her heir. Alfonso arrived in Naples in July 1421, and began to intervene in Neapolitan affairs. When Joan and Caracciolo invited Sforza back to Naples, Alfonso arrested Caracciolo and besieged Joan in Castel Capuano (1423). After Sforza rescued her, she renounced her adoption of Alfonso and recognized Louis as heir. Alfonso was soon forced out of Naples.

The increasingly powerful Caracciolo tried to isolate the Queen and made new overtures to Alfonso. He was assassinated, however, by plotting nobles (August 1432). Joan later disinherited Louis and readopted Alfonso (April 1433) and then readopted Louis in June. When Louis died (Nov. 14, 1434), she recognized as her heir his son René of Anjou, whom Alfonso drove from Naples a few years after Joan's death.

NAVARRE

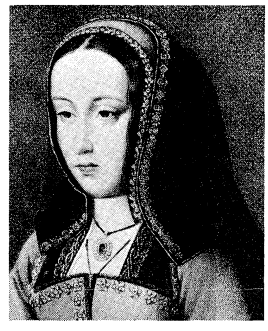
• **Joan I,** byname JOAN OF NAVARRE, French JEANNE DE NAVARRE (b. Jan. 14, 1273, Bar-sur-Seine, Fr.—d. April 2, 1305, Vincennes), queen consort of France (from 1285) and queen of Navarre (as Joan I, from 1274), mother of three French kings—Louis X, Philip V, and Charles IV.

Joan was the sole daughter and heir of Henry I, king of Navarre, her brother Theobald (Thibaut) having died at an early age. She married (Aug. 16, 1284) the future Philip IV the Fair of France, thus bringing to the French crown her rights to Navarre and the countships of Champagne and Brie. On her death in childbirth in 1305 these rights were transmitted to her son, the future Louis X. Joan was a woman of great intelligence and vivacity, a lover of arts and letters who founded the famous college of Navarre.

SPAIN: ARAGON/CASTILE

• **Joan,** byname JOAN THE MAD, Spanish JUANA LA LOCA (b. Nov. 6, 1479, Toledo, Castile—d. April 11, 1555, Tordesillas, Spain), queen of Castile (from 1504) and of Aragon (from 1516), though power was exercised for her by her husband, Philip I, her father, Ferdinand II, and her son, the emperor Charles V (Charles I of Spain).

Joan was the third child of Ferdinand II of Aragon and Isabella I of Castile and became heiress in 1500 on the death of her brother and elder sister. She had married Philip of Burgundy, son of the emperor Maximilian, as part of Ferdinand's policy of securing allies against France. They had two sons, Charles,



Joan the Mad, detail of a portrait

By courtesy of the Biblioteca Nacional, Madrid

born in 1500, who succeeded as emperor and king of Spain, and Ferdinand, his lieutenant and successor as emperor, and four daughters, all of whom became queens: Eleanor, who married Manuel I of Portugal and then Francis I of France; Isabella, who married Christian II

of Denmark; Maria, who married Louis II of Hungary; and Catherine, who married John III of Portugal.

Her mental imbalance showed itself in 1502 in the form of extravagant, though justified, jealousy of the unfaithful Philip. On the death of her mother she returned with Philip to Castile and there claimed the regency against her father, who retired to Aragon. The shock of Philip's sudden death (Sept. 25, 1506) intensified her melancholia, and she refused to be parted from his embalmed body. Her father, Ferdinand, returned to take over the regency, and from 1509 she lived under guard at Tordesillas. On Ferdinand's death, her son Charles arrived from the Low Countries and ascertained her unfitness to rule, before taking power. She was legally queen of Spain throughout almost all of his long reign.

Joan, POPE, legendary female pontiff who supposedly reigned, under the title of John VIII, for slightly more than 25 months, from 855 to 858, between the pontificates of Leo IV (847–855) and Benedict III (855–858). It has subsequently been proved that a gap of only a few weeks fell between Leo and Benedict and that the story is entirely apocryphal.

One of the earliest extant sources for the Joan legend is the *De septem donis Spiritu Sancti* ("The Seven Gifts of the Holy Spirit") by the 13th-century French Dominican Stephen of Bourbon, who dated Joan's election *c.* 1100. In this account the nameless pontiff was a clever scribe who became a papal notary and later was elected pope; pregnant at the time of her election, she gave birth during the procession to the Lateran, whereupon she was dragged out of Rome and stoned to death.

The story was widely spread during the later 13th century, mostly by friars and primarily by means of interpolations made in many manuscripts of the *Chronicon pontificum et imperatorum* ("The Chronicle of the Popes and Emperors") by the 13th-century Polish Dominican Martin of Troppau. Support for the version that she died in childbirth and was buried on the spot was derived from the fact that in later years papal processions used to avoid a particular street, allegedly where the disgraceful event had occurred. The name Joan was not finally adopted until the 14th century; other names commonly given were Agnes or Gilberta.

According to later legend, particularly by Martin (who dated her election in 855 and who specifically named her Johannes Angelicus), Joan was an Englishwoman; but her birthplace was given as Mainz (now in Germany), which some writers reconciled by explaining that her parents migrated to that city. She supposedly fell in love with an English Benedictine monk and, dressing as a man, accompanied him to Athens. Having acquired great learning, she moved to Rome, where she became cardinal and pope. From the 13th century the story appears in literature, including the works of the Benedictine chronicler Ranulf Higden and the Italian Humanists Giovanni Boccaccio and Petrarch.

In the 15th century, Joan's existence was regarded as fact, even by the Council of Constance in 1415. During the 16th and 17th centuries the story was used for Protestant polemics. Such scholars as Aeneas Silvius Piccolomini, afterward Pope Pius II, and Cardinal Caesar Baronius regarded the story as unfounded; but it was the Calvinist David Blondel who made the first determined attempt to destroy the myth in his *Éclaircissement familier de la question: Si une femme a été assise au siège papal de Rome* (1647; "Familiar Enlightenment of the Question: Whether a Woman Had Been Seated on the Papal Throne in Rome"). According to one theory, the fable grew from widespread gossip concerning the influence wielded by the 10th-century Roman woman senator Marozia and her mother Theodora of the powerful house of Theophylact.

The second edition of J.J.I. von Döllinger's *Die Papstfabeln des Mittelalters* ("Fables About the Popes of the Middle Ages") was published in 1890. Another study of the Pope Joan question is contained in E. Vacandard's *Études de critique et d'histoire religieuse,* 4 vol. (1909–23; "Studies of Criticism and of Religious History").

Joan OF ARC, SAINT, byname THE MAID OF ORLÉANS, French SAINTE JEANNE D'ARC, or LA PUCELLE D'ORLÉANS (b. *c.* 1412, Domrémy, Bar, Fr.—d. May 30, 1431, Rouen; canonized May 16, 1920; feast day May 30; French national holiday, second Sunday in May), national heroine of France, a peasant girl who, acting as she believed under divine inspiration, led the French to a momentous victory that was the turning point of the Hundred Years' War.

A brief account of the life and works of Saint Joan of Arc follows; for a full biography, *see* MACROPAEDIA: Joan of Arc.

Joan, the visionary daughter of a plowman, led French armies—at the insistence of the "voices" of St. Michael, St. Catherine, and St. Margaret—to victory over the English at Orléans (1429) and opened the way for the coronation of Charles VII at Reims. She was captured and imprisoned in 1430, condemned as a heretic by an English-dominated church court in 1431, and burned at the stake. Officially rehabilitated later in the same century, she was declared a saint by Pope Benedict XV in 1920.

Joan's place in history is assured. Her achievement in reviving the courage of the French people and their faith in the Valois dynasty is in no way belittled by acknowledging that the reconciliation between Charles VII and the Duke of Burgundy (1435) was yet to provide the practical basis for a French recovery. Beyond this, the story of Joan will probably always be a source of controversy. Facts about her campaigns and about the motives and actions of her supporters and enemies are subject to dispute. Assessments of Joan's character and mission range from inspired saint to deluded hysteric. But essentially Joan exhibits the stamp of the genuine prophets and saints, utterly subordinated to a particular task that they believe has been laid upon them by divine command; Joan differs from many of them only in that she seems never, except for a few days near the end, to have swerved from her path.

Joan OF NAVARRE (b. *c.* 1370—d. July 9, 1437, Havering atte Bowe, Essex, Eng.), the wife of Henry IV of England and the daughter of Charles the Bad, king of Navarre.

In 1386 she was married to John IV (or V), duke of Brittany; they had eight children. John died in 1399, and Joan was regent for her son John V (or VI) until 1401. Early in 1402 a marriage was arranged between Joan and Henry IV of England, and the ceremony took place by proxy on April 3, 1402. Because Brittany was not on good terms with England, the Bretons did not favour the match, so that when Joan embarked for England she left her older children with the duke of Burgundy. Her coronation took place on Feb. 26, 1403, at Westminster. She had no children by this marriage. After Henry IV died in March 1413, Joan maintained good relations with her stepson, Henry V. After a few years, however, her situation became awkward because Brittany, ruled by Joan's son, John V (or VI), was still hostile to England. In 1419 she was accused of witchcraft and, though the whole matter was vague, was imprisoned. Joan's life was uneventful after her release in 1422.

Joan OF NAVARRE (French queen): see Joan I *under* Joan (Navarre).

Joan THE MAD: *see* Joan *under* Joan (Spain).

Joanna I–II (queens of Naples): *see* Joan I–II *under* Joan (Naples).

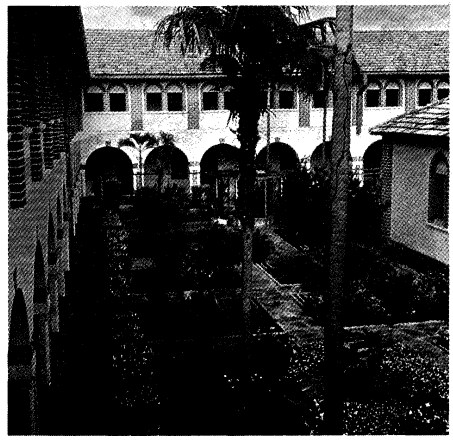
Joannes (Latin personal name): *see under* John.

Joannides (patriarch): *see* Anthimus VI.

João (Portuguese personal name): *see under* John, except as below.

João Belo (Mozambique): *see* Xai-Xai.

João Pessoa, port city and capital, Paraíba state, northeastern Brazil, lying at 148 ft (45 m) above sea level, on the right bank of the Rio Paraíba do Norte, 11 mi (18 km) above its mouth and north of Recife. Founded in 1585, the city was known successively as Filipea de Nossa Senhora das Neves, Frederikstad, and Paraíba. In 1930 the name was officially changed to honour João Pessoa, the state president who was killed in the revolution led by Getulio Vargas. Colonial buildings include the church of Nossa Senhora das Neves (Our Lady of the Snows) and the 18th-century São Francisco church. The Cabo Branco lighthouse at Ponta (point) do Seixas is the most easterly point in Brazil. João Pessoa is the seat of Paraíba University (1955). The city manufactures electrical products, chemicals, metals, plastics, and seaweed products. Pop. (1980 prelim.) 290,424.



Cloister of the Franciscan church, João Pessoa, Braz.

Epaminondas Carneiro Lima—EB Inc.

Job, Russian IOV (d. June 29 [June 19, old style], 1607, Staritsa, Russia), first Russian Orthodox patriarch of Moscow (1589–1605).

Until Job's election, the head of the Russian Church had held the title metropolitan of Moscow and was, at least nominally, subordinate to the patriarch of Constantinople. Moscow, however, was eager to have its own patriarch, and it took advantage of the pecuniary needs of the patriarchs of Antioch and Constantinople to suggest that, in exchange for giving them financial support, Moscow be given a patriarch. At that time, the Orthodox Church had only four patriarchs—those of Constantinople, Antioch, Alexandria, and Jerusalem—instead of the traditional five. Moscow hoped to fill the role of primary patriarch, which, in the Orthodox view, had belonged to Rome before the Schism.

Patriarch Jeremiah of Constantinople ultimately agreed to Moscow's suggestion and in 1589 elevated Job, who was then metropolitan of Moscow, to the position of patriarch of all Russia. In 1593 the patriarchs of Antioch, Alexandria, and Jerusalem confirmed Job's appointment but placed Moscow fifth in the hierarchy of patriarchates.

Job's elevation had both religious and political ramifications. Because Job no longer had

to guard Moscow's primacy within Russia, he was able to raise the bishops of Novgorod and Rostov to the position of metropolitan. On the other hand, when Tsar Fyodor died in 1598, the Russian people turned to Patriarch Job to secure a new tsar, and he chose Boris Godunov, whose reign marked the beginning of the Time of Troubles in Russia. In 1605 Job was removed from his office by boyars who opposed the Godunovs. He was sent to Uspensky Monastery in Staritsa, where he died two years later.

Job, Book of, an Old Testament book often counted among the masterpieces of world literature. Found in the third section of the biblical canon known as the Ketuvim, or Writings, this anonymous book is named after the central character, who attempts to understand the sufferings that engulf him.

Although the book dates from the 6th or 5th century BC, its author sets his poems within the prose framework of an ancient legend that originated outside Israel. Chapters 32–37 were probably a later addition. The genuine poetic discourses consist of three cycles of speeches, in each of which Job disputes with three friends and converses with God. All these discourses probe the meaning of Job's sufferings—the reason for them and the manner in which Job should respond.

The artful construction of the poet accounts for much of the book's impact. In the three cycles of argumentation between Job and his friends, Job proclaims his innocence and the injustice of his suffering, while his friends argue that Job is so afflicted because of personal sin. Job, convinced of his faithfulness and uprighteousness, is not satisfied with this explanation. The conversation between Job and God resolves the dramatic tension without, however, solving the problem of undeserved suffering. The speeches evoke Job's trust in the purposeful activity of God in the affairs of the world, even though God's ways with man remain mysterious and inscrutable.

The Book of Job, along with Proverbs and Ecclesiastes, belongs to that category of Old Testament writings known as wisdom literature. Many of the literary forms in the book bear strong resemblance to literary forms used in Egyptian and Babylonian wisdom literature.

job training: *see* employee training.

Job's tears (*Coix lacryma-jobi*), leafy, jointed-stemmed annual grass of the family Poaceae, native to tropical Asia and naturalized in North America. It is one to three metres (3 to nearly 10 feet) tall.



Job's tears (*Coix lacryma-jobi*)
W.H. Hodge

Job's tears receives its name from the hard, shiny, tear-shaped beads that enclose the edible seed kernels. They are off-white or dark in colour and are 6 to 12 millimetres (1/4 to 1/2 inch) long. They are sometimes used for jewelry and rosaries.

Jobst, also called JOST, or JODOCKS (b. 1351—d. Jan. 17, 1411, Brno, Moravia), margrave of Moravia and Brandenburg and for 15 weeks German king (1410–11), who, by his political and military machinations in east central Europe, played a powerful role in the political life of Germany.

A member of the Luxembourg dynasty, Jobst was a nephew of the Holy Roman emperor Charles IV and cousin to the Bohemian and German king Wenceslas and his half brother the future emperor Sigismund. Ruling Moravia from 1376, he also became general vicar of Italy (1383 and 1389) without ever setting foot there. In 1388 he added Luxembourg and Brandenburg to his dominions. In his many disputes, Jobst did not hesitate to fight his relatives. In 1394, after he captured Wenceslas, he forced his cousin to name him regent of Bohemia. Jobst and Wenceslas made peace in 1397, when Jobst received the two Lusatias and was made a prince of the empire. When the German king Rupert died in 1410, Jobst was elected (October 1) to succeed him by one faction at the Frankfurt assembly, while his cousin Sigismund received the votes of another group. Jobst died, however, early the next year.

Consult the INDEX *first*

Jochelson, Vladimir Ilich (b. Jan. 26 [Jan. 14, old style], 1855, Vilnius, Russia—d. Nov. 1, 1937, New York City), Russian-born ethnographer and linguist noted for his studies of Siberian peoples, especially the Koryaks and Yukaghirs.

Jochelson began his research while in exile in the Kamchatka region of Eastern Siberia because of his activities with the revolutionary Narodnaya Volya (People's Will) organization. He took part in the Jessup North Pacific Expedition of the American Museum of Natural History, New York City, in 1900–01 and produced his study *The Koryak* in 1908. From 1912 to 1922 he was associate curator of the Anthropological and Ethnographical Museum at Petrograd (now Leningrad). He emigrated to the United States in 1922 and was associated with the American Museum of Natural History and later with the Carnegie Institution, Washington, D.C. He wrote *The Yukaghir and the Yukaghirized Tungus* (1926) and *Peoples of Asiatic Russia* (1928).

Jöchi, also spelled JUCHI (d. February 1227), Mongol prince, eldest of Genghis Khan's four sons and, until the final years of his life, a participant in his father's military campaigns. During his lifetime, Jöchi, like his brothers, received a *ulus* (tribes to command), a *yurt* (a domain for his *ulus*), and an *inju* (personal domains to support his court). His lands were in the western part of the Mongol Empire.

For reasons that are not entirely clear, an antagonism of some kind appears to have developed after 1221 between Jöchi and his father. From 1222 until the time of his death, five years later, Jöchi did not participate in Genghis Khan's battles, though he did participate in the attack on the Volga Bulgars in 1223. Genghis Khan may have thought that his son was plotting his death, but Jöchi died before he could take any action. Genghis Khan died six months later, and Jöchi's lands were divided among his sons. His oldest son, Orda, founded the White Horde, his second son, Batu, the Golden Horde.

Jōchō (d. 1057, Japan), great Japanese Buddhist sculptor who developed and perfected so-called *kiyosehō*, or joined-wood techniques.

The son (or pupil) of a famous sculptor, Kōshō, Jōchō chiefly worked for Fujiwara Michinaga, de facto ruler of Japan at that time, and his clan. In 1022 he was awarded the Buddhist title of *hokkyō*, an unprecedented honour for a Buddhist sculptor, for various sculptures he had contributed to the Hōjō-ji in Kyōto (*ji*, "temple"). Later, he was rewarded by an even more exalted title for sculptures made for the Fujiwaras' family temple, Kōfuku-ji, in Nara. He was also instrumental in improving the social position of Buddhist sculptors by organizing a guild, which came to be called "Bussho," or the Buddhist sculpture studio. The Amida (Amitabha) of the Hōō-dō (Phoenix Hall), of the Byōdō-in temple at Uji, near Kyōto, is his only extant work. Carved in 1053, it embodies tranquillity and gracefulness, effects achieved by Jōchō's genius in full use of the jointed-wood technique.

Jochumsson, Matthías (b. Nov. 11, 1835, Skógar, Thorskafjördur, Ice.—d. Dec. 18, 1920, Akureyri), Icelandic poet, translator, journalist, and dramatist who was inspired by Christian faith and pride in Iceland's literature and traditions.

The son of a poor farmer, Jochumsson struggled for his education. At the age of 30 he was ordained from the Lutheran theological college in Reykjavík. Apart from six years as a journalist, he spent his working life as a clergyman until he retired on a poet's pension in 1900. The narrow constrictions of a country parish irked him but drove him to read widely in Scandinavian and English literature and philosophy. These foreign influences were reinforced by periodic visits abroad, but he assimilated them without compromising his national allegiances.

Through his religious poetry, his hymns and funeral elegies, and in his heroic narrative poems, he preached Christian faith and humanity alongside the pagan virtues of the Saga Age.

His innumerable translations of didactic lyrics, patriotic poems, and hymns from the Scandinavian languages and from English and German as well, illustrate those same virtues. His major translations most clearly expose his philosophy: Ibsen's *Brand,* Byron's *Manfred,* Esaias Tegnér's *Frithiofs saga,* and his choice from Shakespeare of *King Lear, Hamlet, Macbeth,* and *Othello.*

Jochumsson's internationalism, his freethinking Christianity, and his unaffected assumption of greatness alienated some Icelandic contemporaries, but he was loved and admired by Scandinavian writers. His intellectual integrity and rich humanity finally established him as a national figure.

Jockey Club, supreme authority in control of horse racing and breeding in Great Britain, formed about 1750 to regulate racing at Newmarket, Suffolk, and support the sport generally. Its Turf Board, consisting of nine Jockey Club stewards, coordinates long-term policy as opposed to day-to-day operation. Overall control of the sport is in the hands of the Joint Racing Board, composed of members of the Jockey Club and members of the Horserace Betting Levy Board appointed by the government. The club also publishes the *Racing Calendar* and *General Stud Book.* Headquarters are at Newmarket.

Other countries have established similar organizations—*e.g.,* the American Jockey Club (founded 1893).

Jodelle, Étienne (b. 1532, Paris—d. July 1573, Paris), French dramatist and poet, one of the seven members of the literary circle known as La Pléiade who applied the aesthetic principles of the group to drama.

Jodelle aimed at creating a classical drama

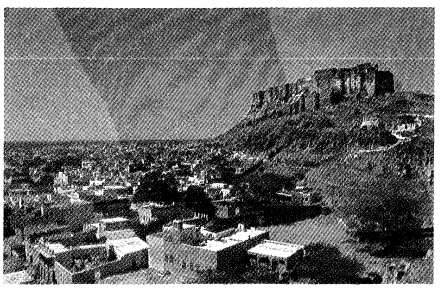
that in every respect would be different from the moralities and mysteries then occupying the French stage; he succeeded in producing the first modern French tragedy and comedy. These plays have the reputation of being unactable and unreadable, but they set a new example that prepared the ground for the great Neoclassical tragedians Corneille and Racine. His first play, *Cléopâtre captive*, a tragedy in verse, was presented before the court at Paris in 1553. The cast included his friends Rémy Belleau and Jean de La Péruse. Jodelle wrote two other plays, *Eugène* (1552), a comedy, and *Didon se sacrifiant*, another verse tragedy, based on Virgil's account of Dido.

In the prologue to *Eugéne* Jodelle explained his theory of comedy. It must deal with people of low or middle class because, he argued, among them can be found the crudity and ignorance that are the stuff of comedy. Tragedy, on the other hand, must have as its characters kings or other nobility, like the audiences for which it is written, because the populace would not understand the classical allusions of tragedy.

Jodhpur, town, administrative headquarters of Jodhpur district, Rājasthān state, northwestern India. It was founded in 1459 by Rāo Jodha, a Rājput (one of the warrior rulers of the historic region of Rājputāna), and served as the capital of the former princely state of Jodhpur. Parts of the town are surrounded by an 18th-century wall. The fort, which contains the palace and a historical museum, is built on an isolated rock eminence that dominates the town. The 4th-century ruins of Mandor, the ancient capital of Mārwār, lie immediately to the north.

A major road and rail junction, the town is a trade centre for agricultural crops, wool, cattle, salt, and hides. It has engineering and railway workshops and manufactures cotton textiles, brass and iron utensils, bicycles, ink, and polo equipment. Jodhpur is famous for its handicraft products, which include ivory goods, glass bangles, cutlery, dyed cloth, lacquerwork, felt and leather products, marble stonework, and carpet weaving. Jodhpur, the second largest town of Rājasthān, is the seat of the Rājasthān state high court. The town is the site of an air force college and airfield, the University of Jodhpur (established 1962), and a medical college affiliated with the University of Rājasthān.

Jodhpur district (8,826 sq mi [22,860 sq km]) chiefly consists of a sterile tract covered



The fort overlooking Jodhpur, Rājasthān, India
Kaypix—Shostal/EB Inc.

with high sand hills, sometimes referred to as Mārwār ("region of death"). Its north and northwest areas form part of the Great Indian (Thar) Desert. The Lūni, the only river in the district, irrigates the southern region. Bajra (pearl millet), pulses, jowar (sorghum), oilseeds, mung (the edible seeds of an Asian bean), and corn (maize) are the chief crops; some cotton and wheat are produced. Lignite, iron-ore, tungsten, garnet, glass-sand, and gypsum deposits are worked. The district has several poultry farms, and sheep, cattle, and camels are bred there.

Jodhpur, the largest princely state in the former Rājputāna Agency, consisted of the present district of Jodhpur as well as Nāgaur, Pāli, Jālor, and Barmer districts. It was founded *c.* 1212, reached the zenith of its power under the ruler Rāo Maldeo (1532–69), and gave allegiance to the Mughals after the invasion of the Mughal emperor Akbar in 1561. The Mughal emperor Aurangzeb invaded and plundered Mārwār in 1679, ordering the conversion of its inhabitants to Islām. The princely states of Jodhpur, Jaipur, and Udaipur formed an alliance, however, and prevented control by the Muslims. The Jodhpur and Jaipur princes then regained the privilege of marriage with the Udaipur family (which they had forfeited on allying with the Mughals) on condition that children of Udaipur princesses be first in succession. Quarrels resulting from this stipulation, however, finally led to the establishment of the supremacy of the Marāṭhās, a Hindu warrior caste. In 1818 Jodhpur came under British paramountcy. It joined the state of Rājasthān in 1949. Pop. (1981) town, 506,-345; district, 1,667,791.

Jodl, Alfred (b. May 10, 1890, Würzburg, Ger.—d. Oct. 16, 1946, Nürnberg), German general who, as head of the armed forces operations staff, helped plan and conduct most of



Jodl
Ullstein, Berlin

Germany's military campaigns during World War II.

Primarily a staff officer during and after World War I, Jodl served as head of the department of national defense in the War Ministry from 1935. A competent staff officer and Adolf Hitler's faithful servant to the end, he was named chief of the armed forces operations staff on Aug. 23, 1939, and, with Wilhelm Keitel, became a key figure in Hitler's central military command, directing all of Germany's campaigns except the beginning of the Russian invasion in the second half of 1941. On May 7, 1945, he signed the capitulation of the German armed forces to the Western Allies at Reims, Fr. As chief of operations staff he had signed many orders for the shooting of hostages and for other acts contrary to international law. He was executed after trial and conviction for war crimes by the International Military Tribunal at Nürnberg.

Jōdo (Japanese: Way to the Pure Land), devotional sect of Japanese Buddhism stressing faith in the Buddha Amida and heavenly reward. *See* Pure Land Buddhism.

Jodocks (German king): *see* Jobst.

Jodrell Bank Experimental Station, also called NUFFIELD RADIO ASTRONOMY LABORATORIES, location of one of the world's largest fully steerable radio telescopes, which has a reflector that measures 76 metres (250 feet) in diameter. The telescope is located with other smaller radio telescopes at Jodrellbank (formerly Jodrell Bank), about 32 kilometres (20 miles) south of Manchester in the county of Cheshire, Eng. Immediately after World War II the British astronomer Alfred Charles Bernard Lovell, working at the University of Manchester's botanical site at Jodrell Bank with war-surplus radar equipment, began research in radio and radar astronomy. Construction of the telescope began in 1952. Operation began shortly before the launching, on Oct. 4, 1957, by the Soviet Union of the first artificial Earth satellite (Sputnik I); and the satellite's carrier rocket was tracked at Jodrell Bank by radar. Most of the operational time at Jodrell Bank is devoted to astronomy rather than to tracking and communication, but the telescope has been part of the tracking network for the United States program of space exploration and has monitored most of the Soviet accomplishments. The Jodrell Bank telescope transmitted the first photographs from the surface of the Moon, received Feb. 6, 1966, by the Soviet Luna 9 probe.

Jōei Shikimoku (1232), in Japanese history, administrative code of the Kamakura shogunate (central military government) by which it pledged just and impartial administration of law to its vassal subjects. The *shikimoku,* or formulary (called Jōei because of its promulgation during the year so named), was a collection of rules for the guidance of the shogun's courts; it dealt with religious matters, land disputes, and criminal offenses. Moderate and conciliatory, especially in its leniency to former enemies of the shogunate and in its acknowledgement of the separate administrative system headed by the emperor, it generally applied to the upper classes only.

Joel, Book of, second of 12 Old Testament books that bear the names of the Minor Prophets. The Jewish canon lumps all together as The Twelve and divides Joel into four chapters; Christian versions combine chapters 2 and 3.

The book relates nothing about Joel except his name and that of his father. An analysis of the text further indicates that Joel lived during the period of the Second Temple of Jerusalem (516 BC–AD 70), for his book reflects the liturgy then in use.

The book's central theme is a concept borrowed from preexilic prophets that salvation will come to Judah and Jerusalem only when the people turn to Yahweh. Then they will not only receive divine favour, but the land itself will become fertile.

Joenckema, Rembert van (Flemish scientist): *see* Dodoens, Rembert.

Joensuu, city, capital of Pohjois-Karjalan *lääni* (province), southeastern Finland, at the mouth of the Pielisjoki (river), southeast of Kuopio. Chartered in 1848, the city is a rail junction and centre for lumber shipment and has connections by steamship, highway, and air. Local industry includes plywood and lumber mills. Notable landmarks include the town hall (1914), designed by the 20th-century architect Eliel Saarinen, the Pielisjoki Castle, the Museum of North Karelia, a Greek Orthodox church (1887), and a monument in honour of Olli Tiainen, a peasant leader who led guerrilla fighters to victory over the Russians in 1808. Pop. (1983 est.) mun., 45,808.

Joffre, Joseph-Jacques-Césaire (b. Jan. 12, 1852, Rivesaltes, Fr.—d. Jan. 3, 1931, Paris), commander in chief (1914–16) of the French armies on the Western Front in World War I, who won fame as "the Victor of the Marne."

After graduating from the École Polytechnique, he took part as a subaltern in the siege of Paris (1870–71) and later served in Indochina, West Africa, and Madagascar. Promoted to general of division in 1905, he was appointed chief of the French general staff in 1911 and thereby commander in chief in the event of war. Joffre was responsible for the French Army's calamitous plan of campaign with which it began operations in 1914 against

Germany, calling for mass attacks across the Franco–German frontier. The plan's futility became apparent when a massive German



Joffre, detail of a portrait by H. Jacquier, 1915
H. Roger-Viollet

encircling movement through Belgium caught Joffre and the rest of the French high command unawares and threatened to outflank the Allied forces and capture Paris. Once convinced of the developing German threat on the French left flank, Joffre shifted his forces and created a new French Army, the 6th, under his direct authority, to counter the threat of German envelopment. In this moment of supreme trial his best qualities came to the fore; his imperturbability, force of character, and courage saved the situation. Constantly threatened by greatly superior German forces wheeling in a great northern arc on Paris, the French retreated steadily until their left flank was fighting just outside the city by September 5. Joffre then issued the order that on September 6 launched the Allied counterstroke, the first of the battles of the Marne. The encounter resulted in the partial repulse of the German advance and the ruin of German hopes for a swift victory on the Western Front.

By the end of 1914 the Western Front had settled into the heavily entrenched lines that existed until 1918. Throughout 1915 the French armies under Joffre attempted to burst through the German positions at ruinous cost, and failed. Joffre's prestige began to wane, and the evident lack of French preparation for the German attack on Verdun in 1916, for which he was held responsible, prepared his downfall. After being stripped of the power of direct command, Joffre resigned on Dec. 26, 1916, and the same day was created a marshal of France. His *Mémoires*, in two volumes, were published in 1932.

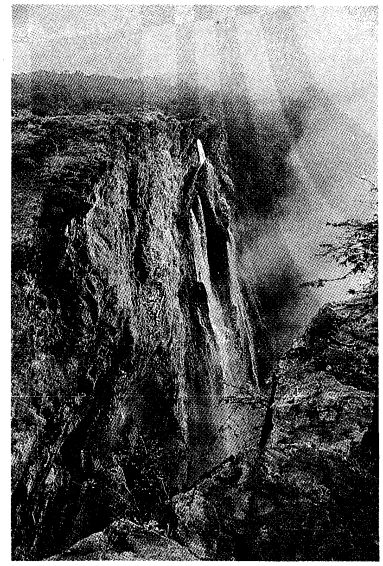
Joffrey, Robert, original name ABDULLAH JAFFA BEY KHAN (b. Dec. 24, 1930, Seattle, Wash., U.S.—d. March 25, 1988, New York City), American dancer, choreographer, and director, founder of the Joffrey Ballet (1956).

Joffrey's father was an immigrant from Afghanistan, and his mother was Italian-born. He began studying tap dancing but soon turned to ballet with Mary Ann Wells, at whose school in Seattle he met Gerald Arpino, who would one day became his company's codirector. After moving to New York City in 1948 and studying with Alexandra Fedorova and at the School of American Ballet, Joffrey joined Roland Petit's Ballets de Paris during the company's 1949 season in New York City. In 1953 Joffrey opened a school, the American Ballet Center, and by then had already created his first major ballet, *Persephone* (1952).

Joffrey formed his first small company, the Robert Joffrey Ballet Concert, in 1954, and in 1956 he formed the Robert Joffrey Ballet with Arpino as chief choreographer. In 1966 the company became the City Center Joffrey Ballet and thereafter grew to international fame. Its name was later changed to simply the Joffrey Ballet. By the time of Joffrey's death his company was performing annually in Los Angeles as well as in New York City.

Joffrey's works of note include *Pas des Déesses* (1954), *Gamelan* (1962), *Astarte* (1967), *Remembrances* (1973), and *Postcards* (1980). Joffrey commissioned many new ballets from new or untried choreographers. His company was noted for its eclectic repertoire that drew upon the classics, new works, and fusions of modern dance and ballet. Joffrey was also noted for his choreographic work on operatic productions.

Jog Falls, also called GERSOPPA FALLS, cataract of the Sharavati River, western Karnātaka (formerly Mysore) state, southwestern India. The Jog Falls are located 18 miles (29 km) upstream from the river's mouth at Honāvar, on the Arabian Sea. As it plunges



Jog Falls, western Karnātaka, India
Milt and Joan Mann—CAMERAMANN INTERNATIONAL

830 feet (253 m) into a chasm, the river splits into four cascades known as the Raja, or Horseshoe; Roarer; Rocket; and Ranee (Queen), or La Dame Blanche (The White Lady). A leading scenic attraction, the falls can be observed from bungalows on either bank of the river. A large hydropower project has been developed at Jog, downstream.

Jogaila (Lithuanian duke): *see* Władysław II Jagiełło.

Jōgan style, Japanese sculptural style of the Early Heian period (794–897). Works of Buddhist sculpture are the most numerous monuments of the period. The figures are columnar icons, erect, symmetrical, and perfectly balanced, carved from single blocks of wood and displaying a keen sense of material, with no attempt to smooth over cuts of the knife. The massive bodies are corpulent and heavy, with almost flabby chests, large round faces, large lips, wide noses, and wide eyes. These parts are simplified to an almost geometric formula. Size and simple contours give the sculpture a forbidding monumentality.

The drapery, called *hompa* ("wave"), is one of the most distinguishing features of the style. The folds are cut deeply in a simple measured rhythm, a technique suggestive of the string drapery of the colossal image of the Buddha at Bāmīān, Afg., a focal figure for all pilgrims traveling the Central Asiatic pilgrimage routes to Bāmīān and India. Holy images done in this style were carried back by pilgrims to China and Japan and became prototypes for sacred images carved there. The Jōgan style of drapery is actually an intermediate stage in



Seated Shaka Nyorai (Buddha), carved wood, Jōgan style, Early Heian period; in the Murō-ji, Nara
By courtesy of the International Society for Educational Information, Tokyo

the development of this mannerism. Alternating series of small and large waves compose the folds of the drapery.

The sculpture of this period is not confined to Buddhism. Shintō deities also were produced but in a simpler, blocklike, and more massive manner.

jogging, form of running at an easy pace, particularly popular from the 1960s in the United States. There, an estimated 7,000,000 to 10,000,000 joggers sought fitness, weight loss, grace, physical fulfillment, and relief from stress by jogging. Joggers expend from 10 to 13 calories per minute in this exercise (compared with approximately 7 to 9 calories per minute for tennis).

The popularity of this activity was given substantial impetus by the publication of the book *Jogging* (1967) by Bill Bowerman, a University of Oregon track coach, and W.E. Harris, a heart specialist. The practice of jogging originated in New Zealand when an Olympic track coach, one Dr. Lydiard, suggested it as a conditioning activity for retired Olympic runners; Bowerman observed the activity there and was impressed.

Jogging has been endorsed by many medical authorities for its value as a heart exercise and for general physical conditioning, usually to be practiced on alternate days. Other medical authorities, however, warn that fallen arches, shin splints, sweat miliaria, strained Achilles tendons, bruised heels, and knee and back ailments can result from jogging—usually done on hard surfaces with the feet striking the ground from 600 to 750 times per mile. Warm-up exercises before jogging, properly designed shoes, loose clothing, proper jogging technique, and general good health—as well as sensible objectives—are necessary for safe pursuit of the activity. Sports magazines, books, and shoe and clothing industries have profited from the popularity of jogging; they and various local organizations and the U.S. National Jogging Association (formed in 1968) promote the pastime.

Jogjakarta (Indonesia): *see* Yogyakarta.

Jogues, Saint Isaac (b. Jan. 10, 1607, Orléans, Fr.—d. Oct. 18, 1646, Ossernenon, near Fort Orange, New Netherland [now Auriesville, N.Y., U.S.]; canonized 1930; feast day October 19), French-born Jesuit missionary who sacrificed his life for the Christianization of North American Indians.

He entered (1624) the Society of Jesus at Rouen, Fr., was ordained in 1636, and was assigned to Canada. For six years in the

Huron lands near Georgian Bay he instructed and aided the Indians. In 1641 he began the Jesuit missions to the Ojibwa tribe at Sault-Ste-Marie. The following year warring Iroquois captured him, his companion René Goupil, and a Huron band near Montreal, and brought them to Ossernenon, where Goupil was slain. Jogues was enslaved for 13 months. Aided by the Dutch of nearby Ft. Orange (Albany), he escaped down the Hudson River, becoming the first priest to visit New Amsterdam (now New York City). On Christmas of 1643, he reached France, where he had been presumed dead. In 1645–46 he was sent by the government to Ossernenon to establish peace between the French and the Mohawk Indians. But when he arrived at Ossernenon the Mohawks accused him of witchcraft, murdered him, and placed his head on a pole for public display.

Johan (Dutch, Norwegian, Swedish, etc., personal name): *see under* John.

Johanan ben Zakkai (fl. 1st century AD), Palestinian Jewish sage, founder of an academy and an authoritative rabbinic body at Jamnia, who had a decisive influence on the continuance and development of traditional Judaism after the destruction of the Temple (AD 70).

As is the case with all the Talmudic teachers (the rabbis who interpreted and applied the Oral Law), little strictly biographical information about Johanan ben Zakkai has been preserved: Talmudic and Midrashic sources (commentative and interpretative writings) are principally devoted to the teachings of the sages and of what they came to represent. Thus, what can be reported essentially about Johanan is this: even before AD 70 he acted as a leading representative of the Pharisees in debate with priestly and Sadducean authorities. (The Pharisees stressed rigorous observance of the Law, inclusion of the oral tradition as normative, and an interpretative adaptation of traditional precepts to new situations; the Sadducees, an elitist conservative group, accepted only the Written Law as authoritative and were more literalist and static in their interpretation.) Johanan's school was apparently famous, and one in search of learning would go to extremes, if need be, to be admitted there. Furthermore, Johanan was opposed to the policy of those who were determined on war with Rome at all costs. By quitting beleaguered Jerusalem according to most accounts in 70 (though it is possible that he left as early as 68) and being brought to the Roman camp, he somehow succeeded in getting permission to set up an academy in Jamnia (Jabneh), near the Judaean coast, and there he was joined by a number of his favourite disciples. Two of them, Eliezer ben Hyrcanus and Joshua ben Hananiah, who are credited with having smuggled their master out of Jerusalem in a coffin, were to become, by the end of the century and the beginning of the following one, the leading teachers of their generation and had a profound influence on the greatest scholars of the next generation.

It is therefore hardly excessive to say that Johanan's teachings are to be traced not merely to the relatively few statements specifically attributed to him but to many views that become articulate during the 2nd century: for example, that acts of loving kindness atone no less effectively than the former Temple sacrificial ritual and are indeed at the core of the universe since its creation; that the study of Torah (the divine instruction or Law) is a central purpose of man and a paramount form of serving God; that a number of ceremonies and regulations once confined to the Temple were to be adopted even outside the Temple complex "to serve as memorials of the Sanctuary"; at the same time, despite the unique sanctity of Jerusalem, basic decisions regarding practice and instruction were now to be permitted to the authorized scholars wherever circumstances compelled them to sit in session. Such views, truly radical in origin, became normative rabbinical teaching and permanent components of Judaism.

Thus, it may be said that, by establishing in Jamnia a major academy and authoritative rabbinic body, Johanan fixed the conditions of continuity of basic traditions; and that, by his lively sense of the need for reinterpreting inherited concepts in new circumstances, he laid the foundations on which Talmudic and rabbinic Judaism built their structure.

The chief preoccupation of Johanan and his students was the study and continuing development of the Law (Halakha). He and they also engaged in the study of nonlegal subjects (Aggada), especially in connection with biblical exegesis (Midrash), explanation and interpretation of the biblical contents. In addition, he was interested in esoteric themes related to the subject of creation and the visions of the Merkavah (the divine chariot of Ezekiel 1), discourses on which were even delivered by some of his disciples. And, at least before the destruction of the Temple, if not thereafter as well, he seems to have held occasional sessions when certain ethical–philosophical questions, typical of Hellenistic–Roman popular philosophical discussion, were raised and explored. His homiletical interpretations of scripture often unite the symbolic with the rationalistic in a remarkable way. Why were not hewn stones permitted in the building of the altar? Because iron is for weapons of destruction, and the altar of God is intended to bring peace, he answers. Why is the ear of one who prefers servitude to have a hole bored in it? Because we are God's servants, and man heard at Sinai with his own ears. Let the unlistening ear be bored. Such are typical comments by Johanan. Although he had discouraged what must have seemed to him unwarranted messianic proclamations, a saying attributed to him in his last illness suggests that messianic speculation was not alien to him.

Of all the Palestinian Jewish sages of the 1st century AD, none apparently proved so fundamentally influential in his own time and for subsequent generations of scholars and spiritual leaders as Johanan ben Zakkai. In the history of Talmudic literature and thought, Johanan is rightly seen as continuing the Hillelite tradition, although this should not be interpreted to mean that he inherited only Hillel's teachings. (J.Gol.)

BIBLIOGRAPHY. The most important modern study of Johanan ben Zakkai is that by G. Alon, *Studies in Jewish History,* vol. 1, pp. 219–273 (1957), in Hebrew. In addition to the summary description in the general Jewish histories such as H.H. Graetz, *Geschichte der Juden,* vol. 2 (1897; *History of the Jews, from the Earliest Times to the Present Day,* vol. 2, pp. 321–359, 1891), see W. Bacher, *Die Agada der Tannaiten,* vol. 1, pp. 25–46 (1884); J. Goldin, "On the Academy of Johanan ben Zakkai," in American Academy for Jewish Research, *Harry Austryn Wolfson: Jubilee Volume on the Occasion of His Seventy-Fifth Birthday,* vol. 3, pp. 69–92 (1965) in Hebrew; and J. Neusner, *A Life of Yohanan ben Zakkai, ca. 1–80 C.E.,* 2nd ed. rev. (1970).

Johann (German personal name): *see under* John, except as below.

Johann Friedrich (German personal name): *see under* John Frederick.

Johann Georg (German personal name): *see under* John George.

Johann Sigismund (German personal name): *see under* John Sigismund.

Jóhann Sigurjónsson (Icelandic playwright): *see* Sigurjónsson, Jóhann.

Johanna (Latin personal name): *see under* Joan.

Johannes (Latin personal name): *see under* John, except as below.

Johannes DE ANGLICUS: *see* Baconthorpe, John.

Johannes DE GARLANDIA: *see* Garland, John.

Johannes SCOTUS ERIGENA (theologian): *see* Erigena, Johannes Scotus.

Johannes VON TEPL, also called JOHANNES VON SAAZ (b. *c.* 1350, Tepl or Schüttwa, Bohemia—d. *c.* 1415, Prague), Bohemian author of the remarkable dialogue *Der Ackermann aus Böhmen* (*c.* 1400; *Death and the Ploughman,* 1947), the first important prose work in the German language.

After taking a degree at Prague University, he was appointed, probably before 1378, a notary in Saaz (Žatec), and he became headmaster of the grammar school there in 1383. In 1411 he became a notary of Prague New Town, where he remained until his death.

In the *Ackermann*—which, though described in a Latin dedication as an exercise in rhetoric, probably arose from the death of the author's first wife in 1400—a plowman, representing Man, bitterly accuses Death of unjust dealings toward mankind. Death's counterarguments reconcile the plowman to the necessity of his activities, though he still champions man's nobility against Death's negative view of humanity. God, the judge, awards Death the victory but man the honour. The complex structure and elaborately artificial but vigorous rhythmical prose of this work make it—despite the uncertain state of the text—unique in medieval German literature. The older view of the *Ackermann* as the chief representative of a "Bohemian Renaissance" has come to be seriously questioned; despite Renaissance features, the work is widely regarded as essentially medieval in thought and even in technique.

Jóhannes Jónasson (Icelandic poet): *see* Jónasson, Jóhannes.

Johannesburg, city, Transvaal province, South Africa. Johannesburg is South Africa's economic and industrial metropolis and the centre of its gold-mining industry. It is the largest city in the country and one of the largest on the continent.

The following article treats briefly the modern city of Johannesburg. Fuller treatment is provided in the following MACROPAEDIA articles. For history and contemporary life, *see* Johannesburg; for additional perspective on the city in its national context, *see* South Africa.

Johannesburg stands at an elevation of 5,709 ft (1,740 m) on the southern slopes of the Witwatersrand—commonly called the Rand—a rocky watershed of east–west ridges surrounded by the Transvaal highveld. The municipal boundaries of the city of Johannesburg as they were constituted at the separation of the city of Soweto from the municipality in late 1983 took in about 171 sq mi (443 sq km) and included a population of about 712,000. Soweto (South-Western Townships), an independent city originally constituted as a group of African (Bantu) townships partly administered by the municipality, adds another 1,000,000 population to the urbanized area of Johannesburg.

The area's climate is semiarid and subtropical, with a mean temperature of 50° F (10° C) in July and 68° F (20° C) in December. The city has about 30 in. (760 mm) of rainfall annually.

Johannesburg is the centre of South African business, with most of the administrative headquarters of the gold-mining companies located there. The mines lie to the south and southwest of the city. Many heavy industries are located in the city, as are domestic and international banking and commercial con-

cerns. It is also the home of the Johannesburg Stock Exchange.

Johannesburg lies in the most thickly populated part of South Africa. The population is segregated by colour according to South Africa's apartheid policies, so that the nonwhite groups are each restricted to residence in certain areas, primarily in the west and southwest. In addition to Soweto, Greater Johannesburg includes Coronationville and Westbury, reserved for Coloureds (those of mixed black and white ancestry), and Lenasia, a township for Asians (Japanese, Chinese, and Indians).

The major administrative and commercial area of the city is located in the vicinity of Eloff and Commissioner streets. Architectural styles are derived chiefly from Cape, European (English, Dutch, Renaissance Italian), and U.S. models. Cultural institutions include the Johannesburg Art Gallery and museums with collections on South African history, military history, medicine, and archaeology. The Civic Centre is the home of Johannesburg's opera, ballet, music, and drama.

Higher education is offered by the University of Witwatersrand (mainly for English-speaking students), the Rand Afrikaans University, and a technical college. Teacher-training courses are available for English- and Afrikaans-speaking students, for Asians, and for Coloureds. Centres of scientific study include the South African Institute for Medical Research and the Republic Observatory.

Local public transport is provided by an expanding system of motorways and, in the suburbs and other areas, by bus services and commuter railways. Johannesburg is the meeting place of roads from major towns in South Africa. The city's large railway station constitutes the heart of the nation's rail system. Jan Smuts (international) Airport is located 14 mi (22 km) northeast of the city. City area (excluding Soweto), 171 sq mi (443 sq km). Pop. (1980 prelim.) 712,000.

Johannitius (Arab scholar): *see* Ḥunayn ibn Isḥāq (al-Ibādī).

Johannsen, Wilhelm Ludvig (b. Feb. 3, 1857, Copenhagen—d. Nov. 11, 1927, Copenhagen), Danish botanist and geneticist whose experiments in plant heredity offered strong support to the mutation theory of the Dutch botanist Hugo de Vries (that changes in heredity come about through sudden, discrete changes of the heredity units in germ cells). Many geneticists thought Johannsen's ideas dealt a severe blow to Charles Darwin's theory that new species were produced by the slow process of natural selection.

Johannsen studied in Copenhagen, Germany, and Finland and was a professor first at the Institute of Agriculture in Denmark and then at the University of Copenhagen. After working initially in plant physiology, he devoted himself entirely to experimental research in heredity, becoming a leading authority in that subject. He found in studies with princess beans that in the succession of individuals arising from a single seed there existed what he termed a "pure line," in which the hereditary units of all individuals are the same. About 1905 he demonstrated that he could produce large or small plants from beans of corresponding size. He concluded that although the plants differed in external characteristics, or in their "phenotype," they nevertheless carried identical hereditary units or, in other words, preserved a common "genotype"; his terms phenotype and genotype are now a part of the language of genetics. Johannsen supported de Vries' discovery that variation in genotype can occur by mutation; that is, as a sudden, spontaneous appearance of a new species character. The new character, while independent of natural selection in its initial occurrence, is then subject to natural selection, as described by Darwin, as it either survives or disappears in future generations.

johannsenite, silicate mineral in the pyroxene family, found as brown or green crystals or fibres in altered limestones adjacent to igneous rocks, often associated with copper, lead, and zinc ores. A calcium, manganese, and iron silicate [$Ca(Mn,Fe)Si_2O_6$], it has been considered to be the manganese analogue of diopside and hedenbergite. For detailed physical properties, *see* pyroxene (table).

Johansson, (Per) Christian (b. May 20, 1817, Stockholm—d. 1903, St. Petersburg, Russia), Swedish-born ballet dancer and a chief teacher at the Imperial Ballet School in St. Petersburg who helped develop the Russian style of ballet.

He studied at the Royal Swedish Ballet School and in Copenhagen with August Bournonville, who was most responsible for establishing the traditions of the Royal Danish Ballet. In 1841 Johansson became premier danseur at the Imperial Ballet in St. Petersburg, Russia. In 1860 he began teaching at the Imperial School and on his retirement from the stage in 1869 was officially appointed to the school teaching staff.

As opposed to the strict, repetitive Italian method, Johansson's teaching method incorporated a variety of ballet styles: the Russian, the Danish, and the classic French. He emphasized purity of line but, like Bournonville, made sharp distinction between the male and female style. During an era when male ballet dancers were generally unpopular and were often given only supporting roles, Johansson was particularly knowledgeable about male ballet technique and often advised Marius Petipa, choreographer of the Imperial Ballet. Johansson's pupils, many of whom danced in Petipa's ballets and later became teachers, included Eugenia Sokolova, Olga Preobrajenska, Mathilde Kschessinskaya, and Anna Pavlova.

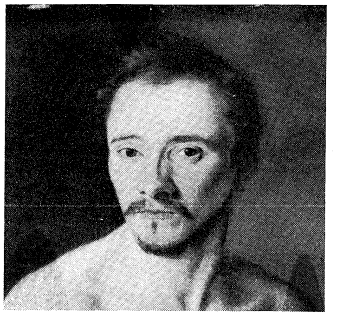
Johansson, (Jens) Ingemar (b. Sept. 22, 1932, Göteborg, Swed.), Swedish-born world heavyweight boxing champion from June 26, 1959, when he knocked out champion Floyd Patterson in three rounds, until June 20, 1960, when he was knocked out by Patterson in five rounds (both bouts in New York City).

As an amateur boxer he was a member of the European Golden Gloves team in 1951 and the Swedish Olympic Games team in 1952. He won the European professional heavyweight title in 1956, and in 1958 he scored a one-round knockout over Eddie Machen, a leading U.S. heavyweight. On March 13, 1961, at Miami Beach, Johansson attempted to regain the championship but failed when Patterson scored a sudden knockout in the sixth round.

Johansson won the European heavyweight championship again in 1962, defended it successfully once, and then retired. From 1952 to 1963, he had 28 bouts, winning 26, 17 by knockouts. His two losses to Patterson were the only defeats in his professional career. Johansson later made his permanent residence in west Florida, U.S.

Johansson, Lars, pseudonym LUCIDOR (b. Oct. 18, 1638, Stockholm—d. Aug. 13, 1674, Stockholm), Swedish lyric poet, author of some of the most powerful poems of the Baroque period in Swedish literature.

Early orphaned, Johansson was reared by an uncle and educated both in Sweden and abroad. He returned to Sweden and became known as a writer of funeral elegies and epithalamiums. His most personal poems are drinking songs and funeral hymns—a typically Baroque combination. His models were the German Baroque poets, but his best poems surpass theirs in intensity of feeling and power of expression. His most famous song is "Skulle jag sörja så vore jag tokot" ("Were



Lars Johansson, portrait by an unknown artist; in Gripsholm Castle, Sweden

By courtesy of the Svenska Portrattarkivet, Stockholm

I to grieve, then I were a fool"). Johansson's poetry was posthumously published in *Helicons blomster* (1689). His collected poems were edited by F. Sandwall in an edition with commentary (1914–30).

John (personal name): *see under* Ivan, Jean, Johannes, Juan, Giovanni, except as below.

John, name of rulers grouped below by country, papacy, or patriarchate and indicated by the symbol •.

Foreign-language equivalents:

Amharic	Yohannes
Czech	Jan
Danish	Hans
Dutch	Jan
French	Jean
German	Johann, or Johannes
Greek	Ioannes
Hungarian	János
Latin	Johannes, or Joannes
Norwegian	Hans
Polish	Jan
Portuguese	João
Russian	Ivan
Spanish	Juan
Swedish	Johan

BOHEMIA

• **John,** byname JOHN OF LUXEMBOURG, or OF BOHEMIA, Czech JAN LUCEMBURSKÝ, or JAN S ČECH (b. Aug. 10, 1296, Luxembourg—d. Aug. 26, 1346, Crécy, Fr.), king of Bohemia from 1310 until his death, and one of the more popular heroic figures of his day, who campaigned across Europe from Toulouse to Prussia.

He was born the son of the future emperor Henry VII of the House of Luxembourg and was made count of Luxembourg in 1310. At



John of Luxembourg, 14th-century silver denier of John as Count of Luxembourg; in the British Museum

Courtesy of the trustees of the British Museum

about the same time he also was named king of Bohemia, and on Feb. 7, 1311, he was solemnly crowned at Prague. When his father died in 1313, John was too young to succeed him as emperor and supported instead the

election of Louis the Bavarian as Emperor Louis IV (1314). John subsequently sided with Louis in his struggle against Frederick of Austria (1322); but in later years he was estranged from the Emperor, especially after Louis's alliance with England against France in the Hundred Years' War. John's own sympathies strongly favoured the French. He had sent his own son, the future emperor Charles IV, to be reared in Paris, and he several times fought in the service of France.

Throughout his reign, John campaigned variously against the Lithuanians and the Russians, against Hungary, England, and Austria, and in northern Italy and in the Tirol. He extended his Bohemian crownland northward, acquiring parts of Upper Lusatia (1320–29) and Silesia (1327–30), and also made himself master of much of Lombardy. His lavish expenditures, heavy taxation, and incessant peregrinations, however, cost him popularity at home and enhanced the power of the Bohemian nobility.

John's continuing quarrels with the Emperor brought him into alliance with the papacy; and in 1346, in concert with Pope Clement VI, he secured the formal deposition of Louis IV and the election of his son Charles as king of the Romans (July 1346). He then went to help King Philip VI of France against the English but was killed at the Battle of Crécy.

Brandenburg

• **John** (b. Aug. 3, 1513, Tangermünde, Brandenburg—d. Jan. 13, 1571, Küstrin, Neumark, Brandenburg), margrave of Brandenburg-Küstrin and a German Protestant ruler who remained loyal to the Catholic Habsburg emperors; he fought against his fellow Protestant princes and was conspicuously successful in the government of his territories.

John was the younger son of Joachim I, elector of Brandenburg, who divided his territory between his two sons. John inherited the eastern lands, the so-called Neumark, while his brother, Joachim II, received the larger, older territories (1535). Although brought up as a strict Roman Catholic, John became a strict Protestant and joined the Protestant Schmalkaldic League, formed to defend the Reformist princes from the Emperor. In 1545, however, having received assurances from Charles that he would not be forced to relinquish his beliefs, he joined the emperor Charles V's side, and his troops contributed to the defeat of the Schmalkaldic League in 1547. After the Augsburg Interim religious agreement of 1548, resulting in the exile of numerous Protestants, John once more opposed the Emperor, but again, impelled by distrust of his fellow princes, returned to the imperial fold. In return, Charles appointed him imperial councilor. John's salary, coupled with wise government of his lands and successful speculations, enabled him to leave a capital of more than 500,000 guilders on his death. Since he did not leave sons, his territories reverted to his brother's son John George.

Brittany

• **John I,** also called JOHN THE REDHEAD, French JEAN LE ROUX (b. 1217—d. 1286), duke of Brittany (from 1237), son of Peter I. Like his father, he sought to limit the temporal power of the clergy; consequently he was excommunicated, upon which he journeyed to Rome to win absolution. Subsequently, he and his wife, Blanche of Champagne, traveled with St. Louis on the crusade to Tunisia (1270).

• **John II** (b. 1239—d. 1305, Lyon), duke of Brittany (from 1286) and count of Richemont, son of John I. He accompanied his father on St. Louis's crusade to Tunisia (1270) and fought also in Palestine. He returned to Europe in 1272 and, in subsequent years, shifted repeatedly from one side to another in the wars between Edward I of England and Philip IV of France, who made him a peer of France (1297). His son, Arthur II, succeeded him.

• **John III,** byname JOHN THE GOOD, French JEAN LE BON (b. 1286—d. 1341), duke of Brittany (from 1312), son of Arthur II. His death without heirs resulted in the War of the Breton Succession, pitting two indirect heirs, John of Montfort and Charles of Blois. Despite three marriages—to Isabella of Valois (d. 1309), Isabella of Castile (d. 1328), and Joan of Savoy (1334)—he was left childless and designated Charles of Blois his successor, to whom he espoused his niece (1338).

• **John (IV),** byname JOHN OF MONTFORT, French JEAN DE MONTFORT (d. 1345), claimant to the duchy of Brittany upon the death of his childless half brother, John III. He was the only surviving son of Arthur II.

At first, John of Montfort had recognized John III's designation of Charles of Blois (nephew of King Philip VI of France) as the successor; but then John of Montfort reneged, had himself crowned at a convocation of bishops and lords at Nantes, and thus started the War of the Breton Succession. John was supported by Edward III of England (who claimed suzerainty over Brittany), but Philip VI favoured his own nephew and captured John at Nantes (1341). John, however, escaped from prison and defeated Charles's partisans at Cadoret (1345). When John himself died the same year, his widow, Joan of Flanders, defended the claims of his son, John IV.

Certain authorities count John of Montfort among the dukes of Brittany; he then becomes John IV, and his successors John V and John VI.

• **John IV (or V),** also called EARL OF RICHMOND, byname JOHN OF MONTFORT, or JOHN THE VALIANT, or THE CONQUEROR, French JEAN DE MONTFORT, or JEAN LE VAILLANT, or LE CONQUÉRANT (b. *c.* 1340—d. Nov. 1, 1399, Nantes, Fr.), duke of Brittany from 1365, whose support for English interests during the Hundred Years' War (1337–1453) nearly cost him the forfeit of his duchy to the French crown. The instability of his reign is attributable not only to his alliances with England but also to his imposition of harsh taxes on his subjects.

John was educated at the court of King Edward III of England. He ended the War of the Breton Succession in September 1364 by defeating Charles of Blois at Auray; he was recognized as duke of Brittany by King Charles V of France in the Treaty of Guérande (April 12, 1365). John secretly aided Edward's cause in 1370, giving the English soldier Robert Knowles a haven in Brittany when Knowles faced defeat at the hands of French forces. In 1372, after making an alliance with Edward, John was granted the earldom of Richmond for allowing the English to garrison his fortresses in Brittany.

After the French drove the English from most of the duchy, however, John fled to England (April 1373). Charles's confiscation of John's property in 1378 met with condemnation from the people of Brittany, but John lost this support when he made an alliance with King Richard II of England in 1380. He managed to reverse his loss by making peace with the regents for King Charles VI through the second Treaty of Guérande (Jan. 15, 1381). In 1392 he was again in ill repute with the crown for instigating an assassination attempt on Charles VI's constable of France, Oliver of Clisson, with whom he had had a long personal feud.

• **John V (or VI),** byname JOHN THE WISE, French JEAN LE SAGE (b. Dec. 24, 1389—d. Aug. 28, 1442), duke of Brittany from 1399, whose clever reversals in the Hundred Years' War and in French domestic conflicts served to strengthen his duchy.

John was on good terms with Philip the Bold, duke of Burgundy, who was his guardian. He began to favour the Armagnac faction in the French civil war, however, after the murder of its leader, Louis, duc d'Orléans, in 1407, though he did not fight the Burgundians. He allowed his subjects to fight the English, but he himself maintained a truce with Henry V of England, and his Breton troops were too late to aid the French at the Battle of Agincourt. John long acknowledged the Treaty of Troyes (1420), which made Henry V of England regent of France and heir to the French throne; but yet he had an alliance with the disinherited dauphin Charles and later allowed his own brother Arthur to become constable of France when the dauphin was claiming the French crown as Charles VII. Though he made efforts toward a real entente with Charles in the 1430s, John was party to the revolts of the Praguerie in 1440 and the League of Nevers in 1442. Within Brittany John brought about significant governmental, military, and economic reforms.

Burgundy

• **John,** byname JOHN THE FEARLESS, French JEAN SANS PEUR (b. May 28, 1371, Rouvres, Burgundy—d. Sept. 10, 1419, Montereau, Fr.), second duke of Burgundy (1404–19) of the Valois line, who played a major role in French affairs in the early 15th century.

The son of Philip the Bold, duke of Burgundy, and Margaret of Flanders, John was born in the ducal castle at Rouvres, where he spent the greater part of his childhood. In 1385 he married Margaret of Bavaria, and in the following decade his father initiated



John the Fearless, portrait by an unknown master of the southern Netherlands, *c.* 1415; in the Musée Royal des Beaux-Arts, Antwerp

By courtesy of the Musee Royal des Beaux-Arts, Antwerp; photograph, A.C.L. Brussels

him into the arts of government and warfare, though he was not given any post of responsibility. Even in 1396, at the age of 24, when he became leader of the Burgundian crusade against the Ottoman Turks in defense of Hungary, his leadership was only nominal. The actual conduct of the expedition, which ended in the disastrous defeat of the crusaders on the battlefield of Nicopolis and the capture of John by the Turks (an adventure that earned him the epithet the Fearless), was entrusted to a group of councilors and military advisers appointed by Philip the Bold. John evidently benefited from the blunders of these com-

manders, for his subsequent career showed that he was the only one of the Valois rulers of Burgundy who knew how to handle an army.

When John at last succeeded his father in 1404 as duke of Burgundy and count of Burgundy, Flanders, and Artois, he was 33 years old.

John the Fearless spent most of his time and his considerable political and military energies in France, Paris being his normal place of residence and seat of government. His only significant personal participation as duke of Burgundy in major events outside France took place in 1408, when he led a Burgundian army to aid his beleaguered brother-in-law, the bishop of Liège, John of Bavaria, against the citizens of Liège, who were in open revolt. On the field of Othée, on Sept. 23, 1408, the men of Liège were decisively defeated, and Burgundian influence was extended over the city and over the bishopric of Liège. From the start, then, John found himself involved in French affairs and was in part responsible for provoking a civil war in France with a rival house, headed by his first cousin, the King's younger brother, Louis, duc d'Orléans. Each man sought control of the mad king Charles VI and his queen and of the capital Paris. While the notorious murder by Duke John of his cousin by hired assassins in 1407 enabled John to subdue Paris and the crown, the opposition to the Burgundians by Louis's followers and heirs continued. Their faction was named after its main supporter, Bernard VII, comte d'Armagnac.

During the five years between 1413 and 1418, in which the Armagnacs succeeded in driving the Burgundians out of Paris, the internal situation in France was further complicated by a new English invasion led by the ambitious king, Henry V. Duke John was one of those French princes who, while pretending to do his best to reach the battlefield of Agincourt to give battle to the English (1415), was unaccountably delayed on the way. His intermittent negotiations with King Henry V did not, however, lead to a firm Anglo-Burgundian alliance, and in the autumn of 1419 John turned instead to the Armagnacs, in the hopes of arranging a truce or even making a firm peace settlement with their youthful leader, the dauphin Charles (the future Charles VII), in an alliance against the English. The two princes, each with 10 companions, met on the bridge of Montereau, some 50 miles southeast of Paris. As the diplomatic parley began, John the Fearless was struck down and killed during a dispute started by the Armagnacs, a political assassination that contemporary evidence shows was almost certainly carefully premeditated.

John pursued aims similar to those of the other rulers of his day: the consolidation and extension of his own and his family's power. In spite of his lapses into violence, his love of intrigue, his hypocrisy, and his rashness, he was a successful diplomat and military leader; he was more dynamic and more of a reformer than his son Philip the Good and more cunning, though less scrupulous, than his father. Yet he has received less attention from historians than either of them. In the eye of history, especially French history, he has long been regarded as a traitor and assassin. There was, perhaps, a dark and sinister element in his character, but he lived in an age when vice, tyranny, and murder were the common properties of every ruler. If he wrought destruction in France, he also brought peace and prosperity to his own Burgundian lands.

(R.Va.)

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Byzantine Empire

• **John I** Tzimisces (b. 925—d. Jan. 10, 976, Constantinople), Byzantine emperor (969–976) whose extension of Byzantine influence into the Balkans and Syria and maintenance of domestic tranquillity assured the prestige



John I Tzimisces (left), effigy on a Byzantine gold coin, 969–976; in a private collection
Peter Clayton

and stability of the empire for his immediate successors.

Descended from an aristocratic Armenian family, John was related through his mother to the general, and later emperor, Nicephorus II Phocas. He entered the imperial army and fought with Nicephorus against the Arabs in Cilicia and Syria. Having helped Nicephorus gain the throne, he was rewarded with the supreme command of Byzantine forces in the East. His ambition for the throne later led him into the conspiracy with his mistress, Theophano (the Emperor's wife), that led to the assassination of Nicephorus in December 969. Forced to do penance by Polyeuctus, patriarch of Constantinople, in order to receive the imperial crown, John banished Theophano to a convent and punished the murderers.

John I strengthened the empire by coupling diplomatic skill with military strength. In 970 he married Theodora, sister of Constantine VII Porphyrogenitus, the legitimate claimant to the throne, to offset challenges to his rule at home. When the Bulgars attacked the empire in 971, he led his forces against their capital, captured their tsar, and forced them to recognize Byzantine suzerainty. In July 971 he defeated the Russian prince Svyatoslav, ending threats to Byzantine rule in the north. To preserve the Byzantine position in the West, he arranged a marriage between one of his relatives and the future Holy Roman emperor Otto II. Turning to the East, he reduced the Fāṭimid strength around Antioch in 974–975, taking Antioch, Damascus, and other cities in Syria. Before he could retake Jerusalem he died, probably of typhoid.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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• **John II** Comnenus (b. 1088—d. April 8, 1143), Byzantine emperor (1118–43) whose reign was characterized by unremitting attempts to reconquer all important Byzantine territory lost to the Arabs, Turks, and Christian crusaders.

A son of Emperor Alexius I Comnenus and Irene Ducas, John kept an austere court and spent most of his reign with his troops. He sought to strengthen Byzantine finances by



John II Comnenus, detail of a mosaic, c. 1118; in Hagia Sophia, Istanbul
Hirmer Fotoarchiv, Munchen

ending Venetian trading privileges in the empire, but was forced to restore them after an unsuccessful war (1122). He thwarted Pecheneg, Hungarian, and Serbian threats during the 1120s, and in 1130 allied himself with the German emperor Lothair II (III) against the Norman king Roger II of Sicily.

In the later part of his reign John focussed his activities on the East. In 1135 he defeated the Danismend emirate of Melitene. Two years later he reconquered all of Cilicia from the kingdom of Lower Armenia and later forced Raymond of Poitiers, prince of Antioch, to recognize Byzantine suzerainty. Though John and Raymond formed an alliance against the Turkish Atabegs of Syria, their campaigns were not particularly successful. In 1143 John returned to press his claims to Antioch. He died following a hunting accident after naming his fourth son, Manuel I, to succeed him.

• **John III** Ducas Vatatzes (b. 1193, Didymoteichos, Byzantine Empire—d. Nov. 3, 1254), emperor of Nicaea (1222–54) who, by acquiring territory, encouraging economic growth, and supporting a cultural revival from his capital at Nicaea (modern İznik, Tur.), paved the way for the recovery of Constantinople from the Latin emperors and the reestablishment of the Byzantine Empire.

Born to an aristocratic Byzantine family, he married Irene, daughter of Theodore I Lascaris, emperor of Nicaea, becoming emperor on Theodore's death. Civil war broke out when Theodore's brothers, Alexius and Isaac, protested the succession, but John defeated them in battle and imprisoned and blinded them (1223). Two years later he also defeated the Latin forces supporting his rivals and made himself master of Asia Minor. He later clashed with Theodore Ducas, despot of Epirus, after the latter took Thessalonica and proclaimed himself Byzantine emperor (1225). John's forces were routed by Theodore when they attempted to take Adrianople later that year. Allied with the Bulgarian tsar John Asen II, John III defeated Theodore in battle (1230) and besieged Constantinople in 1235. Realizing the potential threat from Nicaea, however, Asen declared war on his ally. A peace was arranged in 1237, and, when Asen died in 1241, John III annexed territory in Bulgaria and attacked the despotate of Epirus. By 1242 he had reduced Epirus' territory and forced it to recognize Nicaean suzerainty.

John III also promoted the isolation of Latin Constantinople by making pacts with Western leaders. About 1250 he promised to become the vassal of Frederick II, Holy Roman emperor, in return for aid in reconquering Constantinople. Though the pact was sealed by John's marriage to the Emperor's daughter, Constance, little came of their agreement. He also negotiated, unsuccessfully, with the papacy, promising to end the schism between

the Eastern and Western churches if the Latins returned Constantinople.

In domestic policy John III made the Nicaean empire economically self-supporting, improved agriculture and stockbreeding, built hospitals and poorhouses, and encouraged the development of Nicaea's cultural life. His popularity among his subjects and his reputation for goodness caused him to be canonized a saint of the Eastern Church a half century after his death.

• **John IV** LASCARIS (b. 1250—d. 1261?), emperor of Nicaea whose brief reign as a minor was filled with intrigue and conspiracies that culminated in the seizure of power by Michael Palaeologus, the future Byzantine emperor Michael VIII.

John IV's parents were the Nicaean emperor Theodore II Lascaris (reigned 1254–58) and Helen, a daughter of the Bulgarian tsar John Asen II. Eight years old when his father died, John was advised by his regent George Muzalon, a trusted friend of the former emperor. But Muzalon was assassinated nine days after Theodore's death by associates of Michael Palaeologus, who then became regent. Michael proclaimed himself emperor and was crowned co-emperor with John in December 1258. He was crowned sole ruler in August 1261 in the church of Hagia Sophia in Constantinople, after his troops retook the city from its Latin rulers. Relegated to the background since 1258, John IV was then blinded and imprisoned in a fortress in Bithynia.

• **John V** PALAEOLOGUS (b. 1332—d. Feb. 16, 1391), Byzantine emperor (1341–91) whose rule was marked by civil war and increased domination by the Ottoman Turks, despite his efforts to salvage the empire.

Nine years old when his father, Andronicus III, died, John was too young to rule, and a dispute over the regency broke out between his mother, Anna of Savoy, and John Cantacuzenus, chief minister under Andronicus III. Cantacuzenus won the ensuing civil war and was crowned co-emperor with John V at Constantinople in 1347. Despite John V's subsequent marriage to Helen, Cantacuzenus' daughter, he formed an alliance with the Venetians against Cantacuzenus, forcing him to abdicate in 1354.

When the Ottoman Turks, who had gained a foothold in Europe by occupying Gallipoli, threatened Constantinople (1354), John appealed to the West for help, proposing to end the schism between the Byzantine and Latin churches. Though the popes promised him a crusade in return for his recognition of Rome, it never materialized, and the schism continued. Wars with the Serbs and Turks drained the Byzantine treasury, and John was arrested as an insolvent debtor when he visited Venice in 1369.

In 1371 John was forced to recognize the suzerainty of the Turks when they gained control of large parts of Macedonia. When he was deposed and imprisoned in 1376 by his son, the Turks helped him regain the throne (1379); but when John tried to rebuild the fortifications around Constantinople, the Turkish sultan ordered them destroyed, threatening to blind John's heir, Manuel, then residing at the Turkish court. John left Manuel an empire greatly reduced in size and strength, a Turkish overlord, and a frightened populace.

• **John VI** CANTACUZENUS (b. 1292—d. June 15, 1383, Mistra, Byzantine Empire), statesman, Byzantine emperor, and historian whose dispute with John V Palaeologus over the imperial throne induced him to appeal for help to the Turks, aiding them in their conquest of the Byzantine Empire.

John was chief adviser to Andronicus III Palaeologus, having helped him gain the throne from his grandfather Andronicus II. From 1328 to 1341 Cantacuzenus directed



John VI Cantacuzenus, detail from an illuminated manuscript, 14th century; in the Bibliothèque Nationale, Paris (Ms. Gr. 1242)
Hirmer Fotoarchiv, Munchen

both domestic and foreign policy for the Emperor. He encouraged a reform of the law courts and promoted commercial independence from the Genoese and Venetians by initiating a large shipbuilding project. He distinguished himself in battle against the Serbs and in 1337 helped incorporate the despotate of Epirus, in western Greece, into the empire.

When Andronicus III died in 1341, Cantacuzenus asserted his claim as regent for the young John V, but when he (Cantacuzenus) left Constantinople to battle the Serbs in Thrace, his opponents—led by John V's mother, Anna of Savoy—declared him a traitor and imprisoned his supporters.

Cantacuzenus proclaimed himself emperor, however, at Didymoteichos on Oct. 26, 1341. From 1343 to 1345 he arranged alliances with the Turks and married his daughter to the Ottoman sultan Orhan. He regained Constantinople in February 1347 with Turkish help, and was crowned co-emperor with John V in May.

As John VI, Cantacuzenus agreed to reign for only 10 years and to allow John V to rule alone after that time. He married his daughter Helen to the young emperor to seal the agreement. By 1354 Cantacuzenus was anxious to continue his rule and crowned his son, Matthew, co-emperor. John V appealed to the Venetians for aid and succeeded in retaking Constantinople in 1354. Cantacuzenus was forced to abdicate and retired to a monastery, where he wrote his memoirs, a valuable source for the history of the period from 1320 to *c.* 1357.

• **John VII** PALAEOLOGUS (b. 1360—d. *c.* 1410), Byzantine emperor who reigned for several months in 1390 by seizing control of Constantinople from his grandfather, the emperor John V Palaeologus.

From 1399 to 1402 he acted as regent for John V's successor, Manuel II, at Constantinople while Manuel journeyed to the West to appeal for help against Turkish attacks. During Manuel's absence John arranged a treaty with the Ottoman Turks, granting them financial and religious privileges. Manuel disavowed the treaty on his return and sent John to be governor of Thessalonica (modern Thessaloníki, Greece).

• **John VIII** PALAEOLOGUS (b. 1390—d. Oct. 31, 1448, Constantinople), Byzantine emperor who spent his reign appealing to the West for help against the final assaults by the Ottoman Turks on the Byzantine Empire.

Son of Manuel II Palaeologus, John was crowned co-emperor with his father in 1421 and succeeded him in July 1425. He ruled the area immediately surrounding Constantinople, while his brothers governed remnants of the fragmented empire in the Greek Peloponnese and in the districts on the Black Sea.

Constantinople was besieged in June 1422 by the Turkish sultan Murad II, and when the Turks took Thessalonica (modern Thessaloníki, Greece) in March 1430, John turned to the West for help. In 1437 he went to Italy, where he brought about a union between the Byzantine and Latin churches at the Council of Ferrara–Florence (1439). Western efforts against the Turks failed, and the union stirred dissension among the Byzantines, who refused to submit their church to the papacy. John's spirit was broken, and intrigues over the succession, coupled with news of the Turkish victory over the Hungarians in the Second Battle of Kosovo in October 1448, hastened his death.

CONSTANTINOPLE

• **John,** byname JOHN OF BRIENNE, French JEAN DE BRIENNE (b. *c.* 1148—d. March 1237, Constantinople), count of Brienne who became titular king of Jerusalem (1210–29) and Latin emperor of Constantinople (1231–37).

A penniless younger son of the French count Erard II of Brienne and Agnes of Montbéliard, John passed most of his life as a minor noble until befriended by King Philip II Augustus of France, who arranged for him to marry Mary (Marie) of Montferrat, queen of the crusader state of Jerusalem, in 1210. John reached the Palestinian town of Acre on Sept. 13, 1210, married Mary the following day, and was crowned at Tyre on October 3. Mary died in 1212, and John was named regent for their infant daughter, Yolande de Brienne, who inherited the crown as Isabella II. In 1214 John married Princess Stephanie of Armenia, daughter of the Armenian king Leo II, and later had a son by her.

As regent, John arranged a five-year truce with al-Malik al-ʿĀdil, sultan of Egypt and Syria, in July 1212, and during the truce he persuaded Pope Innocent III to launch the Fifth Crusade in support of his daughter's kingdom. In 1218 he joined the crusading force from the West in an expedition against the Egyptian port of Damietta. After quarrelling with the crusade leader, the cardinal legate Pelagius, John left Egypt in February 1220, returning in July 1221 to witness the humiliating defeat of the crusaders and the abandonment of the siege of Damietta.

Stephanie died in 1219; John then married Berengaria, daughter of Ferdinand III of Castile, and in 1225 gave his daughter Isabella in marriage to the Holy Roman emperor Frederick II, trying to retain his rights as regent of the kingdom of Jerusalem. Immediately following the marriage, however, Frederick began to contest these rights.

In 1228 John was invited to Constantinople to be regent and co-emperor with the young Baldwin II and arranged a match between Baldwin and his four-year-old daughter by Berengaria. Crowned in 1231, John helped fend off attacks by the Bulgarian tsar Ivan Asen II and the Nicaean emperor John III Vatatzes, but shortly before his death he was forced to appeal to the West for help.

DENMARK

• **John** (b. June 5, 1455, Denmark—d. Feb. 20, 1513, Ålborg, Den.), king of Denmark (1481–1513) and Norway (1483–1513) and king (as John II) of Sweden (1497–1501) who failed in his efforts to incorporate Sweden into a Danish-dominated Scandinavian union. He

was more successful in fostering the commercial development of Danish burghers to challenge the power of the nobility.

John succeeded his father, Christian I, king of Denmark and Norway, in 1481, but only by agreeing to a stringent charter imposed by the Danish nobles to limit royal power. Although he was also recognized as sovereign by the Swedish state council (1483), the Swedish regent, Sten Sture the Elder, was able to postpone John's coronation as king of Sweden. In 1490 John divided the territories of Schleswig and Holstein with his brother Frederick (later king of Denmark as Frederick I).

Ignoring the royal charter of 1483, John expanded the authority of his office and further offset the nobles' power by supporting the Danish merchant class against its chief rivals, the traders of the Hanseatic League (a north German trading confederation). His anti-Hanseatic policy was furthered by trade agreements with England, the Netherlands (1490), and the merchants of the south German house of Fugger.



John of Denmark, Norway, and Sweden; detail from a plaster cast of his tombstone, original sculpture by Claus Berg, *c.* 1513; in the Cathedral of St. Canute, Odense, Den.

By courtesy of the Nationalhistoriske Museum paa Frederiksborg, Den.

John was able to force Sten Sture to resign the regency of Sweden (1497) and was crowned king after allying himself with Ivan III, grand prince of Moscow, in 1493. He then ordered the building of a navy to control the Baltic Sea but suffered a serious military defeat in 1500 in a peasant uprising in Dithmarschen (now in Germany). The defeat helped persuade dissident Swedish nobles to rebel and reinstall Sten Sture as regent of Sweden, but Norwegian and Danish uprisings against John's rule were suppressed.

John's commercial treaty with England led to a war against Sweden and the Hanseatic city of Lübeck (1510–12), in which the new Danish navy scored repeated victories.

ENGLAND

• **John,** byname JOHN LACKLAND, French JEAN SANS TERRE (b. Dec. 24, 1167, Oxford—d. Oct. 18/19, 1216, Newark, Nottinghamshire, Eng.), king of England from 1199 to 1216. In a war with the French king Philip II, he lost Normandy and almost all his other possessions in France. In England, after a revolt of the barons, he was forced to seal the Magna Carta (1215).

Youth and rivalry for the crown. John was the youngest son of Henry II and Eleanor of Aquitaine. Henry's plan (1173) to assign to John, his favourite son (whom he had nicknamed Lackland), extensive lands upon his marriage with the daughter of Humbert III, count of Maurienne (Savoy), was defeated by the rebellion the proposal provoked among John's elder brothers. Various provisions were made for him in England (1174–76), including



John, detail of a tomb effigy in Worcester cathedral

By courtesy of the National Monuments Record, London

the succession to the earldom of Gloucester. He was also granted the lordship of Ireland (1177), which he visited from April to late 1185, committing youthful political indiscretions from which he acquired a reputation for reckless irresponsibility. Henry's continued favour to him contributed to the rebellion of his eldest surviving son, Richard I (later called Coeur de Lion), in June 1189. For obscure reasons John deserted Henry for Richard.

On Richard's accession in July 1189, John was made count of Mortain (a title that became his usual style), was confirmed as lord of Ireland, was granted lands and revenues in England worth £6,000 a year, and was married to Isabella, heiress to the earldom of Gloucester. He also had to promise (March 1190) not to enter England during Richard's absence on his crusade. But John's actions were now dominated by the problem of the succession, in which his nephew, the three-year-old Arthur I, duke of Brittany, the son of his deceased elder brother Geoffrey, was his only serious rival. When Richard recognized Arthur as his heir (October 1190), John immediately broke his oath and returned to England, where he led the opposition to Richard's dictatorial chancellor, William Longchamp. On receiving the news in January 1193 that Richard, on his way back from the crusade, had been imprisoned in Germany, John allied himself with King Philip II Augustus of France and attempted unsuccessfully to seize control of England. In April 1193 he was forced to accept a truce but made further arrangements with Philip for the division of Richard's possessions and for rebellion in England. On Richard's return, early in 1194, John was banished and deprived of all his lands. He was reconciled to Richard in May and recovered some of his estates, including Mortain and Ireland, in 1195, but his full rehabilitation came only after the Bretons had surrendered Arthur to Philip II in 1196. This led Richard to recognize John as his heir.

Accession to the throne. In 1199 the doctrine of representative succession, which would have given the throne to Arthur, was not yet generally accepted, and following Richard's death in April 1199 John was invested as duke of Normandy and in May crowned king of England. Arthur, backed by Philip II, was recognized as Richard's successor in Anjou and Maine, and it was only a year later, in the Treaty of Le Goulet, that John was recognized as successor in all Richard's French possessions, in return for financial and territorial concessions to Philip.

War with France. The renewal of war in France was triggered by John's second marriage. His first wife, Isabella of Gloucester, was never crowned, and in 1199 the marriage was dissolved on grounds of consanguinity, both parties being great-grandchildren of Henry I. John then intervened in the stormy politics of his county of Poitou and, while trying to settle the differences between the rival families of Lusignan and Angoulême, himself married Isabella (August 1200), the heiress to Angoulême, who had been betrothed to Hugh IX de Lusignan. This politically conceived marriage provoked the Lusignans into rebellion the next year; they appealed to Philip II, who summoned John to appear before his court. In the general war that followed his failure to answer this summons, John had a temporary success at Mirebeau in August 1202, when Arthur of Brittany was captured, but Normandy was quickly lost (1204). By 1206, Anjou, Maine, and parts of Poitou had also gone over to King Philip.

These failures, foreshadowed under Henry II and Richard, were brought about by the superiority of French resources and the increasing strain on those of England and Normandy. Nevertheless, they were a damaging blow to John's prestige, and, equally important, they meant that John resided now almost permanently in England. This factor, coinciding with the death (1205) of the chancellor and archbishop of Canterbury, Hubert Walter, gave his government a much more personal stamp, which was accentuated by the promotion of members of his household to important office. His determination to reverse the continental failure bore fruit in ruthlessly efficient financial administration, marked by taxation on revenues, investigations into the royal forests, taxation of the Jews, a great inquiry into feudal tenures, and the increasingly severe exploitation of his feudal prerogatives. These measures provided the material basis for the charges of tyranny later brought against him.

Quarrel with the church. John's attention was diverted and his prestige disastrously affected by relations with the papacy. In the disputed election to the see of Canterbury following the death of Hubert Walter, Pope Innocent III quashed the election of John's nominee in procuring the election of Stephen Langton (December 1206). John, taking his ground on the traditional rights of the English crown in episcopal elections, refused to accept Langton. In March 1208, Innocent laid an interdict on England and excommunicated John (November 1209). The quarrel continued until 1213, by which time John had amassed more than £100,000 from the revenues of vacant or appropriated sees and abbeys. But such a dispute was a dangerous hindrance to John's intention to recover his continental lands. In November 1212 he agreed to accept Langton and the Pope's terms. Apparently at his own behest, he surrendered his kingdom to the papal nuncio at Ewell, near Dover, on May 15, 1213, receiving it back as a vassal rendering a tribute of 1,000 marks (£666 13*s.* 4*d.*) a year. He was absolved from excommunication by Langton in July 1213, and the interdict was finally relaxed a year later. John thus succeeded in his aim to secure the papacy as a firm ally in the fight with Philip and in the struggle already pending with his own baronage. But his treatment of the church during the interdict, although arousing little if any opposition among the laity at the time, angered monastic chroniclers, who henceforth loaded him with charges of tyranny, cruelty, and, with less reason, of sacrilege and irreligion.

Baronial rebellion and the Magna Carta. In August 1212 recurrent baronial discontent had come to a head in an unsuccessful plot to murder or desert John during a campaign planned against the Welsh. Pope Innocent's terms had included the restoration of two of those involved, Eustace de Vesci and Robert Fitzwalter, and, although the barons soon lost papal support, they retained the protection of Stephen Langton. John, skillfully isolating the malcontents, was able to launch his long-planned campaign against the French, landing at La Rochelle in February 1214. He

achieved nothing decisive and was forced to accept a truce lasting until 1220. Returning to England in October 1214, he now had to face much more widespread discontent, centred mainly on the northern, East Anglian, and home counties. After lengthy negotiations in which both sides appealed to the Pope, civil war broke out in May 1215. John was compelled to negotiate once more when London went over to the rebels in May, and on June 19 at Runnymede he accepted the baronial terms embodied in the Magna Carta, which ensured feudal rights and restated English law. This settlement was soon rendered unworkable by the more intransigent barons and John's almost immediate appeal to Pope Innocent against it. Innocent took the King's side, and in the ensuing civil war John captured Rochester castle and laid waste the northern counties and the Scottish border. But his cause was weakened by the arrival of Prince Louis (later Louis VIII) of France, who invaded England at the barons' request. John continued to wage war vigorously but died, leaving the issues undecided. His death made possible a compromise peace, including the restoration of the rebels, the succession of his son Henry III, and the withdrawal of Louis.

Assessment. John's reputation, bad at his death, was further depressed by writers of the next generation. Of all centuries prior to the present, only the 16th, mindful of his quarrel with Rome, recognized some of his quality. He was suspicious, vengeful, and treacherous; Arthur I of Brittany was probably murdered in captivity, and Matilda de Braose, the wife of a recalcitrant Marcher baron, was starved to death with her son in a royal prison. But John was cultured and literate. Conventional in his religion rather than devout, he was remembered for his benefactions to the church of Coventry, to Reading Abbey, and to Worcester, where he was buried and where his effigy still survives. He was extraordinarily active, with a great love of hunting and a readiness to travel that gave him a knowledge of England matched by few other monarchs. He took a personal interest in judicial and financial administration, and his reign saw important advances at the Exchequer, in the administration of justice, in the importance of the privy seal and the royal household, in methods of taxation and military organization, and in the grant of chartered privileges to towns. If his character was unreliable, his political judgment was acute. In 1215 many barons, including some of the most distinguished, fought on his side. (J.C.H.)

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Ethiopia

• **John IV:** *see* Yohannes IV.

France

• **John I,** also called JOHN THE POSTHUMOUS, French JEAN LE POSTHUME (b. Nov. 15, 1316—d. Nov. 19/20, 1316, Paris), king of France, the posthumous son of Louis X of France by his second consort, Clémence of Hungary. He died just a few days after his birth but is nevertheless reckoned among the kings of France.

His uncle, who succeeded him as Philip V, has been accused of having caused his death, or of having substituted a dead child in his place; but nothing has ever been proved. In 1358 a man called Giannino, in Florence, persuaded Clémence's nephew, Louis I of Hungary, that he was John I; but otherwise he met with little success and died in jail in Naples (1363).

• **John II,** byname JOHN THE GOOD, French JEAN LE BON (b. April 16, 1319, near Le Mans, Fr.—d. April 8, 1364, London), king of France from 1350 to 1364. Captured by the English at the Battle of Poitiers on Sept. 19, 1356, he was forced to sign the disastrous treaties of 1360 during the first phase of the Hundred Years' War (1337–1453) between France and England.



John II, portrait by an unknown French artist, 14th century; in the Louvre, Paris

Archives Photographiques

After becoming king on Aug. 22, 1350, John continued a truce with the English until later that year, when he had an English hostage, Raoul de Brienne, comte d'Eu, former constable of France, executed. By March 1351 King Edward III of England realized the impossibility of remaining at peace; but John committed the first act of hostility by attacking and recapturing Saint-Jean-d'Angély in western France that September 7. John signed a new truce with England on Sept. 12, 1351, but broke it by supporting the partisans of Charles of Blois (a pretender to Brittany, then held prisoner by Edward) in August 1352; the peace, however, was extended until September 23.

John's other bitter enemy was Charles II the Bad, king of Navarre, to whom John gave his daughter Joan as an offer of alliance; the enmity still remained strong, however, because John never paid a dowry or recognized a rent of 15,000 livres due to Charles. John further irritated Charles by giving the new constable of France, Charles de La Cerda, lands that were claimed by Charles of Navarre. In revenge, the latter had the new constable assassinated; but in spite of John's rage, the two kings made a superficial peace in February 1354. Charles desired an alliance with Edward, which so frightened John that he made another peace with Charles on Sept. 10, 1355. On April 16, 1356, at Rouen, John took his revenge on Charles by having him imprisoned.

Meanwhile Edward, displeased by the 1355 alliance between John and Charles, invaded France later that year but then returned to England before any confrontations. At the same time, Edward's son Edward, prince of Wales (later called the Black Prince), attacked southern France. Unable to halt the English invasions because he lacked funds, John gathered the States General to seek money and to impose an unpopular salt tax. John first went to defend Paris and Chartres. He and the Prince of Wales finally met near Poitiers in September 1356. The French army was decimated, and John was taken prisoner, leaving the French people grief-stricken and confused.

John was taken to London in April 1357, where he was lodged in the Savoy palace; there he concluded treaties (January 1358 and March 1359) so harsh that they were repudiated in France. Finally the treaties of Brétigny and of Calais (May and October 1360) fixed John's ransom at 3,000,000 gold écus and surrendered most of southwestern France to Edward. On Oct. 9, 1360, John was released to raise a ransom that France could not afford to pay, and hostages were accepted in his place. When one of the hostages (John's own son) escaped, John, feeling dishonoured, returned to England on his own volition as a prisoner.

Hainaut

• **John I:** *see* John II (Holland).

Holland

• **John II,** also called JOHN OF AVESNES, Dutch JAN VAN AVESNES (b. *c.* 1247—d. Sept. 11?, 1304, Hainaut), count of Hainaut (1280–1304) and of the Dutch provinces of Holland and Zeeland (1299–1304), who united the counties and prevented the northward expansion of the house of Dampierre, the counts of Flanders.

Eldest son of John of Avesnes, count of Hainaut, and Alida, sister of Count William II of Holland, John secured the title count of Hainaut in 1280 as John I. Long a friend of King Philip IV the Fair of France, the Count influenced his cousin, Count Floris V of Holland, to end his long, friendly relations with King Edward I of England and make an alliance with France, an action that was violently opposed by several Dutch nobles, who seized and murdered Floris (June 27, 1296).

John was then named governor of Holland and guardian of Floris' 15-year-old son, after whose death (1299), he became count of Holland as John II. Though the people of Holland accepted his leadership, he had to ward off a challenge by King Albert I of Germany (1300), repel an invasion by English forces (1300?), subdue a rebellion in Zeeland (1301), and fight the army of the Dampierres for two years before driving the Flemish from Holland and Zeeland in 1304.

Hungary

• **John,** original name JÁNOS ZÁPOLYA, or SZÁPOLYAI (b. 1487, Szepesváralja, Hung.—d. July 22, 1540, Szászebes), king and counterking of Hungary (1526–40) who rebelled against the House of Habsburg.

John began his public career in 1505 as a member of the Diet of Rákos; it was upon his motion that the Diet voted that no foreign prince would ever again be elected king of Hungary after the death of King Ulászló II, who also was king of Bohemia as Vladislas II. Appointed *voivode* (governor) of Transylvania in 1511, John brutally suppressed the peasant uprising of 1514 and, thereby, increased his popularity with the gentry. Consequently the second Diet of Rákos appointed him governor of the infant king Louis II. He failed to acquire the appointment as palatine (imperial governor) of Hungary, which was given to István (Stephen) Báthory in 1519, and dissension between the two contributed to the Turkish conquest of Belgrade two years later.

When the Ottoman sultan Süleyman I the Magnificent invaded Hungary in 1526, and the young king Louis was slain at the Battle of Mohács in August that year, John was accused, probably without justification, of de-

liberate treachery for failing to reach the King in time with a relief army.

Nevertheless, the last Turkish regulars had left Hungary by the end of October; and, with the Turks gone, one party of nobles elected John king (Nov. 10, 1526); but Louis II's brother-in-law, Ferdinand, archduke of Austria (and later Holy Roman emperor as Ferdinand I), also claimed the throne in virtue of the Habsburg-Jagiello family compact, and his adherents crowned him, too, in 1527. An internecine struggle, in which Süleyman supported John, went on until 1538, when by the secret Treaty of Nagyvárad, Hungary was divided: Ferdinand took western Hungary with Croatia; John had the remaining two-thirds, with the royal title and his capital at Buda, and Ferdinand was to succeed on John's death. John, however, remarried and had a son, John Sigismund (1540–71), whom on John's death his adherents elected king. Ferdinand asserted his claim but Süleyman then, posing as John Sigismund's protector, himself occupied most of central and southern Hungary, leaving Ferdinand with only the western portion.

JERUSALEM

- **John:** *see* John (Constantinople).

NAVARRE

- **John (I):** *see* John I (France).
- **John (II):** *see* John II (Spain: Aragon).

NORWAY

- **John:** *see* John (Denmark).

PAPACY

- **John I,** SAINT (b. Tuscany—d. May 18, 526, Ravenna; feast day May 27), pope from 523 to 526 who ended the Acacian Schism (484–519), thus reuniting the Eastern and Western churches by restoring peace between the papacy and the Byzantine emperor Justin I.

Unfortunately the reunion ended friendly relations between the papacy and the Ostrogothic king Theodoric the Great, for Theodoric mistrusted the rapprochement, and his hostility flared when Justin took harsh measures against the heretical Arian sect; Theodoric was himself an Arian Christian, and in 525 he ordered Pope John to negotiate a withdrawal of Justin's edict. John was the first pope to go to Constantinople, but his mission was unsuccessful. After he returned to Ravenna (526), Theodoric had him cast into prison, where he soon died, probably of starvation. He is honoured as a martyr.

- **John II,** original name MERCURIUS (b. Rome—d. May 8, 535, Rome), pope from 533 to 535 and the first pontiff to change his original name, which he considered pagan.

His pontificate opposed Nestorianism, the heresy that separated the divine and human natures of Christ and denied the Virgin Mary the title Mother of God. Nestorianism had been condemned by the Council of Chalcedon in 451. In 534 the Byzantine emperor Justinian I persuaded John to condemn the Acoemeti, a group of monks in Constantinople who had adopted Nestorianism. They were excommunicated on March 24/25, 534, thus ending the Theopaschite controversy.

- **John III,** original name CATELINUS? (b. Rome?—d. July 13, 574, Rome), pope from 561 to 574.

Records of his pontificate were destroyed during an invasion of Italy by the Lombards, a Germanic people whose kingdom was in northern Italy. In 571 John persuaded the Byzantine general Narses to defend Rome, but the Romans opposed Narses because he allegedly caused the Lombard invasion. To avoid involvement in the ensuing quarrel, John withdrew to the catacombs until Narses' death (*c.* 573).

- **John IV** (b. Dalmatia—d. Oct. 12, 642, Rome), pope from 640 to 642.

A Roman archdeacon, he was elected (Dec. 24, 640) as successor to Pope Severinus. He perpetuated Severinus' condemnation of Monothelitism, a 7th-century heresy concerning the will of Christ. He sent an emissary to redeem Christian Balkans captured during Slavic invasions. John was against the date for Easter favoured by Celts in Ireland, and he defended the highly controversial orthodoxy of Pope Honorius I, who had held that Christ's human and divine natures were indivisible and that the Son's will was not different from that of the Father.

- **John V** (b. Syria?—d. Aug. 2, 686, Rome), pope from July 23, 685, to Aug. 2, 686.

As deacon, he was one of Pope St. Agatho's legates to the sixth ecumenical council at Constantinople (680–681), which condemned the Monothelite heresy (the view that Christ had only one will—*i.e.*, divine). He succeeded Pope St. Benedict II and was consecrated July 23, 685. A man of learning and generosity, he made liberal donations for the poor.

- **John VI** (b. Greece?—d. Jan. 11, 705, Rome), pope from 701 to 705.

He was consecrated on Oct. 3, 701. When the Byzantine commander Theophylactus invaded the Italian mainland from Sicily, John protected him from the local reaction; and when Gisulfo, the Lombard duke of Benevento, crossed the southern frontier of Roman territory, John ransomed captives and induced him to withdraw. In his only extant letter, John ordered the restoration of the deposed bishop St. Wilfrid of York.

- **John VII** (b. Greece?—d. Oct. 18, 707, Rome), pope from 705 to 707.

Elected March 1, 705, he was noted for his devotion to the Virgin Mary and for his energetic restoration of Roman churches. John did not recognize the decrees of the Council of Trullo (Constantinople, 692), submitted by the Byzantine emperor Justinian II, which included disapproval of such customs as celibacy of the clergy and rules for fasting.



John VII, mosaic; in St. Peter's, Rome
Alinari—Art Resource/EB Inc.

- **John** (fl. 9th century, Italy), antipope during January 844.

A Roman archdeacon well liked by the populace, he was elected by them on January 25 against the nobility's candidate, Sergius II. John withdrew to the Lateran Palace, his stronghold for a brief period. Concurrently, Sergius was consecrated pope at St. Peter's without imperial sanction. John was saved from being murdered by the noble faction through the intervention of Sergius, who then imprisoned him in a monastery. In the following June, Sergius was finally approved by the Frankish emperor Lothair I, and John's subsequent history is unknown.

- **John (VIII):** *see* Joan, Pope.

- **John VIII** (b. Rome—d. Dec. 16, 882, Rome), pope from 872 to 882.

He was a deacon of the Roman church when elected on Dec. 14, 872, to succeed Pope Adrian II. He supported Archbishop St. Methodius in the Christianization of the Slavs and sanctioned the use of the Slavic language for the liturgy. To unite southern Italy against invasions of the Saracens—Muslim enemies—John allied with the Frankish emperor Louis II. On Louis's death (875) John named and then crowned King Charles II the Bald of France as Western emperor. He supported Charles against the Saracens, but the resistance dissipated when Charles died.

Meanwhile, John was harassed by the cardinal bishop of Porto, Formosus (later pope), and his supporting faction. John deposed and excommunicated Formosus in 876.

John solved a controversy over orthodoxy between the Holy See and the East by recognizing in 879 the heretofore condemned Photius as patriarch of Constantinople. Between 875 and 881 he fortified Rome against the Saracens and founded a papal navy. In 881 he crowned the Frankish king Charles III the Fat as emperor. Throughout his pontificate, John was threatened by intrigues among his political enemies. He is said to have been murdered in a local conspiracy.

- **John IX** (b. Rome—d. January 900), pope from 898 to 900.

Consecrated in January 898, he was opposed by the rival candidate Sergius (later Pope Sergius III), whom he excommunicated. John immediately held councils at Rome and Ravenna to rehabilitate Pope Formosus, whose corpse had been exhumed (897) by Pope Stephen VI (VII) for a posthumous trial that declared his election as pope invalid. John's councils condemned Stephen's synod and destroyed its acts, restored the clergy deposed by Stephen and his faction, and confirmed the Constitutio Romana of the Frankish emperor Lothair I, thereby making compulsory the presence of an imperial emissary at papal elections.

- **John X** (b. Tossignano, near Imola, Romagna—d. May/June 928, Rome), pope from 914 to 928. He was archbishop of Ravenna (*c.* 905–914) when chosen to succeed Pope Lando *c.* March 914.

He approved the severe rule of the Benedictine order of Cluny, which had been founded by William I, duke of Aquitaine, in 909. To drive the Saracens (Muslim enemies) from southern Italy, John allied with the Byzantine emperor Constantine IV and King Berengar I of Italy. In August 915, with the Roman senator Theophylactus and Duke Alberic I of Spoleto, John's forces defeated the Saracens on the Garigliano River. In December 915 he crowned Berengar as Holy Roman emperor. When Berengar was assassinated in 924, John allied with King Hugh of Italy. This act enraged Theophylactus' daughter, Marozia, who was herself a powerful Roman senator; she ordered John imprisoned in Castel Sant'Angelo, Rome, where he was probably smothered to death.

- **John XI** (b. 910?, Rome—d. December 935/January 936, Rome), pope from 931 to *c.* 935.

He was the son of Marozia (dominant lady of the Roman Crescentii family) perhaps by her reputed lover, Pope Sergius III. John was con-

secrated in February/March 931. He served his mother's political ends until 932/933, when his half-brother Alberic II (Marozia's son by Duke Alberic I of Spoleto) deposed, arrested, and imprisoned her in Castel Sant'Angelo, Rome, and confined John to the Lateran. He remained a prisoner until his death.

• **John XII,** original name OTTAVIANO, English OCTAVIAN (b. 937?, Rome—d. May 14, 964), pope from 955 to 964.

He was the only son of Duke Alberic II of Spoleto, then ruler of Rome, who ordered Octavian's election (Dec. 16, 955) as pope when he was only about 18 years of age.

The young pope changed his name to John, and he crowned the German king Otto I the Great and his wife Adelaide as Holy Roman emperor and empress on Feb. 2, 962. But he rebelled when Otto issued his controversial *Privilegium Ottonianum* ("Ottonian Privilege"), which ordered John to take an oath of obedience to the Emperor. On Nov. 6, 963, Otto called a council at St. Peter's, Rome, which on Dec. 4, 963, deposed John for instigating an armed conspiracy against Otto and for dishonourable conduct. The council replaced John with Pope Leo VIII. In February 964, after Otto left, Leo was deposed by a synod conducted by John. Soon after, John died suddenly in the arms of his mistress.

• **John XIII** (b. Rome—d. Sept. 6, 972, Rome), pope from 965 to 972.

He was bishop of Narni, Papal States, when chosen pope on Oct. 1, 965, by Emperor Otto I. Although John was a pious and learned man, the Roman nobles opposed Otto's choice and kidnapped John (December 965). In 966 Otto saved him and took savage vengeance on his enemies. John crowned Otto's 12-year-old son Otto II as emperor (Christmas 967). Immediately before the Byzantine princess Theophano married Otto II (972), John crowned her as empress. John's alliance with the imperial family made his pontificate peaceful.

• **John XIV,** original name PIETRO CANEPANOVA (b. Pavia, Lombardy—d. Aug. 20, 984, Rome), pope from 983 to 984.

He was bishop of Pavia when chosen pope in November/December 983 by the Holy Roman emperor Otto II. His election was opposed by the powerful Roman Crescentii family, which supported Antipope Boniface VII. Boniface had been expelled by Otto but returned to Rome when Otto died (Dec. 7, 983). Aided by the Crescentii, he imprisoned John in the Castel Sant'Angelo, Rome, and presumably had him murdered, either by starvation or by poison. John's sole extant document is a letter to Archbishop Alo of Benevento, Italy, concerning church reform.

• **John (XV):** *see* John (XX) (Papacy).

• **John XV (or XVI)** (d. March 996, Rome), pope from 985 to 996, who carried out the first solemn canonization in history by papal decree.

His election, August 985, came during one of the darkest periods in papal history, shadowed by the murders of the popes Benedict VI and John XIV by the antipope Boniface VII. Boniface had been the candidate of the powerful Roman Crescentii family, and his sudden death in 985 consequently caused the family a political setback. Crescentius II's success in swaying John's election revived that family's good fortune. John's pontificate was thus dominated by Crescentius, except during the interpositions of Empress Theophano, the Holy Roman emperor Otto II's widow. Eventually John appealed to the German king Otto III, later Holy Roman emperor, against Crescentius but died before Otto could intervene. John's solemn canonization of Bishop St. Ulrich of Augsburg in 993 was the first recorded.

• **John XVI (or XVII),** original name GIOVANNI FILAGATO, Latin JOHANNES PHILAGATHUS (b. Rossano, Calabria—d. *c.* 1013), antipope from 997 to 998.

A monk whom the Holy Roman emperor Otto II named abbot of the monastery of Nonantola, Italy, he attained an influential position at the court of Otto's widow, the empress Theophano. In 988 Theophano made John bishop of Piacenza, Italy, later raising his see to an archbishopric. He was godfather of Theophano's son, the imperial prince Otto (III) and later king of Germany, who in 995 sent John to Constantinople as legate for his prospective marriage to a Byzantine princess. When Pope John XV died (March 996), Otto named his cousin Bruno (Gregory V) as the successor. The Crescentii, a powerful Roman family, opposed Otto's choice, and while he was in Germany, Crescentius II led a revolt that usurped Gregory's office. John returned from Constantinople, and Crescentius, planning to ally Rome with Byzantium against Otto, offered John the papacy. Over the protests of his friend Abbot St. Nilus of Rossano, John accepted. In 997 the exiled Gregory excommunicated Crescentius. Otto brought an army to Italy the following year, and a reign of terror ensued. Otto captured both Crescentius and John. Crescentius was beheaded on April 29, and John, after having been blinded and mutilated, was either imprisoned or confined to a monastery. His life was spared through the intercession of Nilus.

• **John XVII (or XVIII),** original name SICCO, or SECCO (b. Rome—d. Dec. 6, 1003), pope from June to December 1003. Chosen by the patrician John Crescentius III, he succeeded Pope Sylvester II. John was merely a puppet of the Crescentii, then the most influential family in Rome.

• **John XVIII (or XIX),** original name FASANO (b. Rome—d. June/July 1009, Rome), pope from 1004 to 1009.

Like his predecessor, Pope John XVII, his election was influenced by the Roman patrician John Crescentius III. He was consecrated in January 1004. More independent of the powerful Italian Crescentii family than John XVII, he eventually abdicated and died shortly thereafter at the Abbey of St. Paul Outside the Walls, Rome.

• **John XIX (or XX),** original name ROMANO, Latin ROMANUS (d. November/December 1032), pope from 1024 to 1032.

A member of the Tusculani family that followed the powerful Crescentii as rulers of Rome, he was a layman when he succeeded his brother Pope Benedict VIII in April/May 1024. On Easter 1027 he crowned as Holy Roman emperor the German king Conrad II, who controlled his ecclesiastical affairs except in Rome. Generally considered inept as pope because of his greed, John consented to be paid for recognizing the patriarch of Constantinople. A public outcry forced him to withdraw the agreement.

• **John (XX),** nonexistent pope. A confusion in the numbering of popes named John after John XIV resulted because Marianus Scotus and other 11th-century historians mistakenly believed that there had been a pope named John between antipope Boniface VII and the true John XV. Therefore they mistakenly numbered the real popes John XV to XIX as John XVI to XX. These popes have since customarily been renumbered XV to XIX, but John XXI and John XXII continue to bear numbers that they themselves formally adopted on the assumption that there had indeed been 20 Johns before them. In current numbering there thus exists no pope by the name of John XX.

• **John XXI,** original name PEDRO JULIÃO, byname PEDRO HISPANO (the Spaniard), Latin PETRUS JULIANI, or PETRUS HISPANUS (b. *c.* 1210–20, Lisbon—d. May 20, 1277, Viterbo, Papal States), pope from 1276 to 1277, one of the most scholarly pontiffs in papal history.

Educated at the University of Paris (*c.* 1228–35), where he received his master's degree *c.* 1240, John taught medicine at the new University of Siena, Italy. In 1272 Pope Gregory X, who made John his personal physician, appointed him archbishop of Braga and cardinal bishop of Tusculum in 1273 (consecrated 1274). After the five-week pontificate of Adrian V, John was elected on Sept. 8, 1276. He chose as his principal adviser Cardinal John Gaetan Orsini, who soon was to succeed him as Nicholas III. John's short pontificate strove for unity between Rome and the Eastern Church. In addition to his psychological treatise *De anima* ("On the Soul") and his commentary to Pseudo-Dionysius the Areopagite's *Celestial Hierarchy*, John wrote one of the most widely used medieval textbooks on logic, *Summulae logicales* ("Small Logical Sums"). One of his most important medical works was *Liber de oculo* ("Concerning the Eye"). He was crushed to death when the ceiling of the papal palace at Viterbo collapsed.

• **John XXII,** original name JACQUES DUÈSE, or D'EUZE (b. Cahors, Fr.—d. Dec. 4, 1334, Avignon), second Avignon pope (reigned 1316–34), who centralized church administration, condemned the Spiritual Franciscans, and, against Emperor Louis IV, upheld papal authority over imperial elections.

Born of a wealthy bourgeois family at Cahors in southwestern France, Jacques Duèse studied canon and civil law at Paris and Orléans. In 1309 he became chancellor to Charles II of Naples and was made a cardinal three years later. On Aug. 7, 1316, he was elected pope at Lyon succeeding Clement V, and proceeded to establish the papal court at Avignon on a permanent basis.



John XXII, contemporary silver coin; in the coin collection of the Vatican Library
Leonard von Matt—EB Inc.

Early in his pontificate, John intervened in a long-standing conflict between two factions in the Franciscan order—the Spirituals, who favoured strict adherence to St. Francis' rule of poverty, and the Conventuals, who held to a broader interpretation. He supported the Conventuals and persecuted Spirituals who resisted his decision. He later condemned the whole Franciscan theory of evangelical poverty in two decretals (letters): *Ad Conditorem Canonum* (1322) and *Cum Inter Nonnullos* (1323), asserting scriptural evidence to show that Christ and the Apostles had owned property.

John also intervened in a quarrel over the crown of the Holy Roman Empire between Louis the Bavarian (Emperor Louis IV) and Frederick of Austria. Louis defeated Frederick in 1322, but John forbade him to exercise

imperial authority until he, as pope, settled the dispute. Louis's answer was the Sachsenhausen Appellation (May 22, 1324), in which he denied papal authority over imperial elections and attacked John's condemnation of the Spiritual Franciscans. At the same time Louis received at his court the political philosophers Marsilius of Padua and John of Jandun, who, in their work *Defensor pacis* ("Defender of the Peace"), had declared the authority of an ecumenical council superior to that of the pope. John retaliated by excommunicating Louis, but, on April 18, 1328, the Emperor had John deposed at Rome. (His condemnation of the Spirituals was held to conflict with the pronouncement of Nicholas III.) The Franciscan Peter of Corbara (Pietro Rainalducci) was elected antipope as Nicholas V, and Michael of Cesena, general of the Franciscan order, appealed to the authority of a church council against John. John thereupon excommunicated Peter and deposed Michael. When Louis returned to Germany in 1329, Peter submitted to John and was subsequently imprisoned at Avignon. The Emperor attempted, without success, to effect a reconciliation with the Pope, and thereafter the Franciscans and their philosopher ally Marsilius continued to carry on a vigorous antipapal propaganda from the imperial court at Munich.

New accusations of heresy were provoked by John's ideas about the experience of God by the souls of the blessed in the afterlife (the Beatific Vision), which he expressed in four sermons delivered in the winter of 1331–32. Most theologians held that the saints in heaven were immediately admitted to a full vision of the Godhead. John disagreed, holding that the fullness of the Beatific Vision would be delayed until the resurrection of the dead and the Last Judgment at the end of the world. Thomas Wallensis, an English Dominican, was imprisoned for publicly disputing the Pope's position, which was subsequently condemned by a committee of doctors of the University of Paris. A pro-imperial cardinal, Napoleone Orsini, began secret negotiations with the Emperor for the convocation of an ecumenical council to judge John. John tried to reconcile his views with those of his opponents before his death in 1334.

During his pontificate, John had promoted missionary activity in Asia, establishing Catholic bishoprics in Anatolia, Armenia, Iran, and India. At Avignon he founded a papal library and at Cahors, a university. Like most of the Avignon popes, he showed favouritism to his relatives and fellow countrymen. Of 28 cardinals created by him, 20 were from southern France and 3 were his nephews. In appearance he was small, thin, and pale; in character, impetuous, astute, obstinate, and autocratic, though simple and approachable.

His most lasting achievements were in the sphere of law and finance. He added to the body of church law the canons (decrees) of his predecessor, Clement V, and many of his own canons were later added. These were the last additions to canon law until the 16th century. The papal treasury, greatly depleted at the time of his accession, was greatly increased when he died. By the bulls (solemn documents) *Execrabilis* (1317) and *Ex Debito* (1319), he increased papal control over the distribution of church offices and over the fees paid by their recipients. He also compiled a new tax book, fixing fees for 145 documents issued by the papal chancery, which was not revised for the next two centuries.

(D.L.D.)

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• **John (XXIII),** original name BALDASSARE COSSA (b. Naples—d. Nov. 22, 1419, Florence), schismatic antipope from 1410 to 1415.

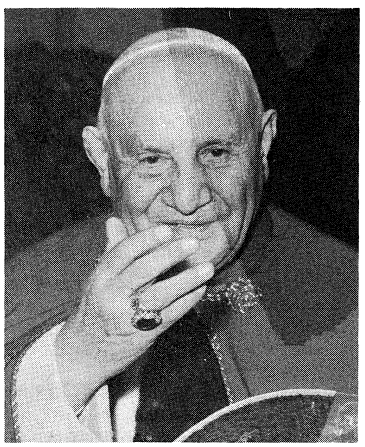
After receiving his doctorate of law at Bologna, Cossa entered the Curia during the Western Schism, when the papacy suffered from rival claimants (1378–1417) to the throne of St. Peter. Pope Boniface IX made him cardinal in 1402. From 1403 to 1408 he served as papal representative in Bologna. The Schism worsened with the hopeless deadlock between Pope Gregory XII and Antipope Benedict XIII; in 1408 Cossa deserted Gregory. In an attempt to save the church through unity and reform, the cardinals convened the invalid Council of Pisa (1409), at which Cossa was a leading figure. The council failed in its objectives, declared both Gregory and Benedict deposed, and elected a third rival, Antipope Alexander V. At the death of Alexander, in May 1410, he was succeeded on May 25 by Cossa as John XXIII.

Meanwhile, King Ladislas of Naples—whom Pope Innocent VII had named "defender" of the church—was occupying Rome and protecting Gregory. Ladislas' rival was Louis II of Anjou, pretender to Naples, who joined forces with John and entered Rome in April 1411. Although Ladislas was defeated on May 19, he soon reorganized his army and forced Louis to withdraw. John then abandoned Louis and in 1412 negotiated with Ladislas; in exchange for Ladislas' repudiation of Gregory, John granted Ladislas large sums of money and territorial concessions. In May/June 1413, however, Ladislas proved disloyal by sacking Rome and expelling John, who fled to Florence, where the German king Sigismund (later Holy Roman emperor) was working for a general council to end the Schism. Sigismund induced John to call the Council of Constance. Interpreting the negotiation between Sigismund and John as a threat to his position in Italy, Ladislas pursued the Pope—who was then en route to Constance while Sigismund was returning to his German kingdom—but died on Aug. 6, 1414.

The Council of Constance opened on Nov. 5, 1414. Although the majority of the council's members acknowledged the Council of Pisa and its candidate, John, political rivalries soon arose; the Italians endorsed John, but eventually the Germans, English, and French asked for the abdication of John, Gregory, and Benedict, thus ridding the Holy See of all three rival pontiffs. At first, John refused to abdicate, but on March 2, 1415, he agreed to resign if his rivals would do the same. Yet on March 20/21 he fled from Constance disguised as a layman, hoping to deprive the council of its authority and to cause its disintegration. Enraged by his desertion, the council pronounced itself supreme, ordered John's arrest and deposed him on May 29, 1415, received Gregory's resignation, condemned Benedict, elected Pope Martin V, and thus restored church unity. John was returned to Constance, where, despite his acceptance of Martin's election, he remained Sigismund's prisoner. In 1418 he was released for a heavy ransom. Martin made John cardinal-bishop of Tusculum in 1419, but John died a few months later.

Consult the INDEX *first*

• **John XXIII,** original name ANGELO GIUSEPPE RONCALLI (b. Nov. 25, 1881, Sotto il Monte, Italy—d. June 3, 1963, Rome), one of the most popular popes of all times (reigned 1958–63), who inaugurated a new era in the history of the Roman Catholic Church by his openness to change, shown especially in his convoking of the second Vatican Council. He wrote several socially important encyclicals (most notably *Pacem in Terris*).



John XXIII, 1963
Keystone

Early life and career. Angelo was one of 13 children born to Giovanni Roncalli, a tenant farmer of Sotto il Monte, a tiny village seven miles from the Lombard city of Bergamo. The Roncallis were poor but not nearly as destitute as some of the later legends would have had it. "We had the necessities of life," the Pope used to say testily, "and we were strong and healthy." Though Angelo, the third child and oldest son of the family, went off to prepare for the priesthood as a child of 11, he continued to spend vacations with the family and remained close to them throughout his life.

No matter how powerful he became, however, he never helped any of the other Roncallis to advance in the world. "The world is only interested in making money . . . ," he wrote to his brother Xaverio after he became pope. "A great honour has come to our family," he acknowledged, but he urged Xaverio and the others to remain humble, seek no honours or preferments, and take no material advantage of their relationship to the Pope. "At my own death," he concluded, "I shall not be denied the praise which did so much honour to the holiness of Pius X: born poor, he died poor." In his last will he bequeathed each of the living members of the family a legacy of less than $20—his total personal fortune.

Angelo, the churchman, however, was destined to spend most of his life among the powerful and cultivated. Inevitably, that set him apart from the other Roncallis almost from the beginning. While still a seminarian, he was already beginning to feel out of place in Sotto il Monte, where he was charged with priggishness and "putting on airs." "Only three days of the holidays have passed and already I am weary of them," he recorded in the diary that he allowed to be published after his death. He was eager, he wrote, to return to Bergamo, with its orderly life of study, prayer, and genteel fellowship, and to escape from the

petty gossip, suspicion, and jealousies of the village.

Roncalli was not an especially brilliant student. He did well enough, however, to be sent to Rome for theological studies in 1900. After only one year at the Seminario Romano, his education was interrupted when he was drafted into military service and assigned to an infantry company conveniently stationed at Bergamo. Later, as a priest, he returned to the army during World War I. Again he served in Bergamo, first as a hospital orderly and later as a military chaplain with the rank of lieutenant.

Even with the time out for military service, he was not yet 23 when he was ordained a priest, in Rome on Aug. 10, 1904. The next day he said his first mass at St. Peter's Basilica. After a visit to the family in Sotto il Monte, he returned to the Seminario Romano for further study. Eventually he received a doctorate in canon law.

As a graduate student in Rome, Roncalli took the first step that was to lead to the papacy a half century later. Simply because he was a priest of Bergamo, he was asked by the reigning pope, Pius X, to assist in the ceremony of consecration for a new bishop, Giacomo Radini-Tedeschi, who had been appointed to take over the diocese of Bergamo. The new bishop, a member of the Italian nobility, was much taken by the young priest and asked him to serve as his secretary.

Back in Bergamo, Don Angelo, in addition to his secretarial duties, was assigned to the faculty of the diocesan seminary. For the next nine years he served as a professor of theology and spiritual director of the young men preparing for ordination. As the Bishop's right-hand man, he gained a wide range of pastoral experience.

Roncalli had great esteem for his superior, who was known as the most progressive prelate in Italy. After the Bishop's death, in 1914, he wrote an appreciative biography of the prelate and sent a copy to the pope, Benedict XV, who had been one of Radini-Tedeschi's personal friends.

With the war behind him, Roncalli was summoned to wider service in the church. In 1920, Pope Benedict, recalling Radini-Tedeschi's biographer, named him a director of the Italian organization for the support of foreign missions. The position was not notably significant in a church top-heavy with dignitaries, but it brought him into personal contact with a number of important clerical figures throughout Europe, and his name became recognizable in ecclesiastical Rome. He also gained some attention because of his work as a part-time historian who specialized in some of the minor activities of St.Charles Borromeo, a cardinal of Milan who played an important role in the 16th-century Counter-Reformation. It was Roncalli's researches for this project that first brought him into contact with Msgr. Achille Ratti, the Milanese librarian who would become Pius XI.

Service as a Vatican diplomat. Pius XI later remembered the Bergamo priest's gift for personal dealings and brought him into the Vatican's diplomatic service. Roncalli was appointed apostolic visitor to Bulgaria in March 1925. In keeping with custom, he was made an archbishop before he left Rome. He spent the next 10 years in that obscure but delicate post, where he was expected to protect the interests of a small Roman Catholic community in a country overwhelmingly Eastern Orthodox. His diary reveals that he was often lonely and discouraged in Bulgaria, but he carried out the assignment with tact, patience, and notable good humour. Still, he was not deemed to be among the best qualified clerics in the papal diplomatic corps.

His next assignment was equally unpromising. He was appointed apostolic delegate to Greece, which was combined with naming him head of the Vatican diplomatic mission to Turkey. Again he was called upon to represent powerless Catholic minorities in an Eastern Orthodox nation, Greece, and a Muslim nation, Turkey. He made his home in Istanbul, where he was generally ignored by both the Turkish government and the Vatican but was warmly appreciated in the diplomatic colony as an amiable host and affable dinner companion.

None of these posts loomed large in the Western-oriented Vatican, and the Archbishop had good reason to believe that his career had reached a dead end. Later, he confessed that he was stunned by the announcement, at the end of 1944, that he had been named papal nuncio to Charles de Gaulle's newly liberated France; his first thought was that a clerical error must have been made in Rome.

The French post was particularly delicate at the time. Roncalli's predecessor, Msgr. Valerio Valeri, had been close to the collaborationist Gen. Philippe Pétain during the German occupation, and de Gaulle made it clear to the Vatican that, since Valeri had become persona non grata to the French people, he would have to be replaced immediately. France was still seething with a spirit of vengeance against former collaborators. It would be the new nuncio's obligation to deal with the ill will created by his predecessor and by the bishops who had cooperated with the hated Vichy government. Someone in the Vatican remembered the genial archbishop languishing in the Near East, and it was decided that, though he was not noted for his political astuteness, perhaps he had precisely the qualifications needed under the circumstances. Roncalli was told that he would be expected to cool the atmosphere, reestablish the independence of the church, and gain the release of a number of German seminarians who were being held as prisoners of war. In addition, he had to deal with an outburst of radicalism among the younger French clergy, which the conservative forces in the Vatican Curia found highly disturbing.

His success in carrying out the assignment was acknowledged by the papacy when Archbishop Roncalli was named a cardinal by Pius XII. In January 1953 the red hat, the symbol of a cardinal, was conferred on him by the Socialist president of France, Vincent Auriol.

Reign as pope. As a cardinal, Roncalli immediately became eligible for one of the major Italian archbishoprics. Appointed patriarch of Venice at the age of 71, he had cause once more to believe that he had reached the end of the line. Thus, perhaps no one was more surprised than he when, after the death of Pius XII on Oct. 9, 1958, he was elected pope on the 12th ballot—clearly a compromise candidate acceptable to all parties only because of his advanced years.

Perhaps a younger pontiff would have been less daring and innovative than John XXIII turned out to be. Soon after his coronation, he announced almost casually that he was summoning an ecumenical council—a general meeting of the bishops of the church—the first in almost a century. He said the idea came to him in a sudden inspiration. His purpose was to "bring the church up to date" (aggiornamento) and to work for its spiritual regeneration. He was the first pope since the Reformation who acknowledged frankly that Catholicism stood in need of reinvigoration and reform.

It was long a truism among church historians that councils are followed by upheaval and disorder in the church. The Pope's decision, consequently, was received coolly by his conservative Curia, who were convinced that the church had prospered under Pius XII's leadership and who saw no good reason for the changes John envisioned. Some of the Vatican cardinals in fact did everything in their power to delay the council until the old man had passed from the scene and the project could be quietly dropped. But the Pope pushed on with his plan and lived long enough to preside over the first session of the second Vatican Council in the fall of 1962.

In keeping with his wishes, the council fathers pledged that they would be consistently positive. No condemnations or anathemas were to be made; political hostilities were to be ignored; and the church above all was to recognize that it was not the master but the servant of humanity. The Pope made it clear that the second Vatican Council was convened as a pastoral council. No new dogmas were to be pronounced, though old doctrines and disciplines were to be reexamined. What John sought, he said, was a "New Pentecost," a new outpouring of the Holy Spirit.

The council, according to John's design, would make a new start toward achieving Christian unity by putting aside the hostilities of the past and acknowledging the Catholics' share of responsibility for the scandal of a divided Christianity. With his long experiences among the Eastern Orthodox, John's interest in Christian ecumenism seemed natural enough, but no one in Rome was quite prepared for the extent of his openness. He received Eastern Orthodox, Anglican, and Protestant religious leaders with extreme cordiality and made sure they were invited to send observers to the Vatican Council. He removed certain words offensive to Jews from the official liturgy of the church. On one notable occasion, he introduced himself to a group of Jewish visitors with the biblical words, "I am Joseph your brother," referring to the Old Testament story of the meeting of the sons of the patriarch Jacob at the court of Egypt.

He travelled around Rome freely, breaking with the tradition that the pope, deprived of his former temporal power, was a "prisoner of the Vatican." In an attempt to depoliticize the church, he played down his position as ruler of the Vatican and emphasized his role as "servant of the servants of God," a traditional title of the pope. In that spirit he called on the President of Italy and cordially received the son-in-law of the Soviet premier, Nikita Khrushchev, in private audience. Among his other visitors were the Archbishop of Canterbury—the first such meeting since the 14th century—the Moderator of the Scottish Kirk, and a Shintō (the religious cult of Japan) high priest—the first such official in history to be received at the Vatican.

During the Cuban missile crisis of 1962, the Pope publicly urged both the United States and the Soviet Union to exercise caution and restraint and won the appreciation of both Pres. John F. Kennedy and Premier Khrushchev. His major encyclical, *Pacem in Terris* ("Peace on Earth"), addressed to all mankind, was received warmly throughout the world and praised by politicians as well as churchmen. Straightforward and frankly optimistic, it avoided the language of diplomacy and set forth the requirements for world peace in profoundly human terms. Distinguishing between the philosophy of Marxism and actual governments to which it gave birth, John suggested that peaceful coexistence between the West and the Communist East was not only desirable but was actually necessary if mankind was to survive. He thereby diluted the religious energy that had been poured into the Cold War as a result of the militant policies shaped by his predecessor.

John saw himself as a reconciler. In statement after statement he emphasized the church's significance as a suprapolitical spiritual force in the world. His greatest claim on the world's affection, however, rested on the warmth of his personality rather than on any of his formal statements. He remained simple and

unaffected, in spite of the baroque setting in which he found himself, and instinctively appealed directly to human values that everyone could understand.

"Since you could not come to me, I came to you," he told the inmates of a Roman prison. When Mrs. John F. Kennedy, then wife of the President of the United States, came to call, he rehearsed "Mrs. Kennedy, Madame Kennedy" in his poor English. Then, when she appeared he spontaneously spread open his arms and cried out, "Jacqueline!" He once told a Communist diplomat, "I know you are an atheist, but won't you accept an old man's blessing?" When a shabby peasant woman reached up to touch him as he was being carried through St. Peter's, he stopped to clasp her hand. "There is no reason why you shouldn't get as close as the King of Jordan did," he said.

The roly-poly pontiff—he was short of stature and never overcame a tendency toward corpulence—gradually became a kind of father figure for the world. When he died in 1963, it was generally recognized that he had become one of the best loved men on Earth.

Assessment. There was nothing in the earlier life of Angelo Giuseppe Roncalli to suggest that his reign as pope would be anything other than the decorous, tradition-bound, static pontificate the Sacred College of Cardinals was counting on when it chose him as an "interim" pope—a *papa di passaggio*—in October 1958. His brilliant, strong-willed predecessor had shaped a defensive policy for dealing with the modern world that the cardinals thought would serve the needs of the church for another century, and they had every reason to believe, from his past behaviour, that the elderly Cardinal Roncalli would maintain the status quo for the few years he had to live. Then, according to the plan, the church would be turned over to a younger prelate who was cast in Pius XII's mold. As pope, however, Roncalli put into effect so many of the ideas he had entertained privately during a half century of obediently serving others that the church was never the same again.

Angelo Roncalli might have lived and died as an obscure parish priest had he been less of a conformist throughout all but the last few years of his life. The child of a peasant family, he began his career in the church with no connections of any significance and no powerful patron to guide him through the maze of ecclesiastical politics. His steady climb was due above all to his readiness to subdue his own preferences, follow orders, and adjust without complaint to the will of his superiors. Such was the clerical ideal proposed at his seminary in Bergamo, and it guided him throughout his life.

His successor, Paul VI, instituted formal proceedings that could lead to his canonization as a saint. Had the ancient custom of popular canonization still been in effect in 1963, however, that honour would probably have been given to him immediately by the tearful crowd who were gathered in St. Peter's Square when his death was announced. (Jo.C.)

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PATRIARCHATE

• John XI BECCHUS (b. *c.* 1235, Nicaea, Empire of Nicaea—d. March 1297, Nicomedia, Byzantine Empire), Greek Orthodox patriarch of Constantinople (1275–82) and leading Byzantine proponent of reunion between the Greek and Roman churches.

As archivist and assistant chancellor to Constantinople's anti-unionist patriarch Arsenius (1255–65), Becchus at first opposed union with Rome, taking the stand of his patriarch against that of the pro-unionist emperor Michael VIII Palaeologus. Eventually, however, he was won over by the Emperor and sent on several diplomatic missions, laying the groundwork for reunion. When Pope Gregory X convened preliminary councils to explore the advantages of an East–West union, however, Becchus once again opposed the project and as a result was imprisoned by Michael. During his captivity, he studied Greek and Latin theology as well as the sources of the East–West schism and thereafter strongly advocated the union, which was tentatively negotiated at the Council of Lyon in 1274.

With the abdication of the anti-unionist patriarch Joseph I, Becchus was named to the office in May 1275. As both Greek and Roman desire for reunion wavered, John's unwavering support met with vehement opposition from Orthodox monasteries and ultimately from the Emperor; he abdicated his patriarchal throne in 1279 and was later recalled when the Emperor again sought a reunion, this time for political reasons. With the death of Michael VIII and the accession of the anti-unionist Andronicus II Palaeologus to Byzantium's throne in 1282, relations with Rome broke down and Becchus resigned permanently.

While in exile, he wrote strong polemics against many anti-Latinist Orthodox theologians, particularly George of Cyprus, who had succeeded to the patriarchal throne as Gregory II. Although he was deported to the more remote area of Nicomedia because of these virulent attacks, Becchus refused to compromise, and his persistence helped bring about Gregory's deposition in 1289.

Among Becchus' principal works are his *Epigraphai* ("Collected Texts"), an anthology of patristic writings on the theology of the Holy Spirit; a tract on the peace and union of the ancient and new Roman Churches; and various polemical treatises proposing recognition of papal primacy.

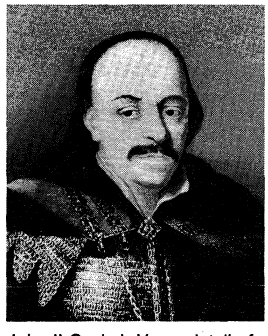
POLAND

• John I Albert, Polish JAN OLBRACHT (b. Dec. 27, 1459, Kraków, Pol.—d. June 17, 1501, Toruń), king of Poland and military leader whose reign marked the growth of Polish parliamentary government.

Second son of King Casimir IV of Poland and Elizabeth of Habsburg, John Albert proved his military ability by defeating the Tatars at Kopystrzyn in 1487 and at Zasław in 1491. After his father's death he was elected king of Poland by nobles in the privy council. Beset by financial problems, in 1493 he convened the privy council, which was henceforth called the senate, along with a new legislative body, the chamber of deputies, representing the *szlachta* (gentry) in the first national Sejm (Diet or Parliament). In return for subsidies he agreed to preserve traditional privileges of nobles and gentry and granted extensive legislative powers to the Sejm (Diet).

John Albert also tried to extend his power. Having purchased some lands and acquired others through diplomacy, he embarked on a campaign in Moldavia in 1497. Initiating the campaign in response to the hospodar Stephen the Great's request for aid against the Tatars, John Albert also hoped to capture the towns of Kilia and Belgorod (Akkerman) at the mouths of the Danube and Dnestr rivers. But Stephen, fearing the King's ambitions, suspected that he intended to depose him and put his own brother, the Polish prince Sigismund (later king as Sigismund I the Old), on the Moldavian throne. When the Polish forces entered Moldavia, they met fierce resistence from Stephen's army and suffered a heavy defeat at Suceava in 1497. From 1498 to 1501 the King was occupied with repelling Tatar attacks on Poland's eastern border. When he died, he was preparing to invade the Prussian lands of his recalcitrant vassal, Frederick of Saxony, grand master of the Teutonic Order.

• John II Casimir Vasa, Polish JAN KAZIMIERZ WAZA (b. March 22, 1609, Kraków, Pol.—d. Dec. 16, 1672, Nevers, Fr.), king of Poland (1648–68) and pretender to the Swedish throne whose reign was marked by heavy losses of Polish territory incurred in wars against the Ukrainians, Tatars, Swedes, and Russians.



John II Casimir Vasa, detail of an oil painting by Daniel Schultz; in the State Collection of Art in the Wawel, Kraków, Pol.

By courtesy of the Panstwowe Zbiory Sztuki na Wawelu, Krakow, Pol.

The second son of Sigismund III Vasa, king of Poland and (from 1594 to 1599) of Sweden, John Casimir fought on the Habsburg side against France, during the Thirty Years' War, from 1635 until, on his way to Spain to assume the office of admiral, he was arrested by the French and imprisoned for two years (1638–40). After his release he decided to forgo military life and became a Jesuit novice (1646), but he resigned his position a year later.

A few months after his brother King Władysław IV's death in May 1648, he was elected to the Polish throne and soon married Marie Louise de Gonzague-Nevers, his brother's widow.

John Casimir tried to end an insurrection of Poland's semi-autonomous Ukrainian Cossack subjects by negotiation but was forced to continue the war by Polish nobles who wished to increase their control over the Ukraine. He defeated the Cossacks and their Tatar allies at Beresteczko June 28–30, 1651, but the fighting began anew when the Cossacks submitted themselves to the Russian tsar in return for military aid. While the Polish army was fighting on the eastern border of Poland, the Swedish army invaded from the west and occupied most of the country by October 1655.

John Casimir fled abroad but returned in 1656, when Polish peasants and gentry rebelled against Swedish control. At the conclusion of the war with Sweden in 1660, he had to renounce his rights to the Swedish throne and to northern Livonia. In January 1667 Poland signed a truce with Russia whereby half of Belorussia (with Smolensk), Chernigov, and all of the Ukraine east of the Dneper River and Kiev, west of the river, were ceded to Russia.

Disgusted with external warfare and facing a rebellion by the Diet, the King abdicated (Sept. 16, 1668) and retired to France, where he served as titular abbot of Saint-Germain-des-Prés until his death in 1672.

• **John III Sobieski,** Polish JAN SOBIESKI (b. Aug. 17, 1629, Olesko, Pol.—d. June 17, 1696, Wilanów), elective king of Poland (1674–96), a soldier who drove back the Ottoman Turks and briefly restored the kingdom of Poland-Lithuania to greatness for the last time.



John III Sobieski, engraving by Carel Allardt

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

Early life and career. Sobieski's ancestors were of the lesser nobility, but one of his great-grandfathers was the famous grand-hetman (military commander) St. Żółkiewski, and, when John was born, his father, James (Jakób) (1588–1646), had already taken a step to the higher ranks, sharing an office on the royal court. At the end of his life, the father even became castellan of Kraków, an office that secured him the highest rank among the members of the Polish Senate, or first chamber of the parliament.

John was well educated and toured western Europe in his youth, as was usual for a Polish noble of his class. When the Swedes invaded Poland in 1655, he joined them in opposition to the Polish king John Casimir. The following year he changed sides again and became one of the leaders in the fight to expel the Swedes. In 1665, through the influence of his patroness, Queen Maria Louisa (Ludwika), he was appointed to the prestigious office of grand marshal. In 1666 he became field commander of the Polish army. In October 1667 he defeated the Tatars and the Cossacks near Podhajce (now Podgaytsy, in the Ukrainian S.S.R.), and in the spring of 1668, when he triumphantly returned to Warsaw, he was named commander in chief. In 1665 he had married an ambitious young French widow, Marie-Casimire de la Grange d'Arquien (Marysieńka). Marysieńka planned to have John elected king after King John Casimir's resignation in 1668. When this plan failed—the nobility elected Michael Wiśniowiecki in 1669—she began working to obtain support from Louis XIV of France for her husband's advancement. Since they were often separated—the husband on the front, his wife on journeys to France—Sobieski wrote long letters to Marysieńka, which are now a highly interesting and important historical source. Her letters have not been preserved.

During the short reign of King Michael (1669–73), Sobieski distinguished himself by further victories over the Cossacks, and simultaneously he tried to undermine Michael, whose policies favoured the Habsburgs against France. Michael died in November 1673, and almost on the same day Sobieski won a splendid victory over the Turks under Hussein Paşa near Chocim (Hoţin). Although this victory did not alter the disastrous conditions of the Peace of Buczacz concluded in 1672 (Poland had to cede territory to the Turks and to pay a considerable indemnity), Sobieski's reputation was so great that in May 1674 he was elected king in preference to the candidate backed by the Habsburgs.

At first Sobieski followed a pro-French policy. He tried to end the Turkish war by French mediation and concluded the secret Treaty of Jaworów with France (June 1675), in which he promised to fight the Holy Roman (Habsburg) emperor after the conclusion of peace with the Turks. In fact, only an armistice with them was concluded at Żórawno (October 1676), and the conditions were only slightly more favourable than those of Buczacz.

Sobieski's hopes of compensating for losses to the Turks in the southeast by using French and Swedish support to make territorial gains from Prussia in the northwest were also disappointed. Furthermore, Louis XIV was neither ready to recognize Marysieńka's French relatives as members of a royal family nor willing to support the succession of Sobieski's son James (Jakób) to the Polish throne. The great nobles, especially those from Lithuania, were opposed to the French alliance because they feared that Sobieski was striving to attain absolute power with the help of France. It was becoming clear, moreover, that it was impossible to reconcile the interests of Poland and those of Louis, whose aim was to use Sobieski as an obedient vassal against the Habsburgs. Poland, for its part, had no differences with the Habsburgs and, after a series of Turkish attacks, came to regard the Ottomans, the allies of France, as its deadliest enemies.

The siege of Vienna. Sobieski, therefore, though always an admirer of France, shifted away from the French alliance and concluded a treaty with the Holy Roman emperor Leopold I against the Turks (April 1, 1683). By the terms of the treaty, each ally had to support the other with all his might if the other's capital were to be besieged. Thus, when a great Turkish army approached Vienna late in the summer of 1683, Sobieski himself rushed there with about 25,000 men. Because he had the highest rank of all military leaders gathered to relieve Vienna, he took command of the entire relief force (about 75,000 men) and achieved a brilliant victory over the Turks at the Kahlenberg (Sept. 12, 1683), in one of the decisive battles of European history.

In the campaign that followed in Hungary (in the autumn of 1683), however, Sobieski was less successful, and his relations with the emperor Leopold deteriorated because of differences in temperament and conflicting political plans. Sobieski's idea was to liberate Moldavia and Walachia (present-day Romania) from Ottoman rule and to expand Poland's influence to the shores of the Black Sea. But his advances into Moldavia, undertaken between 1684 and 1691, were mostly failures, and during the last one he was even in danger of being captured. Despite his previous victories, he was thus not able to achieve his objective. Only in 1699, three years after his death, were the territories that had been lost in 1672 recovered.

In the last years of his life, from 1691 until his death in 1696, Sobieski was often seriously ill and had to face quarrels with the nobles and within his own family. His eldest son, James, was bitterly opposed to the Queen and the younger princes. All of Sobieski's sons were interested in succeeding to the throne and tried to obtain help, either from the Emperor or from France. The marriage of Sobieski's daughter Kunegunda to Maximilian II Emanuel, elector of Bavaria (1694), was the only bright spot in these rather gloomy years.

Although the second half of the reign was much less brilliant than the first, the personal wealth of the royal couple continued to grow because they knew how to obtain money in exchange for offices and favour. Thus, the King left a considerable fortune when he died.

Sobieski also spent large sums on his residences in Żółkiew and Jaworów and especially on the palace of Wilanów near Warsaw, a fine example of Baroque architecture. He was also a patron of poets and painters. Of all the Polish rulers of the 17th century, he was the best educated and took the greatest interest in literature and cultural life.

The struggle against Ottoman power in Europe was the keystone of Sobieski's foreign policy, with which all other foreign relations were closely connected. When the Russians, traditionally Poland's enemies, showed willingness to join the league against the Turks, Sobieski concluded with them the "Eternal" Peace of 1686 (the Grzymułtowski Peace). In this treaty, Kiev, which had been under temporary Russian rule since 1667, was permanently ceded by Poland. But despite all the failures and disappointments he experienced after 1683, Sobieski was able to deliver southeastern Poland from the threat of Ottoman and Tatar attack.

In domestic policy Sobieski was least successful. All his endeavours to strengthen the position of the crown and stabilize the army failed completely, and his own sons opposed him. The nobles showed little interest in defending the country after the great victory of 1683 had been won, and the Lithuanian magnates fought each other rather than the Turks. Thus, John Sobieski, although a brilliant general and organizer, was unable to prevent rebellion in his family and the dissension among his subjects that finally led to Poland's downfall in the 18th century. This tends to make him, in the final reckoning, a somewhat tragic figure.

(G.K.S.R.)

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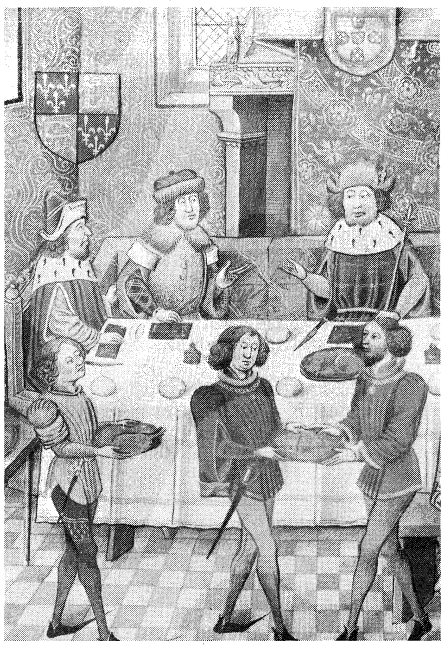
PORTUGAL

• **John I,** byname THE PRINCE OF FOND MEMORY, or JOHN OF AVIZ, JOHN THE GREAT, or JOHN THE BASTARD, Portuguese O PRINCIPE DE BOA MEMÓRIA, or JOÃO DE AVIZ, JOÃO O GRANDE, or JOÃO O BASTARDO (b. April 11, 1357, Lisbon—d. Aug. 14, 1433, Lisbon), king of Portugal from 1385 to 1433, who preserved his country's independence from Castile and initiated Portugal's overseas expansion. He was the founder of the Aviz, or Joanina (Johannine), dynasty.

Early life. John was the illegitimate son of King Pedro I and Teresa Lourenço. At age six he was made master of the military Order of Aviz; he received an ecclesiastical and military education, probably at Aviz in Alentejo. On his father's death, in 1367, his half-brother Ferdinand became king and embarked on a calamitous rivalry with the new ruler of Castile, Henry II, who finally forced Ferdinand to accept a Castilian marriage for his infant heiress, Beatriz, thus compromising the future independence of Portugal.

When Ferdinand died, in 1383, his widow, Queen Leonor, submitted to the demand of her Castilian son-in-law, John I, that he be recognized as king of Portugal. John of Aviz, who had hitherto remained carefully in the background, though he had been arrested for a time in 1382, was now persuaded by a group of young nationalists, led by Nuno Álvares Pereira, to murder Queen Leonor's favourite and adviser, the Galician João Fernandes Andeiro, conde de Ourém. Popular support was

at once stirred up for John, and Queen Leonor fled from Lisbon, appealing to Castile for help. In May 1384 Castilian armies besieged John in Lisbon until the outbreak of plague forced them to withdraw (September).



John I (right) entertaining John of Gaunt (on his right), miniature from a late 15th-century manuscript by Jehan de Wavrin, published as *Anchiennes Croniques d'Engelterre*, 3 vol. (1858–63); in the British Library (Royal MS. 14 E.iv)

By courtesy of the trustees of the British Library

Election as king. John had been named defender of the realm; but in April 1385 representatives of the three estates met in the Cortes (assembly) of Coimbra, and, after it had been demonstrated that King Pedro's elder surviving sons had not been legitimized, John was elected king. The cities of Lisbon and Porto and the merchants and trade guilds enthusiastically backed him, but much of the older nobility still favoured the Castilian succession. John and Nuno Álvares, now his constable, marched northward and obtained the submission of the chief places but returned on hearing that the Castilians were preparing a major invasion. As Spanish forces entered central Portugal, John and Nuno Álvares advanced to bar the road to Lisbon and won the famous Battle of Aljubarrota (Aug. 14, 1385). This victory assured Portugal's independence and made John a desirable ally. He had already received some English aid, and a small party of English archers had fought for him at Aljubarrota; and he now concluded the Treaty of Windsor (May 9, 1386), which became the cornerstone of the Anglo-Portuguese alliance. In consequence, John of Gaunt, duke of Lancaster, arrived in Galicia hoping, through his second marriage (1371), with the daughter of King Pedro I of Castile, to realize his claim to the Castilian crown. John of Aviz sealed the alliance by marrying, in February 1387, Lancaster's daughter, Philippa. A joint invasion of León was unsuccessful, and Lancaster withdrew. John of Aviz made a 10-year truce with Castile in 1389, but frontier warfare with Castile was intermittent thereafter until peace was finally made in 1411.

Consolidation and expansion. John's elder sons had now reached the age at which they could become knights, and it was ostensibly on their behalf that he organized an expedition against Ceuta, which fell in a day (Aug. 24, 1415). He had probably hoped to advance into Morocco and tap the African caravan routes, but, instead, Ceuta became a beleaguered outpost supplied from the Portuguese Algarve. This stimulated the maritime explorations, beginning with the rediscovery and settlement of the Madeira Islands and the Azores.

John's court now became a centre of culture, influenced through Queen Philippa by English traditions. Of their sons, the *inclita geração* ("illustrious generation"), the eldest, Edward, administered the kingdom under his father and was later king; the second, Pedro, travelled through Europe and was regent after Edward's death; and the third, Henry, known as the Navigator, was the patron and organizer of the overseas discoveries. For them, John introduced the title of duke into Portugal. Their sister, Isabel, married Philip the Good, duke of Burgundy and count of Flanders, thus consolidating Portuguese interests in the Low Countries. John's bastard son, Afonso, married the daughter of the constable Nuno Álvares, and their descendants, the House of Bragança, became kings of Portugal from 1640.

John's long struggle with Castile and the need to recompense a new aristocracy caused serious financial difficulties, but he rallied his people around his throne and acquired a reputation as a cautious leader and shrewd statesman. He rewarded the faithful trade guilds by granting them permanent representation in the House of Twenty-four, in which two members of each of the 12 major guilds were to sit. He also granted them a special magistrate, the judge of the people. At Porto he ended the unpopular civil jurisdiction exercised over the city by the bishop. He displayed his devotion by building near Leiria the great Abbey of Batalha to commemorate his victory and serve as a pantheon. He was the author of a work on hunting (*Livro da montaria*), his favourite pastime.

There is a portrait of John in the Museum of Ancient Art, Lisbon, and recumbent statues of John and Philippa over their tomb at Batalha. (H.V.L.)

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• John II, byname THE PERFECT PRINCE, Portuguese O PRINCIPE PERFEITO (b. 1455, Lisbon—d. October 1495, Alvor, Port.), king of Portugal from 1481 to 1495, regarded as one of the greatest Portuguese rulers, chiefly because of his ruthless assertion of royal authority over the great nobles and his resumption of the exploration of Africa and the quest for India.

Early life. John was the great-grandson of the founder of the House of Aviz, John I, and only surviving son of Afonso V by his queen and cousin, Isabella. He was educated by the humanists of the court and was married to his cousin Leonor in 1471. He participated in his father's conquest of Arzila in Morocco, where he was knighted, and was given a separate household at Beja in southern Portugal. In 1474 his father entrusted him with the "trade of Guinea" and the African explorations. When Afonso V claimed the Castilian throne in opposition to Isabella I, plunging Portugal into war, he appointed John his regent (April 1475). The Prince mobilized an army and marched to support his father, but the Battle of Toro (March 1476) checked the Portuguese intrusion into Castile. Afonso V departed for France in a fruitless search for an alliance, while John defended the frontier and parried a Spanish counterattack. Afonso's lack of success caused him to announce his abdication. John was proclaimed king, but his father returned and resumed his reign, concluding the disadvantageous Treaty of Alcáçovas before his death in August 1481.

Assertion of power. At John II's accession, this peace treaty had obliged him to place his young children under Spanish guardianship near the frontier as a pledge of their marriage to Castilians. Afonso had been limited in authority by the ambitious House of Bragança, the wealthiest family in Portugal. John summoned the Cortes (assembly) at Évora (November 1481) and imposed a drastic oath of obedience on his vassals. He also reasserted the *beneplacet,* requiring papal letters to be submitted to him before publication. He successfully negotiated a revision of the treaty with Spain, by which his children were restored to him. He then accused the Duke of Bragança of treason and had him tried and beheaded at Évora (June 1483). Although evidence was produced that the Braganças had intrigued with Castile, it seems clear that John sought vengeance for their having caused the death of his maternal grandfather, the regent Dom Pedro. He confiscated the Braganças' vast estates and appointed royal judges in what had been private jurisdictions of the nobility. When a second conspiracy sought to remove him and bestow the crown on his wife's brother the Duke of Viseu, John killed his rival with his own hand (August 1484).

African exploration. In Africa Afonso V had preferred crusading in Morocco to trade and discovery of the west coast. John II himself never returned to Africa after Arzila but supported the development of commerce and exploration.

In December 1481 he sent Diogo de Azambuja to build the fortress of St. George at Mina (the "gold mine"), near Benin, a powerful native kingdom in the territory of modern Nigeria. Gold currency had been restored by his father, and the new trade now doubled the royal revenues, and in 1485 John assumed the title of lord of Guinea. He had already sent Diogo Cão to search for the seaway to India, and Cão had discovered the Congo. Christopher Columbus tried to interest him in his plan to reach India by a western route. John rejected this but licensed Fernão Dulmo to search for new islands, apparently without result. In 1485 he sent Cão on a second voyage that reached southwestern Africa but failed to find the Cape. When in 1486 merchants in Benin heard news of a native potentate far to the east who was thought to be the legendary Christian ruler Prester John, the King sent Pero da Covilhã and Afonso Paiva to visit India and Ethiopia by an overland route. He also sent Bartolomeu Dias to take over Cão's task of finding the southern extremity of Africa; Dias' return in December 1488 demonstrated that Africa could be rounded and India reached by sea, but it was only after John's death that Vasco da Gama's successful expedition to India was launched. In 1490 a mission was sent to consolidate relations with the kingdom of Congo. In 1493 Columbus arrived in Lisbon with tidings of, as he supposed, islands off Asia, and the Pope awarded these discoveries to the Spanish crown. But John II protested and began negotiations leading to the celebrated Treaty of Tordesillas (June 1494), which gave to Spain all lands west of a line 370 leagues to the west of the Cape Verde Islands. This line, however, reserved Brazil (still apparently unknown) for Portugal.

John had previously negotiated with the papacy, ceding the *beneplacet* but retaining the right to have ecclesiastical cases settled in Portugal and obtaining permission for a crusade

against the Moors. He sent a minor expedition against Anafé and obtained tribute from Safi and Azemmour in Morocco, but in 1489 his attempt to build a fortress at the mouth of the Loukkos was prevented by the ruler of Fez.

When in May 1492 Ferdinand and Isabella of Spain decided to expel the Jewish population, John received a delegation of Spanish Jews who offered 60,000 cruzados for the permanent admission of 600 wealthy families to Portugal, together with a fee of eight cruzados a head for the temporary admission of others, who would be allowed to remain eight months, after which John would supply ships for them to leave. In fact, ships were provided only for Tangier and Arzila; some Jewish children were sent to settle the island of São Tomé.

John's son Afonso was married to the eldest daughter of the Spanish rulers, but soon thereafter the Prince was thrown from a horse and killed (July 1491). John was deeply affected. He thought of legitimizing his other son Jorge but had already promised the succession to his wife's surviving brother, Manuel. He suffered a long illness and died in 1495 at the small castle of Alvor in the province of Algarve. John's exercise of personal power, particularly against the nobles, explains the epithet the Perfect Prince, which owes its origin to Lope de Vega's play about him. (H.V.L.)

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• **John III,** byname JOHN THE PIOUS, Portuguese JOÃO O PIEDOSO (b. June 6, 1502, Lisbon—d. June 11, 1557, Lisbon), king of Portugal from 1521 to 1557. His long reign saw the development of Portuguese seapower in the Indian Ocean, the occupation of the Brazilian coast, and the establishment of the Portuguese Inquisition and of the Society of Jesus.

Shortly after succeeding his father, Manuel I, John married Catherine, sister of Charles V, Holy Roman Emperor and king of Spain, while Charles married John's sister Isabella. These marriages paved the way for the succession of Philip II of Spain to the Portuguese throne in 1580. By the Treaty of Madrid (1529), Portugal secured the Moluccas, or Spice Islands, recognizing Spain's claim to the Philippines; this complemented the Treaty of Tordesillas dividing the New World between the peninsular powers. In 1533 John promoted Portuguese settlement in Brazil and in 1549 set up a central government at Bahia. In India the Portuguese conquered the city of Diu (1535), and they established trade with Siam and a settlement at Macau (Macao) in China. In North Africa John III relinquished some of the costly coastal fortresses, recognizing that Portuguese interests demanded reduction of its commitments.

John III retained control of the spice trade, but profits declined and costs increased, as did the number of court pensioners and the indebtedness of the state.

Though at first favourable to Erasmus, John imposed religious orthodoxy, instituting the Inquisition in 1536. He entrusted the Jesuits with control of the College of Arts of the University of Coimbra, and they remained dominant in Portuguese education and in missionary work in Brazil and the Orient.

John III's heir, also John, died in 1554. His grandson Sebastian, born in 1554, succeeded him in 1557 under the regency of his widow, the Spanish queen Catherine.

• **John IV,** also called (1630–40) JOÃO, 8º DUQUE (8th duke) DE BRAGANÇA, byname JOHN THE FORTUNATE, Portuguese JOÃO O AFORTUNADO (b. March 18/19, 1604, Vila Viçosa, Port.—d. Nov. 6, 1656, Lisbon), king of Portugal from 1640 as a result of the national revolution, or restoration, which ended 60 years of Spanish rule. He founded the dynasty of Bragança (Braganza), beat off Spanish attacks, and established a system of alliances.

John, duke of Bragança, the wealthiest nobleman in Portugal, married Luisa de Guzmán, daughter of the Spanish duke of Medina Sidonia. The Bragança duchy, founded in 1461, was a collateral of the extinct royal House of Aviz; and, when the restorers of independence overthrew the Spanish governor on Dec. 1, 1640, they offered John the crown. On December 15 he was enthroned as John IV. Supported by the Cortes, the national assembly, he entrusted each province with its own defense and sent missions to seek recognition from France, England, and the Netherlands. His alliance with the English Stuarts (1642) was frustrated by the English Civil Wars, but in 1654 John made a new treaty with the English Commonwealth, which gained him military aid in return for trading privileges. The Dutch, already in possession of Pernambuco in northeastern Brazil, seized Angola but were expelled from both, while retaining their conquests in the East Indies. The Spanish were defeated at Montijo (May 26, 1644) and were blocked from further invasion.

John IV and his Queen Leonor governed through a royal council and a committee of the Cortes, the Board of Three Estates, and instituted the Overseas Council. He survived attempts at assassination and Spanish attempts to influence the Vatican to isolate the Portuguese church. John was a notable composer.

At John's death his wife became regent for their son Afonso VI (ruled 1656–83). His daughter Catherine of Braganza married Charles II of England in 1662.

• **John V** (b. Oct. 22, 1689, Lisbon—d. July 31, 1750, Lisbon), king of Portugal from 1706 to 1750, whose relatively peaceful reign saw an increase in the wealth and power of the crown and a generous patronage of learning, culture, and the church.

John inherited Portugal's involvement in the War of the Spanish Succession (1701–14) from his father, Peter II (1683–1706), but peace was finally made with France (1713) and Spain (1715). For the remainder of John's long reign, except for a brief campaign against the Turks, the country remained at peace. The great wealth derived from the gold and diamonds of Brazil, Portugal's colony, freed him from financial dependence on the Cortes, the national assembly, and increased the already substantial power of the crown.

Although John attempted to restore the navy and stimulated industry and building, his administration was not noted for its vigour. His great wealth enabled him to emulate the magnificence of other European courts. In addition, he endowed libraries, encouraged scholarship, patronized the arts, and founded a Royal Academy of History (1720), as well as museums of natural history and architecture. He spent lavish sums on the church and sought to enhance the ecclesiastical status of his court, though his efforts involved him in a lengthy dispute with the papacy.

In his later years John suffered from ill health and the government became dominated by churchmen whose incompetence resulted in neglect of the country's affairs. John was succeeded by his son Joseph.

• **John VI** (b. May 13, 1767, Lisbon—d. March 10, 1826, Lisbon), prince regent of Portugal from 1799 to 1816, and king from 1816 to 1826, whose reign saw the revolutionary struggle in France, the Napoleonic invasion of Portugal (during which he established his court in Brazil), and the implantation of representative government in both Portugal and Brazil.

John was the younger son of Queen Maria I, becoming heir on the death of his elder brother and taking power in 1792 as a result of the mental illness of his mother. In 1799 her illness was declared incurable, and he assumed the title of prince regent, which he used until her death in March 1816. John married Carlota Joaquina, eldest daughter of Charles IV of Spain, and supported Spain against the French Republic. But Spain made peace at Basel in 1795 and served as a vehicle for French pressure on Portugal. In 1801 Spain finally invaded Portugal, though peace was made at Badajoz. In 1807, after his victories in central Europe, Napoleon proclaimed his European blockade, threatening to close the port of Lisbon. As French troops crossed Spain and approached Lisbon, the royal family retired to Brazil with the government (November 1807). Britain guaranteed the throne of the Braganças and in 1808 sent an army to Portugal under Arthur Wellesley (later duke of Wellington), which forced the surrender of the French. John gave full military support to Wellesley, and two French invasions were repelled. After Napoleon's surrender in 1814, John was expected to return; but, on Napoleon's escape from Elba, John returned to Brazil, which he made a united kingdom with Portugal. On March 20, 1816, his mother died, and he became king.

His annexation of Montevideo led to a conflict with Spain, and his stay in Brazil made the Portuguese impatient for reform. In 1820 the radical revolution in Spain spread to Portugal, and he finally agreed to leave Brazil and to sanction a liberal constitution, leaving his heir Peter (Pedro) in Rio de Janeiro. He accepted radical reform limiting his powers, but the liberals precipitated the separation of Brazil, of which his son was declared emperor. When the French intervened to suppress radicalism in Spain (1823), the Portuguese radicals were discredited and overthrown. John VI was restored to his authority but promised a constitution. The absolutists supported his queen, Carlota Joaquina, and made their son Michael (Miguel) commander-in-chief. John attempted to steer a middle course, separating from his wife and sending Michael into exile.

John then negotiated with Peter in Brazil, using the services of a British diplomat, Sir Charles Stuart. He reluctantly accepted the political separation of Brazil in 1825, dying soon after. He supported his favourite daughter, Maria Isabel, as regent, pending the decision of Peter, who attempted to resolve the dynastic and political problem by abdicating the crown of Portugal in favour of his daughter, Maria II, and bestowing his own constitution on Portugal.

RUSSIA

• **John I–VI:** *see* Ivan I–VI *under* Ivan (Russia).

SAXONY

• **John,** byname JOHN THE STEADFAST, German JOHANN DER BESTÄNDIGE (b. June 30, 1468, Meissen, near Dresden, Saxony—d. Aug. 16, 1532, Schweinitz, near Wittenberg, Wittenberg), elector of Saxony and a fervent supporter of Martin Luther; he took a leading part in forming alliances among Germany's Protestant princes against the Habsburg emperors' attempts at forced reconversion.

After his father's death in 1486, John ruled the lands of the Ernestine branch of the Wettin dynasty of Saxony jointly with his older brother Frederick III the Wise, succeeding his brother as elector in 1525. A firm Lutheran, John immediately created the League of Gotha with Philip the Magnanimous, landgrave of Hesse, and shortly thereafter, the Torgau

League with Germany's northern princes. For the first time, German Lutheran rulers were united in a firm alliance. He was leader of the church reformers at the Diet of Speyer (1526) and obtained concessions on the religious question from the emperor Charles V. When these concessions were rescinded at the next diet in 1529, John became one of the original Protestants by signing the minority protest. He accepted the Lutheran Augsburg Confession (1530) and in the winter of 1530–31 was one of the key figures in the formation of the Schmalkaldic League to protect Protestant interests. Charles V, who needed the reformers' aid against the Turks, consequently agreed to the religious Peace of Nürnberg (1532). At the time of John's death, electoral Saxony, staunchly Lutheran, had become the leading Protestant state in Germany.

• **John** (b. Dec. 12, 1801, Dresden, Saxony—d. Oct. 29, 1873, Pillnitz, near Dresden), king of Saxony (1854–73) who was passionately interested in law and in the arts. Under the name Philalethes he published a translation of Dante's *Divine Comedy* (1839–49).

John took part in the commission that drew up the constitution of 1831 and succeeded to the throne upon the death of his brother, King Frederick Augustus II. He was persuaded by his minister, Friedrich von Beust, to support Austria against Prussia in the Seven Weeks' War (1866). After Austria's defeat, however, he dismissed Beust and supported Bismarck's North German Confederation. During the Franco-German War (1870–71) Saxony supported Prussia.

Scotland

• **John,** also called JOHN DE BALLIOL, or BALIOL (b. *c.* 1250—d. April 1313, Château Galliard, Normandy, Fr.), king of Scotland from 1292 to 1296, the youngest son of John de Balliol and his wife Dervorguilla, daughter and heiress of the lord of Galloway.

His brothers dying childless, he inherited the Balliol lands in England and France in 1278 and succeeded to Galloway in 1290. In that year, when the heiress to the kingdom of Scotland, Margaret, the Maid of Norway, died, Balliol became one of 13 competitors for the crown. He at once designated himself "heir of the kingdom of Scotland," clearly anticipating the vindication of his claim, which was derived from his mother, daughter of Margaret, eldest daughter of David, earl of Huntingdon, brother to kings Malcolm IV and William I the Lion. His chief rival was Robert de Bruce (grandfather of King Robert I).

The English king Edward I met the Scottish baronage at Norham in Northumberland and insisted that as adjudicator between the claimants he should be recognized as overlord of Scotland. His court of 104 persons discussed the rival titles for more than a year, but Balliol's simple claim by primogeniture ultimately prevailed. Edward I confirmed the decision on Nov. 17, 1292, and Balliol was enthroned at Scone on November 30, doing homage to Edward at Newcastle on December 26. John, however, soon proved rebellious; and when in June 1294 Edward demanded military aid from Scotland for his projected war in Gascony, the Scottish reaction was to conclude a treaty of mutual aid with the French. When Edward I sent an army to Gascony in January 1296, the Scots raided northern England. Edward reacted quickly; he took Berwick on March 30. Castle after castle fell to the English king, and at Montrose, John resigned his kingdom to Edward. He was stripped of his arms and knightly dignity in a ceremony which later earned him the nickname "Toom (empty) Tabard." John was a prisoner in the Tower of London until July 1299, when papal intervention secured his release. Thereafter, he lived in Normandy.

Spain: Aragon

• **John I** (b. Dec. 27, 1350—d. May 16, 1395), king of Aragon (1387–1395), son of Peter IV. Influenced by his wife, Yolande, he pursued a pro-French policy but refused to become involved in the Hundred Years' War. He died by a fall from his horse, like his namesake, cousin, and contemporary of Castile, John I. He was a man of insignificant character, with a taste for artificial verse.

• **John II** (b. 1398 Medina del Campo, Leon—d. 1479, Barcelona), king of Aragon (1458–79) and also king of Navarre (1425–79); he was the instigator of the union of Castile and Aragon through the historic marriage of his son Ferdinand with Isabella of Castile.

John was a younger son of Ferdinand of Antequera, elected king of Aragon (as Ferdinand I) in 1412. John and his brothers retained their positions and revenues in Castile, and he married Blanche, the heiress to Navarre, of which he claimed the kingship (1425–79). On his wife's death, he married Juana Enriques, daughter of the admiral of castile (1447), whose ambitions led to a conflict between John and his eldest son by his first marriage, Charles, prince of Viana.

In 1458 John succeeded his elder brother Alfonso V as king of Aragon, with Sicily and Sardinia. He was blamed for the mysterious death of his son Charles, who had a strong following in Catalonia, where John's policies were deeply resented. The Catalans offered the crown to Peter of Portugal, who died, after which they appealed to the French for aid. In October 1469 John arranged for his son by his second marriage, Ferdinand, to marry Isabella, the recognized heiress to Castile, despite the opposition of her brother, Henry IV of Castile. This marriage led to the union of Castile and Aragon and the creation of the modern state of Spain. In Aragon, John's rule deepened the rift between Aragon proper and Catalonia.

Spain: Castile

• **John I** (b. Aug. 20, 1358, Épila, Castile—d. Oct. 9, 1390, Alcalá de Henares), king of Castile from 1379 to 1390, son of Henry II, founder of the dynasty of Trastámara.

In the beginning of his reign John had to contend with the hostility of John of Gaunt, who claimed the crown by right of his wife Constance, daughter of Peter I the Cruel. The king of Castile finally bought off the claim of his English competitor by arranging a marriage between his son Henry and Catherine, daughter of John of Gaunt, in 1387. Before this date he had been engaged in hostilities with Portugal, which was in alliance with John of Gaunt. His first quarrel with Portugal was settled by his marriage, in 1382, with Beatriz, daughter of the Portuguese king Ferdinand. On the death of his father-in-law in 1383, John endeavoured to enforce the claims of his wife, Ferdinand's only child, to the crown of Portugal. He was resisted by the national sentiment of the people and was utterly defeated at the Battle of Aljubarrota (Aug. 14, 1385).

King John was killed at Alcalá five years later by the fall of his horse, while he was riding in a fantasia with some of the light horsemen known as the *farfanes,* who were mounted and equipped in the Arab style.

• **John II** (b. March 6, 1405, Toro, Castile—d. July 21, 1454, Valladolid), king of Castile from 1406 to 1454; his political weakness led him to rely on his favourite, Álvaro de Luna, whom he made constable. He was nevertheless considered a man of cultivated taste and a patron of poets.

John succeeded his father, Henry III, as an infant of less than two years of age, under the joint regency of his mother, Catherine of Lancaster, and his uncle, the infante Ferdinand, who became king of Aragon (as Ferdinand I) in 1412. John took the reins in 1419 but soon placed himself in the hands of his companion Luna, who contested the influence of Ferdinand's sons in Castile. This led to factional struggles among the nobles, during which Luna enriched himself and his supporters. In 1430 a settlement was reached, and John II led a campaign against Granada, defeating the Muslims in the Battle of Higueruela (1431). John II sequestered his son, the future Henry IV, at Segovia, giving rise to fresh rivalries. He and Luna vanquished the dissidents at the Battle of Olmedo in 1445.

In 1447 Luna persuaded John, now a widower, to marry Isabella of Portugal, who soon opposed him. After Luna had connived at a murder, the tide turned; and in 1453 John II was persuaded to arrest and execute his favourite. He proved unable to govern alone.

During John's reign the revival of learning had its effect on the culture of the court and nobility. The King protected the poet Juan de Mena and encouraged other writers.

Sweden

• **John II:** *see* John (Denmark).

• **John III** (b. Dec. 21, 1537, Stegeborg Castle, Sweden—d. Nov. 17, 1592, Stockholm), king of Sweden (1568–92), a deeply religious ruler who attempted to reconcile the Swedish Lutheran Church with the Catholic leadership in Rome and to revive discarded elements of the Catholic liturgy.

After being named duke of Finland by his father in 1556, John, the elder son of the second marriage of the Swedish king Gustav I Vasa, pursued a foreign policy independent of the crown, leading to a conflict with his half brother Erik XIV, king of Sweden from 1560.



John III, detail from a portrait by an unknown artist, *c.* 1570; in a private collection

By courtesy of the Svenska Portrattarkivet, Stockholm

Erik limited John's authority and imprisoned him in 1563 after the Duke had acquired a base in Poland by marrying Catherine (1562), sister of Sigismund II Augustus of Poland. After his release in 1567, John joined with his younger brother, the future Charles IX of Sweden, in 1568 to overthrow Erik and secure the throne for himself. He soon ended Sweden's long war against Denmark by signing the Treaty of Stettin (1570), in which he formally renounced Sweden's Estonian acquisitions, though he actually intended to keep them; the territories were largely regained by the end of his reign.

An expert theologian, John believed in the possibility of a synthesis of Lutheranism and Roman Catholicism and negotiated to that end with Catholic leaders in Rome and Spain. He introduced a liturgy of his own in 1577, the "Red Book," which restored some of the

Catholic liturgical usages that had been swept away in the triumph of Lutheranism in Sweden. By 1580 he realized that a settlement with Rome was impossible but renewed his efforts to impose the "Red Book" over an opposition led chiefly by his brother, Charles.

In 1586 John nominated his son Sigismund, who had been brought up as a Catholic, for the vacant Polish throne but withdrew his sponsorship when the Poles demanded the return of Estonia as a condition of Sigismund's accession. The Swedish nobility, however, who controlled the state council, supported Sigismund's candidacy, seeing the link with Poland as an aid against Russia and the prospect of an absentee ruler as a way of enhancing their own power. John and Charles, who had contested his brother's religious policy, became reconciled in common opposition to the nobles' aspirations, but Sigismund nevertheless assumed the Polish throne in 1587.

Although scholarly and cultured, a lavish and discriminating patron of the arts, John had been a poor administrator and a worse financier. He died embittered by his failure to impose his own religious views on the Swedish Church.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

John, SAINT: *see* John I *under* John (Papacy).

John IV OF ODZUN, Armenian HOVHANNES IV OTZNETZI (b. 650, Odzun, Armenia—d. 729, Dvin), Armenian Orthodox catholicos (supreme head of the Armenian Church), a learned theologian and jurist who strove for greater ecclesiastical autonomy for the Armenian Church and supported the movement in the Eastern Church in favour of orthodox Christological theology (*see* Christology).

With a reputation for learning, John was chosen catholicos in 718. Soon afterward he convened a national synod at Dvin to reform the Armenian Church's liturgy and its pastoral discipline. At first apparently in sympathy with the heterodox Monophysites (*q.v.*) in the Eastern Church, he held a second national synod in 726 at Manzikert, near present Erzurum, Tur., to consider union with the Syrian Jacobite Church, a Monophysite community. John is noted for his attempt to reconcile the subtleties of Syrian and Armenian mystical Christology with the exactness of orthodox definitions. He thus sought to express his own theological tradition in terms consonant with the doctrinal decrees of the general council of Chalcedon (451), the standard for Eastern and Western Christological belief.

John's principal writings include a theological treatise on Christ, in which he emphasized the reality of Christ's human nature and material body, in opposition to the view of the extreme Monophysites; a brief tract in which he argued for the preservation of the independent tradition of the Armenian Church within the Eastern Orthodox world; a discourse denouncing the Paulicians (*q.v.*); and a reform of the structure and literary style of the Armenian psalter and prayer book.

Also credited to John is the *Kanonagirk'* ("Corpus of Canon Law"), the first collection of church legislation in the Armenian Church.

The writings of John of Odzun were edited in Armenian and translated into Latin by J.B. Aucher in 1838.

John BAR QURSOS, also called JOHN OF TELLA (b. 483—d. 538, Antioch, Syria), monk and bishop of Tella (near modern Aleppo, Syria), a leading theological propagator of moderate Monophysitism (*see* Monophysites).

A soldier before becoming a monk, John was made bishop in 519 and undertook the spread of a doctrine of Christ's person and work common to Syrian and Egyptian monasticism, a belief derived from a beatifying inner experience of Christ's divine transcendence. Attempting a mediatory theological formula, he rejected those positions he considered extreme. On one hand, he dismissed the teaching of the general Council of Chalcedon (451) as open to an interpretation of a dual personhood in Christ. On the other hand, he viewed the extreme Monophysitism of archimandrite (abbot) Eutyches of Constantinople as derogating from Christ's true humanity.

Summoned to Constantinople in 533 to participate in the dispute over the Christological issue, he later fell victim to the violence of the strict orthodox party in Syria reacting to the earlier bloody persecution by the Monophysites during their ascendancy. Because of the emperor Justinian's (527–565) new policy of conformity with Pope Leo I's (440–461) doctrinal directives declared at Chalcedon, John was arrested, then slain at Antioch. His writings include a liturgical treatise on the celebration of the Lord's Supper, a document that sheds light on the history of early Christian worship.

John CHRYSOSTOM, SAINT: *see* Chrysostom, Saint John.

John CLIMACUS, SAINT (b. *c.* 579—d. *c.* 649, Mt. Sinai, Sinai Peninsula; feast day March 30), Byzantine monk and author of *Climax tou paradeisou* (Greek: "The Ladder of Divine Ascent," the source of his name "John of the Ladder"), a handbook on the ascetical and mystical life that has become a Christian spiritual classic.

After entering the monastery of St. Catherine on Mt. Sinai *c.* 600, John withdrew to live as a hermit in a nearby cell. He was chosen abbot *c.* 639 and ruled until shortly before he died; the book was written during this period.

John's "Ladder" symbolizes the Old Testament patriarch Jacob's dream of a climb to heaven. The work is divided into 30 chapters, representing the 30 years of the life of Jesus before he began his public ministry, which describe the steps in the spiritual struggle to moral perfection. It culminates on the highest rung in passive contemplation and the mystical ecstasy of divine union.

Although influenced by earlier Egyptian and other Eastern monastic writers, John exhibits psychological insights with a distinctive, terse style. Translation of the "Ladder" into almost all classical and modern languages attests to its perennial popularity, having affected especially the Hesychast (mystical and quietistic prayer method) movement among Greek Orthodox and Russian contemplatives.

John DAMASCENE, SAINT: *see* John of Damascus, Saint.

John DE BALLIOL, Balliol also spelled BALIOL: *see* John *under* John (Scotland); Balliol, John de.

John EUDES, SAINT: *see* Eudes, Saint John.

John LACKLAND: *see* John *under* John (England).

John LEONARDI, SAINT, Italian SAN GIOVANNI LEONARDI (b. 1541?, near Lucca, Republic of Lucca—d. Oct. 9, 1609, Rome; canonized 1938; feast day October 9), founder of the Roman Catholic Ordo Clericorum Regularium Matris Dei (Clerks Regular of the Mother of God), whose members were commonly called Leonardini; the order was distinguished for learning and was originally devoted to combatting Protestantism and to promoting the Counter-Reformation.

Joining the now-extinct Apostolic Clerics of St. Jerome, John was ordained priest *c.* 1572 and became particularly active in charity. He soon attracted and trained some laymen and in 1574 founded his religious congregation in Lucca. In 1579 he formed the Confraternity of Christian Doctrine; his congregation of Clerks Regular received episcopal approval in 1583.

John's campaign against Protestantism, however, was so fervent that only with papal protection was he admitted into the Republic of Lucca, which opposed his policies for political reasons. He was aided by St. Philip Neri, the religious reformer, and St. Joseph Calasanz, whose order of the Pious Schools (Piarists) temporarily merged with the Leonardini. John's work attracted the support of Pope Clement VIII, who in 1595 officially approved John's congregation. Having begun four more religious orders amidst his reforming activities, John also cofounded (1603) a seminary to train priests for foreign missions. He died after contracting influenza while nursing epidemic victims. Sta. Maria in Campitelli, Rome, mother church of the Clerks Regular, contains his relics. The Leonardinis' general edition of *S. Giovanni Leonardi, fondatore dei Chierici Regolari della Madre di Dio* appeared in 1938. Other lives include those by L. Marracci, A. Bianchini, and F. Ferraironi.

John OF ANTIOCH: *see* John Scholasticus.

John OF ASIA: *see* John of Ephesus.

John OF AUSTRIA, DON: *see* Juan de Austria.

John OF AVESNES: *see* John II *under* John (Holland).

John OF AVILA, SAINT, Spanish SAN JUAN DE AVILA (b. 1499/1500, Almodóvar del Campo, near Toledo, Spain—d. May 10, 1569, Montilla; canonized 1970; feast day May 10), reformer, one of the greatest preachers of his time, author and spiritual director whose religious leadership in 16th-century Spain earned him the title Apostle of Andalusia.

Jewish-born, he attended the universities of Salamanca and Alcalá, where he studied philosophy and theology under the celebrated Spanish theologian Domingo de Soto. After being ordained priest in 1525 at Alcalá, he gave the fortune inherited from his parents to charity. Although he had prepared for missionary work to North America, he was persuaded in 1527 by Archbishop Hernando de Contreras of Seville to remain in Spain.

Beginning in 1529, John undertook missions throughout Andalusia for nine years. While attracting throngs of penitents, converts, and the faithful, his apostolate also created some influential enemies. The Inquisition investigated his fervent denunciation of wealth and of vice and his encouragement of rigorism; even a spurious connection between his Jewish heritage and charges of heresy was considered. He was acquitted in 1533, after which his fame rose tremendously, securing his reputation as one of Spain's greatest evangelists.

His reform of clerical life (he was a champion of celibacy), considered to be his finest achievement, influenced such eminent disciples as SS. Francis Borgia, John of God, Teresa of Avila, and Luís of Granada (who, in 1588, wrote a life of John, noting him as a leading spiritual director). In 1537 John co-organized the University of Granada with Archbishop Gaspare Avalos; outstanding among the other colleges he founded was that of Baeza. He helped foster in Spain the Society of Jesus, to which he was devoted; he died before he could carry out his plan to become a Jesuit.

John's *Audi filia* ("Listen, Daughter"), a treatise on Christian perfection addressed to the nun Doña Sancha Carillo, is considered to be a masterwork; his classical spiritual letters were edited by J.M. de Buck (*Lettres de direction*) in 1927. His complete works (*Obras completas del B. Mtro. Juan de Avila*) were edited by L. Sala Balust (2 vol.) in 1952–53.

John was beatified in 1894 by Pope Leo XIII

and canonized (1970) by Pope Paul VI, who called him a model for modern priests suffering from an identity crisis. L. degli Oddi's *Life of the Blessed Master John of Avila* appeared in 1898; later lives include that by J.M. de Buck (1927).

John OF AVIZ: *see* John I *under* John (Portugal).

John OF BEVERLEY, SAINT (b. Harpham, Yorkshire, Northumbria—d. May 7, 721, Beverley, Yorkshire), bishop of York, one of the most popular medieval English saints.

After studies at St. Augustine's Monastery, Canterbury, Kent, under the celebrated abbot St. Adrian, John entered Whitby Abbey, Yorkshire. In 687 he succeeded St. Eata as bishop of Hexham, Northumberland, and in 705 was consecrated bishop of York. He founded a monastery at Inderawood, later called Beverley, where he retired after resigning his bishopric between 717 and 720 to St. Wilfrid the Younger.

King Henry V of England ascribed to John the victory of his troops over the French at Agincourt, Fr., on Oct. 25, 1415—the anniversary of the translation of John's remains to York (1037) from Beverley, where his shrine was a popular pilgrimage during the Middle Ages. In 1416 Henry ordered John's feast day, May 7, to be kept throughout England. Accounts of John's miracles are in the *Ecclesiastical History of the English People* by the Venerable Bede.

John OF BOHEMIA: *see* John *under* John (Bohemia).

John OF BRIENNE: *see* John *under* John (Constantinople).

John OF CAPISTRANO, SAINT, Italian SAN GIOVANNI DA CAPISTRANO (b. 1386, Capistrano, Kingdom of Naples—d. Oct. 23, 1456, Villach, Duchy of Carinthia; canonized 1690; feast day October 23), one of the greatest Franciscan preachers of the 15th century and leader of an army that liberated Belgrade from a Turkish invasion.

In 1412 he became magistrate of Perugia, Papal States, where a civil quarrel caused his imprisonment. He experienced an emotional conversion while in prison and after his release in 1416 became a Franciscan. He was ordained in 1426, after which his fame as a preacher spread because of his efforts to restore doctrinal harmony and to promote education. He became the principal force in the founding of the Franciscan Observants, a severely ascetic group of friars who separated from the more liberal Conventuals. In 1451 he was sent to Austria by Pope Nicholas V to convert the Hussites (followers of the Bohemian religious reformer Jan Hus). Aware of the Turkish threat to eastern Europe, he helped raise and lead the army that lifted the Turkish siege of Belgrade in 1456. He died of plague on return from his crusade. John Hofer's *St. John Capistran* appeared in 1943.

John OF DAMASCUS, SAINT, also called SAINT JOHN DAMASCENE, Latin JOHANNES DAMASCENUS (b. *c.* 675, Damascus—d. Dec. 4, 749, near Jerusalem; Western feast day December 4), Eastern monk and theological doctor of the Greek and Latin churches whose treatises on the veneration of sacred images placed him in the forefront of the 8th-century Iconoclastic Controversy, and whose theological synthesis made him a preeminent intermediary between Greek and medieval Latin culture.

John of Damascus succeeded his father as one of the Muslim caliph's tax officials, and while still a government minister he wrote three *Discourses on Sacred Images, c.* 730, defending their veneration against the Byzantine emperor Leo III and the Iconoclasts. The Iconoclasts obtained a condemnation of John at the Council of Hieria in 754 that was reversed at the second Council of Nicaea in 787.

Soon after 730, John became a monk at Mar Saba, near Jerusalem, and there passed the rest of his life studying, writing, and preaching, acquiring the name "the Golden Orator" (Greek: *Chrysorrhoas,* literally "the Golden Stream"). Among his approximately 150 written works the most significant is *Pēgē gnōseōs,* ("The Source of Knowledge"), a synthesis of Christian philosophy and doctrine that was influential in directing the course of medieval Latin thought and that became the principal textbook of Greek Orthodox theology. Revised *c.* 743, it is composed of three parts: the philosophical ("Dialectica"), drawing largely from the late 3rd-century Neoplatonist Porphyry's *Isagoge,* an introduction to the logic of Aristotle; the historical, transcribing sections from the 4th-century Greek churchman Epiphanius' work *Panarion,* on heresies; and the theological and most widely known segment, the "Exposition [*Ekthesis*] of the Orthodox Faith." Essentially a résumé of the 4th-century Cappadocian Fathers Basil, Gregory of Nazianzus, and Gregory of Nyssa, and expressed in Aristotelian vocabulary, it manifests some distinctive originality in John's choice of texts and annotations reflecting Antiochene analytical theology. Through its translation into Oriental languages and Latin, the "Exposition" served both Eastern and Western thinkers not only as a source of logical and theological concepts but also, by its systematic style, as a model for subsequent theological syntheses composed by medieval Scholastics. The "Exposition" speculates on the nature and existence of God, providing points of contention for later theologians.

Elsewhere the "Exposition" analyzes the nature of free choice and the will. The author was sensitive to this question in light of Christian doctrine on personal responsibility for salvation. He describes the human will as a rational appetite or inclination to the good, functioning with regard to ends or goals rather than with means, which relate more to the intellect. In God there is will but no deliberation.

A counterpart to *The Source of Knowledge* is John's anthology of moral exhortations, the *Sacred Parallels,* culled from biblical texts and from writings of the Church Fathers. Among his literary works are several intricately structured *kanōns* (*q.v.*), or hymns for the Greek liturgy, although his reputation in liturgical poetry rests largely on his revision of the Eastern Church's hymnal, the *Octoēchos.*

John OF EPHESUS, also called JOHN OF ASIA (b. *c.* 507, Amida, Mesopotamia—d. *c.* 586, Chalcedon, Bithynia, Asia Minor), Monophysite bishop of Ephesus, who was a foremost early historian and leader of Monophysites (*q.v.*) in Syria.

A Syrian monk, he became a deacon at Amida in 529, but because of the Byzantine persecution of the Monophysites he was forced to lead a nomadic life. Later, at the Eastern imperial court of Constantinople, John was able to gain the support of the empress Theodora and, through her, the favour of the emperor Justinian, culminating in his appointment *c.* 542 as titular bishop of Ephesus. Enjoined to evangelize pagan areas about Constantinople and the mountainous region of central Asia Minor, he succeeded, according to his own estimate, in baptizing more than 70,000 persons and in building numerous churches and monasteries in place of pagan temples that he caused to be destroyed. Justinian's successor, the emperor Justin II, a supporter of the orthodox cause, in 572 imprisoned John and later banished him to Chalcedon.

John wrote an ecclesiastical history, recording events from the time of Julius Caesar (died 44 BC) to AD 585, in three volumes, of which only the third is extant. He also wrote *c.* 568 some lives of the Eastern saints, of signal value as a primary source for sketches of Oriental monks and ascetics.

John OF FORDUN (b. probably at Fordoun, Aberdeen, Scot.—d. after 1384), first chronicler to attempt a continuous history of Scotland. His work is nationalistic in attitude and reliable where he is not dealing with legendary subjects. Evidence about his life is derived from the prologues to Walter Bower's *Scotichronicon.* He may have been a chantry priest in Aberdeen cathedral.

Of John's seven-part chronicle, book 5 (Scotland, 1057–1153) and the fragmentary book 6 (England before 1066) seem to have been composed first. The true continuation of book 5 is his *Gesta annalia* (Scotland, 1153–1363). These were all completed by 1363; thereafter John travelled until 1383, wrote books 1–3 (legendary) and book 4 (814–1057), and brought the *Gesta annalia* down to 1384. Walter Bower's *Scotichronicon,* completed 1447, is in part an expansion and continuation of John's work. John's chronicle was edited, with translation, by W.F. Skene in *Historians of Scotland,* vol. 1 and 4 (1871–72).

John OF GAETA (pope): *see* Gelasius II.

John OF GAUNT, DUKE OF LANCASTER, also called (1342–62) EARL OF RICHMOND, or (from 1390) DUC (duke) D'AQUITAINE (b. March 1340, Ghent—d. Feb. 3, 1399, London), English prince, fourth but third surviving son of the English king Edward III and Philippa of Hainaut; he exercised a moderating influence in the political and constitutional struggles of the reign of his nephew Richard II. He was the immediate ancestor of the three 15th-century Lancastrian monarchs, Henry IV, V, and VI. The term Gaunt, a corruption of the name of his birthplace, Ghent, was never employed after he was three years old; it became the popularly accepted form of his name through its use in Shakespeare's play *Richard II.*



John of Gaunt, duke of Lancaster, detail of a window by an unknown artist, *c.* 1440–50; in the antechapel of All Soul's College, Oxford

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Through his first wife, Blanche (d. 1369), John, in 1362, acquired the duchy of Lancaster and the vast Lancastrian estates in England and Wales. From 1367 to 1374 he served as a commander in the Hundred Years' War (1337–1453) against France. On his return he obtained the chief influence with his father, but he had serious opponents among a group of powerful prelates who aspired to hold state offices. He countered their hostility by forming a curious alliance with the religious reformer John Wycliffe. Despite John's extreme unpopularity, he maintained his position after the accession of his ten-year-old nephew, Richard II, in 1377, and from 1381 to 1386 he mediated between the King's party and the opposition group led by John's younger brother, Thomas Woodstock, earl of Gloucester.

In 1386 John departed for Spain to pursue his claim to the kingship of Castile and Leon

based upon his marriage to Constance of Castile in 1371. The expedition was a military failure. John renounced his claim in 1388, but he married his daughter, Catherine, to the young nobleman who eventually became King Henry III of Castile and Leon.

Meanwhile, in England, war had nearly broken out between the followers of King Richard II and the followers of Gloucester. John returned in 1389 and resumed his role as peacemaker.

His wife Constance died in 1394, and two years later he married his mistress, Catherine Swynford. In 1397 he obtained legitimization of the four children born to her before their marriage. This family, the Beauforts, played an important part in 15th-century politics. When John died in 1399, Richard II confiscated the Lancastrian estates, thereby preventing them from passing to John's son, Henry Bolingbroke. Henry then deposed Richard and in September 1399 ascended the throne as King Henry IV. The standard biography is still S. Armitage-Smith, *John of Gaunt* (1904), but it must be read in conjunction with recent political histories of the period.

John OF GOD, SAINT, Spanish SAN JUAN DE DIOS, original name JUAN CIUDAD, Portuguese SÃO JOÃO DE DEUS, or JOÃO CIDADE (b. March 8, 1495, Montemor-o-Novo, Port.—d. March 8, 1550, Granada, Spain; canonized 1690; feast day March 8), founder of the Hospitaller Order of St. John of God (Brothers Hospitallers), a Roman Catholic religious order of nursing brothers. In 1886 Pope Leo XIII declared him patron of hospitals and the sick.

Formerly a shepherd and soldier, he was so moved by the sermons of the mystic John of Avila, who became his spiritual adviser, that he decided to devote his life to the care of the poor and the sick. For that purpose he rented a house in Granada (1537), where his work won ecclesiastical approval and attracted others. Bishop Sebastián Ramírez of Túy, Spain, named him John of God and gave John and his followers their habit. When John died, his companion, Antonio Martino, succeeded him, and the rule for his order was posthumously drafted. Subsequent houses, richly endowed by King Philip II of Spain, were soon opened. Pope Sixtus V approved the order in 1596, and by the late 1970s it claimed 1,800 brothers and had hospitals throughout the world.

John OF JANDUN, French JEAN DE JANDUN (b. *c.* 1286, Jandun, Champagne, Fr.—d. 1328, Todi, Papal States), foremost 14th-century interpreter of Averroës' rendering of Aristotle.

After study at the University of Paris, John became master of arts at the Collège de Navarre in Paris, where he lectured on Aristotle. He associated with Marsilius of Padua, writer of the *Defensor Pacis,* which asserted the superiority of civil authority over that of the pope. Because of controversy over this work, John and Marsilius sought the protection of Louis IV of Bavaria. After a series of condemnatory papal bulls, they were excommunicated as heretics by Pope John XXII in 1327.

John of Jandun's most influential writings are commentaries on Aristotle; his major concern was the division between faith and reason. Some critics think that he held a "double-truth" theory, believing that contradictory statements of faith and reason may be simultaneously true; others call him anti-Christian, and still others judge him to be a thinker of the Augustinian tradition.

John OF JERUSALEM (b. *c.* 356—d. 417), theologian and bishop, a strong advocate of the Platonistic Alexandrian tradition during the 5th-century doctrinal controversies of the Eastern Church, and co-author of a celebrated collection of catechetical conferences on the Jerusalem Christian creed.

A monk from his early years, John succeeded the noted theologian Cyril of Jerusalem as bishop *c.* 387. In 393 he was attacked by the Western biblical scholar Jerome and by the influential Bishop Epiphanius of Salamis, Cyprus, for adhering to the views of Origen (*q.v.*) of Alexandria.

When Epiphanius incited the Palestinian monks to anti-Origenism, John retaliated by denying them access to the holy places in Jerusalem and refusing to baptize their converts or bury their dead. In the fall of 396, Jerome published a virulent manifesto denouncing John. The consequent scandal reverberated throughout the Greek and Western churches. Reconciled with Jerome at Easter in 397, through the mediation of Theophilus, patriarch of Alexandria, John remained neutral in the continuing Origenist polemic between Jerome and his former theological colleague Tyrannius Rufinus.

Contention arose again, however, over Pelagius' teaching that man is capable of leading a moral life without divine help. Though John received him sympathetically in Palestine, Jerome and an emissary from Augustine of Hippo denounced him as heretical at the Jerusalem synod in July 415. When Augustine's disciples invoked the authority of their master against Pelagius, John retorted that in Jerusalem he alone was the Christian authority. He then devised a compromise formula, distasteful to Jerome, declaring that God can enable the earnest man to avoid sin. Pelagius was judged free of doctrinal error, which was confirmed in December 415 at the metropolitan Council of Diospolis. Soon afterward, John tacitly permitted the Pelagians to sack the monastery at Bethlehem, a centre of vehement anti-Pelagianism, and was sharply reproved by Pope Innocent I.

John is credited with the possible partial authorship, long attributed to Cyril of Jerusalem, of the theologically esteemed *Catecheses,* a series of Easter instructions for the newly baptized. An English translation of the *Catecheses* was edited by F. L. Cross (1951).

John OF KRONSHTADT, original name IVAN ILICH SERGEYEV (b. Oct. 31, 1829, near Archangel, Russia—d. Jan. 2, 1909, Kronshtadt), Russian Orthodox priest-ascetic whose pastoral and educational activities, particularly among the unskilled poor, contributed notably to Russia's social and spiritual reform.

After graduating from the theological academy in St. Petersburg (now Leningrad), John entered the married priesthood in 1855



John of Kronshtadt, detail of an engraving, 1890

BBC Hulton Picture Library

and went to Kronshtadt to minister at the parish church of St. Andrew. There he established among the underprivileged a fraternal association and "work centre" that offered instruction in industrial arts, technical and general education, religious training, and social services. "Father John," as he was called, exercised a widespread moral authority among the various social classes and was reputed to have performed wonders and miracles. He influenced many in the corrupt and despairing Russian society toward moral conversion and a return to religious practices.

John facilitated the worship and sacramental life of the masses by practical innovations in the liturgy and wrote several spiritual works, including *My Life in Christ* and "A Response to the False Doctrines of Count [Leo] Tolstoy." Politically conservative, he rejected any advocacy of radical reform. Despite his condemnation of their activities, a cult of admirers began a quasi-divine worship of him.

John OF LUXEMBOURG: *see* John *under* John (Bohemia).

John OF MATHA, SAINT, French SAINT JEAN DE MATHA (b. June 23, 1160, Faucon-de-Barcelonette, Fr.—d. Dec. 17, 1213, Rome; feast day February 8), cofounder of the Order of the Most Holy Trinity for the Redemption of Captives, commonly called Trinitarians, or Mathurins, a Roman Catholic mendicant order originally dedicated to freeing Christian slaves from captivity under the Muslims.

John received his early education at Aix-en-Provence, Fr., and then retired to a hermitage near Faucon; he later studied theology at Paris, where he was ordained priest. In 1197 he planned to form a group of monks to rescue Christians captured by the Muslims and enslaved in Africa. He may have been joined in this venture by the hermit Felix of Valois; recent historians, however, have come to doubt whether Felix actually existed. At Rome in 1198, John obtained approval for his order from Pope Innocent III, who made John the first superior general. On his return to France, John, possibly accompanied by Felix, was received by King Philip II Augustus, who sanctioned the establishment of the Trinitarians in France. John founded the motherhouse at Cerfroid in the region of Picardy and adopted a severe form of the Rule of St. Augustine of Hippo. In 1655 John's relics were transferred to Madrid; his cult was officially approved in 1655 and again in 1694.

The biographical details given above are those generally accepted as authentic. According to the spurious hagiographies of 15th- and 16th-century Trinitarians, John and Felix founded other French convents and dispatched some of their members to the Crusades. In 1202 John supposedly went to Tunis, Tunisia, and liberated 110 prisoners there, after which he ransomed several more Christian slaves in Spain. His second voyage to Tunis was recorded to have been a near calamity: severely persecuted by the Muslims, he embarked and managed to reach Ostia Antica, Italy, even though his ship was badly damaged. These accounts, however, and the miracles attributed to John were discovered in the 20th century to be fabrications; the hagiographical problem is explained in P. Deslandres' *L'Ordre des Trinitaires pour le rachat des captifs,* 2 vol. (1903).

John OF MIRECOURT, French JEAN DE MÉRICOUR, Latin JOHANNES DE MERCURIA (fl. 14th century), French Cistercian monk, philosopher, and theologian whose skepticism about certitude in human knowledge and whose limitation of the use of reason in theological statements established him as a leading exponent of medieval Christian nominalism (the doctrine that universals are only names with no basis in reality) and voluntarism (the doctrine that will and not reason is the dominant factor in experience and in the constitution of the world).

Originally from the Vosges Mountains in Lorraine, John, also called "the White Monk" because of his religious clothing, obtained his bachelor's degree in theology at Paris in 1345 and wrote a commentary on the *Sentences,* or theological theses, of Peter Lombard. In 1347

the university faculty censured 63 propositions from this commentary for their divergence from Catholic orthodoxy. Later that year, however, following the counsel of Pope Clement VI that church authority should not involve itself in philosophical matters not immediately related to matters of faith, the faculty granted John's request to submit an accompanying "apology," or clarification, with his theological commentary and then reduced the censure to 41 propositions. John's basic proposals were that rational certitude is largely unattainable because of the fallibility of the senses, and, even granting the possibility of the human mind's forming correct ideas, truth escapes it because God, in his absolute power, can alter reality. Accordingly, John denied the possibility of rationally proving the existence of God as the most perfect of all beings or as the first cause of all that exists, indeed, even that any created thing requires a cause. He submitted that it is more meritorious for man to believe in God's existence by faith informed with love than to reach certainty by deductive reasoning.

John, however, admitted the certainty of self-existence, the doubting of which served only to prove the existence of a doubting self. His difficulties with church authorities arose principally from his attributing to God a role in the existence of evil and suffering, citing that, even if God is said only to permit evil, he in effect causes it. John's extreme views derived from his concern to safeguard at least a limited area of cognitional certitude, while acknowledging God's absolute freedom to effect anything, even the possibility that man might hate him.

John OF MONTFORT: *see* John (IV) *under* John (Brittany); John IV (or V) *under* John (Brittany).

John OF NEPOMUK, SAINT, also called JOHN OF POMUK, or JOHN NEPOMUCEN, Czech SVATÝ JAN NEPOMUCKÝ (b. *c.* 1345, Nepomuk, Bohemia—d. March 20, 1393, Prague; canonized 1729; feast day May 16), patron saint of the Czechs, who was murdered during the bitter conflict of church and state that plagued Bohemia in the latter 14th century.



Saint John of Nepomuk, statue by an unknown artist in the workshop of Jan Brokof, 1709; in front of the Chapel of St. Mary's Visitation, Radič, Czechoslovakia

Milan Posselt

In 1383 he began studies at Padua, Italy, where he became a doctor of canon law and subsequently received several church offices. In 1390 he was made vicar general for the Archbishop of Prague. In 1393 the Archbishop, with John's support, excommunicated one of the favourites of King Wenceslas IV of Bohemia and thwarted the King's ambition to make a new bishopric out of the province of Prague. John was arrested as the Archbishop's chief agent. Wenceslas personally tortured him with fire, after which he reconsidered and released him on an oath of secrecy regarding his treatment. John, however, was dying, and to conceal the evidence Wenceslas had him gagged, shoved into a goatskin, and cast into the Vltava River. Bohemian Catholics later regarded him as a martyr.

The Austrian chronicler Thomas Ebendorferus' account that John was killed for refusing to reveal the confessions of Queen Sophia, Wenceslas' wife, was officially declared false in 1961. J. Weisskopf's *Johannes von Pomuk* appeared in 1948.

John OF PARIS, also called JOHN THE DEAF, or JOHN QUIDORT, French JEAN DE PARIS, JEAN LE SOURD, or JEAN QUIDORT, medieval Latin JOHANNES DE SOARDIS (b. *c.* 1255, Paris—d. Sept. 22, 1306, Bordeaux, Gascony), Dominican monk, philosopher, and theologian who advanced important ideas concerning papal authority and the separation of church and state and who held controversial views on the nature of the Eucharist.

A lecturer at the University of Paris and the author of several works defending the doctrines of St. Thomas Aquinas, he was condemned in 1286 for some of his theological propositions but cleared himself by further explanation.

In *De potestate regia et papali* (*c.* 1302; "On Royal and Papal Powers"), he held that church and state both derived power from God but were independent of each other, the church serving spiritual ends and the state serving secular ends. The pope could intervene in secular matters only if the moral or theological order was involved. John also held that since the pope was elected by men, he could be removed by men for good reason. *De potestate*, directed against the extreme papal claims of Pope Boniface VIII, was a valuable contribution to theology.

In his eucharistic doctrines expressed in *Determinatio* (1304), John suggested an alternative to transubstantiation, namely, the proposition that the Person of Christ somehow enters into a kind of hypostatic, or essential, union with the material elements. John's heterodoxy was censured, and he was sentenced to perpetual silence; he died before his appeal to Pope Clement V could be decided.

John OF PLANO CARPINI (Franciscan author): *see* Giovanni da Pian del Carpini.

John OF POMUK, SAINT: *see* John of Nepomuk, Saint.

John OF ROCHESTER, SAINT: *see* Fisher, Saint John.

John OF SABINA (pope or antipope): *see* Sylvester III.

John OF SAINT THOMAS, Spanish JUAN DE SANTO TOMÁS, original name JUAN POINSAT (b. July 9, 1589, Lisbon—d. June 1644, Fraga, near Barcelona), philosopher and theologian whose comprehensive commentaries on Roman Catholic doctrine made him a leading spokesman for post-Reformation Thomism, a school of thought named after its foremost theorist, St. Thomas Aquinas (*c.* 1225–74), who systematically integrated Catholic teaching with Aristotelian concepts.

Of a noble family involved in church and government, John entered the Dominican order in Madrid, assuming the religious name John of St. Thomas on July 18, 1610. From 1620 he taught theology at Madrid; at Piacenza, near Parma; and at the University of Alcalá, Spain, where he obtained the chair of theology in 1641. Two years later King Philip IV of Spain called him to Madrid to be his adviser and confessor. While accompanying Philip on military campaigns, John wrote a major treatise, *De Donis Spiritus Sancti* (*Gifts of the Holy Spirit*, 1951).

Appointed one of the theological interrogators for the Spanish Inquisition, the ecclesiastical heresy trials, John won a reputation for equity in defending the accused, particularly faculty members from Louvain, at that time under Spanish jurisdiction. Among his principal works are the *Cursus Philosophicus*, 9 vol. (1632–36; "Course in Philosophy") and the *Cursus Theologicus*, 7 vol. (1637–44; "Course in Theology"), explicating questions on major speculative themes such as the nature of theology and divine revelation, the demonstrability of God's existence, human freedom, and the rationale for morality, Christian worship, and the church. The *Cursus Philosophicus* includes an exposition of formal logic that has served as the basis for the traditional Catholic teaching on the psychology of knowledge. Set forth in the academic manner of the 16th-century Dominican scholar Cajetan, John's treatises refrained from the polemical style of later Counter-Reformation theological literature. His death was possibly the result of poison administered by envious Spanish courtiers. *The Material Logic of John of St. Thomas: Basic Treatises* and *Outlines of Formal Logic,* English translations, were published in 1955.

John OF SALISBURY (b. 1115/20, Salisbury, Wiltshire, Eng.—d. Oct. 25, 1180, probably at Chartres, Fr.), one of the best Latinists of his age, who was secretary to Theobald and Thomas Becket, archbishops of Canterbury, and who became bishop of Chartres.

After 1135 he attended cathedral schools in France for 12 years and studied under Peter Abelard (1136). He was a clerk in Theobald's household in 1148 and during the next five years was mainly employed on missions to the Roman Curia. His *Historia pontificalis* (*c.* 1163) gives a vivid description of the period, partly through its character sketches. From 1153 John's main duty was to draft the correspondence with the Curia, especially in connection with appeals. In the late summer of 1156 this activity angered King Henry II, who regarded him as a champion of ecclesiastical independence.

The crisis passed, but to some extent it influenced John's two books, the *Policraticus* and the *Metalogicon* (both 1159), in which his general intention was to show his contemporaries that in their thought and actions they were defecting from the true task of humanity. His work represented a protest against the professional specialization slowly developing in royal and papal administration and in the universities. He unfavourably contrasted the way of life followed by courtiers and administrators with an ideal practice derived from Latin poets and from classical and patristic writers.

Out of favour with Henry, John was exiled to France (1163) shortly before Becket was exiled. From his refuge in the monastery of Saint-Rémi at Reims, John wrote many letters assessing the prospects of the Canterbury case. After the reconciliation of Henry and Becket, he returned to England (1170) and was in Canterbury Cathedral when Becket was assassinated (Dec. 29, 1170). Thereafter, John was occupied with collecting Becket's correspondence and preparing a biographical introduction. He became bishop of Chartres

in 1176 and took an active part in the third Lateran Council (March 1179). He was buried at Chartres.

BIBLIOGRAPHY. D. McGarry (ed.), *The Metalogicon* (1955); M. Chibnall (ed.), *Memoirs of the Papal Court* (1956); H.E. Butler and W.J. Millor (eds.), *The Letters of John of Salisbury.*

John OF SCYTHOPOLIS (fl. 6th century), Byzantine theologian and bishop of Scythopolis, in Palestine (*c.* 536–550), whose various treatises on the person and work of Christ and commentaries on Neoplatonic philosophy sought to integrate all possible elements among contrary doctrinal positions. He is sometimes confused with a contemporary, John Philoponus, also called John the Grammarian.

A learned lawyer, John composed several tracts against Monophysite teaching, a heretical doctrine maintaining a single, divine nature in Christ subsuming his humanity. His major work was a treatise, written *c.* 530, defending the theory (termed dioenergism) of Christ's dual source of vital activity, human and divine, against his contemporary Severus of Antioch, a Monophysite leader. Another work attacked the early-5th-century heretic Eutyches, one of the founders of Monophysitism.

John was the first Christian author to annotate and defend the orthodoxy of the writings of the influential 5th-century Greek Neoplatonist Pseudo-Dionysius the Areopagite, in a commentary composed *c.* 532 and preserved in both Greek and Syriac versions. Doctrinally John is termed neo-Chalcedonian in that on one hand he sustained the Christological teaching of the general council of Chalcedon (451) and its affirmation of the dual, human–divine nature in Christ; on the other he integrated with this formula the orthodox tenets of Cyril of Alexandria, Egypt, and his emphasis on the predominance of the divinity in Christ's essential union.

John OF STRUMA (pope): *see* Calixtus (III).

John OF TELLA: *see* John bar Qursos.

John OF THE CROSS, SAINT, original name JUAN DE YEPES Y ÁLVAREZ (b. June 24, 1542, Fontiveros, Spain—d. Dec. 14, 1591, Ubeda; canonized 1726; feast day December 14), one of the greatest Christian mystics and Spanish poets, doctor of the church, reformer of Spanish monasticism, and cofounder of the contemplative order of Discalced Carmelites.



Saint John of the Cross, detail of an oil painting by Joaquin Canedo, 1795; in the Museo Provincial, Valladolid, Spain

By courtesy of the Museo Provincial, Valladolid, Spain; photograph, Mas, Barcelona

John became a Carmelite monk at Medina del Campo, Spain, in 1563 and was ordained priest in 1567. St. Teresa of Ávila, the celebrated mystic, enlisted his help (1568) in her restoration of Carmelite life to its original observance of austerity. A year later, at Duruelo, he opened the first Discalced Carmelite monastery. Reform, however, caused friction within the order and led to his imprisonment, first in 1576 and again in 1577 at Toledo, where he wrote some of his finest poetry. Escaping in August 1578, he later won high office in the order, becoming vicar provincial of Andalusia from 1585 to 1587. Near the end of his life the Discalced Carmelites were again troubled by dissension, and he withdrew to absolute solitude.

John schematized the steps of mystical ascent—a self-communion that in quietude leads the individual from the inharmonious distractions of the world to the sublime peace of reunion between the soul and God. John's schematization combines a poetic sensitivity for the nuances of mystical experience with a theological and philosophical precision guided by his study of St. Thomas Aquinas. By virtue of his intense poems, "Cántico espiritual" ("The Spiritual Canticle"), "Noche obscura del alma" ("The Dark Night of the Soul"), and "Llama de amor viva" ("The Living Flame of Love"), he achieves preeminence in Spanish mystical literature, expressing the experience of the mystical union between the soul and Christ.

In "Noche," perhaps his best known work, he describes the process by which the soul sheds its attachment to everything and eventually passes through a personal experience of Christ's Crucifixion to his glory. The lyric consists of eight stanzas "in which the soul sings of the fortunate adventure that it had in passing through the dark night of faith . . . to union with the Beloved."

Though John reaches peaks of lyricism, he also presents the reader with considerable difficulties because his approach is rigorously intellectual. The same word may recur twice within four lines of a poem with a different symbolism on each occasion.

E.A. Peers's *St. John of the Cross* appeared in 1932, followed by his *Handbook to the Life and Times of St. Teresa and St. John of the Cross* in 1954. *The Collected Works of St. John of the Cross* were translated into English by K. Kavanaugh and O. Rodriguez in 1964. The revised edition of J.F. Nims's English translation of *The Poems of St. John of the Cross* appeared in 1968.

John OF THE HEART OF JESUS: *see* Dehon, Léon-Gustave.

John SCHOLASTICUS, also called JOHN OF ANTIOCH (b. *c.* 503, near Antioch, Syria—d. Aug. 31, 577, Constantinople), patriarch of Constantinople (as John III), theologian, and ecclesiastical jurist whose systematic classification of the numerous Byzantine legal codes served as the basis for Greek Orthodox Church (canon) law.

A lawyer and priest, John served as Antioch's patriarchal legate at Constantinople until early 565, when the emperor Justinian named him patriarch, having just exiled the orthodox patriarch Eutychius. With the ascendancy of the Chalcedonian (orthodox) party during the reign of Justin II (reigned 565–578), John found himself in the curious position of mediator between Monophysite heretical factions (who held the belief that Christ had a single, divine nature); he later served as agent of the Emperor's policy for repressing the entire unorthodox movement.

While still a cleric in Antioch, *c.* 545, John compiled the "Collection of Canons," the earliest catalog of Byzantine Church legislation that has been preserved. It collated imperial ecclesiastical statutes with those of the 4th-century theologian-legislator Basil of Cappadocia. At Constantinople he composed the "Collection of 87 Chapters," a synthesis of the emperor Justinian's supplementary legislation on church matters. Among other works attributed to John are theological writings relative to Trinitarian doctrinal controversy, the "Catechetical Discourse," and instructions for religious initiation, the "Mystagogia."

John SOBIESKI: *see* John III Sobieski *under* John (Poland).

John TALAIA (fl. 5th century), theologian and bishop of Alexandria, Egypt, whose struggle to maintain his episcopal office and preserve the ascendancy of the orthodox party in conjunction with Popes Simplicius (468–483) and Felix III (483–492), against the incursion of Acacius, the heterodox patriarch of Constantinople, occasioned a temporary schism between Eastern and Western churches.

A priest and majordomo of the church in Alexandria, John was recommended to the emperor Zeno (474–491) at Constantinople by Bishop Timothy of Alexandria to succeed him and thus continue orthodox rule. At the death of Timothy, John was duly elected (April 482) but was soon denounced by Patriarch Acacius as a Eutychian heretic (*see* Eutyches). John's denial resulted in a charge of perjury. Because of pressure from Zeno, he was forced to vacate the church of Alexandria and was replaced by one of Acacius' supporters, Petrus III Mongus.

Later in 482 when Acacius wrote, under the authority of Zeno, the *Henoticon* (Greek: "Edict of Union"), a theological formula of Christian Trinitarian and Christological faith incorporating the decisions of the general councils of Nicaea (325) and of Constantinople (381), and after John sought redress from Pope Felix III, he excommunicated Acacius and his sect in 485 for failing to consult the Roman Church in the promulgation of the *Henoticon.* Schism was thus precipitated, although it ended in 519 when the emperor Justin I sought reconciliation. Nevertheless, it established an independent Byzantine church and activated a developing alienation that finally erupted in the definitive schism of 1054. John was never restored to Alexandria, but in 484 he was appointed bishop of Nola, Italy, where he soon died.

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John THE APOSTLE, SAINT, also called SAINT JOHN THE EVANGELIST, OR SAINT JOHN THE DIVINE (fl. 1st century AD), in Christian tradition, the author of three letters, the Fourth Gospel, and the Revelation to John in the New Testament. He played a leading role in the early church at Jerusalem.

The son of Zebedee, a Galilean fisherman, and Salome, John and his brother James were among the first disciples called by Jesus. In the Gospel According to Mark he is always mentioned after James and was no doubt the younger brother. His mother, Salome, was among those women who ministered to the



Saint John the Apostle, on Patmos, writing the book of Revelation, detail of a 14th-century painting; in the Städelsches Kunstinstitut, Frankfurt, Ger.

By courtesy of the Stadelsches Kunstinstitut, Frankfurt

circle of disciples. James and John were called by Jesus "Boanerges," or "sons of thunder," perhaps because of some character trait such as the zeal exemplified in Mark 9:38 and Luke 9:54 when John and James wanted to call down fire from heaven to punish the Samaritan towns that did not accept Jesus. John and his brother, together with Simon Peter, formed an inner nucleus of intimate disciples. In the Fourth Gospel, ascribed by early tradition to John, the sons of Zebedee are mentioned only once, as being at the shores of the lake of Tiberias when the risen Lord appeared; whether the "disciple whom Jesus loved" (who is never named) mentioned in this Gospel is to be identified with John (also not named) is not clear from the text.

John's authoritative position in the church after the Resurrection is shown by his visit with Peter to Samaria to lay hands on the new converts there. It is to Peter, James (not the brother of John but "the brother of Jesus"), and John that Paul successfully submitted his Gospel for recognition. What position John held in the controversy concerning the admission of the Gentiles to the church is not known; the evidence is insufficient for a theory that the Johannine school was anti-Pauline—*i.e.,* opposed to granting Gentiles membership in the church.

John's subsequent history is obscure and passes into the uncertain mists of legend. At the end of the 2nd century, Polycrates, bishop of Ephesus, claims that John's tomb is at Ephesus, identifies him with the beloved disciple, and adds that he "was a priest, wearing the sacerdotal plate, both martyr and teacher." That John died in Ephesus is also stated by Irenaeus, bishop of Lyon *c.* AD 180, who says John wrote his Gospel and letters at Ephesus and Revelation at Patmos. During the 3rd century, two rival sites at Ephesus claimed the honour of being the Apostle's grave. One eventually achieved official recognition, becoming a shrine in the 4th century. In the 6th century the healing power of dust from John's tomb was famous (it is mentioned by the Frankish historian Gregory of Tours); at this time also, the church of Ephesus claimed to possess the autograph of the Fourth Gospel.

Legend was also active in the West, being especially stimulated by the passage in Mark 10:39, with its hints of John's martyrdom. Tertullian, the 2nd-century North African theologian, reports that John was plunged into boiling oil from which he miraculously escaped unscathed. During the 7th century, this scene was portrayed in the Lateran basilica and located in Rome by the Latin Gate; it is still annually commemorated on May 6. John's feast day otherwise is December 27. This belief that John did not die is based on an early tradition. In the original form of the apocryphal *Acts of John* (second half of the 2nd century) the Apostle dies; but in later traditions he is assumed to have ascended to heaven like Enoch and Elijah. A popular tradition known to Augustine declared that the earth over his grave heaved as if the Apostle were still breathing.

The legends that contributed most to medieval iconography are mainly derived from the apocryphal *Acts of John.* These *Acts* are also the source of the notion that John became a disciple as a very young man. Iconographically, the young, beardless type is early (as in a 4th century sarcophagus from Rome), and this type came to be preferred (though not exclusively) in the medieval West. In the Byzantine world the evangelist is portrayed as old, with long, white beard and hair, usually carrying his Gospel. His symbol as an evangelist is an eagle. On account of the inspired visions of the book of Revelation the Byzantine churches entitled him "the Theologian"; and the title appears in Byzantine manuscripts of Revelation but not in manuscripts of the Gospel. (H.Cha.)

BIBLIOGRAPHY. A scholarly study of St. John's life may be found in commentaries on the Gospel, Epistles, and Apocalypse; especially commentaries on the Gospel by R.E. Brown (1966–70), J.N. Sanders (1968), and R. Schnackenburg (1968). See also the entry under December 27 in *Butler's Lives of the Saints,* vol. 4 (1956). For an appreciation of Johannine theology, see F.M. Braun, *Jean le théologien,* 3 vol. (1959–67).

John THE BAPTIST, SAINT (b. Judaea—fl. early 1st century AD), Jewish prophet of priestly origin who preached the imminence of God's Final Judgment and baptized those who repented in self-preparation for it; he is revered in the Christian Church as the forerunner of Jesus Christ.

After a period of desert solitude, he attained notice as a prophet in the region of the lower Jordan Valley. He had a circle of disciples, and Jesus was among the recipients of his rite of baptism.

Sources of information about John. The primary sources for information about John's life and activity are the four Gospels (Matthew, Mark, Luke, and John), the Acts of the Apostles, and the Jewish historian Josephus' *Antiquities of the Jews.* In using these works for historical reconstruction, allowances must be made for the known tendencies of each writer. All four Gospels recognize in John the start of the Christian Era, and each in its own way tries to reconcile John's precedence in time and Jesus' acceptance of his message and of a baptism of repentance from his hands (elements suggesting subordination to John), with the author's belief in Jesus as Messiah and Son of God. The Gospel According to Mark presents Jesus as the hidden Messiah, known only to a narrow circle, and John as the prophet Elijah returned and as the one who had to "come first to restore all things"



Saint John the Baptist, fresco by Pinturicchio, 1504–05; in the chapel of St. John Baptist, the cathedral of Siena, Italy

Alinari—Art Resource/EB Inc.

but who also remained hidden and suffered death with little acknowledgment of his true status (Mark 9). An early collection of sayings of Jesus, known to biblical scholars simply as Q, similarly represents the Baptist as the herald of the Coming One and of the imminent Kingdom, yet tries to stress his preparatory character, and so his subordination to Jesus. Matthew and Luke develop these two sources. The Gospel According to Matthew emphatically identifies John as the returning Elijah, herald of the Kingdom of God (Matt. 3). For Matthew, John's death, like that of Jesus, illustrates the old Israel's hostility to God's offer of salvation. Luke, in his Gospel and in the Acts of the Apostles, neglects the identification with Elijah but describes John as Jesus' forerunner and as inaugurator of the time of fulfillment of prophecy. Luke's account of the infancy of John and of Jesus does not necessarily derive from an underlying document composed in a "Baptist" sect, although it uses material perhaps transmitted by former disciples of the Baptist. It depicts the birth of Jesus and John in two parallel series of scenes, each with an angelic annunciation, conception, marvellous birth, circumcision, hymns greeting the children and predicting their destiny, and infancy. Even in his mother's womb John recognizes Jesus—also still in his mother's womb—as his Lord. The Gospel According to John reduces the Baptist from an Elijah to a model Christian preacher, a mere voice; it omits any description of Jesus' baptism. Its tendency has often been labelled polemic against a continuing group of disciples of John, but it is more plausibly explained by the evangelist's desire that this ideal witness recognize the full character of the Christ as he is presented in the Gospel According to John and as a necessary consequence of the tension between the highly developed understanding of Christ in this Gospel and those details in early Christian tradition that suggested Jesus' subordination to John. The Gospels are thus primarily interested in the relations between John and Jesus.

Josephus sought to present Jewish religious phenomena in Hellenistic categories and to deemphasize any political elements unfavourable to Roman imperial control.

Life and work. After allowances are made for the tendencies of each of these sources, the following items about John appear relatively trustworthy. He was born somewhere in Judaea (localized at ʿEn Kerem from at least AD 530) to Zechariah, a priest of the order of Abijah, and his wife, Elizabeth, perhaps a relative of Mary, the mother of Jesus. His formative years were spent in the Judaean desert, where monastic communities, such as the Essenes (a strict Jewish sect that existed from about the 2nd century BC to the end of the 1st century AD), and individual hermits often educated the young in their own ideals.

In 27/28 or 28/29 John attained public notice, not as a priest but as a prophet. He was active in the region of the lower Jordan Valley, from "Aenon near Salim" (near modern Nablus) to a point east of Jericho. His dress of an austere camel's hair garment was the traditional garb of the prophets, and his diet of locusts and wild honey represented either strict adherence to Jewish purity laws or the ascetic conduct of a Nazirite (a Jew especially vowed to God's service). His mission was addressed to all ranks and stations of Jewish society. His message was that God's wrathful judgment on the world was imminent and that, to prepare for this judgment, the people should repent their sins, be baptized, and produce appropriate fruits of repentance. Certain problems about the meaning of John's message continue to be debated: In Matt. 3, John says, "he who is coming after me is mightier than I"; this might refer to God himself, a human messiah, or a transcendent divine being. He also says, "I baptize you with water . . . ; he will baptize you with the Holy Spirit and with fire"; this second baptism might symbolize the judgment the one coming would carry out. John's followers were characterized by penitent fasting, beyond the demands of Jewish Law, and special prayers. John's ethical call for justice and

charity in Luke 3 requires righteousness from everyone in his own situation.

Although, like earlier prophets, John had an inner circle of disciples, baptism was not an admission rite into this group. It was a rite (immersion in running water) that symbolized repentance in preparation for the coming world judgment and was to be accompanied, before and afterward, by a righteous life. It was hardly conceived as a sacrament, in the Christian sense, conveying forgiveness, or as superseding Judaism and marking off a new people, including both Jews and Gentiles, prepared for God's final Kingdom; nor is a hypothesis that it symbolized a new Israel's crossing of the Red Sea toward a new national deliverance demonstrable. Equally unprovable is that it was a rite symbolizing man's reunion with divinity and return to his heavenly home—a sacrament of salvation and rebirth. The Jewish rite of baptism of converts differs fundamentally and is not its source. There were several other baptizing groups found about the same time and place, but none of these various and little-known baptisms can be shown to have inspired John's. It may have resembled in parts the initiatory baptism of the Essenes, though their other baptisms were more concerned with maintaining their community's ritual purity. John's baptism probably symbolized not so much anticipated entrance into the Kingdom of God as an anticipatory submission to the coming world judgment, which was represented as a coming second "baptism" by the Holy Spirit in a river of fire.

Possible relationship with the Essenes. The discovery of the Dead Sea Scrolls has drawn attention to the numerous parallels between John's mission and that of the Essenes, with whom John may have received some of his religious training. Both were priestly in origin, ascetic, and with intense and, in many respects, similar expectations about the end of the world. But John neither belonged to nor intended to found any organized community; he did not stress study of the Mosaic Law; and his message was more widely directed (to the poor, to sinners) than was that of the Essenes.

Jesus, who was baptized by John, saw in John the last and greatest of the prophets, the one who prepared for the coming of God's Kingdom (Mark 9, Matt. 11, Luke 7), and in many ways his ministry continued and developed John's. Whether John, who probably expected a divine Son of Man, recognized him in Jesus is not clear, but many of his disciples later followed Jesus.

Some time after baptizing Jesus, John was imprisoned by Herod Antipas, ruler of Galilee and central Transjordan. His crime was hardly the innocuous moral message Josephus presents, nor would his message, as found in the Gospels, have had much more immediate political bite. Herod had married (illegally, by Jewish Law) Herodias, the divorced wife of his half brother, after divorcing his first wife, the daughter of King Aretas IV of the Nabataeans, an adjacent Arab people. John's denunciation of this marriage doubtless presented Herod with the danger that his Jewish subjects would combine with his semi-Arab subjects in opposition to him. John's execution certainly preceded Aretas' victory over Herod in 35–36, a defeat popularly considered to have been divine vengeance on Herod for killing John. According to the Gospels, John's death preceded Jesus'; any greater chronological precision depends on the dates of Jesus' ministry and death. It is probable that John's followers recovered and buried his body and revered his tomb. The traditional burial site, at Sebaste (originally Samaria), near "Aenon by Salim," is attested from 360 onward.

(Jo.St.)

BIBLIOGRAPHY. On the ancient sources, see the standard commentaries on the Gospels, the Acts of the Apostles, and Josephus ("Loeb Classical Library"). Among recent monographs, Carl H. Kraeling, *John the Baptist* (1951), is primarily a historical investigation, while Walter Wink, *John the Baptist in the Gospel Tradition* (1968), studies the Gospels' tendencies and their differing representations of John. For analogous contemporary baptizing groups, see J. Thomas, *Le Mouvement baptiste en Palestine et Syrie* . . . (1935), and more recent literature on the community that produced the Dead Sea Scrolls. Most encyclopaedias of religion or biblical studies contain articles on John. Representative are: P. Vielhauer in *Die Religion in Geschichte und Gegenwart,* 3rd ed., vol. 3, pp. 804–808 (1959), who offers the mainline view of critical New Testament scholarship; and W.R. Farmer in *The Interpreter's Dictionary of the Bible,* vol. 2, pp. 955–962 (1962), who stresses the political aspects of John's activity.

John THE BASTARD: *see* John I *under* John (Portugal).

John THE CONQUEROR: *see* John IV (or V) *under* John (Brittany).

John THE DIVINE, SAINT: *see* John the Apostle, Saint.

John THE ELDER (legendary Christian ruler): *see* Prester John.

John THE EVANGELIST, SAINT: *see* John the Apostle, Saint.

John THE FASTER, SAINT (fl. late 6th century—d. Sept. 2, 595, Constantinople; feast days January 7 and August 29), patriarch of Constantinople (John IV) and mediator of theological disputes between the Orthodox and Monophysites (*q.v.*). He reinforced Constantinople's preeminence among patriarchal cities in the Eastern Church by assuming the contested title of ecumenical patriarch. His sobriquet "the Faster" derived from his meagre use of food.

John's devout and conciliatory nature attracted him to Patriarch John III Scholasticus, who ordained him deacon at the cathedral of Hagia Sophia and appointed him to minister to the needs of the poor. Favoured by the Eastern Roman emperor Tiberius II, John became patriarch of Constantinople in 582. A dispute over the title ecumenical patriarch, appropriated by John at a synod in 588 and continued by his successors to the present, evoked charges from the 6th-century popes Pelagius II and Gregory I of usurping spiritual authority. Historical and linguistic evidence exists, however, to show that the title had precedent in both East and West; it signified a spiritual primacy relative to the political boundaries of the Byzantine Empire, whose capital, Constantinople, was in ecclesiastical rank second only to Rome. The Greek Byzantine Church, impressed by his ascetical and charitable character, proclaimed him a saint.

John THE FEARLESS: *see* John *under* John (Burgundy).

John THE GOOD: *see* John III *under* John (Brittany); John II *under* John (France).

John THE GRAMMARIAN: *see* Philoponus, John.

John THE GREAT: *see* John I *under* John (Portugal).

John THE POSTHUMOUS: *see* John I *under* John (France).

John THE REDHEAD: *see* John I *under* John (Brittany).

John THE VALIANT: *see* John IV (or V) *under* John (Brittany).

John THE WISE: *see* John V (or VI) *under* John (Brittany).

John, Acts of, an apocryphal (noncanonical and unauthentic) Christian writing, composed about AD 180, purporting to be an account of the travels and miracles of St. John the Evangelist. Photius, the 9th-century patriarch of Constantinople, identified the author of the Acts of John as Leucius Charinus, otherwise unknown. The book reflects the heretical views of early Christian Docetists, who denied the reality of Christ's physical body and attributed to it only the appearance of materiality. The Acts of John likewise has a hymn containing formulas to evade demons who, according to Gnostic teachings, could impede one's journey to heaven. The book was condemned by the second Council of Nicaea, in AD 787, because of its subversion of orthodox Christian teachings.

John, Augustus (Edwin) (b. Jan. 4, 1878, Tenby, Pembrokeshire, Wales—d. Oct. 31, 1961, Fordingbridge, Hampshire, Eng.), Welsh



Augustus John, self-portrait, chalk, *c.* 1901; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

painter, an accomplished portraitist, muralist, and draughtsman.

John studied at the Slade School of Fine Art from 1894 to 1898. By the age of 20 he had won a reputation as one of the most brilliant draughtsmen in England. His portraits and other paintings done around 1900 gained attention for the vigour and originality of their approach and technique. He enjoyed a wide reputation as an artist by 1910. A colourful personality, John adopted a highly individualistic and bohemian lifestyle; he roamed over Wales, Ireland, and Dorset, living with gypsies and learning their customs and language. The painting "Encampment on Dartmoor" (1906; private collection) is based on these experiences. After World War I John's creative vitality declined even as his reputation continued to grow. He painted portraits of many of the leading personalities of Europe in a slick and somewhat superficial style, occasionally recapturing in such works his former boldness and integrity of form. His most significant portraits include the strong and sensuous "Smiling Woman" (*c.* 1908; Tate Gallery, London), a portrait of his second wife, Dorelia, and those of James Joyce, G.B. Shaw, cellist Mme Suggia, and poet Dylan Thomas. *Augustus John: A Biography,* by Michael Holroyd, was published in 1974–75.

John, Gospel According to, fourth of the four New Testament narratives recounting the life and death of Jesus Christ; John's is the only one of the four not considered among the Synoptic Gospels (*i.e.,* those presenting a common view). Although the Gospel is ostensibly written by John, "the beloved disciple" of Jesus, there has been considerable discussion of the actual identity of the author. The language of the Gospel and its well-developed theology suggest that the author may have lived later than John and based his writing on John's teachings and testimonies. Moreover, the facts that several episodes in the life of

Jesus are recounted out of sequence with the Synoptics and the final chapter appears to be a later addition suggest that the text may be a composite. The Gospel's place and date of composition are also uncertain; many scholars suggest that it was written at Ephesus, in Asia Minor, in about AD 100 for the purpose of communicating the truths about Christ to Christians of Hellenistic background.

John's Gospel differs from the Synoptic Gospels in several ways: it covers a different time span than the others; it locates much of Jesus' ministry in Judea; and it portrays Jesus discoursing at length on theological matters. The major difference, however, lies in John's overall purpose. The author of John's Gospel tells us that he has chosen not to record many of the symbolic acts of Jesus and has instead included certain episodes in order that his readers may understand and share in the mystical union of Christ's church, that they "may believe that Jesus is the Christ, the Son of God, and that believing you may have life in his name" (20:30). This motive pervades the narrative, as do a kind of mystic symbolism and repeated emphasis on the incarnation. The author begins his account with a pronouncement on the incarnation that clearly intimates Genesis ("In the beginning was the Word, and the Word was with God, and the Word was God."). The author continually adds interpretative comments of his own to clarify Jesus' motives. In the narration of certain miraculous deeds, for example, the feeding of the 5,000 (6:1–15), which appears in all four Gospels, John's version is explained as symbolic of a deeper spiritual truth ("I am the bread of life; . . ."). Throughout John's Gospel, Jesus openly presents himself as the divine Son of God, not hiding his identity as he does in Mark. Thus, the author of John's Gospel does not merely narrate a series of events but singles out details that support an ordered theological interpretation of those events.

Because of its special theological character, the Gospel According to John was considered in ancient times to be the "spiritual Gospel," and it wielded a profound and lasting influence on the development of early Christian doctrine.

John, letters of, three New Testament writings, all composed sometime around AD 100 and traditionally attributed to John the Evangelist, son of Zebedee and disciple of Jesus. The author of the first letter is not identified, but the writer of the second and third calls himself "presbyter" (elder). Though the question of authorship has been much discussed, the language and contents of the three letters suggest a common source.

The first letter was apparently addressed to a group of churches where "false prophets," denounced as Antichrist, denied the incarnation of Jesus and caused a secession so substantial that the orthodox remnant was sadly depleted. The faithful were deeply disturbed that the heresy found favour among pagans, and they apparently felt inferior because those who had left their midst claimed to have profound mystical experiences. The heretics asserted that they possessed perfection, were "born of God," and were without sin. By placing themselves above the Commandments, they in fact sanctioned moral laxity. John's letter thus urges the Christian community to hold fast to what they had been taught and to repudiate heretical teachings. Christians are exhorted to persevere in leading a moral life, which meant imitating Christ by keeping the Commandments, especially that of loving one another. The spirit of the letter closely parallels that of the Fourth Gospel.

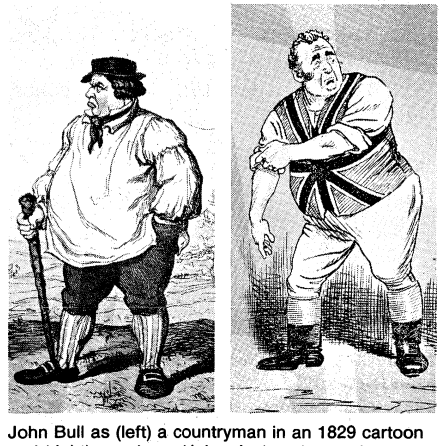
The second and third letters are closely akin to the first in language and ideas. The second exhorts a church, fancifully called "the elect lady and her children," to boycott heretics who deny the reality of the incarnation. The third letter is addressed to a certain Gaius and complains that "Diotrephes, who lies to put himself first, does not acknowledge my authority"—a hint that Gnostic teachings were severely disrupting the community.

John, Revelation to, also called APOCALYPSE OF JOHN: *see* Revelation to John.

John Bartholomew and Son, mapmaking and publishing company of the United Kingdom, located in Edinburgh and specializing in the use of hypsometric (layer) colouring in relief maps. The company was established in 1826 by John Bartholomew. It originally published such diverse items as checkbooks, election literature, and maps. In 1856 his son John George Bartholomew (1831–93), the well-known Scottish cartographer, assumed control of the management, and the company developed into a larger, more prosperous business and acquired its own printing press (1860). Since 1890 production has been devoted mainly to cartographical publications. The company's much acclaimed Environmental Map Programme for Education, using satellite photography to study the Earth's environment and physical features, was launched in 1978. Some of the company's well-known publications are the *World Travel Map Series, World Atlas, Times World Wall Map, National Map Series,* and *City Plans Series.*

John Birch Society, private organization founded in the United States on Dec. 9, 1958, by Robert H.W. Welch, Jr. (1899–1985), a retired Boston candy manufacturer, for the purpose of combating Communism and promoting various ultraconservative causes. The name derives from John Birch, an American Baptist missionary and U.S. Army intelligence officer who was killed by Chinese Communists on Aug. 25, 1945, making him, in the society's view, the first hero of the Cold War. The society publishes the journal *American Opinion,* issued 11 times a year, and a monthly *Bulletin* for members. The *Blue Book,* written by Welch, outlines the nature and purposes of the society. Its headquarters is in Belmont, Mass.

John Bull, in literature and political caricature, a conventional personification of England or of English character. Bull was invented by the Scottish mathematician and physician John Arbuthnot as a character in an extended allegory that appeared in a series of five pamphlets in 1712 and later in the same year published collectively as *The History of John Bull;* he appeared as an honest clothier, bringing action with his linen-draper friend Nicholas Frog (Holland) against Lewis Baboon (Louis XIV) for interfering with trade. The wide circulation of the satire fixed Bull as a popular personification in 18th-century political writings.



John Bull as (left) a countryman in an 1829 cartoon and (right) wearing a Union Jack waistcoat in a 1911 cartoon by "Poy" (Percy Hutton Fearon) in the London *Daily Dispatch*

By courtesy of (right) J. Henry Fearon; photograph, R.B. Fleming & Co. Ltd.

Subsequently, the French Revolutionary and Napoleonic wars brought John Bull's first great period in caricature, when such satirists as James Gillray and Thomas Rowlandson conventionalized a gross, rather stupid figure, weighed down with debt or taxation or oppression, according to the artists' political allegiance; but, less than 50 years later, "HB" (John Doyle) raised John Bull in the social scale, and he became the portly, prosperous citizen. This was the typical native representation, however; hostile foreign caricature identified him with "perfidious Albion."

John Bull's widest recognition came in the middle and late 19th century, especially through the influential cartoons portraying him in the periodical *Punch.* The most familiar and frequent representation was that developed by *Punch* cartoonists John Leech and Sir John Tenniel: the jovial and honest farmer figure, solid and foursquare, sometimes in Union Jack waistcoat and with bulldog at heel. John Bull had by now become so universally familiar that the name frequently appeared in book, play, and periodical titles and pictorially as a brand name or trademark for manufactured goods.

John Day, city, Grant County, northeast central Oregon, U.S., situated at the confluence of John Day River and Canyon Creek, near the Strawberry Mountain Wilderness Area. A stopover on the Pony Express trail from The Dalles (220 mi [354 km] northwest), it originated in the early 1860s, along with adjacent Canyon City, as a mining and cattle town. It was named for the river, which had in turn been named after a heroic Virginian scout of the Astor overland expedition (1811). The present city is a trading point for a cattle and mining region and is headquarters of the Malheur National Forest, which spreads over the foothills of the Blue Mountains. Timber, beef, and tourism are the economic mainstays. The nearby Herman and Eliza Oliver Historical Museum houses relics of the gold-mining days. Westward along the river is the John Day Fossil Beds National Monument, with fossils more than 30,000,000 years old, and Picture Gorge, with ancient Indian pictographs. Pop. (1982 est.) 1,976.

John Dory (fish): *see* dory.

John Frederick, byname JOHN FREDERICK THE MAGNANIMOUS, German JOHANN FRIEDRICH DER GROSSMÜTIGE (b. June 30, 1503, Torgau, Saxony—d. March 3, 1554, Weimar, Saxe-Weimar), last elector of the Ernestine branch of the Saxon House of Wettin and leader of the Protestant Schmalkaldic League. His wars against the Holy Roman emperor Charles V and his fellow princes caused him to lose both the electoral rank and much of his territory.

The elder son of the elector John the Steadfast, John Frederick succeeded to the Ernestine lands in 1532. As head of the Schmalkaldic League (*q.v.*) for the defense of the reformers, he hesitated to oppose the Holy Roman emperor Charles V, in whose pacific intentions he believed. His Naumburg coup, when he forced the replacement of an elected Catholic bishop by a Protestant one, however, helped convince Charles V to take up arms against the Reformation. Furthermore, by seizing the town of Wurzen, John Frederick ignored the rights of his second cousin Maurice, Saxon duke of the rival Albertine branch of the House of Wettin.

The ensuing enmity helped split Germany's Protestant princes. When the Emperor defeated the Schmalkaldic League at the Battle



John Frederick the Magnanimous, portrait by Lucas Cranach the Elder; in the Gemäldegalerie, Berlin
By courtesy of the Staatliche Museen zu Berlin

of Mühlberg (1547) with the aid of Maurice, the electoral dignity was granted to the Albertines. John Frederick, wounded and taken prisoner, was condemned to death but saved himself by acquiescing to electoral and territorial losses. He refused to compromise on religious issues, however, and enjoined his sons to refuse peace with Maurice. In 1552, during a war between the Emperor and Maurice, John Frederick was freed. After the death of Maurice (1553), he hoped to regain the electorship but was disappointed when Maurice's successor Augustus was granted the title. Considered a martyr of Protestantism, John Frederick continued to enjoy the respect of his people and fellow princes until his death.

John Frederick (II), byname JOHN FREDERICK THE MIDDLE ONE, German JOHANN FRIEDRICH DER MITTLERE (b. Jan. 8, 1529, Torgau, Saxony—d. May 9, 1595, Steyr, Austria), Ernestine duke of Saxony, or Saxe-Coburg-Eisenach, whose attempts to regain the electoral dignity, lost by his father to the rival Albertine branch of the House of Wettin, led to his capture and incarceration until his death.

On the imprisonment of his father, the former elector John Frederick the Magnanimous, John Frederick II and his brothers John William and John Frederick III the Younger ruled the remaining Ernestine lands jointly. In 1565, on John Frederick III's death, John Frederick II became sole ruler, after ceding Coburg as a separate duchy to John William. A strict Lutheran, he repeatedly purged the clergy of his realm for teachings of which he disapproved. John Frederick never forgave the Emperor for his father's loss of the electorship. Attempting to regain the dignity, he allied himself with the powerful Palatinate and the adventurer Wilhelm von Grumbach (*q.v.*) and tried to foment an uprising. Placed under the imperial ban in 1566, John Frederick was captured at Gotha in 1567. For the next 28 years until his death he was held prisoner in various places. His wife, Elizabeth of the Palatinate, shared his captivity.

John G. Shedd Aquarium: *see* Shedd Aquarium.

John Gaston (grand duke of Tuscany): *see* Gian Gastone.

John George, German JOHANN GEORG, name of rulers grouped below by country and indicated by the symbol •.

BRANDENBURG

• **John George** (b. Sept. 11, 1525, Kölln an der Spree, Brandenburg—d. Jan. 18, 1598, new style, Kölln an der Spree), elector of Brandenburg who in 1571 succeeded his father, Joachim II. Under his rule the divided electorate was reunited. His economies earned him the surname Oekonom (Steward) and made him popular with the nobility, to whom he granted concessions at the expense of the peasant class. A Lutheran, John George welcomed Protestant refugees from France and the Netherlands, but refused to become involved in the religious wars of either country.

SAXONY

• **John George I** (b. March 5, 1585, Dresden, Saxony—d. Oct. 8, 1656, Dresden), elector of Saxony from 1611, whose irresolution lost for Saxony, then the richest and most powerful of the German states, opportunities for ascendancy and territorial expansion.

An easygoing, indolent drunkard whose chief wish was "to drink his beer in peace," he was a faithful adherent of the house of Habsburg. As a result of his inability to grasp political opportunities, he lost the leadership of the German Protestants, first to Frederick V of the Palatinate, then to Gustavus II Adolphus of Sweden, and last to Frederick William of Brandenburg. During the Thirty Years' War, his vacillation and half-hearted efforts lost him the Bohemian crown and the chance to acquire permanently the archbishopric of Madgeburg. The Peace of Westphalia (1648), which ended the Thirty Years' War, determined the ascendance of Brandenburg over Saxony.

• **John George II** (b. May 31, 1613, Dresden, Saxony—d. Aug. 22, 1680, Freiberg, Saxony), elector of Saxony (1657–80), under whom Dresden became the musical centre of Germany.

In 1657, just after his accession, he made an arrangement with his three brothers with the object of preventing disputes over their separate territories, and in 1664 he entered into friendly relations with Louis XIV of France. He received money from the French king, but the existence of a strong anti-French party in Saxony induced him occasionally to respond to the overtures of the emperor Leopold I. The elector's primary interests were not in politics but in music and art. He adorned Dresden; welcoming foreign musicians and others, he gathered around him a large and splendid court, and his capital was the constant scene of musical and other festivals. His enormous expenditure compelled him in 1661 to grant greater control over monetary matters to the estates, a step that laid the foundation of the later system of finance in Saxony.

• **John George III** (b. June 20, 1647, Dresden, Saxony—d. Sept. 12, 1691, Tübingen, Württemberg), elector of Saxony (1680–91).

He forsook the vacillating foreign policy of his father, John George II, and in June 1683 joined an alliance against France. Having raised the first standing army in the electorate, he helped to drive the Turks from Vienna in September 1680, leading his men with great gallantry; but, disgusted with the attitude of the emperor Leopold I after the victory, he returned at once to Saxony. However, he sent aid to Leopold in 1685. When Louis XIV's armies invaded Germany in September 1688, John George was one of the first to take up arms against the French; and, after sharing in the capture of Mainz, he was appointed commander in chief of the imperial forces. He had not, however, met with any notable success when he died at Tübingen.

Like his father, he was very fond of music, but he appears to have been less extravagant. His wife was Anna Sophia, daughter of Frederick III, king of Denmark, and both his sons, John George and Frederick Augustus, became electors of Saxony, the latter also becoming king of Poland as Augustus II.

• **John George IV** (b. Oct. 18, 1668, Dresden, Saxony—d. April 27, 1694, Dresden), elector of Saxony (1691–94).

At the beginning of his reign his chief adviser was Hans Adam von Schöning (1641–96), who counselled a union between Saxony and Brandenburg and a more independent attitude toward the emperor Leopold I. In accordance with this advice certain proposals were put before Leopold to which he refused to agree; consequently the Saxon troops withdrew from the imperial army, a proceeding that led the chagrined emperor to seize and imprison Schöning in July 1692. Although John George was unable to procure his minister's release, Leopold managed to allay the elector's anger, and early in 1693 the Saxon soldiers rejoined the imperialists. John George IV is chiefly celebrated for his passion for Magdalene Sibylle von Neidschütz (d. 1694), created in 1693 countess of Rochlitz, whom on his accession he publicly established as his mistress. John George left no legitimate issue, and the electorship passed to his brother Frederick Augustus (Augustus II of Poland).

John Henry, hero of a widely sung U.S. black folk ballad. It describes his contest with a steam drill, in which John Henry crushed more rock than did the machine but died "with his hammer in his hand." Writers and artists see in John Henry a symbol of man's foredoomed struggle against the machine and of the black man's tragic battle with the white man.

Some factual basis exists for the ballad of John Henry. When the Chesapeake and Ohio Railroad drove the Big Bend Tunnel through



John Henry, tempera painting by James Lewicki, 1961; in the artist's collection
James Lewicki

the Allegheny Mountains in West Virginia, from 1870 to 1873, steel drivers hammered steel drills into the rock to make holes into which to pack explosives. The modern steam drill was introduced into the South in 1870; hence, it is possible that the comparative efficiency of the two methods could have been tested at Big Bend.

Although Southern blacks sang about John Henry, they told few stories of him, and, like Paul Bunyan, he is not truly a folk hero. The imaginative treatment by Roark Bradford in *John Henry* (1931) made the name known to many Americans.

John Hyrcanus I (b. *c.* 175 BC—d. 104 BC), high priest and ruler of the Jewish nation from 135/134 to 104 BC. Under his reign the Hasmonean kingdom of Judaea in ancient Palestine attained power and great prosperity, and the Pharisees, a scholarly sect with popular backing, and the Sadducees, an aristocratic sect that comprised the priesthood, became well-defined religious parties.

Hyrcanus was the youngest son of Simon

Maccabeus and thus a member of the Hasmonean dynasty (so-called after an ancestor named Hasmoneus). In 137 BC he and his brother Judas commanded the force that heroically repelled the invasion of Judaea led by Cendebeus, the general of the Syrian king Antiochus VII Sidetes. In 135 Hyrcanus' brother-in-law, Ptolemy, the governor of Jericho, assassinated Hyrcanus' father and two elder brothers; Hyrcanus then succeeded to the high priesthood and the supreme authority in Judaea. The remainder of Hyrcanus' reign was marked by his efforts to punish his enemies, ward off the Syrians, and enlarge Judaea's boundaries. Although he struggled in vain to destroy Ptolemy, he successfully thwarted Syrian incursions by alliance with Rome and conquered the unfriendly neighbouring territories of Samaria and Idumaea (Edom). He forced Idumaea to convert to Judaism, the first example of conversion imposed by the Jews in their history. Upon his death Hyrcanus was succeeded by his eldest son, Aristobulus I. Hyrcanus' reign was the last under which Judaea was a powerful, united state.

John Hyrcanus II (d. 30 BC, Jerusalem), high priest of Judaea from 76 to 40 BC, and, with his brother Aristobulus II, last of the Maccabean (Hasmonean) dynastic rulers. Under Hyrcanus' vacillating leadership, Judaea (southern of the three traditional divisions of ancient Palestine, today mostly in Israel) fell into vassalage to Rome.

When his father, Alexander Jannaeus, died in 76, Hyrcanus was appointed high priest, and on his mother's death in 67 he assumed the rulership of Judaea. After a troubled reign of three months, his warlike brother Aristobulus drove him from power.

Hyrcanus sought counsel from Antipater, satrap of Idumaea (a neighbouring province conquered by Hyrcanus' grandfather John Hyrcanus I), who, seeing in the weak-willed Hyrcanus a possible tool for his own desire to control Judaea, induced him to wage war on Aristobulus. After a brutal struggle, the two brothers appealed to the great Roman general Pompey to be their arbiter. Pompey, also seeing in Hyrcanus a means of controlling Judaea, restored him to the high priesthood and some semblance of civil authority.

During the rest of his life, Hyrcanus II was manipulated by those who wished to use him. He was deprived of his office by the military commander (proconsul) Aulus Gabinius; he was restored to it again by Julius Caesar as a reward for Hyrcanus' support after Caesar had defeated Pompey at the Battle of Pharsalus; and then in 42 he was rendered powerless by Mark Antony's appointment of Antipater's two sons Herod and Phasael as tetrarchs (rulers) of Judaea. In 40 the invading Parthians, at the instigation of Hyrcanus' ambitious nephew Antigonus, cut off Hyrcanus' ears in order to disqualify him for the priesthood. In 36, after a forced sojourn in Babylon, Hyrcanus was allowed by Herod to return to Jerusalem; six years later, Herod, wishing to end any threat of popular support for Hyrcanus, had him executed.

John Joseph OF AUSTRIA: *see* Juan José de Austria.

John Maurice OF NASSAU, byname THE BRAZILIAN, Dutch JOHAN MAURITS VAN NASSAU, DE BRAZILIAAN (b. June 17, 1604, Dillenburg, Nassau [Germany]—d. Dec. 20, 1679, Cleves, Brandenburg), Dutch colonial governor and military commander who consolidated Dutch rule in Brazil (1636–44), thereby bringing the Dutch empire in Latin America to the peak of its power.

The son of John, count of Nassau-Siegen-Dillenburg, John Maurice fought in the campaigns of his cousin, the Dutch commander Frederick Henry, prince of Orange, against Spain after 1621. On Frederick Henry's recommendation, John Maurice was, in 1636, named *kapitein-generaal* (governor-general) of the Dutch colony in Brazil, which had recently been conquered from Portugal. As governor, he secured control for the Dutch West India Company of vast areas of Brazil from São Luís in the north to Sergipe, bordering Bahia state, in the south. He also expanded Dutch influence in the Caribbean and sponsored the seizure of Angola (1641) and of several key ports on the west African coast in order to secure trade and supply African slaves for Brazilian plantations.

John Maurice was a capable general and an able and humane administrator. He tried to reconcile the Portuguese plantation owners, vital to the colony's economy, to Dutch rule, but his efforts were undercut by intolerant Calvinist ministers and by the arousal of Portuguese nationalist feelings after Portugal's liberation from Spain in 1640. He resigned in 1644, after the Dutch government refused him the financial support he needed to maintain control in the colony. A revolt against Dutch rule broke out the next year.

In 1647 John Maurice accepted the position of *Statthalter* (governor) of Cleves, Mark, and Minden from Frederick William the Great, elector of Brandenburg. He led a Dutch army in 1665 in the second Anglo-Dutch War against England's ally Christoph Bernhard von Galen, bishop of Münster, and was named commander of forces in Friesland and Groningen by William III, prince of Orange, in the Dutch War (1672–78) against France. He distinguished himself at the Battle of Seneffe (1674) and retired the next year. His house in The Hague, the Mauritshuis, designed for him by Pieter Post, still displays a splendid collection of Dutch paintings.

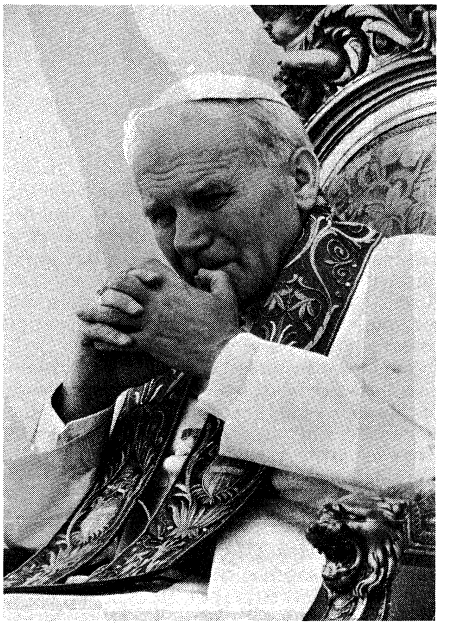
John o'Groats, locale near Dunnet Head, northernmost point of the mainland of Great Britain, in the district of Caithness, Highland region, Scotland. The scattered village is the site of a house, now only a mound, connected with a story, first recorded in 1793 in *The Statistical Account of Scotland,* which tells of John de Groat and his two brothers from Holland, who settled there with a royal letter of protection. The expression "from Land's End to John o'Groats" (a distance of about 870 miles [1,400 km]) means "from end to end of Great Britain." The northernmost part of the British mainland is in fact nearby Dunnet Head, and the point on the mainland farthest from Land's End is nearby Duncansby Head. The most northerly point in the British Isles is the Muckle Flugga lighthouse on a rock off the island of Unst in Shetland.

John Paul I, Latin JOHANNES PAULUS, original name ALBINO LUCIANI (b. Oct. 17, 1912, Forno di Canale, Italy—d. Sept. 28, 1978, Rome), pope whose 34-day pontificate in 1978 was the shortest in modern times. He was the first pope to choose a double name and did so in commemoration of his two immediate predecessors, John XXIII and Paul VI.

Born of a poor family, Albino was graduated from the Gregorian University in Rome and was ordained a priest in 1935. Appointed deputy director of the seminary in the Belluno diocese, he taught moral theology, canon law, and sacred art. In 1948 he was made vicar-general of his diocese, and in 1958 he was appointed bishop of Vittorio Veneto. Made archbishop of Venice in 1969, he became a cardinal in 1973. He was elected pope on Aug. 26, 1978, the first pope with a pastoral rather than a diplomatic or scholarly background since Pius X (reigned 1903–14). He died of a heart attack.

John Paul II, Latin JOHANNES PAULUS, original name KAROL WOJTYŁA (b. May 18, 1920, Wadowice, Pol.), pope from 1978, the first non-Italian pope in 456 years.

When his studies in Polish literature at the Jagiellonian University of Kraków were interrupted by World War II, he became a chemical worker; in 1942, determined to become a priest, he went into hiding in the palace of the archbishop of Kraków. Ordained on Nov. 1, 1946, he studied at the Angelicum University in Rome (earning a doctorate in ethics) and at the Catholic University of Lublin. A professor of philosophy at Lublin and the University of Kraków, he was made auxiliary bishop (1958) and archbishop (1964) of Kraków and cardinal in 1967.



John Paul II, 1979
Lochon-Francolon-Simon—Gamma-Liaison Agency

He was elected pope on Oct. 16, 1978, and invested on October 22, becoming the first Polish pope in the Roman Catholic church's history. His fluency in a number of modern languages (Polish, Italian, English, French, German, Spanish, and Portuguese) as well as in Latin qualified him uniquely as a roving international ambassador for the church. From the beginning of his reign he was an active pontiff, taking seriously his local duties as bishop of Rome in visiting parishes and institutions and at the same time undertaking extensive travels to Latin America and the Caribbean, the United States and Canada, Africa, various European countries, India, the Far East, and Australia.

On May 13, 1981, John Paul II was the victim of an assassination attempt, in which he was shot and seriously wounded in St. Peter's Square by Mehmet Ali Ağca, a Turkish national. Three Bulgarians suspected of conspiring with Ağca and three other Turks in the assassination plot—attempted, it was believed, because of the pope's outspoken support of the Roman Catholic church and the Solidarity trade union in his native Poland—were later acquitted for lack of proof.

On social questions, John Paul II was a conservative pope who firmly endorsed traditional Catholic views, such as prohibitions against abortion, use of contraceptives, divorce, political officeholding by nuns and priests, and ordination of women to the priesthood. However, he also championed democracy and economic justice for the developing nations of the world. John Paul's strongly centralized leadership and conservative teachings on doctrine aroused some dissent among more liberal Roman Catholic clergymen in western Europe and the Western Hemisphere.

John Sigismund, German JOHANN SIGISMUND (b. Nov. 8, 1572—d. Jan. 2, 1620), elector of Brandenburg from 1608, who established Hohenzollern power in Prussia and the Rhineland.

His marriage to Anna of Prussia (1594) made him heir to the title of that duchy, and he became duke of Prussia in 1618. Through his mother-in-law he acquired rights over the Rhenish territories of Jülich, Cleves, and Berg; but his claims were challenged by the Spanish candidate, Wolfgang William of Neuberg. Supported by the Dutch, John Sigismund acquired Cleves with the counties of Mark and Ravensburg by the Treaty of Xanten (1614). He espoused Calvinism (1613) but accorded toleration to his Lutheran subjects. Like his predecessor, Joachim Frederick, he was forced to make concessions to the nobles of Brandenburg. He was succeeded by his eldest son, George William.

John William Friso, Dutch JOHAN WILLEM FRISO (b. Aug. 14 [Aug. 4, Old Style], 1687, Dessau, Anhalt—d. July 14, 1711, near Dordrecht, Neth.), Dutch prince of Nassau-Dietz and of Orange and stadholder of the provinces of Friesland and Groningen, whose rejection as stadholder by five of the seven Dutch provinces in 1702 marked the return to political supremacy of the States General (national assembly).

The son of Henry Casimir II, stadholder and captain general of Friesland and Groningen, and Henriëtte Amalia of Anhalt-Dessau, John William succeeded to his father's titles in 1696. Although his cousin, the stadholder William III, prince of Orange (William III as king of England after 1689), named John William as successor to his titles in 1695, he was rejected as stadholder general on William III's death in 1702, marking the beginning of the second stadholderless period (1702–47) in Dutch history. His claim to William's possessions was also disputed by William's cousin Frederick I of Prussia.

John William served with distinction as a general against France in the War of the Spanish Succession (1701–14) and in 1709 married Maria Louise of Hesse-Kassel. He was on the verge of a settlement with Frederick I when he drowned while crossing the Hollands Diep en route to The Hague. His posthumous son, William IV, prince of Orange-Nassau, became stadholder of the Netherlands in 1747.

Johne's disease, also called PARATUBERCULOSIS, serious infectious disease caused by *Mycobacterium* (or *Bacillus*) *paratuberculosis.* Although principally a disease of cattle, it can affect horses, sheep, deer, and goats. Cows may not show signs of the disease for as long as a year after exposure to it.

Chronic diarrhea and loss of weight are prominent effects; a substantial drop in milk production also occurs. A diseased animal's coat becomes rough and does not shed as usual; the skin dries. The disease is spread chiefly in the droppings of diseased animals. Slaughter of afflicted animals is advocated as a control.

Johnny Appleseed: *see* Chapman, John.

Johns, Jasper (b. May 15, 1930, Augusta, Ga., U.S.), American painter and graphic artist who is generally (though not altogether accurately) associated with the Pop art movement. He is perhaps best known for his paintings of the U.S. flag.

He studied briefly (1947–48) at the University of South Carolina at Columbia and, after a period of military service, moved to New York City. For a time he worked as a commercial artist, designing store windows. His first one-man show, held in New York City in 1958, was a resounding success. The exhibit included a number of collages and constructions. Johns came to be much better known, however, as a painter.

His paintings typically featured commonplace, two-dimensional subjects such as flags, targets, maps, numbers, and letters of the alphabet, all readily recognizable. This characteristic caused him to be generally classified with Pop artists. Johns also used methods often associated with the Abstract Expressionist painters (fluid brushstrokes and layered areas of paint) as well as methods typical of Op art (geometric patterns). His "Field Painting" (1963–64; collection of the artist) included real objects such as a beer can and paintbrushes that projected from the picture.

Johns also worked in other media; one of his best known pieces of sculpture is a cast of two Ballantine Ale cans, "Painted Bronze" (1960; Mr. and Mrs. Robert C. Skull, New York City). Beginning in 1960 Johns was also active as a printmaker, producing lithographs, etchings, silk screens, and embossed prints that explored many of the same subjects as his paintings. Like Robert Rauschenberg, with whom Johns was associated as a young artist, he collaborated with Merce Cunningham and John Cage in dance projects for the Merce Cunningham Dance Company.

Johns Hopkins University, The, privately controlled institution of higher learning at Baltimore, Md., U.S. Opened primarily as a graduate school for men in 1876 with an endowment from Johns Hopkins, a Baltimore banker, it also provided undergraduate instruction for men. The university, now coeducational, consists of a faculty of philosophy, four professional schools, a college for part-time students, and two separate research units.

Johns Hopkins Hospital, a separate institution, was opened in 1889, but because of lack of funds the university was unable to initiate a medical school at that time. In 1893 a group of women interested in obtaining opportunities in medical education raised an endowment of $500,000 given with the understanding that women would be admitted to Johns Hopkins Medical School on the same terms as men. It is operated in close relationship with Johns Hopkins Hospital. In 1918 the School of Hygiene and Public Health was opened.

Besides its world-renowned medical facilities, the university is also noted for its School of Advanced International Studies. The university maintains the Johns Hopkins Press, the oldest continuously operated university press in the United States, and has founded and supported a number of scientific and literary journals. The university also has a faculty of arts and sciences and an applied physics laboratory.

Johnson, Amy (b. July 1, 1903, Kingston upon Hull, Humberside, Eng.—disappeared Jan. 5, 1941, over the Thames estuary), pioneering female aviator who first achieved fame as a result of her attempt to set a record for solo flight from London to Darwin, Australia.

Johnson attended the University of Sheffield, graduating with a B.A. in economics in 1925. Though she had intended to be a teacher, she instead began work as a secretary in London. While in London she became absorbed in aviation and airplanes. She gained her pilot's license in 1928, and she was also the first British woman granted a ground engineer's license. On May 5, 1930, she set off on her solo flight to Darwin; eventually missing the record by three days, she nevertheless gained great popularity in the English-speaking world for her spirit and daring. She was dubbed "Queen of the Air" by the British press.

Thereafter Johnson made a number of long-distance flights—in 1931 she set a record for her flight across Siberia to Tokyo, and in 1932 she broke the record for solo flight to Cape Town, S.Af. Her later achievements were less remarkable. She joined the Air Transport Auxiliary in 1939. It was while on a flying mission for the Air Ministry that she disappeared over the Thames estuary.

Johnson, Andrew (b. Dec. 29, 1808, Raleigh, N.C., U.S.—d. July 31, 1875, near Carter Station, Tenn.), 17th president of the United States (1865–69), who took office upon the assassination of President Abraham Lincoln during the closing months of the Civil War (1861–65); his lenient Reconstruction policies toward the South embittered the Radical Republicans in Congress and led to his political downfall.

Johnson's lack of formal schooling and his homespun quality were distinct assets in building a political base in eastern Tennessee, where his family moved in 1826. Before he was 21 he organized a workingman's party that elected him first alderman and then mayor of



Andrew Johnson

By courtesy of the Library of Congress, Washington, D.C.

Greeneville. During his eight years in the legislature (1835–43), he found a natural home in the states' rights Democratic Party of Andrew Jackson and emerged as the raucous spokesman for mountaineers and small farmers; he went to Congress for 10 years as their representative (1843–53), after which he served as governor of Tennessee (1853–57). Elected a U.S. senator in 1856, he generally adhered to the dominant Democratic views favouring lower tariffs and opposing antislavery agitation. In 1860, however, he broke dramatically with the party when, after Lincoln's election, he vehemently opposed Southern secession. When Tennessee seceded in June 1861, he alone among the Southern senators remained at his post and refused to join the Confederacy. Although denounced by his constituents, he remained loyal to the Union. In recognition of this unwavering support, Lincoln appointed him (May 1862) military governor of Tennessee, by then under Federal control.

To broaden the base of the Republican Party to include loyal "war" Democrats, Johnson was selected to run for vice president on Lincoln's successful reelection ticket of 1864. Thrust unexpectedly into the presidency (April 1865), he was faced with reconstruction of the Confederate states as his most vexing problem. Congressional Republicans who favoured severe measures toward the defeated South were disappointed with the new president's program, in which seceded states were readmitted to the Union with few provisions for reform or civil rights for freedmen. Congress was outraged at the return of power to traditional white aristocratic hands, coupled with the emergence of restrictive Black Codes. In the Congressional elections of 1866, Johnson's vigorous efforts to explain and defend his policies and defeat Congressional opponents proved vain as the Radicals won a commanding majority, sufficient to override any presidential veto.

In March 1867 the new Congress passed, over Johnson's veto, the first of the Reconstruction Acts, providing for Negro suffrage and military administration of the Southern states. By vetoes and narrow interpretation of the law, the President managed to delay the

program so seriously that he contributed materially to its failure. He further played into his enemies' hands by an imbroglio over the Tenure of Office Act, passed the same day, forbidding the chief executive to remove certain federal officers without the Senate's concurrence. Johnson plunged ahead and dismissed from office Secretary of War Edwin M. Stanton—the Radicals' ally within his Cabinet—to provide a court test of the act's constitutionality. In response, the House of Representatives voted articles of impeachment against the President—the first such occurrence in U.S. history. In a theatrical trial before the Senate, the charges proved weak, however, and the key votes (May 16 and 26, 1868) fell one short of the necessary two-thirds for conviction, seven Republicans voting with Johnson's supporters. Despite his exoneration, Johnson's usefulness as a political leader was over, though after returning to Tennessee he finally won reelection as a senator (1875) shortly before he died.

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Johnson, Ban, byname of BYRON BANCROFT JOHNSON (b. Jan. 5, 1864, Norwalk, Ohio, U.S.—d. March 28, 1931, St. Louis, Mo.), U.S. professional baseball administrator and first president of the American League of Professional Baseball Clubs (1900–27).

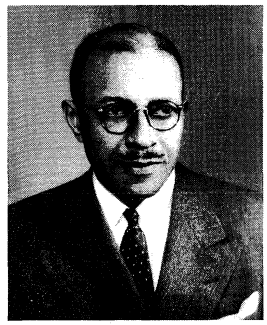
Johnson attended Oberlin and Marietta colleges in Ohio; he also attended law school in Cincinnati but did not finish the course. He became a reporter for the *Cincinnati Commercial Gazette* in the mid-1890s and later became sports editor. He met many baseball players, owners, and managers, including Charles Comiskey, who in 1894 persuaded him to become president of the Western League. After a year he abandoned his newspaper work and devoted the rest of his life to baseball.

In that period professional baseball was engaged in a "war" between the National League and Johnson's Western League (renamed the American League in 1900). The American League began to move teams into what had been exclusively National League territory, culminating in 1903 with a New York City franchise. In that year the Cincinnati Agreement between the two leagues resolved competition between them. Johnson initiated the annual World Series championship games between the two leagues in 1903 and cleaned up rowdyism at the ballparks to the point that baseball acquired an image conducive to family attendance. Though Johnson helped expose the Black Sox scandal (*q.v.*) of 1920, he opposed the appointment of a single commissioner for baseball to replace the earlier three-man commission. His differences with the first commissioner, Kenesaw Mountain Landis, gradually eroded his authority, and he resigned in 1927. He was elected to the Baseball Hall of Fame in 1937.

Johnson, Charles Anthony, original name of Sir Charles Anthony Johnson Brooke, second raja of the Brooke Raj (*q.v.*).

Johnson, Charles Spurgeon (b. July 24, 1893, Bristol, Va., U.S.—d. Oct. 27, 1956, Louisville, Ky.), U.S. sociologist, authority on race relations, and the first black president (1946–56) of Fisk University, Nashville, Tenn. (established in 1867 and long restricted to black students). Earlier he had founded and edited (1923–28) the intellectual magazine *Opportunity,* a major voice of the "Negro Renaissance" of the 1920s.

After graduation from Virginia Union University, Richmond, Johnson studied under the sociologist Robert Ezra Park at the University



Charles Spurgeon Johnson
Fisk University News Bureau

of Chicago and then worked for the Chicago Commission on Race Relations (1919–21). His first important writing, *The Negro in Chicago* (1922), was a sociological study of the race riot in that city in July 1919. His research technique, called "community self-survey of race relations," facilitated the gathering of sociological data and interpretations from both blacks and whites. After directing research for the National Urban League, New York City, he served as chairman of the social sciences department at Fisk (1928–47). After World War II he helped to plan the reorganization of the Japanese educational system.

In *Growing Up in the Black Belt* (1941), Johnson denied the common assertion that U.S. race relations constitute a true caste system; he pointed out that the status of the Negro in American society did not have universal acquiescence or a religious basis. Among his other books are *The Negro in American Civilization* (1930), *The Negro College Graduate* (1936), and *Patterns of Negro Segregation* (1943).

Johnson, Cornelius, also called CORNELIS JOHNSON VAN CEULEN, or VAN KEULEN, Johnson also spelled JONSON, JANSSEN, or JANSON (baptized Oct. 14, 1593, London—d. Aug. 5, 1661, Utrecht, Neth.), Baroque painter, considered the most important native English portraitist of the early 17th century.

The son of Dutch parents living in London, he was patronized by James I and Charles I but seems to have lost his popularity with the court when Van Dyck came to England in 1632. His English career dates to 1643, after which he went to Holland, painting in Middelburg, Amsterdam, The Hague, and finally Utrecht.

Johnson seldom painted anything except bust portraits, usually oval in format. These pictures are distinguished for their sensitive rendering of the sitter's likeness and their delicate and deft technique; *e.g.,* "Sir Robert Dormer" (1642; T. Cottrell-Dormer Collection, Rousham House, Oxfordshire). He generally painted upon wood panels on a small scale, sometimes producing replicas of his larger works.

Johnson, Eyvind (b. July 29, 1900, Svartbjörnsbyn, near Boden, Swed.—d. Aug. 25, 1976, Stockholm), one of the few working-class novelists to bring not only new themes and points of view to Swedish literature but also to experiment with new forms and techniques of the most advanced kind. With Harry Edmund Martinson he was awarded the Nobel Prize for Literature in 1974.

After a grim boyhood of hard labour in his home region near the Arctic Circle, Johnson, as a youth of 20 with practically no schooling, made his way south into war-devastated western Europe. He was never quite happy on his visits home because of Sweden's readiness to ignore the misery at its borders. His early novels, in which the influence of Proust, Gide, and Joyce can be discerned, are mainly concerned with man's frustration. In *Bobinack* (1932), an exposé of the machinations of modern capitalism, *Regn i gryningen* (1933; "Rain at Daybreak"), an attack on modern office drudgery and its effects, and *Romanen om Olof,* 4 vol. (1934–37), which tells of his experiences as a logger in the sub-Arctic, he begins to seek out the causes for that frustration. During World War II and immediately preceding it, Johnson's novels took the form of intense protest against totalitarian terror and sharp attacks against neutralism. *Strändernas svall* (1946; *Return to Ithaca,* 1952) and *Hans nädes tid* (1960; *The Days of His Grace,* 1968) have been translated into many languages.

Johnson, Gerrard: *see* Jensen, Gerrit.

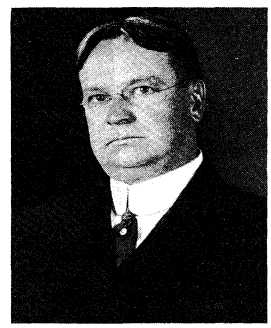
Johnson, Harry Gordon (b. May 26, 1923, Toronto—d. May 8, 1977, Geneva), Canadian-born economist who managed to synthesize diverse viewpoints in economics. Johnson was one of the dominant economists of the post-World War II generation, a ubiquitous figure at conferences, with a published output that dwarfed those of his contemporaries and that contained real contributions in macroeconomics and international trade.

Johnson graduated from the University of Toronto in 1943 and from Cambridge University in 1946. He taught at Cambridge (1948–56) and then, after three years at the University of Manchester, at the University of Chicago. At the time of his death he was in the highly unusual position of holding full professorships at two major institutions, the University of Chicago, where he was the Charles F. Grey Professor of Economics, and the London School of Economics.

Although Johnson was an astringent critic of the later followers of Keynes, neither did he espouse the conservative Chicago school of monetarism. Perhaps his most lasting contributions are to be found in trade theory, where he was an early proponent of the concept of effective trade protection and later published significant work on tariffs and on trade and growth. He also inspired a revival of interest in the classical monetary theory of the balance of payments.

Johnson, Hiram (Warren) (b. Sept. 2, 1866, Sacramento, Calif., U.S.—d. Aug. 6, 1945, Bethesda, Md.), reform governor of California (1911–17) and a U.S. senator for 28 years (1917–45), a Progressive Republican and later a staunch isolationist.

Winning acclaim in 1906 as a crusading San Francisco prosecuting attorney, Johnson was elected governor four years later on a reform ticket. Under his leadership the legislature cur-



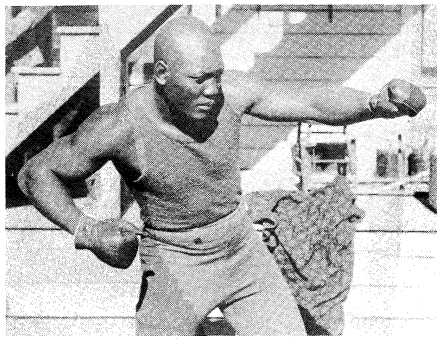
Hiram Johnson, *c.* 1912
By courtesy of the Library of Congress, Washington, D.C.

tailed the political hold on California of the Southern Pacific Railroad and placed the state in the forefront of the Progressive movement.

In 1912 Johnson helped form the Progressive Party and was its unsuccessful vice-presidential candidate on a ticket with Theodore Roosevelt. In the Senate he opposed the dominant conservative tendencies of the Republican Party, supporting ameliorative farm legislation and, in the 1930s, New Deal measures to

relieve unemployment. Gradually he became best known for his implacable isolationism, opposing U.S. adherence to the Treaty of Versailles, the League of Nations, and the Permanent Court of International Justice, known as the World Court. He sponsored the Neutrality acts of the 1930s and resisted all preparedness measures before World War II as well as the formation of the United Nations.

Johnson, Jack, byname of JOHN ARTHUR JOHNSON, also called LI'L ARTHA (b. March 31, 1878, Galveston, Texas, U.S.—d. June 10, 1946, Raleigh, N.C.), first black to hold the heavyweight boxing championship of the world.



Jack Johnson
UPI Compix/EB Inc.

He won the title by knocking out champion Tommy Burns in Sydney, Dec. 26, 1908, and lost it on a knockout by Jess Willard in 26 rounds in Havana, April 5, 1915. He fought professionally from 1897 to 1928 and engaged in exhibition matches as late as 1945.

Until his fight with Burns, discrimination limited Johnson's opportunities and purses. When he became champion, a hue and cry for a "Great White Hope" produced numerous opponents.

At the height of his career Johnson owned as many as a half-dozen automobiles and travelled over the world with a retinue of servants. He was excoriated by the press for having twice married white women, and he further offended white supremacists by knocking out former champion James J. Jeffries, who was induced to come out of retirement as a "Great White Hope." In connection with one of his marriages, Johnson was convicted in 1912 of violating the Mann Act in transporting his wife across state lines before their marriage. He was sentenced to a year in prison and was released on bond, pending appeal. Disguised as a member of a black baseball team, he fled to Canada, made his way to Europe, and was a fugitive for seven years.

He defended the championship three times in Paris before agreeing to fight Willard in Cuba. Some observers thought that Johnson, mistakenly believing that the charge against him would be dropped if he yielded the championship to a white man, deliberately lost to Willard. From 1897 to 1928, Johnson had 114 bouts, winning 80, 45 by knockouts.

In 1920 Johnson surrendered to U.S. marshals and served his sentence, fighting in several bouts within the federal prison at Leavenworth, Kan. After his release he fought occasionally and appeared in vaudeville and carnival acts, appearing finally with a trained flea act. He wrote two books of memoirs, *Mes Combats* (in French, 1914) and *Jack Johnson in the Ring and Out* (1927; reprinted 1975). He died in an automobile accident.

Johnson, James Weldon (b. June 17, 1871, Jacksonville, Fla., U.S.—d. June 26, 1938, Wiscasset, Maine), poet, diplomat, and anthologist of black culture who advanced the cause of his people by his literary contributions and organizational leadership.

Trained in music and other subjects by his mother, a schoolteacher, Johnson graduated from Atlanta University with A.B. (1894) and M.A. (1904) degrees and later studied at Columbia. For several years he was principal of the Negro high school in Jacksonville, Fla. He read law at the same time, was admitted to the Florida bar in 1897, and began practicing there. During this period, he and his brother, John Rosamond Johnson (1873–1954), a composer, began writing songs. One of the most successful was the famous "Lift Every Voice and Sing," widely known and used as the Negro national anthem. In 1901 the two went to New York, where they wrote some 200 songs for the Broadway musical stage.

In 1906 Pres. Theodore Roosevelt appointed him U.S. consul to Puerto Cabello, Venezuela, and in 1909 he became consul in Corinto, Nicaragua, where he served until 1914. He later taught at Fisk University. Meanwhile, he began writing a novel, *Autobiography of an Ex-Coloured Man* (published anonymously, 1912), which attracted little attention until it was reissued under his own name in 1927.

Johnson's formal association with the National Association for the Advancement of Colored People (NAACP) began as field secretary in 1916. He served as executive secretary until 1930, contributing substantially to the NAACP's influence and strength during a period of vital struggle and growth.

Fifty Years and Other Poems (1917) was followed by his pioneering anthology *Book of American Negro Poetry* (1922) and books of *American Negro Spirituals* (1925, 1926), collaborations with his brother. His best known work, *God's Trombones* (1927), a group of black dialect sermons in verse, includes "The Creation" and "Go Down Death." Johnson's introductions to his anthologies contain some of the most perceptive assessments ever made of black contributions to American culture, including informed and sympathetic discussions of ragtime, of black folk music and religion. *Black Manhattan* (1930), a history of the Negro in New York, was especially noted for its detailed account of the Negro's role in the American theatre. *Along This Way* (1933) is a highly esteemed autobiography.

Johnson, J.J., original name JAMES LOUIS JOHNSON (b. Jan. 22, 1924, Indianapolis, Ind., U.S.), U.S. composer and trombonist who demonstrated the viability of the trombone in the highly demanding context of modern jazz.

Johnson's early training as a pianist was followed by study of the trombone, beginning when he was 15. He became a professional musician in 1941 and during the decade worked in the orchestras of Benny Carter and Count Basie. He became widely recognized as a dexterous soloist who had assimilated the techniques of the bebop movement of the 1940s. After a temporary retirement in 1952, he returned in 1954 to tour with fellow trombonist Kai Winding; their duets have been recognized as watersheds in the evolution of jazz trombone technique. In 1959 he made his debut as an orchestral composer at the Monterey Festival.

Johnson moved to California in 1970, wrote musical scores for motion pictures and television, and virtually abandoned playing in favour of composing, arranging, and conducting.

Johnson, John Arthur (boxer): *see* Johnson, Jack.

Johnson, John H(arold) (b. Jan. 19, 1918, Arkansas City, Ark., U.S.), U.S. magazine and book publisher, the first black American to attain major success in those fields.

Johnson's mother decided to settle in Chicago while visiting that city in 1933 to see the World's Fair. The young Johnson was an honour student at Du Sable High School in Chicago. He was managing editor of the school paper and business manager of the yearbook and decided on journalism as a career. He later studied at the University of Chicago and Northwestern University, while working for a life insurance company catering to blacks. There he conceived the idea of a magazine for blacks, which became *Negro Digest*; its first issue (1942) sold some 3,000 copies. From that beginning Johnson launched *Ebony*, a picture magazine for blacks, in 1945. *Ebony*'s initial press run of 25,000 copies was completely sold out. By 1967 the magazine, modified in format and content, had a circulation of more than 1,000,000. Johnson went on to create other black magazines, and then moved into publishing black-oriented books.

Johnson, Lionel Pigot (b. March 15, 1867, Broadstairs, Kent, Eng.—d. Oct. 4, 1902, London), English poet and critic, notable for his fastidious and wistful lyrical poems, but mainly remembered as a typical representative of the "tragic generation" of the 1890s, which suffered from *fin de siècle* decadence and perfervid melancholy.

A fine scholar, Johnson became an alcoholic and solitary early in life and was oppressed by religious melancholy. His friend William Butler Yeats, Ireland's great poet, left a touching portrait of him in *Autobiographies.* Johnson wrote the first solid study of novelist and poet Thomas Hardy, and his *Poetical Works* were edited in 1915 by Ezra Pound.

Johnson, Lyndon B(aines) (b. Aug. 27, 1908, Gillespie County, Texas, U.S.—d. Jan. 22, 1973, San Antonio, Texas), 36th president of the United States (1963–69). A moderate Democrat and vigorous U.S. Senate leader, he was elected vice president in 1960 and acceded to the presidency upon the assassination of Pres. John F. Kennedy (Nov. 22, 1963). His administration produced significant social-welfare and civil-rights legislation, but his escalation of the Vietnam War seriously divided the American people and compromised his credibility with a large segment of the electorate.



Lyndon B. Johnson
By courtesy of the National Archives, Washington, D.C.

As a young man he worked at miscellaneous jobs and taught school in Texas. His introduction to the national political scene came after he successfully managed the congressional campaign of Rep. Richard M. Kleberg (1931), in whose Washington office he served. Following two years as director of the National Youth Administration in Texas (1935–37), Johnson ran successfully for Congress at a time when the New Deal administration of Pres. Franklin D. Roosevelt was under heavy conservative attack. Impressed by the newcomer's loyalty and astuteness, Roosevelt made Johnson his political protégé.

In 1948 Johnson was elected to the Senate, where he remained for 12 years, becoming Democratic whip in 1951. He developed a talent for negotiating and reaching accommodation with his colleagues in government, creating a remarkably disciplined group of the

often divided Senate Democrats. As majority leader (1955–61), he was largely responsible, through his resourceful leadership, for the passage of the civil rights bills of 1957 and 1960.

In view of the acute rivalry between Johnson and Kennedy in the contest for the Democratic presidential nomination of 1960, the invitation to Johnson to run for vice president on the Kennedy ticket came as a surprise. He accepted and campaigned energetically, and many felt his presence on the ticket was instrumental in the November victory.

In the trying period after the death of Kennedy, Johnson helped to calm national hysteria and ensure continuity in the presidency. In his first few months in office the new president succeeded in getting Congress to pass important legislation—previously stalled—in civil rights, tax reduction, anti-poverty programs, and conservation.

In November 1964 Johnson won reelection with an unprecedented popular majority of more than 15,000,000 votes, which he interpreted as an extraordinary mandate to pursue his domestic reform program, aimed at creating what he called the Great Society. He succeeded in pushing through a scarcely precedented mass of welfare legislation—in medical care for the aged, education, housing and urban development, conservation, and immigration. But the effect of these accomplishments was vitiated by increasing U.S. military involvement in Indochina, which had begun under Kennedy.

Despite specific campaign pledges not to extend hostilities, U.S. intervention in Indochina steadily increased, and the President's public support diminished markedly. Strident student opposition to both the war and the draft system spread to include liberals, intellectuals, and civil rights leaders.

On March 31, 1968, after three of the most turbulent years in U.S. political history, Johnson announced that he would neither seek nor accept his party's renomination. In January 1969 he returned to his ranch near Johnson City, Texas, and wrote his version of the presidential years, *The Vantage Point* (1971).

Johnson, Pamela Hansford (b. May 29, 1912, London—d. June 18, 1981, London), English novelist who treated moral concerns with a light but sure touch. In her novels, starting with *The Unspeakable Skipton* (1959), she mined a vein of rich satire.

Born into a middle-class family, she grew up in the somewhat shabby inner London suburb of Clapham. She was the wife of C.P. (later Lord) Snow. Her first novel, *This Bed Thy Centre* (1935, reissued 1961), was a popular and critical success. Among her most fully realized novels are *Too Dear for My Possessing* (1940), *An Avenue of Stone* (1947), and *A Summer to Decide* (1948), a trilogy following a group of people from the 1920s to the end of the 1940s.

In the 1960s she became concerned with the implications of modern permissiveness, expressed satirically in her novel *Cork Street, Next to the Hatter's* (1965) and nonfictionally in *On Iniquity* (1967), her reflections on the Moors murder, a contemporary case involving sexual sadism. *The Good Listener* (1975) and *The Good Husband* (1978) tell the story of a younger man in love with and married to a glamorous older woman. Other works include a volume of essays, *Important to Me* (1974), and the novel *A Bonfire* (1981).

Johnson, (Emily) Pauline (b. March 10, 1862, Six Nation Indian Reserve, Brant County, Upper Canada—d. March 7, 1913, Vancouver, B.C.), Canadian Indian poet proudly celebrated the heritage of her people in poems that had immense appeal in her lifetime.

The daughter of a Mohawk chief and an English mother, she began publishing poetry in her teens. Using her Indian name, "Tekahionwake," she successfully toured Canada, England, and the United States, giving poetry recitals in buckskin dress. Later she settled in Vancouver, where she wrote prose tales based on romanticized Indian life and legend: *Legends of Vancouver* (1911), *The Shagganappi* (1913), and *The Moccasin Maker* (1913). Her verse was collected as *Flint and Feather* (1912). Her best known poem, "The Song My Paddle Sings," is familiar to all Canadian schoolchildren.

Johnson, Pete (b. March 25, 1904, Kansas City, Mo., U.S.—d. March. 23, 1967, Buffalo, N.Y.), U.S. jazz pianist in the boogie-woogie style, noted for his ability to sustain swing and for his touch, unusually forceful even for the boogie-woogie idiom.

A professional pianist from 1926, he was associated with the jazz singer Joe Turner for several years. Subsequently, Johnson and Albert Ammons became popular for boogie-woogie duets and, with Meade Lux Lewis, formed a three-piano team. Johnson, frequently referred to as "Boss of the Blues," composed such compositions as "Cherry Red," "Just for You," "Roll 'em Pete," and "The Wee Baby Blues."

Johnson, Philip C(ortelyou) (b. July 8, 1906, Cleveland), U.S. architect and architectural theorist notable initially as a proponent of the International style and then, as a practicing architect, for his evolution from this style to a personal one in which historical references played an important part.

Johnson majored in philosophy at Harvard University, graduating in 1927. In 1932 he was named director of the Department of Architecture of the Museum of Modern Art in New York. With Henry-Russell Hitchcock he wrote *The International Style: Architecture Since 1922* (1932), which provided a description of (and also a label for) the post-World War I phase of modern architecture. His catalog *Machine Art* (1934) and exhibits of industrial design were also influential.

Johnson returned to Harvard in 1940, where he entered the Graduate School of Design and studied with Marcel Breuer. His real master, however, was Mies van der Rohe (with whom he collaborated later on the widely praised Seagram Building, New York City, 1958). After service in the U.S. Army in World War II he returned to the Museum of Modern Art



Philip C. Johnson, photograph by Arnold Newman, 1959

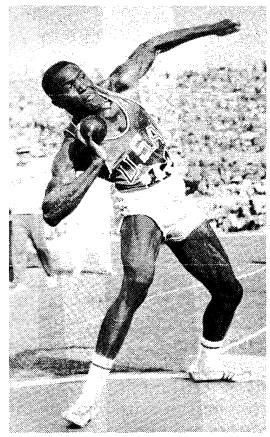
© Arnold Newman

as director of the Department of Architecture and Design from 1946 to 1954. His influential monograph *Mies van der Rohe* was published in 1947 (rev. ed., 1953).

Although he had built houses in Cambridge, Mass. (1942–43), and Sagaponack, Long Island, N.Y. (1946), his own "Glass House," at New Canaan, Conn. (1949), brought him his initial fame as an architect. Based on a design by Mies van der Rohe, the house is notable for severely simple, rectilinear structure and its use of large glass panels as walls.

Beginning with the Temple Kneses Tifereth Israel, Port Chester, N.Y. (1954–55), Johnson's work took a new turn. Miesian influence receded, curvilinear (particularly arch) forms appeared, and historical allusion became more evident. Subsequent works indicated an interest in form for its own sake and included the Sheldon Memorial Art Gallery, University of Nebraska, Lincoln (1960–63); a shrine at New Harmony, Ind. (1960); the art gallery at Dumbarton Oaks, Washington, D.C. (1962–64); the New York State Theater, Lincoln Center, New York (1964); and the IDS Center, a multibuilding group in Minneapolis, Minn. (1974). Critics adversely judge some of the buildings in which form for its own sake seemed to dominate, notably the New York City American Telephone and Telegraph headquarters (1982), which had a top resembling a Chippendale cabinet. In 1978 Johnson was awarded the Gold Medal of the American Institute of Architects.

Johnson, Rafer (Lewis) (b. Aug. 18, 1935, Hillsboro, Texas, U.S.), U.S. athlete who won the decathlon championship at the 1960 Olympic Games in Rome.



Rafer Johnson, putting the shot in the Olympic decathlon, 1960

AP/Wide World Photos

Johnson competed in his first decathlon in 1954 as a sophomore at the University of California, Los Angeles, and in 1955 he won the gold medal at the Pan-American Games. Injuries prevented him from winning the 1956 Olympic decathlon in Melbourne, but he set a world record in 1958.

Johnson's schoolmate Chuan-Kwang Yang, competing for Taiwan, and the Russian Vassily Kuznyetsov (who had set a new world record in 1959), were his main competitors for the 1960 Olympics. In the closest decathlon in Olympic history, Johnson scored 8,392 points, winning by only 58 points over Yang. At that Olympiad Johnson became the first black to carry the U.S. flag in the Olympic procession. He received the James E. Sullivan Memorial Award as the outstanding amateur athlete of 1960 and retired from sports soon afterward. He became a sports commentator and then an executive with the Continental Telephone Corporation in Atlanta, Ga., in 1979. He made a dramatic appearance to light the torch signalling the opening of the 1984 Olympic Games in Los Angeles.

Johnson, Reverdy (b. May 21, 1796, Annapolis, Md., U.S.—d. Feb. 10, 1876, An-

napolis), constitutional lawyer, U.S. senator from Maryland (1845–49, 1863–68), attorney general under Pres. Zachary Taylor (1849–50), and minister to Great Britain (1868–69). Able to grasp either side of an issue, he was called "the Trimmer" for his ability to bring about compromises.

Although he lived in a slave state, Johnson opposed slavery and the annexation of possible slave territory after the Mexican War (1846–48). He helped to keep Maryland in the Union during the American Civil War (1861–65). Nonetheless, he represented the slave-owning defendant in the famous Dred Scott case (1857), in which the U.S. Supreme Court decided that Negroes could not be citizens of the United States. During the Civil War he generally opposed extreme measures, and afterward he sought a moderate reconstruction program for the defeated South. As a senator he voted for a wartime loyalty oath, but after the war he was instrumental in having test oaths declared unconstitutional. He aided in securing acquittal in impeachment proceedings against Pres. Andrew Johnson (1868). As minister to Great Britain he prepared the way for the peaceful settlement of disputes between that nation and the United States over British policy toward the Confederacy.

Johnson, Richard (baptized May 24, 1573, London—d. ?1659), English author of popular romances, notably *The Most Famous History of the Seaven Champions of Christendome* (1596), which was so successful that one or two further parts were added later. The work includes a number of unacknowledged quotations from Shakespeare.

Almost nothing is known of Johnson's life, though in his *Nine Worthies of London* (1592) he refers to himself as an apprentice. He may have been employed in the household of Queen Anne, wife of James I. Among his many other works is a book of ballads, *A Crowne-Garland of Goulden Roses* (1612).

Johnson, Richard M(entor) (b. 1780, near Louisville, Ky., Virginia Colony—d. Nov. 19, 1850, Frankfort, Ky., U.S.), ninth vice president of the United States (1837–41), in the Democratic administration of Pres. Martin Van Buren.

Admitted to the bar in 1802, Johnson was elected to the state legislature in 1804 and two years later to the U.S. House of Representatives, where he served for 20 years (1807–19, 1829–37); he was also in the U.S. Senate from 1819 to 1829. Despite his early affiliation with the Whigs, he became a loyal supporter of Pres. Andrew Jackson (1829–37), accommo-



Richard M. Johnson, lithograph portrait by Charles Fenderich, 1840

By courtesy of the Library of Congress, Washington, D.C.

dating himself to the Democratic position on low tariffs and the dissolution of the national bank. In turn, Jackson insisted on Johnson's nomination for vice president in 1836. For the first time in U.S. history, the Electoral College could not agree among four candidates, and thus Johnson was selected by the Senate.

Though Johnson's term in office was uneventful, opposition to him within the party grew, and the Democratic national convention of 1840 took the unprecedented course of refusing to nominate anyone for the vice presidency. In the ensuing election, Johnson was defeated by the Whig candidate John Tyler. He retired to private life and died shortly after being re-elected to the Kentucky legislature.

Johnson, Robert (b. *c.* 1911, Hazlehurst, Miss., U.S.—d. Aug. 16, 1938, near Greenwood, Miss.), American blues composer, guitarist, and singer whose eerie falsetto singing voice and masterful, rhythmic slide guitar influenced both his contemporaries and many later blues and rock musicians.

Born into the large family of a sharecropper, Johnson was reared in Memphis, Tenn., and near Robinsonville, Miss. He learned to play the harmonica and then the guitar, probably influenced both by recordings and by personal contact with Eddie "Son" House, Charley Patton, Willie Brown, and other well-known Mississippi Delta bluesmen. He travelled widely throughout Mississippi, Arkansas, Texas, and Tennessee and as far north as Chicago and New York, playing at house parties, "juke joints," lumber camps, and on the street. In 1936–37 he made a series of recordings in San Antonio and Dallas, Tex. His repertoire included several blues songs by House and others, but Johnson's original numbers, such as "Me and the Devil Blues," "Hellhound on My Trail," and "Love in Vain" are his most compelling pieces. Despite the limited number of his recordings, Johnson had a major impact on other musicians, including Muddy Waters and Elmore James.

Johnson, Robert Wood (b. Feb. 15, 1845, Carbondale, Pa., U.S.—d. Feb. 7, 1910, New Brunswick, N.J.), American manufacturer who helped further the cause of modern surgery by developing antiseptic bandages and dressings.

Johnson began his career as an apprentice in a pharmacy and went on to become a retail pharmacist and then a drug broker in New York City. In 1874, he formed the partnership of Seabury & Johnson to manufacture bandages using a new formula employing India rubber. Twelve years later Johnson left that partnership to form the now well-known company of Johnson & Johnson with his brother James. The company became known for its high-quality, inexpensive medical supplies and dressings.

Johnson was an early proponent of the teachings of Joseph Lister, who advocated antiseptic surgery and care of the wound to prevent infection. These theories were still novel during the late 1800s. Johnson worked to develop a dressing that would be as germ-free as possible, from its manufacture in his plants to its eventual use in surgeries across the country.

Johnson, Samuel, byname DR. JOHNSON (b. Sept. 18, 1709, Lichfield, Staffordshire, Eng.—d. Dec. 13, 1784, London), English poet, essayist, critic, journalist, lexicographer, and conversationalist, regarded as one of the outstanding figures of 18th-century life and letters. His *Dictionary of the English Language* (1755) was the first major English dictionary to use illustrative historical quotations.

A brief account of the life and works of Samuel Johnson follows; for a full biography, *see* MACROPAEDIA: Johnson, Samuel.

Johnson, the son of a bookseller, was educated at the University of Oxford and set up a school near Lichfield, which was not a success. In 1737 he went to London with a former pupil, David Garrick, and made friends with Richard Savage. His early writings were journalism for the *Gentleman's Magazine.* He came to public notice with attacks on Walpole's ministry. In 1745 he turned his attention to Shakespeare, writing *Miscellaneous Observations on the Tragedy of Macbeth,* and he published his didactic poem *The Vanity of Human Wishes* in 1749. In 1746 he signed a contract to prepare his *Dictionary of the English Language.* The *Dictionary* gave Johnson a great reputation, but he still had to rely on journalism and hack writing for a living. In 1750 his paper *The Rambler* began to appear, to be followed by *The Idler.* His philosophical tale *Rasselas* was written in 1759 in order to meet a pressing demand for money. *The Lives of the Most Eminent English Poets* (1777) shows Johnson's power to lift hackwork to the level of sustained literary criticism.

In 1763 Johnson met James Boswell, with whom he formed one of the most famous friendships in literary history. In 1773 they journeyed together through the Highlands of Scotland and to the western islands, and both left entertaining accounts of the trip. In 1765 Johnson's edition of Shakespeare was completed, and in the year of its publication Trinity College, Dublin, conferred the LL.D. degree on him. Brilliant as Johnson was as a writer, he was perhaps even more brilliant as a conversationalist.

Johnson, Thomas (b. Nov. 4, 1732, Calvert County, Md.—d. Oct. 26, 1819, Rose Hill, near Frederick, Md., U.S.), American Revolutionary War leader, first governor of Maryland (1777–79), and associate justice of the United States Supreme Court (1792–93).

Johnson studied law in Annapolis, Md., and entered the provincial assembly in 1762. Opposed to British colonial policy, he was a member of several committees formed to draft memorials to the crown for redress of grievances and of the convention charged with organizing a colonial congress. He represented Maryland at the first Continental Congress in Philadelphia in September 1774. At the second Congress it fell to him to nominate George Washington as commander in chief. Johnson supported conciliation with Great Britain but, once persuaded that the effort was fruitless, voted for the Declaration of Independence, helped frame the constitution of the state of Maryland, and, as the first brigadier general of the state militia, recruited 1,800 men to join Washington.

He was elected first governor of the state of Maryland and was twice reelected, after which he served in the legislature. After the war, he and Washington formed a company to extend navigation of the Potomac River. He also served briefly in the legislature again, where he supported ratification of the federal Constitution, and then became chief judge of the General Court of Maryland. He was named by Washington to the U.S. Supreme Court and took his seat in 1792. Johnson wrote the first opinion of that court but, because of ill health, served only briefly. Appointed to the board of commissioners of Federal City, he was largely responsible for renaming it Washington in honour of his friend.

Johnson, Uwe (b. July 20, 1934, Cammin, Pomerania, Ger.—d. March 12, 1984, Sheerness, Kent, Eng.), German author, many of whose novels explore the contradictions of life in a Germany divided after World War II.

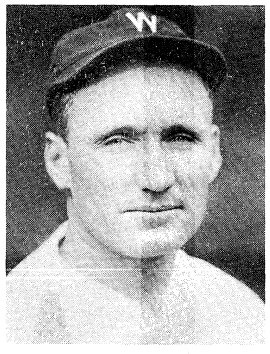
Johnson was born into a Mecklenburg family of ancient Swedish descent. He studied German at the universities of Rostock and Leipzig, where he received a diploma in 1956. He translated the work of several American and British authors before beginning to write himself. His first novel, *Ingrid Babendererde,* was refused by East German publishers when he declined to make various alterations to it. The novel remained unpublished. Aware that the same problem might well arise repeatedly, he moved to West Berlin in 1959. His subsequent work focussed on the estrangement between people in the two Germanys.

Once in the West, Johnson published *Mutmassungen über Jakob* (1959; *Speculations About Jakob*, 1963), *Das dritte Buch über Achim* (1961; *The Third Book About Achim*, 1967), shorter fiction in *Karsch, und andere Prosa* (1964; the novella *Eine Reise wegwohin* translated as *An Absence*, 1969), and *Zwei Ansichten* (1965; *Two Views*, 1966). All of Johnson's work was experimental: the narrative abruptly shifts from one consciousness or place to another; words assume different meanings when used by different characters; objects and events are described with intricate exactness, as if to emphasize their constancy against the mutability of emotions and reminiscences. In the tetralogy *Jahrestage. Aus dem Leben von Gesine Cresspahl* (1970–83; "Anniversaries: From the life of Gesine Cresspahl"), Johnson used a montage technique, combining newspaper clippings, notes, and narrative to describe problems in New York in the 1960s and events in German history between the 1920s and 1960s as recalled by the heroine's family.

Johnson lived in New York (1966–68), returned to West Berlin, and moved to England in 1974. Although younger than many of them, he was a member of the Gruppe 47 authors of postwar Germany. Later works included an essay on the poet Ingeborg Bachmann, *Eine Reise nach Klagenfurt* (1974; "A Journey to Klagenfurt"); a volume of essays, including two in English, *Berliner Sachen* (1975; "Berlin Affairs"); and *Begleitumstände: Frankfurter Vorlesungen* (1980; "Circumstances: Frankfurt Lectures"). Studies of Johnson include Mark Boulby's *Uwe Johnson* (1974).

Johnson, Virginia E(shelman): *see* Masters, William H(owell); and Johnson-Masters, Virginia E(shelman).

Johnson, Walter (Perry), byname BIG BARNEY, OR THE BIG TRAIN (b. Nov. 6, 1887, Humboldt, Kan., U.S.—d. Dec. 10, 1946, Washington, D.C.), U.S. professional baseball



Walter Johnson
UPI Compix/EB Inc.

player who had perhaps the greatest fastball in the history of the game. A right-handed thrower and batter, Johnson pitched for the Washington Senators of the American League from 1907 through 1927.

During those 21 seasons he struck out more batters (3,508) and scored more shutout victories (110 or 113; authorities differ) than did any other pitcher in major league history. He also won the most games (413, 414, or 416) and pitched the most innings (5,923⅔) among players whose careers were entirely in the 20th century. In 1983 his career strikeout record was broken by three pitchers: Nolan Ryan, Steve Carlton, and Gaylord Perry.

Johnson was nonplaying manager of the Washington club (1929–32) and of the Cleveland Indians (1933–35). A popular player, Johnson was elected in 1936 to the Baseball Hall of Fame.

Johnson, William (b. Dec. 27, 1771, Charleston, S.C.—d. Aug. 4, 1834, Brooklyn, N.Y., U.S.), associate justice of the United States Supreme Court from 1804 who established the practice of rendering individual opinions—concurring or dissenting—in addition to the majority opinion of the court. A deeply sensitive man and a learned, courageous jurist, he set himself against the dominance exercised over the court by Chief Justice John Marshall.

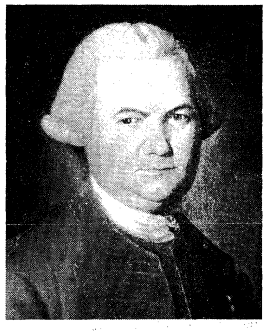
After serving in the South Carolina House of Representatives (1794–99; speaker, 1798–99), Johnson was elected by the legislature to the Court of Common Pleas, at that time the highest tribunal in the state. During his tenure as a state judge he was active in organizing at Columbia a college that later became the University of South Carolina.

Appointed by Pres. Thomas Jefferson in March 1804, Johnson was the first Democratic-Republican justice of the U.S. Supreme Court. In attempting to secure the court's position as the interpreter of the law and the Constitution (largely according to Federalist Party principles), Chief Justice Marshall discouraged the writing of seriatim (separate) opinions, delivered the opinion of the court in most major cases, and strove for unanimity among his colleagues. Johnson, however, often expressed independent views; he had been accustomed to preparing seriatim opinions in the state court, and in this predisposition he was supported by Jefferson, a political opponent of Marshall.

Although Jefferson and Johnson remained friends until the former's death in 1826, Johnson did not always sustain Jeffersonian policy. In *Gilchrist* v. *Collector of Charleston* (1808), Johnson, while holding federal circuit court, allowed clearance from the port of Charleston to a ship detained under Jefferson's Embargo Act of 1807, a measure intended to preserve U.S. neutrality in the Napoleonic Wars. In Supreme Court cases Johnson usually agreed with Marshall's insistence on broad federal power unhampered by state action. More than his fellow justices, however, Johnson favoured cooperation rather than antagonism between federal and state governments and economic regulation in the public interest. Concurring with Marshall's opinion in *Gibbons* v. *Ogden* (1824), he defended the regulatory power of Congress over interstate and foreign commerce; over one of Marshall's few dissents, he upheld, in *Ogden* v. *Saunders*, (1827), state power to alleviate economic distress. Late in his life Johnson angered many in his state by his circuit court decision in *Holmes* v. *United States* (1832), rejecting state nullification of federal statutes.

Justice William Johnson, the First Dissenter (1954) was written by Donald Grant Morgan.

Johnson, Sir William, 1ST BARONET (b. 1715, Smithtown, County Meath, Ire.—d. July 11, 1774, near Johnstown, N.Y.), pioneer in



Sir William Johnson, detail of a portrait by Matthew Pratt, *c.* 1772; in the collection of the New York State Education Department
By courtesy of the New York State Education Department

the Mohawk Valley, New York, whose service as colonial superintendent of Indian affairs was largely responsible for keeping the Iroquois neutral and even friendly to the British in the latter stages of the struggle with the French for control of North America.

Immigrating to the New World in 1737, Johnson purchased his first tract of land two years later, thus beginning the acquisitions that eventually made him one of the largest landholders and wealthiest settlers in British America. His rapport with neighbouring Indians began early on his estate, Mount Johnson, on the north bank of the Mohawk River, which became a centre of Indian trade and a shelter for the Mohawks. He tried to indoctrinate the natives in European ways by encouraging educational and missionary activities. His ties with the Indians were further cemented when, following the death of his first wife, he married successively two Mohawk women. The second of these was Molly Brant, sister of the Indian leader Joseph Brant.

Because of Johnson's skill as a diplomat, Gov. George Clinton in 1746 made him colonel of the Six Iroquois Nations (also known as the Iroquois League). Spending much of his time keeping peace among the tribes, he gleaned valuable information at frequent council meetings and organized and supplied war parties against the French. After a dispute with the provincial assembly several years later, he resigned his superintendency, but when the last French and Indian War broke out (1756) he was hastily pressed into service and promised new authority directly from the crown. At the Albany Congress of 1754 he conducted the British negotiations with the Indians and partially succeeded in assuring their support in the approaching war against the French.

In 1755 Johnson was appointed superintendent of the Six Iroquois Nations and their allies. Commissioned a major general, he defeated French forces at Lake George, N.Y. (September 8). He was made a baronet and the following year reappointed northern Indian superintendent—a post he held for the next 18 years. In 1759 he commanded a force that captured Ft. Niagara, and in 1760 he joined Sir Jeffrey Amherst's victorious assault on Montreal. After the war he was active in subduing the Indian uprising known as Pontiac's Conspiracy (1763–64) and was chief British negotiator in the settlement of 1768, the first Treaty of Ft. Stanwix. A reliable biography is J.T. Flexner's *Mohawk Baronet: Sir William Johnson of New York* (1959).

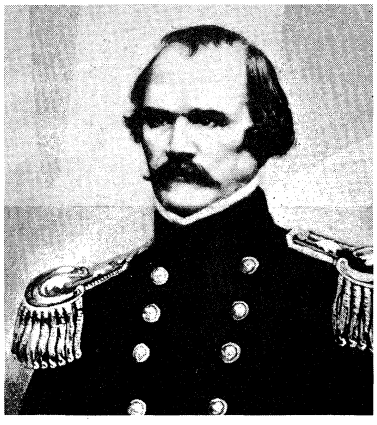
Johnson City, city, Washington County, northeastern Tennessee, U.S., lying in the Great Appalachian Valley, 98 mi (158 km) east-northeast of Knoxville. In the 1760s farmers and iron-makers settled in the vicinity. Following the arrival of the East Tennessee and Virginia Railroad in 1857, a settlement grew up around the water tank; it was called Johnson's Depot after Henry Johnson, the town's first postmaster. In 1859 it was renamed Haynesville for Landon C. Haynes, later a Confederate senator, but was renamed for Johnson again in 1861. The economy depends on diversified agriculture (cattle, alfalfa, and poultry), a burley tobacco market, and manufactures, which include telephone and electrical equipment, textiles, hardwood flooring, hospital supplies, chemicals, clothing, furniture, tools, and building materials. There is mining and quarrying (limestone) in the area. A Veterans Administration Center (Mountain Home) serves a five-state area. Educational facilities include East Tennessee State University (1909), Milligan College (founded in 1866 as Buffalo Male and Female Institute), and Steed College (1940). Inc. 1869. Pop. (1980) city, 39,753; Johnson City-Kingsport-Bristol metropolitan area, (SMSA), 433,638.

Johnson City, city, seat (1858) of Blanco County, south central Texas, U.S., on the

Pedernales River, 40 miles (64 km) west of Austin. The hometown of President Lyndon B. Johnson, it was founded in 1879 by James Polk Johnson, a forebear of the president, and was incorporated in 1944. It is a ranching supply centre and tourist base for the Lyndon B. Johnson National Historic Site, designated in 1969. The Johnson City Unit of the site includes the frame house (1901) where Johnson spent his boyhood and the Johnson Settlement, a restored ranch home owned in the mid-19th century by Sam Ealy Johnson, the president's grandfather. The LBJ Ranch Unit in Gillespie County, near Stonewall, 13 miles (21 km) west, includes the president's birthplace (a reconstructed late 19th-century farmhouse) and the family cemetery where Johnson is buried. The Lyndon B. Johnson State Park (269 acres [109 hectares]) is nearby, with a visitor centre containing Johnson family memorabilia. Hereford cattle, sheep, and goats are raised in the surrounding rolling hill country, and the city is a grading point for wool, mohair, and turkeys. Pop. (1984 est.) 914.

Johnston, Albert Sidney (b. Feb. 2, 1803, Washington, Ky., U.S.—d. April 6, 1862, Shiloh, Tenn.), Confederate general during the American Civil War (1861–65); his death in the second year of the war was considered an irreparable loss by the South.

An 1826 graduate of the U.S. Military Academy, West Point, N.Y., Johnston fought



Albert Sidney Johnston

By courtesy of the Library of Congress, Washington, D.C.

in the Black Hawk War (1832) and the Mexican War (1846–48) and was in the bloodless expedition against the Mormons in Utah (1857). When his adopted state of Texas seceded from the Union in 1861, he resigned his commission as commander of the U.S. Pacific Department and was appointed second-ranking general in the Confederate Army by President Jefferson Davis, whom he had known at West Point. Assuming command of the Western Department in September, Johnston succeeded in raising and organizing an army to guard a long and vulnerable line from the Mississippi River to the Allegheny Mountains. His forces were no match, however, for the superior numbers of the North, which forced the Confederates to retreat from Forts Henry and Donelson, in Tennessee, and from Bowling Green, Ky., and led to the fall of Nashville, Tenn., in February 1862. Nevertheless, bitter criticism of Johnston did not affect Davis' confidence in him.

Concentrating his army at Corinth, Miss., Johnston determined to attack General Ulysses S. Grant at Pittsburg Landing. His surprise assault upon the Union forces at the Battle of Shiloh (April 6 and 7) was almost successful, but he was mortally wounded in the first afternoon's fighting.

Johnston, Archibald: *see* Warriston, Archibald Johnston, Lord.

Johnston, David Claypoole (b. March 1799, Philadelphia—d. Nov. 8, 1865, Dorchester, Mass., U.S.), American cartoonist who, strongly influenced by the English caricaturist George Cruikshank, produced imaginative and original drawings.

As a schoolboy, Johnston showed an interest in drawing, and in 1815 he was apprenticed to a successful Philadelphia engraver. Shortly afterward he began making caricatures, which he published himself. They were popular, but the subjects he ridiculed were influential, and so he switched to an acting career. He first appeared on the stage in 1821, and for several years he played with a Philadelphia company. In 1825 he joined a Boston company, and along with his acting he made caricatures, particularly of actors and actresses. After a year he decided to devote himself to drawing and to book illustration. He quickly became popular, particularly as a lithographer.

Beginning in 1830 and until 1849, Johnston annually issued a series of humorous etchings under the title *Scraps,* and it was because of these that he came to be called the American Cruikshank.

Johnston, Edward (b. Feb. 11, 1872, Uruguay—d. Nov. 26, 1944, Ditchling, Sussex, Eng.), British teacher of calligraphy who had a widespread influence on 20th-century typography and calligraphy, particularly in England and Germany. He has been called the father of the modern revival of lettering.

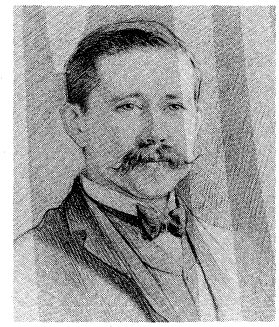
The son of a Scottish military officer, Johnston was brought to England as a child and received his early education at home. After graduating in medicine from the University of Edinburgh (1898) he went to London, where, instead of practicing his profession, he began to accept writing commissions. His teaching career began in 1899, when W.R. Lethaby, an English architect and educator, asked him to take charge of writing and lettering classes at the London Central School of Arts and Crafts. He taught there until 1913, and beginning in 1901 he also taught at the Royal College of Art, South Kensington. Through Lethaby, Johnston met Sydney Cockerell, who had been associated with William Morris' Kelmscott Press. Cockerell directed his attention to the manuscripts in the British Museum, and, encouraged by Cockerell, he rediscovered techniques for making and using reeds and quills.

Johnston's outstanding and highly influential *Writing and Illuminating, and Lettering* (1906), containing clear and practical information on writing procedures, was followed by *Manuscript and Inscription Letters* (1909). Commissioned by the London Underground Railway to execute a new alphabet for its signs and publicity, he finished in 1916 a sans serif design that was a notable success and is considered the first modern sans serif face, the precursor of many such types.

Johnston's teaching was notable in conveying the fundamental principle that writing and printing are interdependent. Among his students who later became well-known calligraphers and designers of letters were Anna Simons, T.J. Cobden-Sanderson, Eric Gill, Graily Hewitt, and Percy Smith.

Johnston, Sir Harry Hamilton (b. June 12, 1858, London—d. Aug. 31, 1927, Woodsetts House, near Worksop, Nottinghamshire, Eng.), British explorer, botanist, and pioneer colonial administrator. Widely traveled in Africa and speaking many African languages, he was closely involved in what has been called the scramble for Africa by 19th-century colonial powers. He published 40 books on African subjects and from 1891 to 1895 served as the first British commissioner in Nyasaland, now the Republic of Malawi.

He gained his early African experience as a painter, natural-history collector, and freelance journalist. He was in Tunis (1879–80), then traveled through Angola and up the Congo River (1882–83). On a botanical expedition to Kilimanjaro in eastern Africa, he



Harry Hamilton Johnston, pencil sketch by T.B. Wirgman, 1894; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

obtained a land concession that helped draw the frontiers between British and German territories in that region. Joining the consular service in 1885, he spent three years administering a British protectorate in eastern Nigeria. Between 1888 and 1891 he exercised much influence on British African policy and obtained the treaties on which the United Kingdom based its claims to Nyasaland and Northern Rhodesia. Knighted in 1896, Johnston served two years as consul general in Tunis and then was special commissioner in Uganda (1899–1901).

Johnston, Joseph E(ggleston) (b. Feb. 3, 1807, near Farmville, Va., U.S.—d. March 21, 1891, Washington, D.C.), Confederate general who never suffered a direct defeat during the American Civil War (1861–65). His military effectiveness, though, was hindered by a long-standing feud with Jefferson Davis.

A graduate of the U.S. Military Academy, West Point, N.Y. (1829), Johnston resigned his commission at the outbreak of the Civil War to offer his services to his native state of Virginia. Given the rank of brigadier general in the Confederate Army of the Shenandoah (May 1861), he was credited in July with the first important Southern victory at the First Battle of Bull Run (Manassas). He was promoted to general, but his dissatisfaction with his seniority was the start of his lengthy differences with Davis, president of the Confederacy. When the Peninsular Campaign began in April 1862, Johnston withdrew to defend the capital at Richmond. Although objecting to the strategy prescribed by Davis, he fought well against the Union forces. Severely



Joseph E. Johnston

By courtesy of the Library of Congress, Washington, D.C.

wounded at the Battle of Fair Oaks (Seven Pines) in May, he was replaced by General Robert E. Lee.

A year later Johnston assumed control of Confederate forces in Mississippi threatened

by the Federal advance on Vicksburg. He warned Gen. John C. Pemberton to evacuate the city, but President Davis counterordered Pemberton to hold it at all costs. Lacking sufficient troops, Johnston could not relieve Pemberton, and Vicksburg fell on July 4, 1863. Bitterly criticized, Johnston nonetheless took command of the Army of the Tennessee that December as the combined armies of the North advanced toward Atlanta, Ga. Subsequent events demonstrated the soundness of Johnston's strategy of planned withdrawal to avoid a defeat by superior forces and the disintegration of the Confederate Army; nevertheless, Davis, dissatisfied with his failure to defeat the invaders, replaced him in July.

Restored to duty in February 1865, Johnston took command of his old army, now in North Carolina, and succeeded in delaying the advance of Gen. William T. Sherman at Bentonville, in March. Lack of men and supplies forced Johnston to order continued withdrawal, however, and he surrendered to Sherman at Durham Station, N.C., on April 26.

After the war, Johnston engaged in business ventures, wrote his memoirs, served in the U.S. House of Representatives (1879–81), and was named U.S. commissioner of railroads in 1885.

Johnston and Sand Islands, unincorporated territory of the U.S. in the central Pacific Ocean, 715 mi (1,150 km) southwest of Honolulu. A raised coral atoll formation measuring 3,000 ft (900 m) by 600 ft, the two islands have a total land area of 320 ac (130 ha). Johnston, the larger, rises to 44 ft at Summit Peak. Both are within a 7½-mi semicircular reef. Rainfall is sparse, and there are no sources of fresh water. Vegetation is limited to bunch grass and herbs. Sand Island is uninhabited.

Sighted in 1807 by an English mariner, Capt. C.J. Johnston, the islands were uninhabited and remained unclaimed until 1858, when both the United States (under the Guano Act of 1856) and the Kingdom of Hawaii laid claim. The islands' guano deposits were exhausted by 1908. Declared a bird sanctuary in 1926 under the administration of the U.S. Department of Agriculture, the atoll was placed under the U.S. Navy in 1934. By 1941 a naval air station had been built, the landing field taking up almost the full length of the island. Transferred to U.S. Air Force jurisdiction in 1948, Johnston was associated with U.S. nuclear-weapons tests until 1962. The island has been managed by the Defense Nuclear Agency since 1974 and is also used as a storage dump for chemical weapons. It is visited occasionally by scientists from the Smithsonian Institution (Washington, D.C.) studying bird migrations. Pop. (1980) 327.

Johnstown, city, seat (1838) of Fulton County, east central New York, U.S., near the Mohawk River, adjoining Gloversville, 43 mi (69 km) northwest of Albany. It was founded in 1762 by Sir William Johnson, whose baronial home, Johnson Hall (which served as a centre for important negotiations between Colonials and Indians), is preserved. Drumm House and Tryon County Court House also date from the colonial period. A minor battle of the Revolution was fought there on Oct. 25, 1781, six days after Yorktown. Elizabeth Cady Stanton, pioneer suffragette, was born at Johnstown in 1815. Glove making is the basic industry. The city is the seat of Fulton-Montgomery Community College (1964). Inc. village, 1808; city, 1895. Pop. (1980) 9,360.

Johnstown, city, Cambria County, southwestern Pennsylvania, U.S., at the confluence of the Conemaugh River and Stony Creek, 76 mi (122 km) east of Pittsburgh. It is the centre of a metropolitan area comprising more than 60 townships and boroughs.

Founded in 1800 by Joseph Johns, a Swiss Mennonite, it was known as Conemaugh until renamed in 1834 to honour the founder. Johnstown first became important as the western terminus of the Allegheny Portage Railroad (1831–34), a series of inclined planes whereby Pennsylvania Canal barges were transported piggyback on railway cars for 36 mi over the Allegheny Mountains. A park and national historic site recalls this early engineering feat. In 1861 use of the Kelly Converter (for converting iron to steel) spurred growth of the Johnstown steel industry, which later developed the nation's first blooming mill (for the breaking down of steel ingots) and the first domestic steel rails. By 1873, Johnstown was a leading U.S. steelmaking centre. Coal mining, also important, diminished after the 1930s.

On May 31, 1889, the South Fork Dam, which held a major upstream reservoir, collapsed, sending a great wall of water down the Conemaugh Valley that caused more than 2,200 deaths and widespread property damage. Grandview Cemetery contains the graves of 777 unidentified victims. The Johnstown Flood National Memorial stands at the site of the old dam. After another disastrous flood in 1936, a flood-control program was completed (1943), although this did not prevent heavy flooding in July 1977 when 68 people were killed.

Modern industries include the production of clothing, chemicals, furniture, fabricated steel plate, and the manufacture of wheels, axles, freight cars, and wire. The Johnstown branch of the University of Pittsburgh was opened in 1927. An inclined-plane passenger car rises 500 ft (150 m) at a 71 percent grade from the business to the residential district. Inc. city, 1898. Pop. (1970) 42,476; (1980) 35,496.

Johor, formerly JOHORE, southernmost state (*negeri*) in West Malaysia (Malaya), bounded northwest by the states of Melaka and Negeri Sembilan and north by Pahang. Its 250-mi (400-km) coastline along the Strait of Malacca and South China Sea also winds around the Republic of Singapore's northern border and is dotted with small islands. Its area of 7,330 sq mi (18,984 sq km) is generally flat and jungle covered, with large swamps, but rises in the east central region to peaks of over 3,000 ft (900 m).

Founded by Mahmud, the fugitive sultan of Malacca, and his son Ala'ud'din after the Malaccan kingdom fell to the Portuguese (1511), the area declined in the 18th century when the seat of power shifted to the Riau (Riouw) islands, south of Singapore. The governors of the Johore sultanate were recognized as independent by the British in the cession of Singapore (1819). After 1830, Chinese pepper



Coconut palm grove in Johor state, Malaysia
Art Resource/EB Inc.

and gambier (catechu) planters settled in the plains, and a few small trading centres were established along the rivers.

The economy developed after 1919, when the railway was extended southward from Malaya's tin and rubber belt to Singapore, ending Johore's historical isolation (by swamps) from the rest of the peninsula. After World War I, large-scale rubber planting was introduced, and tin and iron deposits were discovered. Bauxite is worked at Teluk Ramunia. Johor is a leading state in oil-palm production, and coconut (copra) and pineapple estates flourish in the swampy plains, particularly in the peat areas to the west. Canning factories adjoin the estates. Johor Tenggara is the site of a large agricultural and resettlement project, part of a long-term (1970–90) development plan.

Because of Johor's shallow harbours, its trade depends on Singapore's port facilities. Commodity movements are now mainly by roads, all converging on the state capital, Johor Baharu, linked by causeway to Singapore. The latter depends on Johor's Sungai (River) Teberau for its water supply. Johor has become essentially a part of Singapore's hinterland; its economic relations with Pahang state to the north are negligible. Aside from Johor Baharu (*q.v.*), other important towns are Muar, Batu Pahat, Mersing, and Segamat (*qq.v.*). Pop. (1982 est.) 1,649,207.

Johor Baharu, formerly JOHORE BAHRU, capital of Johor state, West Malaysia, at the



The Abu Bakar Mosque, Johor Baharu, Malaysia
J. Allen Cash—EB Inc.

southern end of the Malay Peninsula, separated from Singapore Island by the Johor Strait. At this point, a short rail and road causeway (¾ mi) crosses the strait to link the mainland with Singapore. Founded by Temenggong Ibrahim, the ruler of Johore, it was originally called Tanjung Putri until renamed Johore Bahru (New Johore) in 1866, replacing Johore Lama (Old Johore), 18 mi east.

The town, long a trade outlet for the products of the peninsula and a major port of entry, is on low hills surrounded by rubber, oil-palm, and pineapple estates. It has a textile industry, and bauxite is mined at Teluk Ramunia to the southeast. Many of its residents use the amenities of the city of Singapore, of which it is almost a satellite. The Malay dialect spoken in the Johor Baharu district is considered the standard for Bahasa Malaysia, the national language. The town, largely Chinese in character, has the Istana Besar ("big palace"), the picturesque Abu Bakar Mosque, the Bukit Serene Palace (the sultan's residence), and a public zoo. Mohammad Khalid Teachers' College is located here, as is Ibrahim Temenggong Teachers' College (1965). Pop. (1980) 246,395.

Johore Strait, Bahasa Malaysia SELAT TABRAU, northern arm of the Singapore Strait, 30 mi (50 km) long and ¾–3 mi wide, between the Republic of Singapore and the State of Johor at the southern tip of the Malay Peninsula. It is crossed by a rail and road causeway linking Johor Baharu, Malaysia, with Woodlands, Singapore. The strait was the scene of fighting in February 1942 during the Japanese drive to conquer Singapore, then a British colony. Its eastern portion contains the

Singapore islands of Ubin and Tekong Besar and has a deepwater access channel to Changi naval base on Singapore's northeastern coast.

Joiachin (king of Judah): *see* Jehoiachin.

joinder and impleader, in law, processes whereby third parties are brought into suits because their participation is necessary for the successful adjudication of the issues. Impleading occurs when a third party against whom the defendant may himself have a claim is brought into the original suit in the interests of time and efficiency. Joinder of suit occurs when two or more issues are dispensed within the same hearing.

Impleading is a procedural device. Any defendant who claims that a third party may have a portion (or more) of the liability claimed by the plaintiff has the right to bring that third party into the suit. By the same token, the same right is available to a plaintiff against whom a defendant (or defendants in third-party suits) may have filed a counterclaim.

The courts have tended to favour such causes of action in the interest of time and costs saved.

Joinder may be mandatory in some instances. Compulsory joinder requires the uniting of a person who must be made a party with others in a suit because his participation is necessary for a just adjudication of the matter. A plaintiff bringing several claims on a related subject must follow the procedure of joinder or risk having those several suits barred from a hearing on the ground that they constitute a multiplicity of suits. A similar procedure is available for defendants, as compulsory counterclaims must also be raised in such a case situation.

Permissive joinder is the uniting of several persons, under certain instances, as either defendant or plaintiff, until they can bring suit or be sued separately.

Joinder and impleading, as procedural devices, are both required, in certain situations, in the interest of saving time and money in the pursuit of a just verdict, and are also considered a desirable right on the part of those who would certainly benefit from these procedures.

joint, in anatomy, a structure connecting two or more adjacent elements of the skeleton.

A brief treatment of joints follows. For full treatment, *see* MACROPAEDIA: Supportive and Connective Tissues.

Structurally, there are two types of joints: diarthrosis, containing fluid, and synarthrosis, which function without fluid. Synarthroses are classified as fibrous, cartilaginous, or fibrocartilaginous. The elements of a fibrous joint are connected with collagen fibres. Cartilaginous joints, or synchondroses, are transient, linking bones which become fused after birth; they usually disappear before the age of 25. Fibrocartilaginous joints, or symphyses, are the connections between the body of one bone and the body of another. With two exceptions, all symphyses are located in the spinal column and are termed intervertebral disks. These disks have a hard, elastic outer ring, and a soft, mucoid core. Disks permit the vertebrae of the spine to move and insulate against the jolts of severe movements, such as jumping.

A diarthrosis, or synovial joint, consists of a sac (bursa) containing fluid which both nourishes and lubricates the joint, making motion possible. All synovial joints are either ovoid (which is either convex or concave in all directions) or sellar, with concave and convex sides at right angles to each other. The ovoid bone surface is termed male if it is convex, and female if it is concave.

The collagen fibres which connect the bones of a joint are ligaments. It was accepted until recently that ligaments held the bones of a joint in place, but it is now believed that it is in fact muscles which keep bones in their joint. Joints are nourished by blood supplied through capillaries, with the exceptions of the moving cartilage parts of a joint, disks, and menisci, which are nourished by synovial fluid.

Joint disease is one of the leading causes of invalidism. The disease can be of a short duration or can be chronic and can affect one joint or many. The aged are most susceptible to joint disease, but all ages can be affected. These disorders can be classified in two general categories: inflammatory, causing swelling, pain, redness, and heat; and noninflammatory, in which inflammation is not the principal effect.

Arthritis refers to all inflammatory joint diseases, whereas synovitis describes inflammation of the lining of a joint. Spondylitis is the term for inflammation of the spine. Rheumatism refers to a state of discomfort related to any part of the skeletal system, including tendons and ligaments. When joints become infected the illness is known as infectious arthritis. Having symptoms similar to infectious arthritis, but with no known cause, is rheumatoid arthritis. It usually affects matching joints of the body, such as knees and wrists, and leads to a serious incapacity in an estimated one-third of all cases.

Diseases referred to as collagen diseases describe a general condition of abnormality of the connective tissues. These include lupus erythematosus, which can affect any organ or structure of the body, causing eruptions on the face, inflammation of the joints and eyes, and kidney disease or afflictions of the central nervous system. Rheumatic fever is frequently defined as a collagen disease. It resembles rheumatoid arthritis but is usually linked to a streptococcal infection.

Noninflammatory joint diseases include traumatic joint diseases, which are the result of joint injuries and can take the form of a sprain, fracture, or dislocation. A sprain is an injury to the ligaments, tendons, or muscles resulting from an abrupt, jerking movement. It will normally heal in a matter of days. A more severe stress can cause ligaments, tendons, or muscles to tear, healing by fibrous union. Joint dislocations demand extended immobilization and, in some instances, surgery to heal.

Osteoarthritis is a degenerative joint disease of the cartilage. All adults past middle age are to some degree affected. This disease is the most destructive when located in the hip. It is extremely unusual for a single injury to be the cause of osteoarthritis, but repeated stresses can make people vulnerable to this affliction.

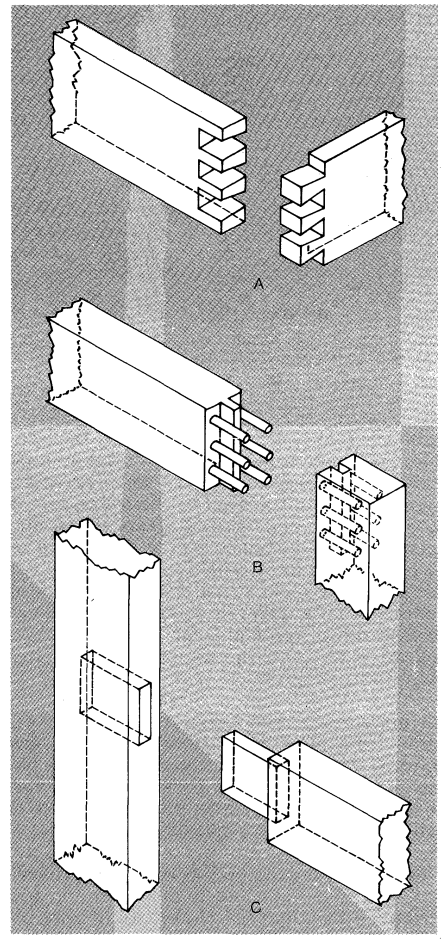
Congenital and hereditary abnormalities are not always evident at birth. Defects that appear at birth or at an early age are most often structural, whereas those that manifest later in life are usually the result of systemic metabolic deficiencies which lead to structural problems.

Joint diseases can have other causes. Nutritional inadequacies can cause rickets and scurvy. Hemophilia causes bleeding into the joints, a damaging condition called hemarthrosis. Bone tissue death not caused by infection, termed aseptic necrosis, can lead to insufficient blood supply to the joint. Acromegaly, extreme activity of the pituitary gland, causes an overabundance of joint cartilage in peripheral joints, leading to osteoarthritic damage. A Charcot joint is characterized by an inability to receive sensory stimulation. This has a severely destructive impact on joints. A heart attack is frequently the cause of shoulder-hand syndrome, or it can be related to neck vertebrae diseases. Its symptoms are pain in the shoulders and swelling in the hands.

Evidence of joint disease can be traced as far back as fossils from the Mesozoic Era. Rheumatoid arthritis has been detected in Egyptian mummies. All chronic arthritis was interpreted as gout until recent times. The first man to determine the existence of rheumatism was the Parisian physician Guillaume de Baillou in 1591.

For diagnostic purposes, X-rays are used to detect bone problems but not abnormalities of tissue or joints. Synovial fluid is analyzed to aid in the diagnosis of inflammatory diseases. A synovial biopsy assists in determining whether arthritis is infectious or rheumatoid in nature.

joint, in carpentry, junction of two or more members of a framed structure. Joinery, or the making of wooden joints, is one of the principal functions of the carpenter and cabinetmaker. Wood, being a natural material, is not uniform in quality, and moisture, present in the tree during growth, is uneven in cut wood. Wood used for building is subject to movement caused by changes in its moisture content. Though such movement is frequently quite small and accurately predictable, it remains a critical consideration in joint design. Because wood has been used as a building material for centuries throughout the world, the designs of most joints were perfected hundreds of years ago and have changed little since that time.

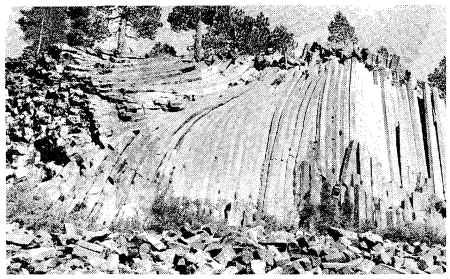


Three types of carpenter's joints
(A) Thru multiple dovetail; (B) dowelled joint; (C) blind mortise and tenon

The object of the joint is to fix two members together so that the joint has the greatest possible mechanical strength and is as unobtrusive as possible. Though there are many joints in use, they fall into a few basic groups, many being variations and elaborations on fundamentally simple ideas. Practically all are based on handwork, and with few exceptions

most machine-made joints follow the traditional patterns; most joints rely to a considerable extent on a combination of mechanical fit and glue for their strength. Common types of joints include the dovetail, used for joining two flat members together at right angles, as in the sides of a drawer; the dowelled joint, in which dowelling is employed to impart mechanical strength; and the mortise and tenon, used to join a horizontal member with the vertical member of a frame.

joint, in geology, a brittle-fracture surface in rocks along which little or no displacement has occurred. Present in nearly all surface rocks, joints extend in various directions, generally more toward the vertical than to the horizontal. Joints may have smooth, clean surfaces, or they may be scarred by slickensides, or striations. Jointing does not extend to a very great depth in the Earth's crust, because at about 12 kilometres (7.5 miles) even rigid rocks tend to flow plastically in response to stress.



Columnar jointing in basalt, near Mammoth Mountain, Sierra Nevada, California
Robert C. Frampton

In unweathered rocks, joints are relatively inconspicuous, but upon weathering they become marked, especially in a soluble rock such as limestone. Solution by water percolating through joints has led to the formation of large caves and underground rivers. Quarrying operations are facilitated by the presence of a well-developed joint system.

Sedimentary rocks usually show two sets of joints at right angles to one another, each extending down perpendicular to the bedding; one set extends in the direction of dip and the other in the direction of strike (trend of the line of intersection of the bedding and the horizontal). The distance between joints varies from about two centimetres to a few hundred metres; in alternating strata the degree of jointing may vary from bed to bed and in some cases is related to the compaction of sediments during rock formation.

In igneous rocks, jointing is generally quite irregular; but in granite, two vertical sets forming right angles to one another on the top surface and another set of cross joints approximately horizontal occur frequently. (These cross joints are the effect of weathering.) Intrusions of molten rock, when cooled, form sills and dikes, which, in many places, show columnar jointing. Three sets of joints perpendicular to the cooling surfaces intersect each other at angles of about 120°. These form polygonal columns of rock that range from about 7–8 centimetres (3 inches) to about 6 metres (19 feet) in diameter; the size depends on the rate of cooling of the intrusive rock—the faster the cooling, the smaller the columns.

The principal cause of jointing in both stratified and igneous rocks is crustal movement, although the specific origin of the movement may not always be apparent. Contraction upon consolidation of sediment, as well as crystallization, also contributes to minor irregular jointing, as does expansion and contraction from the intrusion of hot igneous rocks.

joint family, family in which members of a unilineal descent group (a group in which descent through either the female or the male line is emphasized) live together with their spouses and offspring in one homestead and under the authority of one of the members. The joint family is an extension of the nuclear family (parents and dependent children), and it typically grows when children of one sex do not leave their parents' home at marriage but bring their spouses to live with them. Thus, a patrilineal joint family might consist of an older man and his wife, his sons and unmarried daughters, his sons' wives and children, and so forth. For a man in the middle generation, belonging to a joint family means joining his conjugal family to his family of orientation (*i.e.,* into which he was born).

The joint family is distinguished from the extended family (*q.v.*) only in that members of the latter live in separate compounds. Members of a joint family share all the tasks of food gathering, trade, food preparation, and child rearing; and at times the social organization is so cohesive that the discrete nuclear families are barely visible in the daily chores, with children addressing all the adult women as "mother."

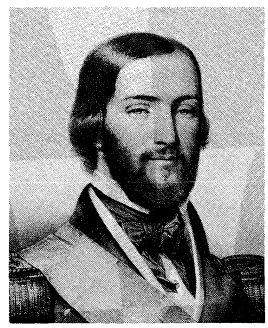
joint ganglion, saclike structure containing thick gelatinous material that appears on the top or underside of the wrist, or less commonly on the top of the foot. The cause is unknown, but trauma (wound or injury) to the tendon sheaths or the lining material of the joint may be implicated; it is most common in persons who use their hands and wrists constantly, as typists and pianists. The swelling develops slowly, causes little or no pain, and may disappear spontaneously. It may also be removed by surgery or be shrunk by injection of chemicals.

Joint Industrial Council: *see* Whitley Council.

jointed charlock (plant): *see* wild radish.

Joinvile, city, northeastern Santa Catarina state, southern Brazil, on the Rio Cachoeira adjacent to Boa Vista, near the end of Baía (bay) de São Francisco, at 20 ft (6 m) above sea level. Established as a city in 1887 from the former colony of Dona Francisca, Joinvile has become a modern industrial city. Iron, steel, lead, flour, and cotton manufactured in the city are exported along with large quantities of timber via the port of São Francisco do Sul (42 mi [68 km] to the northeast) and by highway and railroad to other urban centres in Santa Catarina along the coast. Canadians reforested the Joinvile area during the late 1970s for timber and cellulose (from carnauba palms, pine, and eucalyptus). Tourist attractions include an archaeological museum. Pop. (1980 prelim.) 217,074.

Joinville, François-Ferdinand-Philippe-Louis-Marie d'Orléans, prince de (b. Aug. 14, 1818, Neuilly, Fr.—d. June 16, 1900, Paris), naval officer and writer on military topics who was prominent in the modernization of the French Navy.

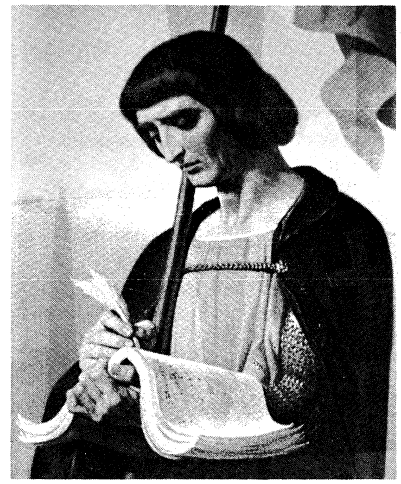


Prince de Joinville, lithograph after a portrait by Antoine Maurin, 1841
By courtesy of the Bibliotheque Nationale, Paris

The son of Louis-Philippe, duc d'Orléans, later king of the French from 1830 to 1848, Joinville joined the navy in 1831, becoming lieutenant in 1836. Sent to Vera Cruz in 1838, he fought well, rising to captain (1839), and in 1840 he carried Napoleon's remains back to France. Named vice admiral in 1844, he caused a stir with an article in the *Revue des Deux Mondes* comparing the naval forces of England and France, to the detriment of France. To redress the balance he urged France to acquire steamships. A great sponsor of new inventions, he was the patron of Dupuy de Lôme, architect of the earliest steam- and screw-rated ships.

After 1848 Joinville went to England and in 1861 to the United States to offer his services to President Lincoln. Returning to France in 1870, he was expelled, returned under the name of Colonel Lutherod, and was exiled again, but the law that exiled the Orléans family was repealed in 1871. Elected deputy of Haute-Marne in 1871, he retired from public life in 1875. His works include *Essais sur la marine française* (1852; "Essays on the French Navy") and *Études sur la marine,* 2 vol. (1859; "Naval Studies").

Joinville, Jean, sire de (b. *c.* 1224, Joinville, Champagne—d. Dec. 24, 1317, Joinville), author of the famous *Histoire de saint-Louis,* a chronicle in French prose, providing a supreme account of the Seventh Crusade (1248–54).



Jean, sire de Joinville, detail of an oil painting by Merry-Joseph Blondel, 19th century; in the Musée National de Versailles et des Trianons
Cliche Musees Nationaux, Paris

A member of the lesser nobility of Champagne, Joinville first attended the court of Louis IX at Saumur (1241), probably as a squire. The young Joinville took the crusader's cross at the same time as the King (1244) and set out with him (August 1248) on his expedition to Egypt, from where the crusaders planned to attack Syria. Captured with the entire army, Louis and Joinville were ransomed, and Joinville became friends with Louis during the King's subsequent stay at Acre. They returned to France in 1254. While in Syria, Joinville wrote the first draft of a minor work, his *Credo,* a rather naive statement of belief that was probably revised later. Made seneschal of Champagne on his return, he became an expert in court procedures and seems to have divided his time between the royal court and his fief of Joinville. He refused to accompany the King on his fatal crusade to Tunis (1270), having previously told him that it was folly. Joinville lived to testify for the canonization of the King (1282) and to see it enacted (1298); he controlled his domain until his death at 93.

Preliminary drafts of Joinville's major work,

the *Histoire de Saint-Louis,* may have been begun as early as the 1270s, but the final form was commissioned by Jeanne of Champagne and Navarre, wife of King Philip IV the Fair; it was not completed at the time of her death (1305) and so was presented in 1309 to her son Louis X. The *Histoire* is a personal account, which, in the course of setting forth the exploits of his idol, King Louis IX, reveals Joinville himself as a deeply moving man: simple, honest, straightforward, affectionate. He makes no attempt to conceal his occasional cowardice, his lack of piety, his tactlessness, or his garrulity. Although the short narratives of Louis's early life and of his later reign, death, and canonization are valuable because of the author's proximity to them, the heart of the book lies in its lengthy central section, the account of the Crusade. Besides telling the financial hardships, the dangers of sea voyages, and the ravages of disease, he vividly describes the confusion and lack of discipline in the crusading army. A blunt adviser, Joinville paints his king's sublime unworldliness against his own frank humanity. In addition, the book describes Muslim customs.

The original manuscript of the work disappeared from all records shortly after its composition. The *Histoire* was first printed and modernized from an inferior manuscript in 1547. Most recent editions are based on a text constructed by Natalis de Wailly (1874). Translations into English include Joan Evans, *The History of St. Louis, by Jean, Sire de Joinville* (1938); and René Hague, *The Life of St. Louis by Jean of Joinville* (1955).

joist, ceiling or floor support in building construction. Joists—of timber, steel, or reinforced concrete—are laid in a parallel series across or abutting girders or a bearing wall, to which they are attached, usually by metal supports called joist hangers, or anchors.

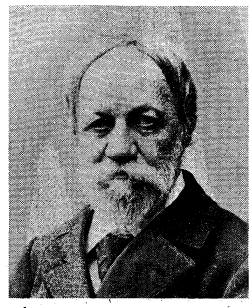
The ends of the joists are grooved or notched so that they are flush with the weight-bearing elements to provide a smooth horizontal. Before the floor is laid above or the ceiling laths hung below the principal joists, additional strength may be given in the form of bridging joists—diagonal braces between the horizontal beams.

Jōjitsu, Chinese CH'ENG-SHIH, minor school of Buddhist philosophy introduced into Japan from China during the Nara period (710–784). The school holds that neither the self nor the elements that make up the mental and material world have any permanent, changeless reality and that they therefore cannot be said to have any real existence.

The school takes its name from its most authoritative text, the *Jōjitsu-ron* (Sanskrit: *Satyasiddhi-śāstra;* "True Attainment Treatise"), attributed to the 3rd–4th-century Indian scholar Harivarman, who studied both Hīnayāna and Mahāyāna traditions. The doctrine was introduced into Japan in the 7th century by the learned Korean priest Ekwan. The school now exists in Japan only as a subsect of the Sanron ("Three Treatises") school and is no longer found in China.

jojoba, also called GOAT NUT (*Simmondsia chinensis*), leathery-leaved shrub in the box family (Buxaceae), native to the southwestern United States and northern Mexico, the capsules of which yield jojoba oil. The stiff-branched plant, which grows to a height of up to 2 m (7 feet), is cultivated as hedge material, substituted for boxwood in arid areas. It is also grown in limited but expanding commercial quantities in southern California for the oil, which is equal to sperm oil in quality. Jojoba oil is found in a variety of cosmetic products, such as soaps, shampoos, and hair conditioners, where it is believed to have certain restorative effects.

Jókai, Mór (b. Feb. 18, 1825, Komárom, Hung.—d. May 5, 1904, Budapest), most important Hungarian novelist of the 19th century. Jókai's collected works (published 1894–98), which did not include his considerable journalistic writing, filled 100 volumes. Early works such as *Hétköznapok* (1845; "Weekdays") show the influence of French Romanticism, but his mature novels are more concerned with reality and personal experience.



Jókai
By courtesy of the Petofi Irodalmi Muzeum, Budapest

Egy magyar nábob (1853–54; "A Hungarian Nabob") and *Az aranyember* (1873; "A Man of Gold") are among his most important novels dealing with contemporary Hungary.

joking relationship, institutionalized form of social interaction between two persons or groups in which one is permitted—or even required—to make fun of or tease the other, who, usually, is not permitted to take offense. The joking may be mutual (symmetrical) or formalized in such a way that one person does the teasing and the other does not retaliate (asymmetrical). The form of joking varies and may include verbal abuse, obscenity, or horseplay.

The joking relationship combines friendliness and hostility and is generally found in situations in which conflict or rivalry is possible but must be avoided. It may, for example, be used as an instrument of social sanction, the joker calling public attention to an individual or a family group who has behaved in a socially unacceptable way. When a joking relationship occurs between groups, the jocularity, although disrespectful, expresses the separateness of the groups in a manner that averts actual conflict.

As a social institution the joking relationship is often found in association with the avoidance relationship, which limits direct personal contact and maintains an extreme degree of respect. For example, in many cultures a man must avoid his mother-in-law and joke with his sisters- and brothers-in-law. Joking relationships are often prescribed between people of opposite sex who are potential partners in marriage or sexual relations; avoidance relations, on the other hand, may be required between persons of opposite sex for whom marital or sexual relations are forbidden. Both of these customs—viewed as points along a continuum of respectful behaviour ranging from avoidance to license—act to stabilize relations that might be subject to conflict. Because patterns of these relationships between certain categories of kinsmen occur with considerable similarity across many cultures with different social structures, it has been suggested that the causal factors are almost universal.

Jokjakarta (Indonesia): *see* Yogyakarta.

Jökulsá á Fjöllum, river, northeastern Iceland, fed by the northern meltwaters of the Vatna Glacier in east-central Iceland; it flows northward for 128 miles (206 km) to Axar Fjord, an arm of the Greenland Sea. The river skirts the eastern margins of Ódádhahraun, an extensive lava field, and then tumbles over a series of falls, the largest of which (Dettifoss, 144 feet [44 m]) has the greatest hydroelectric potential on the island. The second longest of Iceland's rivers, Jökulsá á Fjöllum has the largest drainage basin, 3,070 square miles (7,950 square km).

Jolas, Eugene and Maria, Maria Jolas *née* MARIA McDONALD (respectively b. Oct. 26, 1894, Union City, N.J., U.S.—d. May 26, 1952, Paris; b. January 1893, Louisville, Ky., U.S.—d. March 4, 1987, Paris), American founders, with Elliot Paul, of the revolutionary literary quarterly *transition.*

Raised in Lorraine, France, Jolas worked as a journalist both in America and in France. As he rejected the industrial focus of American society in the 1920s, he also lost faith in newspaper reporting and became more interested in literature. The Jolases met in the United States and moved to Paris after their marriage in 1926. There Jolas sought to provide a forum for international writers with the establishment of the periodical *transition* (1927–30, 1932–39). Dedicated to the original, the revolutionary, and the experimental, *transition* published foreign writers in translation as well as such writers as Gertrude Stein, Kay Boyle, Archibald MacLeish, H.D., Allen Tate, Ernest Hemingway, Samuel Beckett, William Carlos Williams, and—perhaps most significantly—James Joyce. The magazine was an immediate literary success.

In addition to his role as the chief editor and guiding light of *transition,* Jolas wrote poetry that reflected his beliefs that language should be re-created and should rely upon dreams and the subconscious for inspiration. His best volume was *The Language of Night* (1932).

Maria Jolas' work on *transition* was less visible than her husband's; she was essentially the managing and production editor as well as a translator of the foreign pieces that appeared in the magazine. Her other work included the establishment of the École Bilingue de Neuilly (1932–40; "Bilingual School of Neuilly") and the translation of 12 novels by Nathalie Sarraute.

Consult the INDEX *first*

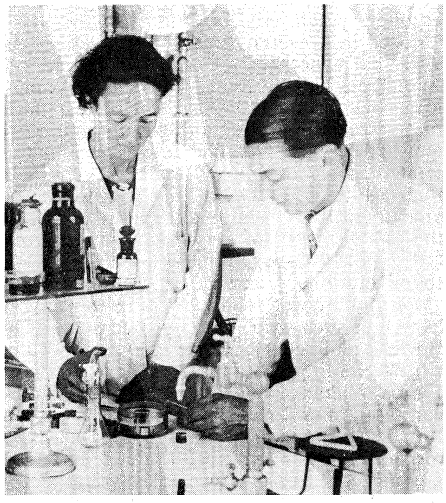
Joliet, city, seat of Will county, northeastern Illinois, U.S., on the Des Plaines River. Settled in 1833 and named Juliet in honour of Juliet Campbell, daughter of a settler, it was renamed (1845) for Louis Jolliet, the French-Canadian explorer who visited the site in 1673. It was once known as the "stone city" for its limestone, used throughout the Middle West (*e.g.,* in the Rock Island Arsenal, the Illinois State House, and the Lincoln Monument in Springfield). The opening of the Illinois and Michigan Canal (1848), the arrival of the Rock Island Railroad (1852), and completion of the Chicago Sanitary and Ship Canal in 1900 contributed to the city's expansion as an industrial and agricultural centre, and provided outlets for its farm products, manufactures (construction materials and equipment, machinery, wire, chemicals, paper), coal (strip mining), and oil-refinery products.

Joliet Junior College was opened in 1901, and the College of St. Francis in 1930. Lewis College (1930) is in nearby Lockport. The Joliet Correctional Center (a state prison) was built in the mid-19th century. The Illinois Crime Laboratory is nearby, and Stateville Correctional Center, a maximum security prison, is 5 miles (8 km) north. Inc. 1852. Pop. (1987 est.) 76,232.

Joliet, Louis (explorer): *see* Jolliet, Louis.

Joliot-Curie, Frédéric and Irène,, original names (until 1926) JEAN-FRÉDÉRIC JOLIOT and IRÈNE CURIE (respectively b. March 19, 1900, Paris—d. Aug. 14, 1958, Arcouest, Fr.;

b. Sept. 12, 1897, Paris—d. March 17, 1956, Paris), French physical chemists, husband and wife, who were jointly awarded the 1935 Nobel Prize for Chemistry for their discovery of new radioactive elements prepared artificially. They were the son-in-law and daughter of Nobel Prize winners Pierre and Marie Curie.



Irène and Frédéric Joliot-Curie
EB Inc.

Irène Curie from 1912 to 1914 prepared for her *baccalauréat* at the Collège Sévigné and in 1918 became her mother's assistant at the Institut du Radium of the University of Paris. In 1925 she presented her doctoral thesis on the alpha rays of polonium. In the same year she met Frédéric Joliot in her mother's laboratory; she was to find in him a mate who shared her interest in science, sports, humanism, and the arts.

As a boarding student at the Lycée Lakanal, Frédéric Joliot had distinguished himself more in sports than in studies. Reversals of family fortune had then forced him to choose a free public education at the Lavoisier municipal school in order to prepare for the entrance competition at the École de Physique et de Chimie Industrielle, from which he was graduated with a degree in engineering, ranking first. After completing his military service, he accepted a research scholarship and, on the recommendation of the physicist Paul Langevin, was hired in October 1925 as Marie Curie's assistant. The following year (on Oct. 9, 1926) Frédéric and Irène were married.

Joliot simultaneously pursued new studies to obtain his *licence ès sciences* in 1927, taught at the École d'Électricité Industrielle Charliat in order to augment his finances, and learned laboratory techniques under the guidance of Irène Curie. Beginning in 1928 they signed their scientific work jointly.

In the course of their researches they bombarded boron, aluminum, and magnesium, respectively, with alpha particles; and they obtained radioactive isotopes of elements not ordinarily radioactive, namely, nitrogen, phosphorus, and aluminum. These discoveries revealed the possibility of using artificially produced radioactive elements to follow chemical changes and physiological processes, and such applications were soon successful; the absorption of radioiodine by the thyroid gland was detected, and the course of radiophosphorus (in the form of phosphates) was traced in the metabolism of the organism. The production of these unstable atomic nuclei afforded further means for the observation of changes in the atom as these nuclei broke down. The Joliot-Curies observed also the production of neutrons and positive electrons in the changes that they studied; and their discovery of artificial radioactive elements was an important step toward the solution of the problem of releasing the energy of the atom, since the method of Enrico Fermi, using neutrons instead of alpha particles for the bombardments which led to the fission of uranium, was an extension of the method of the Joliot-Curies for producing radioelements artificially.

In 1935 Frédéric and Irène Joliot-Curie were awarded the Nobel Prize for Chemistry for the synthesis of new radioactive elements. The Joliot-Curies then moved into a home at the edge of the Parc de Sceaux. They left it only for visits to their house in Brittany at Pointe de l'Arcouest, where university families had been meeting together since the time of Marie Curie. And, for the sake of Irène's lungs, they visited the mountains of Courchevel during the 1950s.

Frédéric, appointed professor at the Collège de France in 1937, devoted a part of his activities to preparing new sources of radiation. He then supervised the construction of electrostatic accelerators at Arcueil–Cachan and at Ivry and a cyclotron of seven million electron volts at the Collège de France, the second (after the Soviet Union) installation of equipment of this type in Europe.

Irène then devoted her time largely to the upbringing of their children, Hélène and Pierre. But both she and Frédéric had a lofty idea of their human and social responsibilities. They had joined the Socialist Party in 1934 and the Comité de Vigilance des Intellectuels Antifascistes (Vigilance Committee of Anti-Fascist Intellectuals) in 1935. They also took a stand in 1936 on the side of Republican Spain. Irène was one of three women to participate in the Popular Front government of 1936. As undersecretary of state for scientific research, she helped to lay the foundations, with Jean Perrin, for what would later become the Centre National de la Recherche Scientifique (National Centre for Scientific Research).

Pierre and Marie Curie had decided to publish everything. This was also the attitude adopted by the Joliot-Curies for the discovery of artificial radioactive elements. But anxiety resulting from the rise of Nazism and the awareness of the dangers that could result from the application of chain reactions led them to cease publication. On Oct. 30, 1939, they recorded the principle of nuclear reactors in a sealed envelope, which they deposited at the Académie des Sciences; it remained secret until 1949. Frédéric chose to remain in occupied France with his family and to make certain that the Germans who came into his laboratory could not use his work or his equipment, whose removal to Germany he prevented. The Joliot-Curies continued their research, notably in biology; after 1939, Frédéric demonstrated, with Antoine Lacassagne, the use of radioactive iodine as a tracer in the thyroid gland. He became a member of the Académie de Médecine in 1943.

But the struggle against the occupying forces began to require more and more of his attention. In November of 1940 he denounced the imprisonment of Paul Langevin. In June of 1941 he took part in the founding of the National Front Committee, of which he became the president. In the spring of 1942, after the execution by the Nazis of the theoretical physicist J. Solomon, Frédéric joined the French Communist Party, of which in 1956 he became a member of the central committee. He created the Société d'Études des Applications des Radio-éléments Artificiels, an industrial company that gave work certificates to scientists and thus prevented their being sent to Germany. In May 1944, Irène and their children took refuge in Switzerland, and Frédéric lived in Paris under the name of Jean-Pierre Gaumont. His laboratory at the Collège de France, at which he organized the production of explosives, served as an arsenal during the battle for the liberation of Paris. In recognition, he was designated a commander of the Legion of Honour with a military title and was decorated with the Croix de Guerre.

In France, after the liberation in 1944, Frédéric was elected to the Académie des Sciences and was entrusted with the position of director of the Centre National de la Recherche Scientifique.

Then, in 1945 General de Gaulle authorized Frédéric and the minister of armaments to create the Commissariat à l'Energie Atomique to ensure for France the applications of the discoveries made in 1939. Irène devoted her scientific experience and her abilities as an administrator to the acquisition of raw materials, the prospecting for uranium, and the construction of detection installations. In 1946 she was also appointed director of the Institut du Radium. Frédéric's efforts culminated in the deployment, on Dec. 15, 1948, of ZOE (*zéro, oxyde d'uranium, eau lourde*), the first French nuclear reactor, which, though only moderately powerful, marked the end of the Anglo-Saxon monopoly. In April 1950, however, during the climax of the cold war and anti-Communism, Prime Minister Georges Bidault removed him without explanation from his position as high commissioner, and a few months later Irène was also deprived of her position as commissioner in the Commissariat à l'Energie Atomique. They devoted themselves henceforth to their own laboratory work, to teaching, and to various peace movements.

During the 1950s, following several operations, Irène's health began to decline. In May of 1953 Frédéric had the first attack of hepatitis from which he was to suffer for five years, with a serious relapse in 1955. In 1955 Irène drew up plans for the new nuclear physics laboratories at the Université d'Orsay, south of Paris, where teams of scientists could work with large particle accelerators under conditions less cramped than in the Parisian laboratories. Early in 1956 Irène was sent into the mountains, but her condition did not improve. Wasted away by leukemia as her mother had been, she again entered the Curie Hospital, where she died in 1956.

Ill and knowing that his days were also numbered, Frédéric decided to carry on Irène's unfinished work. In September 1956 he accepted the position of professor at the University of Paris left vacant by Irène, at the same time occupying his own chair at the Collège de France. He also successfully completed the establishment of the Orsay laboratories and saw the start of research there in 1958.

BIBLIOGRAPHY. Eugénie Cotton, *Les Curie* (1963), contains recollections of the Curie family and an assessment of their scientific accomplishments. The author, a student of Marie Curie, met Irène, as a child of five; and, toward the close of her life, she was associated with Frédéric Joliot in the Movement for Peace. Two sympathetic biographies of Frédéric are Maurice Goldsmith, *Frederic Joliot-Curie* (1976), a comprehensive work by a former colleague of Joliot in the World Federation of Scientific Workers, and Pierre Biquard, *Joliot-Curie* (1961; Eng. trans. 1965), an account that includes recollections of the friendship between Joliot and the author, who was closely associated with Joliot's activities for peace.

Jolivet, André (b. Aug. 8, 1905, Paris—d. Dec. 19/20, 1974, Paris), French composer noted for his sophisticated, expressive experiments with rhythm and new sonorities.

Interested in drama, painting, and literature as a young man, Jolivet soon turned to music and studied seriously with the avant-garde composer Edgard Varèse, among others. His succinct early works (*String Quartet* and *Andante for String Orchestra,* both 1934) demonstrate his familiarity with the techniques of Béla Bartók, Arnold Schoenberg, and Alban Berg. In 1935 Jolivet helped found a contemporary chamber-music organization, La Spirale, later to become La Jeune France (the



Jolivet, 1972
Jimmy Fox, © 1972

name originated with Hector Berlioz), dedicated to fostering modern nationalistic music. During his service in the French Army during World War II, Jolivet grew interested in primitive religion and magic—influences that may be detected in his style.

In 1945 he was named music director of the Comédie-Française; thereafter he developed an expressive melodic style exemplified in the virtuoso *Concertino for Trumpet, Strings, and Piano* (1948) and the spontaneous but symmetrical *Flute Concerto* of 1949. Opposition to the Neoclassicism of the 1930s led him to experiments with the Ondes Martenot, an electronic instrument (*Concerto,* 1948), and with complex and enormous orchestrations (*Concerto for Piano and Orchestra,* 1951), in which the movements evoke sounds of Africa, East Asia, and Polynesia.

Jolliet, Louis, Jolliet also spelled JOLIET (b. before Sept. 21, 1645, probably Beaupré, near Quebec—d. after May 1700, Quebec province), French-Canadian explorer and cartographer who, with Father Jacques Marquette, was the first white man to traverse the Mississippi River from its confluence with the Wisconsin to the mouth of the Arkansas in Arkansas.

Jolliet received a Jesuit education, but he renounced the priesthood for a life of adventure in the North American wilderness. In 1669, after searching for copper in the region of Lake Superior, he led a party of Frenchmen from Lake Huron to Lake Erie. In 1672 Jolliet was commissioned by the governor of New France to explore the Mississippi in the company of Father Marquette and five voyageurs. On May 17, 1673, the party set out in two birchbark canoes from Michilimackinac (St. Ignace, Mich.) for Green Bay, on Lake Michigan. Continuing up the Fox River in central Wisconsin and down the Wisconsin, they entered the Mississippi about a month later. Pausing along the way to make notes, to hunt, and to glean scraps of information from Indians, they arrived in July at the Quapaw Indian village (40 miles north of present Arkansas City, Ark.) at the mouth of the Arkansas River. From personal observations and from the friendly Quapaw Indians, they concluded that the Mississippi flowed south into the Gulf of Mexico—not, as they had hoped, into the Pacific Ocean.

In July the party returned homeward via the Illinois River and Green Bay. Their journey is described in Marquette's journal, which has survived.

Jolliet later travelled to Hudson Bay, the Labrador coast, and a number of Canadian rivers. In 1697 he was made royal hydrographer of New France.

Jolly, George (d. 1673?), actor-manager who, after obscure beginnings, emerged as the leader of the last troupe of English strolling players in a tradition that influenced the German theatre.

Early in his career Jolly was reportedly employed at the Fortune Theatre, London. Travelling in Germany in 1648, he and his company gained a foothold at Cologne, moving on to other German cities, notably Frankfurt am Main, where they performed annually at the time of that city's fair and where they probably played before Prince Charles (later King Charles II), who visited the city in 1655. Like his predecessors Jolly continued to introduce prosaic dialogue, violent action, visual effects, and passion to German audiences, preparing them to appreciate tragedy and helping significantly to revolutionize German drama.

Jolly's company performed with Italianate scenery, and Jolly was a pioneer in the use of elaborate machinery, dance, and music on the public stage in England. At the Restoration of Charles II, he received a royal grant permitting him to manage a theatre in London and succeeded William Beeston as manager of the Cockpit (later Phoenix Theatre). In 1663, while Jolly was touring the provinces, Sir William Davenant and the dramatist Thomas Killigrew, the patentees holding the theatrical monopoly, conspired against him and persuaded the King to revoke Jolly's grant. He fought back but ultimately had to accept the terms of the patentees, agreeing to serve as their "deputy" by managing the Nursery, a training school for young actors.

Jolly balance, device, now largely obsolete, for determining the specific gravity (relative density) of solids and liquids. Invented by the 19th-century German physicist Philipp von Jolly, it consists in its usual form of a long, delicate, helical spring suspended by one end in front of a graduated scale. To the lower end of the spring is attached a weight pan and below that a small wire basket for samples. The difference in extension of the spring when the sample is suspended in air and in water represents the loss of weight in water; the weight in air divided by the loss of weight in water gives the specific gravity. The specific gravity of a liquid can be obtained by suspending any convenient specimen of a solid first in water and then in the liquid undergoing the test; the ratio of loss of weight of the solid in water and in the test liquid gives the specific gravity of the liquid.

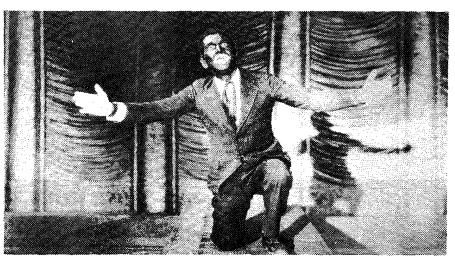
Jolo, chief island and town, Sulu province, southwestern Philippines. The island (345 sq mi [894 sq km]), between the Sulu (west) and Celebes (east) seas, is characterized by lush tropical vegetation, many short streams, and several extinct volcanoes, including Mt. Tumatangas at 2,664 ft (812 m). Mt. Dajo National Park is a game refuge with an area of 526 ac (213 ha). Jolo has considerable arable land that supports agriculture (rice, coconuts, cassava, fruits), but the principal economic activity is fishing. The main population centres are Jolo town, Parang, Patikul, and Talipaw.

Jolo town, on the northwestern coast, is a port of entry and capital of the province of Sulu. A focal point of a lively trade with Zamboanga, Manila, Singapore, and Borneo, it has a pier that can accommodate interisland vessels, oceangoing freighters, and naval craft. Smaller piers serve smaller local craft. Jolo also has an airport. The town, settled before the introduction of Islām in the 14th century, became the residence of the Sulu sultans. In 1876 the Spanish attempted to gain control over the independent Muslims by burning Jolo, their chief settlement. The walled, fortified town that the Spaniards then constructed formed the nucleus of the modern town. Jolo was devastated in 1974 in fighting between Muslims and government troops. Pop. (1980) island (including adjoining islets), 360,588; (1980) mun., 52,429.

Jolson, Al, byname of ASA YOELSON (b. May 26, 1886, Srednike, Russia—d. Oct. 23, 1950, San Francisco), popular U.S. singer and blackface comedian of the musical stage and motion pictures, from before World War I to 1940. His unique singing style and personal magnetism established an immediate rapport with audiences.

Brought to the United States when he was seven years old, Jolson was reared in Washington, D.C., where he made his first stage appearance in 1899. He performed with his brother and others in vaudeville before joining Lew Dockstader's minstrel troupe in 1909. He became a popular New York entertainer and singer, being featured in the musicals *La Belle Paree* (1911), *Honeymoon Express* (1913), *Bombo* (1921), and *Big Boy* (1925). In *Sinbad* (1918) he transformed an unsuccessful Gershwin song, "Swanee," into his trademark number. And in *Bombo* he introduced "My Mammy." The same show included three Jolson favourites: "Toot, Toot, Tootsie," "California, Here I Come," and "April Showers." Some of his biggest successes were achieved at the New York Winter Garden.

In 1927 Jolson starred in *The Jazz Singer,* the first feature film with synchronized speech as well as music and sound effects. The picture revolutionized the motion-picture industry and marked the end of the silent-film era. Other films include *The Singing Fool* (1928), *Say It with Songs* (1929), *Mammy* (1930), *Hallelujah, I'm a Bum* (1933), *Go into Your Dance* (1935), and *Swanee River* (1940). The



Jolson in *The Jazz Singer,* 1927
Culver Pictures

story of his life was filmed in *The Jolson Story* (1946) and a sequel, *Jolson Sings Again* (1949). He also collaborated in the writing of many song hits and was a very popular recording artist.

Joly, John (b. 1857, Holywood, King's County, Ire.—d. Dec. 8, 1933, Dublin), Irish geologist and physicist who, soon after 1898, estimated the age of the Earth at 100,000,000 years. He also developed a method for extracting radium (1914) and pioneered its use in cancer treatment.

Joly was educated at Trinity College, Dublin, where he became professor of geology and mineralogy (1897) after having served as demonstrator in civil engineering (1883) and physics (1893). He first sought to estimate the age of the Earth from the salt content of the oceans, then from rocks containing radioactive zircon and alanite. He also tried to explain the formation of the Earth's crust by convection of heat generated by radioactive decay in the Earth's interior.

Joly is also noted for his inventions of a thermometer, a steam calorimeter for measuring heat energy, and a photometer for measuring light frequencies. The recipient of many honours, Joly was elected a fellow of the Royal Society of London (1892).

Jomini, (Antoine-) Henri, baron de (b. March 6, 1779, Payerne, Switz.—d. March 24, 1869, Passy), French general, military critic, and historian whose systematic attempt to define the principles of warfare made him one of the founders of modern military thought.

Jomini began his military career by offer-

ing his services as a volunteer staff member in the French army in 1798. Returning to business in 1800 after the peace of Amiens,



Jomini, engraving by B.-J.-F. Roger, after a painting by Muneret

H. Roger-Viollet

he wrote his *Traité de grande tactique,* later titled *Traité des grandes opérations militaires* (5 vol., 1805; *Treatise on Grand Military Operations,* 1865). Rejoining the army in 1804 as a volunteer, he was appointed staff colonel in 1805 by Napoleon, who had read his book. Jomini served under Marshal Ney at the battles of Ulm (1805), Jena, and Eylau (1806) and accompanied him to Spain in 1808. In 1810 he began negotiating a contract of service with Russia, at that time France's ally. His attempted resignation from the French army induced Napoleon to make him general of brigade. In 1813 he became chief of staff to Ney, who commanded the most important corps in the army. Nevertheless, Ney's recommendation for Jomini's promotion to general of division was rejected, and a superior officer who was prejudiced against Jomini put him under arrest for the tardy submission of a military report. Feeling himself unjustly treated, he left the French army in August 1813 and fought for France's enemy, Russia, serving as lieutenant general and aide-de-camp to Alexander I.

In 1826 Jomini became aide-de-camp to Nicholas I with the rank of general in chief. He fought against the Turks in 1828 and in 1830 organized the Russian military academy. Although retired, in 1837 he was appointed military tutor to the tsar's son Alexander, for whom he wrote his greatest work, *Précis de l'art de la guerre* (1838; *Summary of the Art of War,* 1868). In 1854 he served as adviser to Tsar Nicholas on tactics during the Crimean War and in 1859 advised Emperor Napoleon III on the Italian expedition.

As a critic of military policy, Jomini succeeded for the first time in fixing divisions between strategy, tactics, and logistics. Primarily interested in strategy, he found the central problem in successful planning to be the choice of correct lines of operation by which a general could dominate the zone of operations in which he is engaged. His other works include *Principes de la stratégie* (3 vol., 1818; "Principles of Strategy"); *Histoire critique et militaire des campagnes de la Révolution, de 1792 à 1801* (5 vol.; "Critical and Military History of the Campaigns of the Revolution from 1792 to 1801,"); and *Vie politique et militaire de Napoléon* (4 vol., 1827; *Life of Napoleon,* 1864).

Jommelli, Niccolò (b. Sept. 10, 1714, Aversa, Kingdom of Naples—d. Aug. 25, 1774, Naples), composer of religious music and operas. Jomelli produced his first opera in Naples in 1737 (*L'Errore amoroso*) and *Odoardo* in 1738. Jommelli went to Rome in 1740 and produced two new operas there. He went on to Bologna and Vienna (1749) and in 1753 became kapellmeister to the duke of Würtemberg at Stuttgart. There he wrote his best operas, including *L'Olimpiade* and *Fetonte* (first performed 1768), in which he introduced a free use of accompanied recitative and broke with the tradition of the *da capo aria,* thus anticipating Gluck. Indeed, he became known as "the Italian Gluck." His last composition was a *Miserere* for two voices, finished just before his death and for long his best known work. The style of his overtures influenced the early symphonies of Johann Stamitz.

Jōmon culture (5th or 4th millennium BC–*c.* 250 BC), earliest major culture of prehistoric Japan, characterized by pottery decorated with cord-pattern (*jōmon*) impressions or reliefs. The artifacts of this Neolithic culture have been uncovered in numerous sites from the northern island of Hokkaidō to the southern Ryukyus, but they appear most commonly in eastern Japan where the culture survived longest. The Jōmon people lived in small communities comprised mainly of sunken pit dwellings situated near inland rivers or along the seacoast, and subsisted primarily by hunting, fishing, and gathering. Recent excavations suggest that a primitive form of agriculture may also have been practiced by the end of the period.

The distinctive Jōmon pottery was made of unrefined, low-fired clay. Because the potter's wheel was unknown, manual methods were relied upon, particularly the coiling method—that is, preparing the clay in the shape of a rope and coiling it spirally upward. Vessels were simply heaped up and baked in open fires. Early forms were limited to simple jars and bowls, but later Jōmon pottery, including figurines that probably represented fertility symbols, were more varied in style and function and demonstrated increasing technical and artistic skill, often surpassing the craftsmanship of other Stone Age cultures. Stone and bone tools as well as wooden bows have also been found in Jōmon sites. The origins



Clay urn, mid-Jōmon period; in the Tokyo National Museum

By courtesy of the Tokyo National Museum

of Jōmon culture remain uncertain, although similarities with early cultures of northeast Asia and even America are often cited.

Jon, François du: *see* Junius, Franciscus.

Jón Arason (Icelandic poet and bishop): *see* Arason, Jón.

Jón Magnússon (Icelandic pastor and author): *see* Magnússon, Jón.

Jón Thorkelsson Vídalín (Icelandic bishop): *see* Vídalín, Jón Thorkelsson.

Jón Thórtharson Thoroddsen (Icelandic novelist): *see* Thoroddsen, Jón (Thortharson).

Jonah, Book of, also spelled JONAS, the fifth of 12 Old Testament books that bear the names of the Minor Prophets, embraced in a single book, The Twelve, in the Jewish canon. Unlike other Old Testament prophetic books, Jonah is not a collection of the prophet's oracles but primarily a narrative about the man.

Jonah is portrayed as a recalcitrant prophet who flees from God's summons to prophesy against the wickedness of the city of Nineveh. According to the opening verse, Jonah is the son of Amittai. This lineage identifies him with the Jonah mentioned in II Kings 14:25 who prophesied during the reign of Jeroboam II, about 785 BC. It is possible that some of the traditional materials taken over by the book were associated with Jonah at an early date, but the book in its present form reflects a much later composition. It was written after the Babylonian Exile (6th century BC), probably in the 5th or 4th century and certainly no later than the 3rd, since Jonah is listed among the Minor Prophets in the apocryphal book of Ecclesiasticus, composed about 190. Like the Book of Ruth, which was written at about the same period, it opposes the narrow Jewish nationalism characteristic of the period following the reforms of Ezra and Nehemiah with their emphasis on Jewish exclusivity. Thus the prophet Jonah, like the Jews of the day, abhors even the idea of salvation for the Gentiles. God chastises him for his attitude, and the book affirms that God's mercy extends even to the inhabitants of a hated foreign city. The incident of the great fish, recalling Leviathan, the monster of the deep used elsewhere in the Old Testament as the embodiment of evil, symbolizes the nation's exile and return.

As the story is related in the Book of Jonah, the prophet Jonah is called by God to go to Nineveh (a great Assyrian city) and prophesy disaster because of the city's excessive wickedness. Jonah, in the story, feels about Nineveh as does the author of the Book of Nahum—that the city must inevitably fall because of God's judgment against it. Thus Jonah does not want to prophesy, because Nineveh might repent and thereby be saved. So he rushes down to Joppa and takes passage in a ship that will carry him in the opposite direction, thinking to escape God. A storm of unprecedented severity strikes the ship, and in spite of all that the master and crew can do, it shows signs of breaking up and foundering. Lots are cast, and Jonah confesses that it is his presence on board that is causing the storm. At his request, he is thrown overboard, and the storm subsides.

A "great fish," appointed by God, swallows Jonah, and he stays within the fish's maw for three days and nights. He prays for deliverance and is "vomited out" on dry land (ch. 2). Again the command is heard, "Arise, go to Nineveh." Jonah goes to Nineveh and prophesies against the city, causing the King and all the inhabitants to repent.

Jonah then becomes angry. Hoping for disaster, he sits outside the city to await its destruction. A plant springs up overnight, providing him welcome shelter from the heat, but it is destroyed by a great worm. Jonah is bitter at the destruction of the plant, but God speaks and thrusts home the final point of the story: "You pity the plant, for which you did not labor, nor did you make it grow, which came into being in a night, and perished in a night. And should not I pity Nineveh, that great city, in which there are more than a hundred and twenty thousand persons who do not know their right hand from their left, and also much cattle?" (ch. 4).

Jonah has been the subject of works by such artists as John Bernard Flannagan and Albert Pinkham Ryder. Chapter nine of Herman

Melville's *Moby Dick* is a sermon and hymn about Jonah.

Jonah, Rabbi (Hebrew grammarian): *see* Ibn Janāḥ.

Jonah crab, North American crab species closely related to the Dungeness crab (*q.v.*).

Jonas, Russian IONA (fl. 15th century, Moscow), first independent metropolitan of Moscow, elected in 1448.

Until the 15th century the Orthodox Church had depended upon the patriarch of Constantinople to choose its ecclesiastical head, usually a Greek, to fill the position of metropolitan of Kiev (later metropolitan of Moscow). In 1448, however, the Russian Church declared itself "autocephalous" (*i.e.*, independent of Constantinople) as a result of the actions of the Byzantine-appointed metropolitan Isidore, who accepted the decision of the Council of Florence in 1439 and embraced the idea of reuniting the Eastern Orthodox and Roman Catholic churches. Grand Prince Vasily (Basil) II of Russia arrested and imprisoned Isidore, and the council of Russian bishops elected Jonas as metropolitan, without Byzantine consent.

Jonas' appointment, an act of Russian national pride, marked the weakening of Constantinople's ecumenical primacy; and many, including Jonas, believed that when Constantinople eventually fell, as it did to the Turks in 1453, Moscow would become the new centre of Eastern Orthodoxy.

Jonas, Justus, original name JODOCUS KOCH (b. June 5/6, 1493, Nordhausen—d. Oct. 9, 1555, Eisfeld, Saxony), German religious Reformer and legal scholar. A colleague of Martin Luther, he played a prominent role in the early Reformation conferences, particularly at Marburg (1529) and at Augsburg (1530), where he helped draft the Augsburg Confession, a fundamental statement of Lutheran belief. He is best known for his German translation of the Latin writings of Luther and Philipp Melanchthon. An advocate of Erasmus' Humanism, he introduced Greek and Hebrew into the curriculum on becoming rector of the University of Erfurt (1519).

Jónas Hallgrímsson (Icelandic poet): *see* Hallgrímsson, Jónas.

Jónasson, Jóhannes Bjarni, also called JÓHANNES JÓNASSON ÚR KÖTLUM (b. Nov. 4, 1899, Goddastadir, Dalasýsla, Ice.—d. April 27, 1972, Rekyjavík), poet and reformer whose works reflect his resistance to the political and economic trends that he perceived as threatening Iceland's traditional democracy.

The son of a poor farmer, he studied at Reykjavík Teacher's Training College and worked first as a peripatetic rural teacher and later in Reykjavík until he retired to the country as a full-time writer.

Jonasson's poetic development mirrors the major literary and social trends in 20th-century Iceland. His early works, *Bí bí og blaka* (1926; "Sleep Baby Sleep"), and *Álftirnar kvaka* (1929; "The Swans are Singing"), are neoromantic and lyrical in form and express a love of Nature. Neoromanticism gave way to Socialism in the 1930s, however, as a result of the depression in Iceland, and his third volume of poetry *Ég læt sem ég sofi* (1932; "I pretend to sleep") reflects this change. The poem "Frelsi" ("Freedom") was featured in the first volume of *Raudir pennar* (1935; "Red Pens"), a Socialist literary periodical of the time.

The mood and style of Jonasson's poetry underwent another change with the volume *Sjödægra* (1955; "Book of Seven Days"), written not in traditional verse form but with modernistic imagery. At this stage he attacked the resignation and apathy of the welfare society. Yet in his last volume, *Ný og nid* (1970; "Waxing Moon and Waning Moon"), Jonasson's hope is voiced in Iceland's new generation to continue the struggle.

After World War II, Jonasson also published four novels, but his prose never reached the level of his poetry. In 1948, as "Anonymous," he published *Annarlegar tungur* ("Strange Tongues"), which included translations of such modern poets as T.S. Eliot and e.e. cummings. His authorship was not revealed until the late 1950s.

Jonathan, in the Old Testament (I and II Samuel), eldest son of King Saul; his intrepidity and fidelity to his friend, the future king David, make him one of the most admired figures in the Bible. Jonathan is first mentioned in I Sam. 13:2, when he defeated a garrison of Philistines at Geba. Later (I Sam. 14), Jonathan and his armour bearer left Saul's army at Geba and captured the outpost at Michmash. The Israelites then attacked and defeated the Philistines.

Possibly because of his piety, Saul then ordered a fast for one day, but the absent Jonathan was unaware of the order and ate wild honey. When Saul requested information about the war from God and there was no answer, Saul blamed the silence on Jonathan's breaking of the fast and would have killed him had not his own soldiers ransomed Jonathan.

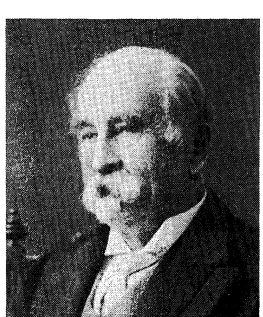
When David became a member of Saul's household and won many victories against the Philistines, he and Jonathan became close friends. After Saul jealously turned against David, Jonathan attempted to reconcile them, but he was only briefly successful. Saul tried to enlist Jonathan's aid to kill David, but Jonathan remained David's friend and warned him of Saul's anger so that David hid. When the two met for the last time in the Wilderness of Ziph, they planned that David would be the next king of Israel and Jonathan his minister (I Sam. 23:16–18).

Saul, Jonathan, and Jonathan's brothers were killed in a battle against the Philistines at Mt. Gilboa. Despoiled and exposed by the Philistines, the bodies were rescued by men from Jabesh-gilead and buried in Jabesh. Years later, David reinterred the remains in the tomb of Kish in the land of Benjamin. David lamented the deaths of Saul and Jonathan in a moving elegy (II Sam. 1:17–27).

Joncs, Plaine des (Vietnam): *see* Thap Muoi, Dong.

Jones, Alfred Gilpin (b. Sept. 28, 1824, Weymouth, Nova Scotia—d. March 15, 1906, Halifax, Nova Scotia, Can.), Canadian statesman, opponent of confederation, and influential member of Parliament who served as lieutenant governor of Nova Scotia in 1900–06.

Jones ran a West Indian importing firm in Halifax until his opposition to the union of Nova Scotia with Canada brought him into politics in 1864. He protested the refusal of the British government to exempt Nova Scotia from the British North America Act, which created the Dominion of Canada in 1867, the year in which he was elected member of the Canadian House of Commons for Halifax. In 1878 he was briefly minister of militia in Alexander Mackenzie's Liberal government, and his refusal to abandon the free trade policy influenced the party and led to its defeat. He represented Canada on the Pacific Cable Commission.



Alfred Gilpin Jones

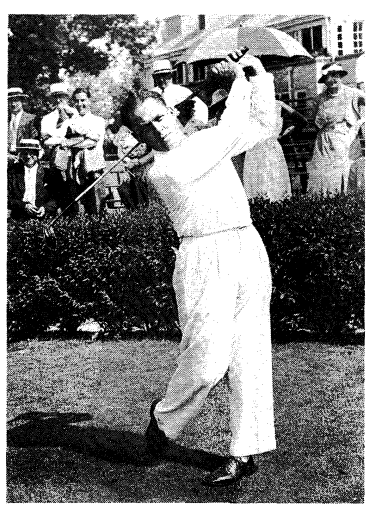
By courtesy of the Public Archives of Nova Scotia; photograph, Halifax Photo Service Ltd.

Jones, Arthur Llewellyn (novelist): *see* Machen, Arthur.

Jones, Ben, byname of BENJAMIN ALLYN JONES (b. Dec. 31, 1882, Parnell, Mo., U.S.—d. June 13, 1961, Lexington, Ky.), trainer of U.S. Thoroughbred racehorses, who trained six winners of the Kentucky Derby and two winners of all three events comprising the U.S. Triple Crown (the Derby, the Preakness, and the Belmont Stakes), Whirlaway in 1941 and Citation in 1948.

In 1914 Jones began breeding and training horses in the U.S. Midwest. In 1932, he joined the Woolford Farm, where he trained Lawrin, winner of the Kentucky Derby in 1938. In 1939, he joined Calumet Farm, where he was outstandingly successful. At the height of his career, Jones 11 times led all U.S. trainers in earnings from his horses' winnings. In addition to Whirlaway and Citation, famous horses trained by him include Pensive, Twilight Tear, Armed, Coaltown, Fervent, Faultless, Bewitch, Wistful, and Pot o' Luck. In 1947 Jones retired as full-time trainer and became general manager of Calumet Farm, where his son, Horace Allyn Jones, called Jimmy, or H.A., also was a trainer.

Jones, Bobby, byname of ROBERT TYRE JONES, JR. (b. March 17, 1902, Atlanta, Ga., U.S.—d. Dec. 18, 1971, Atlanta), U.S. amateur golfer, the first man to achieve the Grand Slam—winning in a single year the four major tournaments of the time. In 1930 he won the British and U.S. Opens and Amateur championships. From 1923 through 1930 he won 13 championships in those four annual tournaments, a feat unequalled until 1973, when Jack Nicklaus surpassed that total in U.S. and British Opens, PGA (U.S.), and Masters.



Bobby Jones

UPI/EB Inc.

A practicing lawyer in Atlanta, Jones never became a professional golfer and rarely played in championship competition after his final Grand Slam victory, the U.S. Amateur tournament in 1930. He won the U.S. Amateur five times (1924, 1925, 1927, 1928, and 1930), the U.S. Open four times (1923, 1926, 1929, and 1930), the British Open three times (1926, 1927, and 1930; he was the first amateur to win), and the British Amateur in 1930. In five Walker Cup tournaments between U.S.

and British amateur teams, he won 9 of 10 matches. In 1934 he helped to initiate the annual Masters Tournament at the Augusta (Ga.) National Golf Club. In 1958 he became the first American since Benjamin Franklin (in 1759) to receive the freedom of the burgh of St. Andrews, Fife, Scot., home of the premier golf club of the world.

Jones, Casey, byname of JOHN LUTHER JONES (b. March 14, 1864, southeastern Missouri, U.S.—d. April 30, 1900, near Vaughan, Miss.), railroad engineer whose death as celebrated in the ballad "Casey Jones" made him a folk hero.

When he was in his teens, his family moved across the Mississippi River to Cayce, Ky., the town name (pronounced the same as Casey) providing his nickname. An engineer with a penchant for speed and virtuoso use of the whistle, he was making up time when his fireman warned him of a train ahead. After telling the fireman to jump, Casey died in the collision, one hand on the brake, the other on the whistle. An engine wiper, Wallace Saunders, wrote the first ballad. Another version was published by Lawrence Siebert and Eddie Newton in 1909 and became a popular hit in vaudeville. Other versions appear in railroad, construction, hobo, radical, and World War I song collections, and there are versions in French, German, and Afrikaans. Later versions transferred Casey to Western railroads, and some made him into a roistering ladies' man, to his widow's distress.

Jones, Donald Forsha (b. April 16, 1890, Hutchinson, Kan., U.S.—d. June 19, 1963, Hamden, Conn.), American geneticist and agronomist who made hybrid corn (maize) commercially feasible.

Jones earned his B.S. degree at Kansas State College of Agriculture and Applied Science, Manhattan, in 1911. For the next two years he worked at the Arizona Agricultural Experiment Station, Tucson, and then held a teaching fellowship at Syracuse (N.Y.) University. In 1914 he went to Harvard University, where he studied under Edward M. East, who was directing experiments in the inbreeding of corn in search of a high-yield hybrid. In 1917 Jones successfully combined two single-cross hybrid corn varieties in a double cross, or four-way combination, that resulted in a new, uniform, highly productive variety. Jones produced the first hybrid sweet corn in 1924; within a few years corn growing in the United States had been revolutionized by the new plant, which made possible greater yields on smaller acreage.

Jones made two other major contributions, one in theory, the other in practice. He postulated a genetic interpretation of hybrid vigour on the basis of the principles of heredity established by Gregor Mendel. By his development (with Paul C. Mangelsdorf) of a method of genetically transmitting pollen sterility, he eliminated from field work the costly job of detasseling, until then necessary in growing hybrid corn seed.

Jones, Edward Coley Burne (painter): *see* Burne-Jones, Sir Edward Coley, 1st Baronet.

Jones, Edward German (composer): *see* German, Sir Edward.

Jones, Elvin (Ray) (b. Sept. 9, 1927, Pontiac, Mich., U.S.), American jazz drummer and bandleader who established a forceful polyrhythmic approach to the traps set, combining different metres played independently by the hands and feet into a propulsive flow of irregularly shifting accents.

Mostly self-taught, though of a musical family including siblings Hank and Thad, jazz pianist and trumpeter, respectively, Jones played in school and army bands before beginning his professional career in Detroit in 1949. In 1956 Jones moved to New York City, where he performed with Donald Byrd, Pepper Adams, and others, and in 1960 he joined saxophonist John Coltrane's quartet with McCoy Tyner, pianist, and Jimmy Garrison, bassist. In the subsequent six years, Jones perfected his powerful polyrhythmic style, recording a series of albums with Coltrane that influenced jazz substantially, including *Crescent* and *Live at the Village Vanguard.* Rather than merely keeping time, the drummer, through Jones's example, became an improviser of equal importance to the lead melodic instrumentalist. After the addition of a second drummer, Rashied Ali, to the Coltrane group, Jones left to lead his own small bands, featuring such saxophonists as Joe Farrell, Frank Foster, Dave Liebman, and Pat LaBarbera.

Jones, (Alfred) Ernest (b. Jan. 1, 1879, Rhosfelyn, Glamorgan, Wales—d. Feb. 11, 1958, London), psychoanalyst and a key figure in the advancement of his profession in Britain. One of Sigmund Freud's closest associates and staunchest supporters, he wrote an exhaustive three-volume biography of Freud.

After receiving his medical degree (1903), Jones became a member of the Royal College of Physicians, London (1904), and held several successive hospital and clinical posts in that city. His interest shifted gradually from clinical medicine to neurology, psychiatry, and, ultimately, psychoanalysis. With Carl Jung he organized the first psychoanalytic congress at Salzburg, Austria (1908), where he first met Freud. That year he went to Canada, where he began a four-year period at the Toronto General Hospital and ventured into teaching psychoanalysis and experimenting with psychoanalytic techniques. Jones's principal contributions to psychoanalytic theory developed from his application of psychoanalytic principles to anthropology, folklore, art, and literature. His famous essay (1910) explaining the character of Hamlet in terms of the Oedipus complex later was revised and published in book form as *Hamlet and Oedipus* (1949).

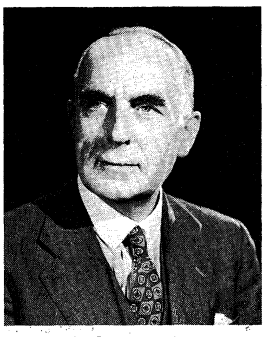
Active in establishing the American Psychoanalytic Association (1911), Jones wrote monographs on the study of suggestion, symbolism, character formation, and emotional disorders known as obsessional neuroses; those works were collected in *Papers on Psycho-Analysis* (1913). After his return to London in 1913 he practiced psychoanalysis. He founded an institute and clinic as well as the *International Journal of Psychoanalysis,* which he edited until 1939. Largely through his efforts, the British Medical Association recognized psychoanalysis in 1929. During the 1930s, Jones helped many displaced German analysts to resettle in England and other countries. After the Nazi takeover of Austria in 1938, Jones played a critical role in enabling the ailing Freud and his family to go to London. From 1944 on he spent much of his time preparing his authoritative biography, *The Life and Works of Sigmund Freud* (1953–57).

Jones, Golden Rule: *see* Jones, Samuel M.

Jones, Sir Harold Spencer (b. March 29, 1890, London—d. Nov. 3, 1960, London), 10th Astronomer Royal of England (1933–55), who organized a program that led to a more accurate determination of the mean distance between the Earth and the Sun. His scientific work largely concerned determining more accurately the fundamental constants of astronomy and in particular the solar parallax—the apparent shift of the Sun's position in the sky as the position of the Earth changes. Using information from observations of the asteroid Eros during its close approach to the Earth in 1931, he computed in 1941 the solar parallax and from that the mean distance to the Sun, approximately 93,000,000 miles (149,000,000 kilometres). He also investigated problems in geophysics, particularly the Earth's rotation and magnetism.

When the encroachment of the smoke and lights of London spoiled observation at the Royal Observatory of Greenwich, of which Jones was director from 1933 until 1955, he took steps to have the observatory moved. After World War II a new site was procured at Herstmonceux Castle, Sussex; the new observatory was completed in 1958.

In 1943 he was knighted and received the Gold Medal of the Royal Astronomical Society and the Royal Medal of the Royal Society of London. He was created a Knight of the



Sir Harold Spencer Jones
Camera Press

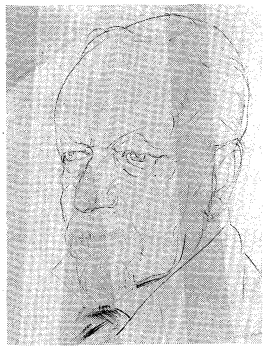
British Empire in 1955. His works include *Worlds Without End* (1935), *Life on Other Worlds* (1940), and *A Picture of the Universe* (1947).

Jones, Henry, byname CAVENDISH (b. Nov. 2, 1831, London—d. Feb. 10, 1899, London), English surgeon, the standard authority on Whist in his day, who also wrote on other games.

Jones was educated at King's College School (1842–48) and studied at St. Bartholomew's Hospital. He practiced as a surgeon (1852–69). Jones learned Whist from his father, who was an avid player at London's Portland Club and coauthor of *The Laws of Short Whist.* The younger Jones's importance lay in his ability to codify and comment upon the rules. He published *Principles of Whist* (1862; later titled *Laws and Principles,* 11th ed., 1886). He became Whist editor of *The Field* magazine (1862). He also wrote manuals on croquet (1869); Bezique, Écarté, and Euchre (all 1870); Cribbage (1873); Vingt-et-un (1874); lawn tennis and badminton (both 1876); Chess and Backgammon (both 1878); and Patience (1890). In 1870 he helped found the All-England Croquet Club, and in 1888 he contributed articles on Whist and other games to the ninth edition of the *Encyclopædia Britannica* (1889). Jones visited the United States in 1893 and was honoured by Whist clubs. His pseudonym derived from the name of the first Whist club to which he was admitted in London's Cavendish Square.

Jones, Henry Arthur (b. Sept. 20, 1851, Grandborough, Buckinghamshire, Eng.—d. Jan. 7, 1929, London), English playwright who first achieved prominence in the field of melodrama and who later contributed to Victorian "society" drama.

In 1879 his play *Hearts of Oak* was produced in the provinces, and he won fame in London with *The Silver King* (first performed 1882; written with Henry Herman). More popular melodramatic plays followed, such as *Michael and His Lost Angel* (1896). But Jones was by now moving in high society, and a vein of more sophisticated comedy was beginning to appear in works such as *The Case of Rebellious Susan* (1894) and *The Liars* (1897). His plays, however, display a rigid acceptance of the Victorian moral code, and this conservative attitude lost him the sympathy of new



Henry Arthur Jones, pen and ink drawing by Alfred Wolmark, 1928; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

liberal audiences that were attending the theatre of such pioneers as George Bernard Shaw and William Archer. He nevertheless shows considerable skill in theatrical construction, and *Mrs Dane's Defence* (1900) has a finely wrought cross-examination scene. Jones was a controversialist who wrote and lectured widely about the function of theatre, notably in *The Renaissance of the English Drama, 1883–94* (1895).

Jones, Howard (Harding) and T(homas) A(lbert) D(wight) (respectively b. Aug. 23, 1885, Excello, Ohio, U.S.—d. July 27, 1941, Toluca Lake, Calif.; b. Feb. 21, 1887, Excello—d. June 19, 1957, New Haven, Conn.), U.S. collegiate football coaches, brothers, who made their mark on West and East Coast football.

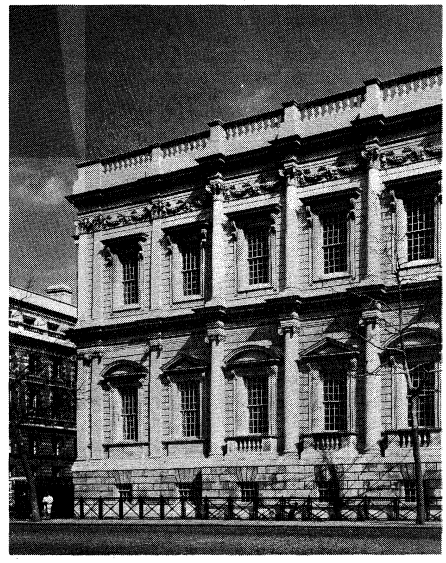
The brothers played football at Middletown, Ohio, and at Phillips Exeter (N.H.) Academy (1903–04) and entered Yale University (New Haven, Conn.) in 1905, where Howard played end. After playing from 1905 to 1907 Howard coached at Yale in 1909, after he had begun his coaching career at Syracuse (N.Y.) University in 1908. He coached at Ohio State University (Columbus) in 1910, returned to Yale in 1911 as assistant coach, and became the first paid coach at Yale in 1913. During his coaching stay at the University of Iowa (Iowa City; 1916–23), his team's 10–7 victory over Notre Dame in 1921 drew national attention to him. After coaching at Duke University (Durham, N.C.) in 1925, he went to the University of Southern California (Los Angeles), where he remained until retirement after the 1940 season. There he developed 13 All-American players, and his teams won seven Pacific Coast Conference championships, two national championships, and were undefeated in five Rose Bowl games.

T.A.D. Jones—called "Tad"—was an All-American football player at Yale in 1907, becoming first string quarterback in his freshman year. He was an assistant coach at Yale in 1908, coached at Syracuse (1909–10), and, after coaching at preparatory schools, Pawling School and Exeter, he again coached at Yale in 1916. During World War I he worked in shipbuilding, after which he returned to coach at Yale (1920–27). After he left coaching, he formed an industrial oil and coal company.

Jones, Inigo (baptized July 19, 1573, London—d. June 21, 1652, London), painter, architect, and designer, who founded the English classical tradition of architecture. The Queen's House at Greenwich, his first major work, became a part of the National Maritime Museum in 1937. His greatest achievement is the Banqueting House, Whitehall (1619–22). Jones's only other surviving royal building is the Queen's Chapel at St. James's Palace (1623–27).

Jones was the son of a clothworker also called Inigo. Of the architect's early life little is recorded, but he was probably apprenticed to a joiner. By 1603 he had visited Italy long enough to acquire skill in painting and design and to attract the patronage of Christian IV of Denmark, at whose court he was employed for a time before returning to England. There, he is next heard of as a "picture maker" (easel painter). Christian IV's sister, Anne, was the queen of James I of England, a fact that may have led to Jones's employment by her in 1605 to design the scenes and costumes of a masque, the first of a long series he designed for her and later for the King. The words to these masques were often supplied by Ben Jonson; the scenes, costumes, and effects nearly always by Jones. More than 450 drawings by him, representing work on 25 masques, a pastoral, and two plays ranging in date between 1605 and 1641, survive at Chatsworth House, Derbyshire.

From 1605 until 1610 Jones probably regarded himself as primarily under the Queen's protection, but he was patronized also by the Earl of Salisbury, for whom he produced his earliest known architectural work, a design for the New Exchange in the Strand (*c.* 1608; demolished in the 18th century). Though a somewhat immature design, the work was more sophisticated than anything being done in England at the time. Some designs (later superseded) for the restoration and improvement of old St. Paul's Cathedral also date from this period, and in 1610 Jones was given an appointment that confirmed the direction of his future career. He became surveyor of works to the heir to the throne, Henry, prince of Wales.



Detail of the Banqueting House, Whitehall, London, by Inigo Jones, 1619–22

A.F. Kersting

This appointment, with all its promise, was short-lived, and Jones did little or nothing for the Prince before the latter's death in 1612. In 1613, however, he was compensated by the guarantee of still higher office on the death of the King's surveyor of works, Simon Basil. To this office Jones succeeded in 1615, in the meantime having taken the opportunity offered him by Thomas Howard, 2nd earl of Arundel, to revisit Italy. Arundel and his party, including Jones, left England in April 1613 and proceeded to Italy, spending the winter of 1613–14 in Rome. In the course of the visit Jones had ample opportunity to study the works by modern masters as well as antique ruins. Of the masters, the one to whom he attached the greatest importance was Andrea Palladio (1508–80), the Italian architect who had gained wide influence through his *Quattro libri dell'architettura,* which Jones took with him on his tour. Returning to England in the autumn of 1614, Jones had completed his self-education as a classical architect.

Jones's career as surveyor of works to James I and Charles I lasted from 1615 to 1642. During most of those 28 years he was continuously employed in the building, rebuilding, or improvement of royal houses. His first important undertaking was the Queen's House at Greenwich, near London, based to some extent on the Poggio a Caiano, the Medici villa near Florence, but detailed in a style closer to Palladio or Vincenzo Scamozzi (1552–1616). Work there was suspended on the death of King James's queen in 1619 and only completed in 1635 for Charles's queen, Henrietta Maria. The building, considerably altered, now houses the National Maritime Museum. In 1619 the Banqueting House at Whitehall was destroyed by fire; and between that year and 1622, Jones replaced it with what has always been regarded as his greatest achievement. The Banqueting House consists of one great chamber, raised on a vaulted basement. It is conceived internally as a basilica on the Vitruvian model but without aisles, the superimposed columns being set against the walls, which support a flat, beamed ceiling. For the main panels of this ceiling allegorical paintings by Rubens were commissioned by Charles I and set in place in 1635. The exterior echoes the arrangement of the interior, with pilasters and regular columns set against rusticated walling.

The Banqueting House has only two complete facades. The ends were never completed, and this has given rise to the supposition that the building was intended to form part of a larger whole. This may have been so, and it is certain that Charles I, nearly 20 years after the Banqueting House was built, instructed Jones to prepare designs for rebuilding the whole of Whitehall Palace. These designs exist (at Worcester College, Oxford, and at Chatsworth House) and are among Jones's most interesting creations. They owe something to the Escorial Palace near Madrid but are worked out in terms deriving partly from Palladio and Scamozzi and partly from Jones's own studies of the antique.

Jones's work was not confined to royal palaces. He was much involved in the regulation of new buildings in London and out of this work emerged the project that he planned in 1630 for the 4th Earl of Bedford on his land at Covent Garden. This comprised a large open space bounded on the north and east by arcaded houses, on the south by the Earl of Bedford's garden wall, and on the west by a church with flanking gateways connecting to two single houses. The design probably derives partly from the piazza at Leghorn, Italy, and partly from the Place Royale (now des Vosges) at Paris. None of the original houses survive, but the church of St. Paul still stands, though much altered. Its portico is an instance, unique in Europe at its date, of the use of the primitive Tuscan order.

With Covent Garden, Jones introduced formal town planning to London—it is the first London "square." He was probably instrumental, from 1638, in creating another square by planning the layout of the houses in Lincoln's Inn Fields, one of the houses (Lindsey House, still existing at No. 59 and 60, Lincoln's Inn Fields) being attributed to him.

The most important undertaking of Jones's later years in office was the restoration of St. Paul's Cathedral in 1634–42. This included not only the repair of the 14th-century choir but the entire recasing, in rusticated masonry, of the Romanesque nave and transepts and the building of a new west front with a portico (56 feet [17 metres] high) of 10 columns. This portico, among Jones's most ambitious and subtly calculated works, tragically van-

ished with the rebuilding of the cathedral after the Great Fire of 1666. Jones's work at St. Paul's, however, considerably influenced Sir Christopher Wren and is reflected in some of his city churches as well as in his early designs for rebuilding the cathedral.

At the outbreak of the Civil War in 1642, Inigo Jones was compelled to relinquish his office as surveyor of works and left London. He was captured at the siege of Basing House in 1645. His estate was temporarily confiscated, and he was heavily fined. In the following year, however, his pardon was confirmed by the House of Lords and his estate restored. In the year of Charles I's execution, 1649, he was doing work at Wilton for the Earl of Pembroke, but the great double-cube room there is probably mostly due to his pupil John Webb, whom he had trained and who survived to reestablish something of the Jones tradition after the Restoration of 1660. Jones was buried with his parents in the Church of St. Benet, Paul's Wharf, in London.

(J.Sum.)

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Jones, James (b. Nov. 6, 1921, Robinson, Ill., U.S.—d. May 9, 1977, Southampton, N.Y.), U.S. novelist best known for *From Here to Eternity* (1951), a novel about the peacetime army in Hawaii just before the Japanese attack on Pearl Harbor in 1941.

The strongest influence on Jones's literary career was his service in the U.S. Army from 1939 to 1945, during which he received the Bronze Star and the Purple Heart after actions in the South Pacific. He used his knowledge of day-to-day life in the military to advantage in his first novel, *From Here to Eternity,* which described the experiences of a charismatic serviceman who dies shortly after the outbreak of war in the Pacific. (A film in 1953 adapted from the book won eight Academy Awards and several other awards.) In his second novel, *Some Came Running,* published in 1958, the same year that he moved to Paris, Jones drew on his Midwestern life in Illinois after the war. His next two novels, however, returned to his wartime experiences: *The Pistol* (1959) and *The Thin Red Line* (1963). Jones remained an expatriate in Paris until 1975, when he returned to the United States. He settled in Long Island, where he remained until his death in 1977. None of his later works attracted the public or critical attention that his first novel had.

Jones, James Earl (b. Jan. 17, 1931, Arkabutla, Miss., U.S.), American actor best known for his leading roles in Shakespeare's *Othello* and in *The Great White Hope,* a play about the tragic career of the first black heavyweight-boxing champion.

Jones's father, the actor Robert Earl Jones, left his family before Jones was born, and the youth was raised largely by his grandparents in Michigan. He attended the University of Michigan (B.A., 1953), majoring in drama, and, after a brief stint in the U.S. Army, went to New York City, studying at the American Theatre Wing and with Lee Strasberg. He played in his first off-Broadway production in 1957 and subsequently, with the New York Shakespeare Festival, played a number of Shakespearean roles from 1961 to 1973. He also performed in other New York productions and won a Tony award for his boxer role in Howard Sackler's *The Great White Hope* (1968), later starring in the film version (1970). Through the 1970s and '80s he received critical acclaim for a number of stage, film, and television roles, notably in the two-character stage play *Paul Robeson* (1978) and in the title role of *Othello,* opposite Christopher Plummer's Iago (1981–82).

Jones, Jesse H(olman) (b. April 5, 1874, Robertson County, Tenn., U.S.—d. June 1, 1956, Houston, Texas), U.S. banker, businessman, and public official, chairman of the Reconstruction Finance Corporation (RFC) from 1933 to 1939.

As a young man, Jones moved with his family to Texas, where he worked in his uncle's lumber business. He subsequently established his own lumber business and went on to make his fortune in banking, real estate, and construction. By 1912 Jones had ties with business interests in New York City, and he became a leading financial supporter of Woodrow Wilson. He expanded his role in Democratic Party affairs during the 1920s, even arranging for his beloved city of Houston to host the party's 1928 national convention.

Appointed one of the RFC directors by President Hoover in 1932, Jones became chairman after Franklin Delano Roosevelt was inaugurated. Under Jones's leadership, the agency provided loans to railroads and financial institutions in order to stimulate commerce.

Jones resigned as RFC chairman in 1939 in order to accept appointment as director of the Federal Loan Agency. While continuing, effectively if not nominally, to superintend the former agency, he now exercised control over the Federal Housing Administration, the Export-Import Bank, and the Home Owners' Loan Corporation. A special act of Congress permitted him to carry out his activities at the Federal Loan Agency even after he became Roosevelt's secretary of commerce in 1940. In this position (and as a member of the War Production Board), Jones played a major part in mobilizing U.S. industrial production for World War II.

Jones left government service in 1945 at the request of President Roosevelt, who wanted the commerce post for Jones's rival, former Vice President Henry Wallace. Jones returned to his home city and spent the remainder of his life publishing the *Houston Chronicle* and engaging in more highly successful investments and business ventures.

Jones, Jim, byname of JAMES WARREN JONES (b. May 13, 1931, Lynn, Ind., U.S.—d. Nov. 18, 1978, Jonestown, Guyana), American cult leader who promised his followers a utopia in the jungles of South America after proclaiming himself messiah of the People's Temple, a San Francisco-based evangelist group. He ultimately led his followers into a mass suicide, which came to be known as the Jonestown Massacre (Nov. 18, 1978).

In the 1950s and '60s in Indianapolis, Ind., Jones gained a reputation as a charismatic churchman, and, after moving his headquarters to northern California in 1967 (first settling in Ukiah and then in San Francisco in 1971), he apparently became obsessed with the exercise of power. In the face of mounting accusations by journalists and defectors from the cult that he was illegally diverting the income of cult members to his own use, Jones and hundreds of his followers emigrated to Guyana and set up an agricultural commune called Jonestown (1977). As ruler of the sect, Jones confiscated passports and millions of dollars and manipulated his followers with threats of blackmail, beatings, and probable death. He also staged bizarre rehearsals for a ritual mass suicide.

On Nov. 14, 1978, U.S. Rep. Leo Ryan of California arrived in Guyana with a group of newsmen and relatives of cultists to conduct an unofficial investigation of alleged abuses. Four days later, as Ryan's party and 14 defectors from the cult prepared to leave from an airstrip near Jonestown, Jones ordered the group assassinated. When he learned that only Ryan and four others (including three newsmen) had been killed and that those that had escaped might bring in authorities, Jones activated his suicide plan. On November 18, he commanded his followers to drink cyanide-adulterated punch, an order that the vast majority of them passively and inexplicably obeyed. Jones himself died of a gunshot wound in the head, probably not self-inflicted. Guyanese troops reached Jonestown the next day, and the death toll of cultists was eventually placed at 913 (including 276 children).

Jones, John, pseudonym JAC GLAN-Y-GORS (b. Nov. 10, 1766, Glanygors near Cerrig-y-Druidion, Denbighshire, Wales—d. May 21, 1821, London), Welsh-language satirical poet and social reformer who, under the impact of the French Revolution, produced some of the earliest Welsh political writings. Greatly influenced by the political and social essays of the American and French Revolutionary propagandist Thomas Paine, he published his views in two pamphlets: "Seren tan Gwmmwl" (1795; "A Star Under Cloud") and "Toriad y Dydd" (1797; "The Break of Day").

Probably educated at the free school at Llanrwst, Denbighshire, he settled in London in 1789 and became proprietor of the King's Head Inn, Ludgate Hill. He was a member of the Gwyneddigion, a literary society of Welshmen living in London. Other works include the poems "Sessiwn yng Nghymru," a satire on the difficulties arising from the use of the English language to administer law in Wales; and "Dic Shon Dafydd" (1803), a satiric characterization of a Welshman who feigns ignorance of his native tongue.

Jones, John Paul, original name JOHN PAUL (b. July 6, 1747, Kirkbean, Kirkcudbright, Scot.—d. July 18, 1792, Paris), American naval hero in the U.S. War of Independence, renowned for his victory over British ships of war off the east coast of England (Sept. 23, 1779).



John Paul Jones, portrait by Charles Willson Peale, 1781

By courtesy of the Independence National Historical Park Collection, Philadelphia

Apprenticed at the age of 12 to John Younger, a Scottish merchant shipper, John Paul sailed as a cabin boy on a ship to Virginia, where he visited his older brother William at Fredericksburg. When Younger's business failed in 1766, Paul found work as chief mate of a Jamaica-owned slaver brigantine. After two years he quit the slave trade and shipped passage for Scotland. When both master and chief mate died of fever en route, he brought the ship safely home and was appointed a master. In 1772 he purchased a vessel in the West

Indies but the following year, after killing the ringleader of a mutinous crew, he fled the islands to escape trial and changed his name to John Paul Jones. Two years later he returned to Fredericksburg and when the Revolutionary War broke out, he went to Philadelphia and was commissioned a senior lieutenant in the new Continental Navy.

Assigned to the "Alfred," flagship of the little fleet commanded by Commo. Esek Hopkins, Jones distinguished himself in action in the Bahamas and against the British ship "Glasgow" on the return trip. In 1776 he was in command of the "Providence," and between August and October he ranged over the Atlantic from Bermuda to Nova Scotia, twice outwitting British frigates, manning and sending in eight prizes, and sinking and burning eight more. Again in charge of the "Alfred," later in the same year, he reached port unmolested with several prizes in tow.

Appointed by Congress to the newly built "Ranger" (June 1777), Jones made a spectacular cruise through St. George's Channel and the Irish Sea, where he took a number of prizes. Arriving at Brest, Fr. on May 8, 1778, he was hailed as a hero by the French.

In August 1779 Jones took command of the "Bonhomme Richard" and, accompanied by four small ships, sailed around the British Isles. In September the little squadron intercepted the Baltic merchant fleet under convoy of the British ships "Serapis" and "Countess of Scarborough." What followed was one of the most famous naval engagements in American history. During the early stages of a gruelling 3½-hour gun battle, Jones answered an enemy challenge to surrender with the memorable words, "I have not yet begun to fight!" He won a stunning victory, though with a heavy loss of life, when the "Serapis" surrendered and was boarded by Jones and his crew. The "Bonhomme Richard" sank soon afterward from damage received in the engagement, and Jones sailed both the "Serapis" and the captured "Countess of Scarborough" to the Netherlands. In France Louis XVI rewarded him with a gold-hilted sword and made him a chevalier of France.

After receiving a Congressional gold medal in 1787, Jones was dispatched on official business to Denmark; while abroad he accepted an appointment to the Russian Navy as rear admiral. This period in his life was uniformly disappointing, and he was plagued with lack of recognition and false accusation. In 1790 he returned to Paris embittered and physically broken. He died soon after and was buried in an unmarked grave. More than a century later, however, U.S. warships escorted his remains back to his adopted country, and his grave at Annapolis, Md., was made a national shrine.

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Jones, (Everett) Leroi: *see* Baraka, Imanu Amiri.

Jones, Lewis Ralph (b. Dec. 5, 1864, Brandon, Wis., U.S.—d. March 31, 1945, Orlando, Fla.), U.S. botanist and agricultural biologist, one of the first and most distinguished of American plant pathologists.

Jones studied botany at the University of Michigan (Ph.D., 1889) and afterward left for the University of Vermont to become research botanist at the Agricultural Experiment Station, where he made his first major contribution to plant pathology. He successfully used the French-made Bordeaux mixture fungicide in the prevention and control of potato blight and pear and apple scab. He also studied the problems of bacterial soft rot of vegetables and found that the action of *Bacillus carotovorus* initiated rotting by destroying a section of the cell wall of the host plant. His was the first thorough investigation of the mechanism of bacterial disease infection in plants and earned him a second Ph.D. (Michigan, 1904) and a worldwide reputation as an accomplished plant pathologist.



Lewis Ralph Jones, *c.* 1940

By courtesy of L.A. Charette and the Hunt Institute, Pittsburgh

In 1909 Jones became professor of botany at the University of Wisconsin, where he developed a department of plant pathology. At Wisconsin he again gained recognition by developing a variety of cabbage resistant to yellows, a cabbage disease.

Jones, Mary Harris, *née* HARRIS, byname MOTHER JONES (b. May 1, 1830, County Cork, Ire.—d. Nov. 30, 1930, Silver Spring, Md., U.S.), labour organizer, widely known in the United States as a fiery agitator for the union rights of coal miners and other workers.

In 1871 Jones, the widow of an iron-moulder, who had died in 1867 in an epidemic in Memphis, Tenn., lost all her possessions in the great Chicago fire. She turned for assistance to the Knights of Labor, attracted by their campaign for improved working conditions. By 1880 she had herself become a highly visible figure in the American labour movement. She travelled across the country, both organizing for the United Mine Workers and orating on her own, supporting strikes, and galvanizing public support for labour with her slogan, "Join the union, boys."

Jones was also an active proponent of legislation to prohibit child labour. She was one of the founders of the Social Democratic Party in 1898 and of the Industrial Workers of the World in 1905. *The Autobiography of Mother Jones* was published in 1925. A biography, *Mother Jones, the Miner's Angel*, by Dale Fetherling, was published in 1974.

Jones, Owen (b. Feb. 15, 1809, London—d. April 19, 1874), English designer, architect, and writer, best known for his standard work treating both Eastern and Western design motifs, *The Grammar of Ornament* (1856), which presented a systematic pictorial collection emphasizing both the use of colour and the application of logical principles to the design of everyday objects.

Educated at the Royal Academy, Jones travelled in the Near East and Spain from 1833 to 1834. He drew attention to Islāmic design in his work *Plans, Elevations, Sections and Details of the Alhambra* (1842–45), treating the famous palace at Granada, an outstanding example of Moorish architecture.

Jones also worked as an interior decorator and book illustrator and pioneered in the use of prefabricated metal buildings for the tropics. He was appointed superintendent of works for England's Great Exhibition of 1851, which was housed in the newly built Crystal Palace, a metal and glass building employing prefabricated parts. In 1852 he supervised the decorations for the Crystal Palace.

Jones, R(enato) William (b. Oct. 5, 1906, Rome), organizer of international basketball.

Jones was born the son of a British father and an Italian mother and assumed British citizenship. After schooling at Rome, he went to Springfield (Mass.) College, where basketball had been invented in 1891. After graduation in 1928, he attended schools in Denmark, Germany, and Switzerland (1929–32). He introduced basketball to Switzerland in 1929 and was among the founders of the Fédération Internationale de Basketball Amateur (FIBA) in 1932, serving from 1936 as secretary general of this body that governs international basketball competition, including the Olympic Games. He was made secretary general of the International Council of Sport and Physical Education in 1958.

He was elected to the Basketball Hall of Fame in 1964 and was elected patron of the Amateur Basket Ball Association of England in 1973.

Jones, Richard (b. 1790, Tunbridge Wells, Kent, Eng.—d. Jan. 26, 1855, Haileybury, Hertfordshire), British economist and clergyman.

Jones was educated at Cambridge University, graduating in 1816. He entered the Church of England ministry and spent a period of time as a curate. In 1833 he was appointed professor of political economy at King's College, London. Jones resigned this position (1835) in order to succeed the British demographer Thomas Malthus at the East India Company's college at Haileybury. He was also a tythe commissioner and a charity commissioner.

Jones is chiefly remembered in economics for his advocacy of a methodology based on observation and induction. In this he was influenced by the British philosopher William Whewell, who felt that analysis of the particulars could lead to a scientific generalization (induction).

Jones was a critic of the deductive procedures associated particulary with the prominent British economist David Ricardo. In his *Essay on the Distribution of Wealth* (1831), Jones was not only critical of Ricardo's rent theory, but he criticized existing studies in economic history. Although many of his criticisms, particularly the charge that previous writers had neglected the importance of agricultural improvements in offsetting diminishing returns, could be met without great difficulty by classical economists, Jones's emphasis on historical and factual studies gives him a strong claim to be regarded as the founder of the English historical school in economics. He was, with Malthus, instrumental in the establishment of the Statistical Society of London, which later became the Royal Statistical Society.

Jones, Robert (fl. 1597–1615), songwriter of the school of English lutenists that flourished around the turn of the 17th century.

Little is known about his life save that he received a bachelor of music degree at Oxford in 1597 and that in 1610 he and Philip Rosseter and two others were granted a patent to train, in London, a group of children to be called "The Children of the Revels to the Queene." However, the privy council ordered the demolition of the building in which they were to perform. Jones's works include *The First Set of Madrigals* (1607), now incomplete, and five books of songs for voice and lute (1600–11).

Jones, Robert Edmond (b. Dec. 12, 1887, Milton, N.H., U.S.—d. Nov. 26, 1954, Milton), U.S. theatrical and motion-picture designer whose imaginative simplification of sets initiated the 20th-century American revolution against realism in stage design.

Graduating from Harvard University (1910), Jones began designing scenery for the theatre in New York City in 1911. His settings for *The Man Who Married a Dumb Wife* (1915), a version by the French satirist Anatole France of an old French folk drama, employed an

austere, gray-and-black, poster-like street facade and brilliant costumes. Jones achieved unencumbered, fluid stage arrangements in which it was possible (as it had been on the Shakespearean stage) to change scenes with a minimal shifting of props and backgrounds. Associated with Kenneth Macgowan as a director of the Greenwich Village Playhouse after 1925, Jones published, with Macgowan, *Continental Stagecraft* (1922) and by himself, *The Dramatic Imagination* (1941). He designed sets for play by Eugene O'Neill from 1921 through 1946. He began designing sets for colour motion pictures in 1933.

Jones, Robert Tyre, Jr.: *see* Jones, Bobby.

Jones, Rufus Matthew (b. Jan. 25, 1863, South China, Maine, U.S.—d. June 16, 1948, Haverford, Pa.), one of the most respected U.S. Quakers of his time, who wrote extensively on Christian mysticism and helped found the American Friends Service Committee.

In 1893 Jones became editor of the *Friends'*



Rufus Jones

By courtesy of the American Friends Service Committee, Philadelphia

Review (later the *American Friend*) and in the same year began to teach philosophy at Haverford College, where he remained until 1934. In 1897, with the English Quaker John Wilhelm Rowntree, Jones made ambitious plans for a history of mysticism and Quakerism. Despite Rowntree's untimely death, Jones continued the project, publishing *Studies in Mystical Religion* (1909), *The Quakers in the American Colonies* (with others; 1911), *Spiritual Reformers in the 16th and 17th Centuries* (1914), and *The Later Periods of Quakerism* (1921). These volumes form the larger part of a series still valued for its interpretation of spiritual religion in Western culture.

In 1917, following U.S. entry into World War I, Jones joined other Friends in organizing the American Friends Service Committee (AFSC) and became its first chairman. At first providing opportunities for conscientious objectors to do relief work in Europe as an alternative to military service, AFSC later widened its program to include educational and relief work around the world. For most of its first three decades Jones was the committee's chairman or honorary chairman, and he worked to further unity and liberal thought among Quakers. Considered the leading U.S. exponent of the mystical viewpoint within Quakerism, Jones dealt with mysticism in most of his more than 50 books. He was also the author of several autobiographical works, such as *Finding the Trail of Life* (1926) and *A Small-Town Boy* (1941). His life and work are examined in the biography by E.G. Vining, *Friend of Life* (1958).

Jones, Samuel M(ilton), byname GOLDEN RULE JONES (b. August 3, 1846, Ty Mawr, Wales—d. July 12, 1904, Toledo, Ohio, U.S.), Welsh-born U.S. businessman and civic politician notable for his progressive policies in both milieus.

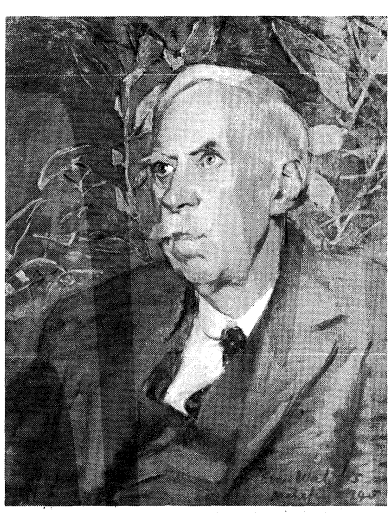
Jones immigrated to the United States with his parents at age three and grew up in New York. At 18, after very little schooling, he went to work in the oilfields of Titusville, Pa. Jones rose from field hand to oil producer; his invention of an improved oil-pumping mechanism in 1891 earned him a fortune. He opened a factory in Toledo to manufacture his invention and introduced there a host of employee benefits, including the eight-hour workday, profit sharing, paid vacations, a minimum wage, Christmas bonuses, and recreational facilities.

His guide in dealing with employees, Jones attested, was the Golden Rule, and admirers and critics alike (many businessmen despised him as a socialist) applied that term as his sobriquet. Nominated by the Republican Party and elected in 1897 as mayor of Toledo, he set about governing by the same ideal. He established free kindergartens, playgrounds, even free lodging for tramps; he granted city employees benefits comparable to those his factory workers enjoyed; he sought to root out corruption from city government; and he advocated public ownership of utilities.

In 1899 the Republicans repudiated Jones and nominated a more conventional candidate for the office of mayor. Yet so popular was Jones with the electorate that he captured more than 70 percent of the vote by running as an independent. Reelected in 1901 and again in 1903, he died in office in 1904. In his will, Jones left a $10,000 "Golden Rule Trust" to the workers in his factory.

Jones, Thomas Gwynn (b. Oct. 10, 1871, Abergele, Denbighshire, Wales—d. March 7, 1949, Aberystwyth, Cardiganshire), Welsh-language poet and scholar best known for his narrative poems on traditional Celtic themes.

After spending much of his earlier life as a journalist, Jones joined the National Library of Wales at Aberystwyth in 1909; in 1913 he went to the University of Wales as lecturer



Thomas Gwynn Jones, oil painting by Evan Walters, 1945; in the National Museum of Wales, Cardiff

By courtesy of the National Museum of Wales, Cardiff

and, later, as professor of Welsh literature.

Critics have seen his greatest achievement in the poems *Tir na n-Og,* a lyrical play for performance with music; "Broseliawnd," set in the forest of Broceliande; "Anatiomaros," set in a district of ancient Gaul; "Argoed," depicting an ideal community; and "Cynddilig," about the 6th-century Welsh poet Llywarch Hen. His translations of Goethe's *Faust* (1922) and his collection of Greek poems and Latin epigrams, *Blodau o Hen Ardd* (1927; "Flowers from an Ancient Garden"), with H.J. Rose, are considered among the most successful renderings of ancient literature into Welsh.

Jones, Sir William (b. Sept. 28, 1746, London—d. April 27, 1794, Calcutta), British Orientalist and jurist who did much to encourage interest in Oriental studies in the West.

Of Welsh parentage, he studied at Harrow and University College, Oxford (1764–68), and learned Latin, Greek, Hebrew, Arabic, and Persian. By the end of his life, he had learned 28 languages, including Chinese, often by teaching himself.

After several years in translating and scholarship, he turned, for financial reasons, to the study of law and was called to the bar in 1774. Meanwhile, he did not give up Orientalism. His *Grammar of the Persian Language* (1771) was authoritative in the field for a long time. His *Moallakât* (1782), a translation of seven famous pre-Islamic Arabic odes (*see* Mu'allagāt, al-), introduced these poems to the British public.

In 1783 he was knighted and sailed for Calcutta as judge of the supreme court. In 1784 he founded the Asiatic Society of Bengal to encourage Oriental studies. He himself took up Sanskrit, to equip himself for the preparation of a vast digest of Hindu and Muslim law. Of this uncompleted venture, his *Institutes of Hindu Law* was published in 1794 and his *Muhammedan Law of Inheritance* in 1792. In his 1786 presidential discourse to the Asiatic Society, he postulated the common ancestry of Sanskrit and Greek, his findings providing one of the earliest examples of the science of comparative linguistics.

Jones's letters, edited by Garland Cannon, were published in two volumes in 1970. Cannon was also the author of a biography published in 1964.

Jones Act, formally PHILIPPINE AUTONOMY ACT OF 1916, statute announcing the intention of the United States government to "withdraw their sovereignty over the Philippine Islands as soon as a stable government can be established therein." The U.S. had acquired the Philippines in 1898 as a result of the Spanish–American War; and from 1901 legislative power in the islands had been exercised through a Philippine Commission effectively dominated by Americans. One of the most significant sections of the Jones Act replaced the Commission with an elective Senate and, with minimum property qualifications, extended the franchise to all literate Filipino males. The law also incorporated a bill of rights.

American sovereignty was retained by provisions of the act reserving to the governor general power to veto any measure passed by the new Philippine legislature. The liberal governor general Francis B. Harrison rarely used this power and moved rapidly to appoint Filipinos in place of Americans in the civil service. By the end of Harrison's term in 1921, Filipinos had taken charge of the internal affairs of the islands.

The Jones Act remained in force as a de facto constitution for the Philippines until it was superseded by the Tydings–McDuffie Act of 1934. Its promise of eventual absolute independence set the course for future American policy in the islands.

Jonesboro, city, Craighead County, northeastern Arkansas, U.S., on Crowley's Ridge, bordering the Mississippi Valley. Founded as the county seat in 1859 and laid out by J.N. Burk on land donated by Fergus Snoddy, it was named for state senator William A. Jones. It was incorporated as a city in 1883, when the railroads reached the area. Jonesboro prospered as a sawmilling town until local timber was exhausted before 1910, by which time it had become an agricultural market and processing centre. Its growth was fostered by the foundation in 1909 of a vocational high school, later Arkansas State University. After World War II there was industrial diversification. In 1958 the city boundaries were extended to include Nettleton. Jonesboro was the home of

Hattie Caraway (1878–1950), the first woman to be elected to the U.S. Senate (following her husband's death; she was elected to his seat and served 1932–45). Pop. (1980) 31,530.

Jonesboro, town, seat of Washington County, northeastern Tennessee, U.S., just west of the Unaka Division of the Cherokee National Forest, near Johnson City. Laid out in 1779 and named for William Jones, a North Carolina Revolutionary War leader, it is one of the oldest towns in Tennessee. There in 1784 the State of Franklin was organized by aroused settlers after North Carolina had ceded their lands to the U.S. Congress; Jonesboro was designated the capital and John Sevier, the state's first and only governor. The Franklin General Assembly convened there twice before the capital was moved to Greeneville in 1785. The short-lived State of Franklin disintegrated with the establishment of the Territory South of the River Ohio in 1788. Andrew Jackson was admitted to law practice in Jonesboro in 1788 and fought a duel there. The *Emancipator,* one of the first Abolitionist newspapers in the U.S., was published (1820) in the town by Elihu Embree. Historic buildings include the Chester (Jonesboro) Inn (*c.* 1798) and the Methodist Church. The birthplace of Davy Crockett, frontiersman, is a few miles west near the small town of Limestone.

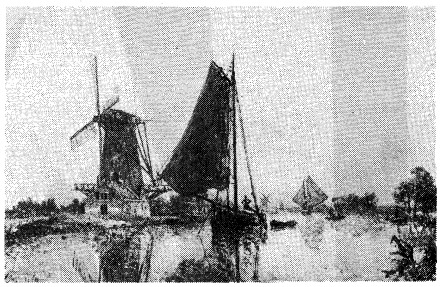
Jonesboro has survived as a southwestern suburb of Johnson City, with an economy based on timber, poultry, and livestock. Pop. (1980) 2,829.

Jonestown, former site of the People's Temple commune in North West district, Guyana, near the Venezuelan border. A religious cult group, the commune ended in 1978 when the cult's founder and leader, the Rev. Jim Jones (*q.v.*), initiated a mass suicide in which 913 people died.

Jongen, Joseph (b. Dec. 14, 1873, Liège, Belg.—d. July 13, 1953, Sart-lez-Spa, near Liège), outstanding modern Belgian composer.

He studied at the Liège Conservatory and later in Italy, France, and Germany. In 1903 he became professor of harmony at Liège. As a refugee in England during World War I he formed a piano quartet with D. Defauw, L. Tertis, and E. Doehaerd. In 1920 he taught at the Brussels Conservatory, becoming director, 1925–39. His works, moderately conservative in style, include the *Concert à cinq* (1923), for flute, violin, viola, cello, and harp; the Concerto for Harp (1944); songs, string quartets, and piano trios.

Jongkind, Johan Barthold (b. June 3, 1819, Lattrop, Neth.—d. Feb. 9, 1891, Côte-Saint-André, Fr.), painter and printmaker whose small, informal landscapes continued the tradition of the Dutch landscapists while stimulating the development of Impressionism.



"Holland, Boats By the Mill," painting by Johan Barthold Jongkind, 1868; in the Louvre, Paris
Cliche Musees Nationaux, Paris

Jongkind first studied under local landscape painters at The Hague. In 1846 he moved to Paris and worked under the genre painter Jean-Baptiste Isabey and François Picot. He exhibited at the Salon in 1848 and again in 1852, when he received a medal. His paintings were exhibited with those of Camille Corot and Charles-François Daubigny, but his work owes more to the atmosphere-conscious 17th-century Dutch landscapists than to his French contemporaries. He chose as subjects scenes along the banks of the Seine, picturesque old quarters of Paris, the seacoast of Normandy, and views of the Dutch canals.

When his work was not accepted for exhibition at the Salon of 1863, he joined in the Salon des Refusés and met Claude Monet, the pioneer of Impressionism, who learned much from Jongkind's rendering of atmosphere and his study of fleeting effects of light and reflections. In 1878 Jongkind settled at Côte-Saint-André (Isère), where he painted the simple landscape motifs for which he is famous. Suffering from a persecution complex, Jongkind dissipated most of his earnings on drink and spent a good deal of time avoiding creditors. He died in a mental institution.

jongleur, professional storyteller or public entertainer in medieval France, often indistinguishable from the trouvère. The role of the jongleur included that of musician, juggler, and acrobat, as well as reciter of such literary works as the fabliaux, chansons de geste, lays, and other metrical romances that were sometimes of his own composition. Jongleurs performed in marketplaces on public holidays, in abbeys, and in castles of nobles, who sometimes retained them in permanent employment. In such a case the jongleur became known as a *ménestrel* and devoted more of his time to literary creation than to entertainment. Fraternities of jongleurs became known as *puys,* groups that held competitions for lyric poets. The jongleur reached the height of his importance in the 13th century but lapsed into decline in the 14th, when various facets of his complex role disseminated among other performers; *e.g.,* musicians, actors and acrobats.

Jongley (The Sudan): *see* Junqulī.

Jonker diamond, white diamond tinged with blue that weighed 726 carats in rough form. It was named for its discoverer, the prospector Jacobus Jonker, who found the stone in 1934 on a farm near Pretoria, S.Af. After a year of study, it was cleaved by the New York cutter Lazare Kaplan into 12 stones ranging in weight from about 5 carats to an emerald-cut stone of about 143 carats. It was the first great diamond to be cut in the United States.

Jönköping, *län* (county) of southern Sweden, in Götaland region. Its land area of 3,839 sq mi (9,944 sq km) extends southward from Vättern (Lake Vätter) through part of the traditional *landskap* (province) of Småland. Jönköping is the highest county of southern Sweden, with heights rising above 1,300 ft (400 m). Its rough terrain is studded with lakes and drained by the rivers Eman, Lagan, and Nissan. Although it is primarily wooded, the *län* supports rye and oats cultivation and cattle raising. Most manufacturers exploit the timber supply. The main city is Jönköping, the capital, on the southern shore of Vättern. Pop. (1984 est.) 301,036.

Jönköping, city and capital of the *län* (county) of Jönköping, southern Sweden. It lies at the southern end of Vättern (Lake Vätter) and on the shores of Munksjön and Rocksjön. In 1283 Franciscan monks built a monastery on this site, and the following year the town was chartered. Because of its strategic position, it suffered greatly in the wars between Denmark and Sweden, during which it was twice (1567 and 1612) set on fire by its own citizens at the approach of the Danes. The present town dates from the rebuilding begun in 1614. Historic buildings include the Old Town Hall (1696–99), the Court of Appeal (1655; the second oldest in Sweden), and the Kristinekyrkan (Christina Church; 1649–73); there is also a county museum. The leading industry is the manufacture of matches; paper, textiles, and machinery are also produced. Jönköping is connected by rail with the main Swedish lines and has water connections through the Göta Kanal with the Kattegat and the Baltic; there is an airport. Pop. (1984 est.) 106,899.

Jonquière, city, Saguenay-Lac-Saint-Jean region, southern Quebec province, Canada, on the Rivière aux Sables, a tributary of the Saguenay. Named after the Marquis de La Jonquière, who was governor of New France (1749–52), it originated as an agricultural settlement in the mid-19th century and grew to become an important lumber and wood-pulp centre. Additional employment is provided by local Canadian National Railway workshops and a huge aluminum plant. In 1976 the cities of Arvida, Jonquière, and Kénogami and the municipality of Saint-Dominique-de-Jonquière were dissolved to facilitate the incorporation of a new, enlarged Jonquière. Inc. village, 1904; town, 1912; city, 1956, reincorporated 1976. Pop. (1981) 60,354.

Jonson, Ben, byname of BENJAMIN JONSON (b. June 11?, 1572, London—d. Aug. 6, 1637, London), English Jacobean dramatist, lyric poet, and literary critic. He is generally regarded as the second most important English dramatist, after Shakespeare, during the reign of James I. Among his major plays are *Every Man In his Humour* (1598), *Volpone* (1606), *The Alchemist* (1610), *Every Man Out of his Humour* (1599), *Sejanus* (1603; one of only two tragedies), *Eastward Hoe* (1605), *Epicoene* (1609), and *Bartholomew Fair* (1614).

Theatrical career. Jonson was born two months after his father died. His stepfather was a bricklayer, but by good fortune the boy was able to attend Westminster School. His formal education, however, ended early,



Ben Jonson, oil painting by an unknown artist; in the National Portrait Gallery, London
By courtesy of the National Portrait Gallery, London

and he at first followed his stepfather's trade, then fought with some success in the Netherlands. On returning to England he became an actor and playwright, experiencing the life of a strolling player and writing plays for Philip Henslowe, the leading impresario for the public theatre. With one exception (*The Case is Altered*), these early plays are known, if at all, only by their titles. He apparently wrote tragedies as well as comedies in these years, but his extant writings include only two tragedies, *Sejanus* (1603) and *Catiline* (1611).

The year 1598 marked an abrupt change in Jonson's status, when *Every Man In his Humour* was successfully presented by the Lord Chamberlain's theatrical company (a legend has it that Shakespeare himself recommended it to them), and his reputation was estab-

lished. In this play Jonson tried to bring the spirit and manner of Latin comedy to the English popular stage. Following this success, the same company acted Jonson's *Every Man Out of his Humour,* which was even more ambitious: it was the longest play ever written for the Elizabethan public theatre; it strove to provide an equivalent of the Greek comedy of Aristophanes; "induction," or "prelude," and regular between-act comment explicated the author's views on what the drama should be.

The play, however, proved a disaster, and Jonson had to look elsewhere for a theatre to present his work. The obvious place was the "private" theatres, in which only young boys acted. The high price of admission they charged meant a select audience, and they were willing to try strong satire and formal experiment; for them Jonson wrote *Cynthia's Revels* (*c.* 1600) and *Poetaster* (1601). Even in these, however, there is the paradox of contempt for human behaviour hand in hand with a longing for human order.

His masques at court. It appears that Jonson won royal attention by his *Entertainment at Althorpe,* given before James I's queen as she journeyed down from Scotland in 1603, and in 1605 *The Masque of Blackness* was presented at court. The "masque" was a quasi-dramatic entertainment, primarily providing a pretense for a group of strangers to dance and sing. This elementary pattern was much elaborated during the reign of James I, when the architect Inigo Jones provided increasingly magnificent costumes and scenic effects for masques at court. The few spoken words that the masque had demanded in Elizabethan days expanded into a "text" of a few hundred lines and a number of set songs. Thus the author became important as well as the designer: he was to provide not only the necessary words but also a special "allegorical" meaning underlying the whole entertainment. It was Jonson, in collaboration with Jones, who gave the Jacobean masque its characteristic shape and style. He did this primarily by introducing the suggestion of a "dramatic" action. The degree of elaborate presentation, and also the length of time taken up by the entertainment, was far greater than a perusal of the text might suggest. Thus, although the poet could be regarded as a mere auxiliary, it was he who provided the informing idea and dictated the fashion of the whole night's assembly. Jonson's early masques were clearly successful, for during the following years Jonson was repeatedly called upon to function as poet at court. In his masques Jonson was fertile in inventing new motives for the arrival of the strangers. But this was not enough: he also invented the "antimasque" (sometimes "antemasque"), which preceded the masque proper and which featured grotesques or comics who, while they might dance and sing, were primarily actors (the "masquers" were played by ladies and gentlemen of the household; accomplished dancers and musicians, they could not necessarily act). A structural contrast developed between antimasque and masque, and soon the antimasquers began to speak. From one antimasque there came to be several—though Jonson generally managed to keep the device in its place.

His prime and later life. In 1606 Jonson and his wife (whom he had married in 1594) were brought before the consistory court in London to explain their absence from church. He denied that his wife was guilty but admitted that his own opinions held him aloof from attendance. The matter was patched up through his agreement to have conference with learned men, who might persuade him if they could. Apparently it took six years for him to decide to conform. For some time before this he and his wife had lived apart, Jonson taking refuge in turn with his patrons Sir Robert Townshend and Esmé Stuart, Lord Aubigny.

During this period, nevertheless, he made a mark second only to Shakespeare's in the public theatre. *Volpone* and *The Alchemist* were among the most popular and esteemed plays of the time. Each exhibited man's folly in his pursuit of gold. Set respectively in Italy and London, they demonstrate Jonson's enthusiasm both for the typical Renaissance setting and for his own town on Europe's fringe. Both plays are eloquent and compact, sharp-tongued and controlled.

Jonson embarked on a walking tour in 1618–19 which took him to Scotland. During the visit the city of Edinburgh made him an honorary burgess and guild brother, giving a special banquet in his honour. On his return to England he received an honorary master of arts degree from Oxford University, a most signal honour in his time.

In 1623 his personal library was destroyed by fire, his services were seldom called on for the entertainment of Charles I's court, and his last plays failed to please. In 1628 he suffered what was apparently a stroke and, as a result, was confined to his room and chair, ultimately to his bed. That same year he was made city chronologer (thus theoretically responsible for the city's pageants, especially the lord mayor's show) in succession to Thomas Middleton, who had died in 1627. Middleton, a distinguished dramatist, had done the city proud: there was restiveness because Jonson did nothing to earn his salary. As so often with Jonson, the quarrel was patched up: in 1634 his salary was declared to be a pension.

Jonson's life was a life of talk as well as of writing. He engaged in "wit-combats" with Shakespeare, and, first at the Mermaid Tavern and then at the Devil Tavern, Jonson reigned supreme. It was a young man's ultimate honour to be regarded as a "son of Ben." The most prominent of his "sons" among the Caroline dramatists was Richard Brome, whose spirited comedies show how much he learned from his master: he had apparently been some sort of a "servant" to Jonson, perhaps as secretary, perhaps more menially. Others, more genteel, also flocked around him.

Jonson died in 1637 and was buried in Westminster Abbey, and on his gravestone there is an inscription "O rare Ben Jonson." It has been suggested that the first two words should be joined to make the Latin word *Orare,* the whole reading "Pray for Ben Jonson"—perhaps as a surreptitious tribute to Jonson's former Catholicism. The following year appeared *Jonsonus Virbius,* a collection of elegies written in his honour.

The first folio edition of his works had appeared in 1616; posthumously, in a second Jonson folio (1640), appeared *Timber: or, Discoveries,* a series of observations on life and letters. It was also called *Sylva* before its epigraph and *Explorata* in the title before the text. Here Jonson held forth on the nature of poetry and drama and noted his various debts to reading; here, too, he paid what was probably his final tribute to Shakespeare, in which, despite acknowledging a belief that his great contemporary was, on occasion, "full of wind"—*sufflaminandus erat*—he declared that "I loved the man, and do honour his memory, on this side idolatry, as much as any." Another prose work that also first appeared in this folio was *The English Grammar.* If it is true that for a time Jonson acted as professor of rhetoric at Gresham College, both this and the *Discoveries* may have been written with lectures in mind.

Assessment. Ben Jonson occupies by common, though not universal, consent the second place among English dramatists of the reigns of Elizabeth I and James I. He was a man of contraries. For "twelve years a papist," he was also—in fact though not in title—Protestant England's first poet laureate. His major comedies express a strong distaste for the world in which he lived and a delight in exposing its follies and vices. A gifted lyric poet, he wrote two of his most successful plays entirely in prose, an unusual mode of composition in his time. Often an angry and stubborn man, no one had more disciples than he. Much the most learned dramatist of his time, he was a master of theatrical plot, language, and characterization. It is a measure of his reputation that his dramatic works were the first to be published in folio (the term effectively means the "collected works") and that his plays held their place on the stage until the period of the Restoration, whose dramatists he influenced. Later his plays fell into neglect, though *The Alchemist* was revived during the 18th century, and in the mid-20th century several came back into favour: *Volpone, The Alchemist,* and *Bartholomew Fair* especially have been staged with striking success.

Jonson's chief plays are still very good theatre. His insistence on putting classical theory into practice in them has reinforced rather than weakened the effect of his gift of lively dialogue, robust characterization, and intricate, controlled plotting. In each of them he manoeuvres a large cast of vital personages, all consistently differentiated from one another. His plots are skilfully put together; incident develops out of incident with consistency and taking into account the respective natures of the personages involved. Sometimes his comedy derives from the dialogue, especially when it is based on his observation of contemporary tricks of speech. But there are also superbly ludicrous situations, often hardly removed from practical joke. Jonson is also renowned for his method of concentrating on a selected side, or on selected sides, of a character, showing how they dominate the personality. This is to some extent a natural outcome of his classical conception of art, but it also stems from his clear, shrewd observation of people. In Jonson's plays both eccentricity and normal behaviour are derived from a dominating characteristic, so that the result is a live, truthfully conceived personage in whom the ruling passion traces itself plainly. Later plays, for example, have characters whose behaviour is dominated by one psychological idiosyncrasy. Jonson's plotting at its best is also a consistent chain of cause and effect, taking character into account, and proceeding confidently through a twisting, turning action which is full of surprises without relying on coincidence or chance.

Jonson exerted a great influence on the playwrights who immediately followed him. In the late Jacobean and Caroline years, it was he, Shakespeare, and Beaumont and Fletcher who provided all the models. But it was he, and he alone, who gave the essential impulse to dramatic characterization in comedy of the Restoration and also in the 18th and 19th centuries. (Cl.L./Ed.)

MAJOR WORKS. *Every Man In his Humour* (1598); *Every Man Out of his Humour* (1599); *Sejanus* (1603); *The Masque of Blackness* (1605); *Eastward Hoe* (1605); *Volpone* (1606); *Epicoene* (1609); *The Alchemist* (1610); *Bartholomew Fair* (1614); *The Metamorphos'd Gypsies* (1621); *The Newe Inne, or The light Heart* (1629); *Timber; or, Discoveries* (1640).

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Jonson and the Language of Prose Comedy (1960); and Lester A. Beaurline, *Jonson and Elizabethan Comedy* (1978), a scholarly study of several comedies. On the masques, see especially *Stephen Orgel, The Jonsonian Masque* (1965, reissued 1981); and *John C. Meagher, Method and Meaning in Jonson's Masques* (1966). For the stage history of the plays, see *R.G. Noyes, Ben Jonson on the English Stage, 1660–1776* (1935); and Herford and Simpson's edition, vol. 9 (1950).

Jonson, Cornelius (English painter): *see* Johnson, Cornelius.

Jónsson, Arngrímur, also called ARNGRÍMUR JÓNSSON VÍDALÍN, byname ARNGRÍMUR THE LEARNED (b. 1568, Vídidalur, Ice.—d. 1648, Hólar), scholar and historian who brought the treasures of Icelandic literature to the attention of Danish and Swedish scholars.

Jónsson studied at Copenhagen University and returned to Iceland to be head of the Latin school at Hólar, which had been established to educate the new Reformed clergy and had become a general centre of learning. Here, Jónsson collected Icelandic manuscripts on which he based his studies of Icelandic and Scandinavian history.

In 1597 he produced for the Danish government a digest of his studies, which presented virtually a new history of Norway and Denmark and threw light on the early history of Sweden. Never published in full, it was probably his most influential work. *Crymogaea* (1609) and *Specimen Islandiae Historicum et Magna ex Parte Chorographicum* (1643), which described Iceland and its history, were his most widely read publications. Jónsson's scholarship was not fully accepted until the end of the 17th century. From then on it became the foundation on which his successors built for 200 years.

Jónsson, Hjálmar, also called BÓLU-HJÁLMAR (b. 1796, Eyjafjördur, Ice.—d. July 25, 1875, Breidumýri), Icelandic folk poet of brilliant satirical power who depicted his hard life in noteworthy poems.

The illegitimate son of a servant girl and a farmhand, Jónsson had little education, but he soon became an avid reader of the sagas and *Eddas*. Miserably poor all his life, he was first a farmhand, then a small tenant farmer. He was strongly independent. He fought for a living from the soil and lived in a turf cottage, yet put together a small library of Icelandic and Danish books. Bólu-Hjálmar was notable as a scathing critic of bureaucracy and the church, and used a rough invective that made some of his verse unprintable, though it was common currency in the oral tradition of Iceland long after he died. He had few friends, even among his neighbours, and lived and died a lonely rebel. The first collection of his poems was not published until 1879. His collected poems were published in two volumes (1915, 1919) and his collected works in four volumes (1949).

Jonsson, J(ohn) Erik (b. Sept. 6, 1901, Brooklyn, N.Y., U.S.), U.S. instrument manufacturer under whose management Texas Instruments Inc. became one of the leading electronics companies. Jonsson was also mayor of Dallas, Texas, from 1964 to 1971.

A graduate of Rensselaer Polytechnic Institute, Jonsson first worked for the Aluminum Company of America (1922–27) and Dumont Motor Car Co. In 1930 he became a laboratory superintendent for an oil-exploration company, Geophysical Service, Inc. Vice president by 1942, Jonsson steered the company into electronics during World War II. In 1951, he became president of the company, now called Texas Instruments Inc. The company split into an electronics and a geophysical division with a central research group to develop new projects.

In 1952 Texas Instruments was licensed by the American Telephone & Telegraph Company to make transistors. The company began making high-frequency germanium transistors for military and industrial computers. However, germanium could not be used in equipment that generated excessive heat. Texas Instruments was the first company to produce a silicon transistor that resists high temperatures and can therefore be used in computers on supersonic planes and missiles.

Between 1948 and 1958, when Jonsson was elected chairman of the board, Texas Instruments' sales rose 18-fold to nearly $92,000,000 a year. In 1966 Jonsson gave up his chairmanship and semiretired.

In 1964, Jonsson was asked to serve the remaining year of Dallas Mayor Earle Cabell's term when Cabell resigned to run for the U.S. Congress. Jonsson accepted and was reelected mayor for a total of seven years. In 1968, he became chairman of the Dallas–Fort Worth Regional Airport Board that planned and built the 27-square-mile airport (opened in 1976).

Joos VAN CLEVE, Cleve also spelled CLEEF, also called JOOS VAN DER BEKE (b. *c.* 1480—d. 1540, Antwerp), Flemish painter known for his portraits of royalty and his religious paintings, now often identified with the "Master of the Death of the Virgin."

In 1511 he entered the Antwerp guild as a master painter, and in 1520 he was appointed dean of the guild. He received a number of commissions from Cologne, where he influenced the local school of painting. The well-known triptychs of the "Death of the Virgin" (Munich and Cologne), painted for the Hackeney family of Cologne, gave the artist the provisional name of the "Master of the Death of the Virgin." He is thought to have gone to France as a portraitist to Francis I, and his portrait of Henry VIII suggests that he may have visited England.

Joos van Cleve's work is facile, eclectic, and conservative. He generally altered his style only to agree with the changes in fashion. He is sometimes called "the Elder" to distinguish him from his son, Cornelis van Cleve (1520–67), none of whose paintings survive.



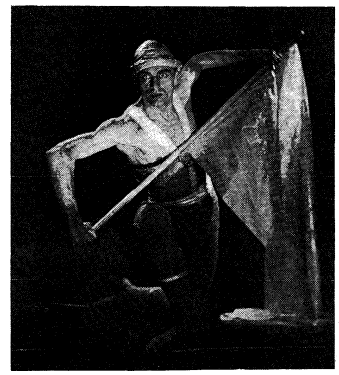
"Death of the Virgin," centre panel of triptych by Joos van Cleve; in the Alte Pinakothek, Munich

By courtesy of the Alte Pinakothek, Munich; photograph, Joachim Blauel

Joos VAN WASSENHOVE (Flemish painter): *see* Justus of Ghent.

Jooss, Kurt (b. Jan. 12, 1901, Wasseralfingen, Ger.—d. May 22, 1979, Heilbronn, W.Ger.), German dancer, teacher, and choreographer whose dance dramas combined Expressionistic modern-dance movements with fundamental ballet technique.

Initially a music student, he trained in dance from 1920 to 1924 with Rudolf Laban, then worked as choreographer for the avant-garde Neue Tanzbühne (New Dance Stage). After studying ballet in Vienna and Paris, Jooss returned to Germany and established a school (1927) and company (1928); in 1930 he became ballet master at the Essen Opera House, where his own group performed. In 1932 he choreographed *The Green Table*, which won first prize in the choreographic competition organized by the Archives Internationales de la Danse in Paris. Subsequently his group became known as Ballets Jooss and made a world tour during 1933 and 1934. Because Hitler had come to power, Jooss did not return to Germany but with Sigurd Leeder made his headquarters at Dartington Hall, Devon, Eng., where many students came to study his approach to dance and to learn Rudolf Laban's principles of movement. Jooss returned to Essen in 1949, as a British citizen, and reopened his school. His company was disbanded in 1953 (and he retired as school director in 1968), but he reorganized the company for festivals during 1963 and 1964. Many of his works have been recorded in Labanotation.



Jooss in *The Green Table, c.* 1935

H. Roger-Viollet

Jooss's masterpiece, *The Green Table*, is a caustic satire on the futility of war. His other ballets, which include *The Big City* (1932) and *The Seven Heroes* (1933), also have contemporary themes or implications. Jooss retained basic ballet steps and positions in his

choreography and made extensive use of expressive gesture but eliminated such displays of virtuosity as the use of points and multiple pirouettes. At his school at Dartington Hall and later at Essen, Jooss formalized his approach by further developing eukinetics, a system originated by Laban and designed to enable a dancer to perform a wide variety of dance styles with expression and control. Through his eclectic choreography and his teaching, Jooss expanded the technical and thematic range of theatrical dance.

Joplin, city, Jasper and Newton counties, in the Ozark region of southwestern Missouri, U.S. It lies adjacent to Webb City, near the Kansas and Oklahoma borders. It was founded in 1871 by John Cox, who named it after his friend the Reverend Harris Joplin, a Methodist missionary who, along with Cox, had come from Tennessee in about 1840. The discovery of lead and zinc ores in the area in 1849 brought prosperity, and in 1873 Joplin merged with Murphysburg. When the mining boom collapsed in the 1930s, other industry was developed. Large tailing piles in the vicinity are virtually the only remnants of the once-thriving mining industry. Now a shipping and trade centre for the area's farm products, the city also has diversified manufactures, including chemicals, electric power units, and hydraulic pumps. The city is the seat of Missouri Southern State College (1965) and Ozark Bible College (1942). The Joplin school system received national recognition for the Joplin reading plan, an innovative program for the teaching of reading that was instituted in 1953 and that was designed to improve reading skills in the elementary grades. The Mineral Museum (1931) displays models of mining processes, fossils, artifacts, and a pictorial history of Joplin. The George Washington Carver National Monument, immediately southeast, preserves the birthplace of the eminent black agricultural scientist. Inc. town, 1871; city, 1873. Pop. (1988 est.) city, 40,782; MSA 136,000.

Joplin, Scott (b. Nov. 24, 1868, Bowie county, Texas, U.S.—d. April 1, 1917, New York, N.Y.), American black composer and pianist known as the "king of ragtime" at the turn of the 20th century.

Studying piano with teachers near his childhood home, Joplin traveled through the Midwest from the mid-1880s, performing at the Columbian Exposition in Chicago in 1893. Settling in Sedalia, Mo., in 1895, he studied music at the George R. Smith College for Negroes and hoped for a career as a concert pianist and classical composer. His first published songs brought him fame, and in 1900 he moved to St. Louis to work more closely with the music publisher John Stark.

Joplin published his first extended work, a ballet suite using the rhythmic devices of ragtime, with his own choreographical directions, in 1902. His first opera, *A Guest Of Honor* (1903), is no longer extant and may have been lost by the copyright office. Moving to New York City in 1907, Joplin wrote an instruction book, *The School Of Ragtime,* outlining his complex bass patterns, sporadic syncopation, stop-time breaks, and harmonic ideas, being widely imitated. Joplin's contract with Stark ended in 1909, and, though he made piano rolls in his final years, most of Joplin's efforts involved *Treemonisha,* which synthesized his musical ideas into a conventional, three-act opera. He also wrote the libretto, about a mythical black leader, and choreographed it. *Treemonisha* had only one semipublic performance during Joplin's lifetime; he became obsessed with its succeeding, suffered a nervous breakdown and collapse in 1911, and was institutionalized in 1916.

Joplin's reputation as a composer rests on his classic rags for piano, including "Maple Leaf Rag" and "The Entertainer," published from 1899 through 1909, and his opera, *Treemonisha,* published at his own expense in 1911. *Treemonisha* was well received when produced by an Atlanta, Ga., troupe on Broadway in 1972, and interest in Joplin and ragtime was stimulated in the 1970s by the use of his music in the Academy Award-winning score to the film *The Sting.*

Joppa (Israel): *see* Tel Aviv–Yafo.

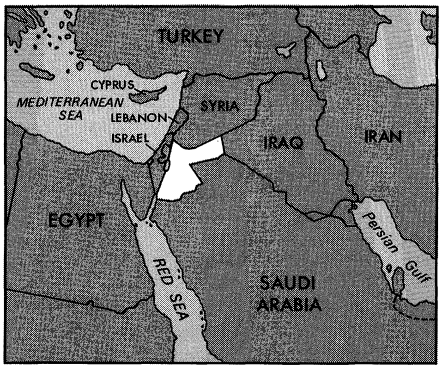
Joram (Old Testament king): *see* Jehoram.

Jörd (Old Norse: "Earth"), also called FJÖRGYN, or HLÓDYN, in Norse mythology, a giantess, mother of the deity Thor and mistress of the god Odin. In the late pre-Christian era she was believed to have had a husband of the same name, perhaps indicating her transformation into a masculine personality. Her name is connected with that of the Lithuanian thunder god Perkun; both are thought to be related to Old High German *forha,* "oak" (also "fir"), and Latin *quercus,* "oak."

Jordaens, Jacob (b. May 19, 1593, Antwerp, Spanish Netherlands [now in Belgium]—d. Oct. 18, 1678, Antwerp), Baroque artist whose boisterous scenes of peasant life and sensuous allegories made him one of the most important painters of 17th-century Flanders.

Jordaens studied, like Peter Paul Rubens, under the painter Adam van Noort, and he married his master's daughter in 1616, the year after his admission to the guild of painters. Early in his career Jordaens executed designs for tapestries, and such paintings as "Allegory of Fertility" (*c.* 1625; Musées Royaux des Beaux-Arts, Brussels) reveal his training as a decorator. He never went to Italy as did other Flemish artists of his time, and his work is essentially Flemish in its exaggerated treatment of form and its crude humour. Jordaens was greatly influenced by his older contemporary Rubens. The colours of Jordaens' paintings are warm and glowing, his figures are robust and incline to corpulence, and their faces are red and healthy. Jordaens' paintings are particularly noted for their strong contrasts of light and shade, their compositions crowded with figures, and an air of sensual vitality that occasionally borders on coarseness. He was a prolific painter and employed many pupils in his studio to reproduce versions of his most popular pictures, such as "The King Drinks" and "The Satyr and Peasant."

Although he declared himself converted to Calvinism in 1648, Jordaens received numerous commissions for Roman Catholic churches, and after the death of Rubens he was considered the greatest painter in Antwerp. In 1652 he played a major role in the decoration of the Huis ten Bosch ("house in the woods"), a royal country house situated near The Hague, with mural paintings representing the "Triumph of Frederick Henry of Orange, Stadtholder of Holland" and "The Victory of Time." These works are masterpieces of architectural decoration, in which the complex allegory is rendered in exuberant colours and vivacious, swirling lines. Jordaens' later works, however, are of uneven quality, showing the increasingly important role assumed by his studio assistants.



Jordan

Jordan, officially HASHEMITE KINGDOM OF JORDAN, Arabic AL-URDUN, or AL-MAMLAKAH AL-URDUNĪYAH AL-HĀSHIMĪYAH, Arab state of southwest Asia, covering an area of 34,343 square miles (88,947 square km) east of the Jordan River. The capital is Amman. Extending about 285 miles (460 km) from north to south and about 220 miles (355 km) from east to west, Jordan is bordered on the north by Syria, on the northeast by Iraq, on the southeast and south by Saudi Arabia, and on the west by Israel. Jordan has 12 miles (19 km) of coastline on the Gulf of Aqaba. The territory west of the Jordan River (known as the West Bank) was administered by Jordan from 1949 until it was occupied by Israel in 1967; that area is excluded from all statistical statements in this article. The population of Jordan in 1990 was estimated to be 3,173,000.

A brief treatment of Jordan follows. For full treatment, *see* MACROPAEDIA: Jordan.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.


"The King Drinks," oil painting by Jordaens, 1638; in the Musées Royaux des Beaux-Arts, Brussels

By courtesy of the Musees Royaux des Beaux-Arts, Brussels; photograph, Photo SASKIA, North Amherst, Mass.

The land. Jordan may be divided into three physiographic regions. The desert, which is an extension of the Syrian, or North Arabian, Desert, occupies the eastern four-fifths of the country and is composed in the north of volcanic lava and basalt and their eroded sands and in the south of sandstone outcroppings. The East Bank uplands region (east of the Jordan River) averages between 2,000 and 3,000 feet (600 and 900 m) in elevation, rising at the country's highest point, Mount Ramm, to 5,754 feet (1,754 m) near the Gulf of Aqaba in the far south. The Jordan Valley region, formed by the Rift Valley, contains the Dead Sea, which at approximately 1,312 feet (400 m) below sea level is the lowest body of water on Earth.

The land is generally arid; the climate varies from the desert type in the east to the Mediterranean type in the west. Less than 5 percent of Jordan's total area receives more than 16 inches (400 mm) of rain a year, and between April and October there is almost no rainfall. The interior basin of the eastern desert is drained by intermittent streams, or wadis. The Jordan River, which separates Jordan from the West Bank and Israel, is joined by many springs and streams from the eastern plateau, but, because of excessive evaporation, the river becomes increasingly salty before it empties into the extremely salty Dead Sea, which averages nearly 300 parts per thousand of salt at its surface. Jordan has cool, rainy winters, with average temperatures of about 49° F (9° C) at Amman in the north to 63° F (17° C) at al-'Aqabah on the southern gulf, and hot, dry summers averaging 76° F (24° C) at Amman and 89° F (32° C) at al-'Aqabah. A shortage of water has become one of the country's major problems.

The people. Most of the populace are Arabs and speak Arabic; they have traced their ancestry from the northern Arabian Qaysī or the southern Arabian Yemeni tribes. About half of Jordan's population is under the age of 15. The birth rate is comparatively high, and the death rate is low for a developing country, resulting in a relatively high annual rate of population growth that promises to become even higher in the future. Internal migration from rural to urban centres has burdened the economy as well; more than two-thirds of the population is urban.

More than nine-tenths of the people are Sunnite Muslims, and about 1 in 20 is Christian. Most Christians are adherents to the Rūm, or Greek Orthodox Church. The influx of more than 1,000,000 Palestinian Arabs, including more than 850,000 registered refugees and displaced persons, by the mid-1980s has not only altered Jordan's demographic map but also affected its political, social, and economic life. Most refugees are housed in camps and are supported at a subsistence level by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), which is also primarily responsible for their health, education, and welfare. All have been granted Jordanian citizenship and have refugee status only for relief purposes.

The economy. Jordan has a developing free-enterprise economy. The gross national product (GNP) per capita, which grew more rapidly than the population until the early 1980s but subsequently declined, is similar to those of the world's other rapidly developing countries. The GNP originates primarily from community, social, and personal services; trade; construction; and manufacturing.

Only about one-twentieth of Jordan's total land area is arable. Irrigation is widespread in the Jordan River valley and the highlands immediately east of it. Agriculture accounts for about one-twentieth of the GNP and employs a comparable proportion of the labour force. Vegetables are the principal crops, especially tomatoes, eggplants, pumpkins and squashes, and peppers. Other crops include cereals (mostly wheat and barley), lentils, olives, watermelons, bananas, and oranges.

There is almost no pastureland in Jordan, and what little there is usually requires well water to support livestock. The principal livestock are sheep and goats, both producing meat and milk. Honey is also produced. Jordan's scant forests are found mainly in the highlands of the east, near Syria. Lumber production meets about half of Jordan's annual needs. The loss of the agricultural land of the West Bank following the 1967 war with Israel forced the government to reexamine its reforestation program and convert some forest to farmland.

Mining and quarrying account for less than one-twentieth of the GNP and about 1 percent of the labour force. Phosphates constitute the principal mineral production, and other resources include copper, gypsum, manganese ore, kaolin clay, potash, and glass sands. Jordan uses solar energy for some domestic heating and telecommunications.

Manufacturing (centred in Amman) accounts for about one-tenth of the GNP and employs about one-fifteenth of the labour force. The principal products include cement, phosphate fertilizer, rolled steel, cigarettes, beer, and wine. Electricity is produced exclusively by thermal power plants. Construction generates only about one-twentieth of the GNP. Major construction projects have included irrigation dams and works in the Jordan River valley, the Dead Sea potash works, a fertilizer complex and port facilities at al-'Aqabah, and a large cement works at Rashidiyah.

Antiquities at Jerash and Petra and thermal springs and spas along the Dead Sea are major tourist attractions, bringing in many tourists annually.

About one-half of Jordan's labour force is employed in government and community, social, and personal services.

Although industries are not nationalized, the government is part owner of many industries and is the majority owner in oil refining, phosphate mining, irrigation and electric generation, and transport and communications. Foreign aid from Arab and Western nations has assisted economic development. The existence of labour unions and employer organizations is recognized by law.

More than two-fifths of Jordan's budgetary revenue comes from grants and loans, and about two-fifths from domestic revenue (mainly indirect taxes, fees, and direct taxes). Expenditures are principally for development, and defense and police.

Jordan's transportation network includes a government-operated railroad system that traverses the country from south to north and links Amman with Damascus in Syria. Nearly three-fourths of the country's roads are paved. Jordan has one port, al-'Aqabah, on the Gulf of Aqaba. There are international airports at Amman, al-'Aqabah, and Zizya.

Exports consist mainly of natural phosphate fertilizer; assorted vegetables and fruits; live animals; chemical fertilizers; pharmaceuticals; and wearing apparel, textiles, and yarn. Major importers of Jordanian products are Iraq, India, and Saudi Arabia. Imports, exceeding exports in value by one-fourth, are mostly electrical and nonelectrical machinery and equipment, crude petroleum, transport equipment, iron and steel, and cereals. Major sources are Iraq, the United States, the United Kingdom, and Japan. The large trade deficit is offset, somewhat variably, by remittances from Jordanian workers abroad, tourism, and grants and loans.

Government and social conditions. Jordan is a constitutional monarchy and the supreme executive power is vested in the king. Jordan had a bicameral national assembly which was suspended in 1976 by King Abdullah Ibn al Hussein, who ruled by royal decree during the late 1970s and early 1980s. In 1984 the National Assembly, consisting of a Senate with 30 members appointed by the king and a House of Deputies with 130 elected members, was reconvened. The judicial system is headed by the Court of Cassation and includes Sharī'ah Muslim courts which exercise jurisdiction over matters of personal status. Jordan has a military force of about 70,000, most of it in the army.

Jordan's social welfare system is relatively undeveloped, and the government's benefits program covers only old age, disability, and death. Government-run health facilities are located mainly in Amman and other urban areas, leaving large segments of the rural population without medical care.

Inadequate nutrition, poor sanitation, and a harsh climate lead to the prevalence of diseases such as typhoid, paratyphoid, salmonella, hepatitis, and dysentery. Life expectancy in Jordan stands at only 60 years for men and 64 years for women. The housing situation remains critical despite continuing housing construction, and the major proportion of households consists of one-room dwellings.

There are three types of schools in Jordan—government schools, private and missionary schools, and the UNRWA schools for refugee children. The Ministry of Education supervises all schools, and enforces compulsory education to the age of 14. The country's centres of higher education include the State University of Jordan (1962) at Amman, Yarmūk University (1976) at Irbid, and Mu'tah University (1981) at al-Karak.

Newspapers in Jordan are privately owned but extensively regulated by the government. The Hashemite Jordan Broadcasting Service and the Jordan Television Corporation, both supervised by the government, control Jordan's electronic media.

Cultural life. Jordan has an Arabic culture and the highest form of artistic expression remains oral and literary, as in the rest of the Arab world. Folk culture has been manifested in such oral arts as songs, ballads, and storytelling. Jordan's most famous poet was Mustafā Wahbah at-Tāl, whose style and content rank him among the major Arab poets of the 20th century. The post-World War II period saw the emergence of a new generation of poets and prose writers, including Ibrahim Abu Naab, Fawda Tuqan, and Samira Azzam.

History. Jordan shares much of its history with Israel, as both occupied the area known historically as Palestine. Human habitation in Jordan dates from as far back as Lower Paleolithic times. The earliest-known "states" of Jordan date from the 13th century BC and included Gideon, Ammon, Moab, and Edom. Much of present-day eastern Jordan was incorporated in the kingdom of Israel under David and Solomon (*c.* 1000 BC). Then, together with other Middle Eastern territories, Jordan passed in turn to the Assyrians, the Babylonians, the Persians, and, around 330 BC, to the Seleucids.

Conflict between the Seleucids and the Ptolemies enabled the Arabic-speaking Nabataens to create a kingdom in southeastern Jordan. It was conquered by the Romans in 64–63 BC. The area fell to the Muslim Arabs in the 7th century AD. The Ummayad caliphs established their capital in Damascus, and the 'Abbāsids moved it to Baghdad. Jordan was now distant from the centre of power, and its people slowly reverted to the nomadic Bedouin way of life. With the capture of Jerusalem by Crusaders in 1099, the Latin kingdom of Jerusalem was extended east of the Jordan River. In the 16th century, Jordan submitted to Ottoman rule and was administered from Damascus.

In the 19th century the Ottomans settled Circassian, Caucasian, and other refugees in

Jordan to protect their communications with Arabia.

In 1920 Jordan, then known as the Transjordan, and Palestine became British mandates. Abdullah ibn Ḥusayn was installed as emir (military commander). Transjordan was excluded from the scope of the Balfour Declaration and became an independent constitutional state in 1927, although the British mandate did not end until 1948. The West Bank of the Jordan River was annexed by Jordan in 1950 after cessation of hostilities with the newly created state of Israel in 1949. After the Six-Day War of 1967, the West Bank was occupied by Israel. In 1970–71 Jordan was wracked by military conflicts between the government and Palestinian guerrillas based within the country. The struggle ended in the expulsion of the Palestinian forces from Jordan by the army.

Jordan, A(rchibald) C. (b. Oct. 30, 1906, Mbokothwana Mission, Cape Colony [now in South Africa]—d. Oct. 20, 1968, Madison, Wis., U.S.), Xhosa novelist and educator who belonged to the second generation of South African black writers (of which Ezekiel Mphahlele and Peter Abrahams are the best-known).

Jordan served as lecturer in Bantu languages and African studies at the University of Cape Town until 1961, when he immigrated to the United States. He taught at the University of California, Los Angeles (1962), and at the University of Wisconsin (1963–68).

Jordan wrote a series of articles entitled *Towards an African Literature* in the periodical *Africa South*. They discuss such topics as traditional praise poems, riddles and proverbs, the history of Xhosa literature, and various important individual Bantu writers. His novel *Ingqumbo Yeminyanya* (1940; "The Wrath of the Ancestors") goes much beyond earlier Xhosa novels in its attempt to reveal the workings of a modern black African mind in its fight against conservative tribal forces. In developing his theme of the conflict between traditional and Western ways, Jordan realistically denies any easy solution. Before his death, Jordan had completed two more novels and a collection of short stories; the stories were published in 1975 under the title *Kwezo mpindo zeTsitsa* ("Along the Bends of the Tsitsa").

Jordan, Barbara C(harline) (b. Feb. 21, 1936, Houston, Texas, U.S.), American lawyer, educator, and politician, congressional representative from Texas (1972–78). She was the first black congresswoman to come from the Deep South.

Jordan was graduated magna cum laude in 1956 from Texas Southern University (Houston, Texas), majoring in political science and history. She went on to earn a law degree at Boston University in 1959 and later that year was admitted to the bar in both Texas and Massachusetts.

Returning to Texas, she worked as an administrative assistant to a judge. In 1966 she won a seat in the state Senate, where she served until 1972, the year she was elected to represent Texas' 18th District in the U.S. House of Representatives.

Although she was active on several House committees, Jordan did not become a national figure until July 25, 1974, when a speech that she made during the hearings held by the House Judiciary Committee on the impeachment of President Richard M. Nixon was televised nationwide. Her keynote address at the 1976 Democratic National Convention confirmed her reputation as one of the most commanding and articulate public speakers of her era.

In 1977 Jordan unexpectedly announced that she would not run for a fourth term. Instead, she accepted a position at the University of Texas, Austin, teaching political ethics and intergovernmental relations at the Lyndon B. Johnson School of Public Affairs.

Jordan, (Marie-Ennemond-)Camille (b. Jan. 5, 1838, Lyon—d. Jan. 20, 1922, Milan), French mathematician whose work on substitution groups (groups of permutations) and the theory of equations first brought full understanding of the importance of the theories of the eminent mathematician Évariste Galois, who had died in 1832.

Jordan's early research was in geometry. His *Traité des substitutions et des équations algebriques* (1870; "Treatise on Substitutions and Algebraic Equations"), which brought him the Poncelet Prize of the Académie des Sciences, gave a comprehensive account of Galois's theory of substitution groups and applied them to algebraic equations. He also solved the problem proposed by Niels Henrik Abel of ascertaining the solvability of any given algebraic equation by radicals. Jordan published his lectures and researches on analysis in *Cours d'analyse de l'École Polytechnique,* 3 vol. (1882; "A Course of Analysis of the Polytechnic School"). In the third edition (1909–15) of this notable work, which contained a good deal more of Jordan's own work than did the first, he treated the theory of functions from the modern viewpoint, dealing with the function of bounded variation, which he applied to the curve known as Jordan's curve. The Jordan algebras are named in his honour.

In topology Jordan proved (1887) that a simple arc does not divide the plane and that a simple closed curve divides the plane into exactly two parts. Although intuitively obvious, these theorems require sophisticated proofs.

Jordan was professor of mathematics at the École Polytechnique, Paris (1876–1912). He also edited the *Journal de Mathématiques Pures et Appliquées* (1885–1922).

Jordan, David Starr (b. Jan. 19, 1851, Gainesville, N.Y., U.S.—d. Sept. 19, 1931, Stanford, Calif.), naturalist and educator who was the foremost American ichthyologist of his time.

Jordan studied biology at Cornell University (M.S., 1872), and became professor of biology at Butler University, Indianapolis, Ind., before becoming a professor of natural history at Indiana University, Bloomington, in 1879. He became president of that university in 1885. In 1891 he became the first president of the newly opened Leland Stanford Junior University (now Stanford University), California, and he served in this post until 1913.

Jordan was inspired to specialize in ichthyology by the American naturalist Louis Agassiz. From the 1870s on Jordan made extensive field trips throughout the United States and its coastal areas, and his efforts led to the naming of a total of 1,085 genera and more than 2,500 species of fishes, together with broader classifications of them. With B.W. Evermann he wrote the authoritative "The Fishes of North and Middle America," and his *Manual of the Vertebrates of the Northern United States* went through 13 editions between its publication in 1876 and 1929. Jordan devoted his later career primarily to the cause of international peace, acting as chief director of the World Peace Foundation and writing many books and articles on the subject.

Jordan, Dorothea, also called DOROTHY JORDAN (b. Nov. 22, 1761, near Waterford, Ire.—d. July 3, 1816, Saint-Cloud, Fr.), actress especially famed for her high-spirited comedy and tomboy roles.

Her mother, Grace Phillips, also known as Mrs. Frances, was a Dublin actress. Her father, named Bland, was said to have been a gentleman but was more probably a stagehand. She made her stage debut in 1777 in Dublin as Phoebe in *As You Like It* and in 1779 played in Henry Fielding's farce *The Virgin Unmasked* at the Crow Street Theatre, Dublin. She then acted with the provincial company of Tate Wilkinson until 1785, when she played in London. She retired in 1814.



Dorothea Jordan as Viola in *Twelfth Night,* detail of an oil painting by John Hoppner

By courtesy of the Greater London Council as trustees of the Iveagh Bequest, Kenwood

Dorothea had a daughter by her first manager in Dublin, three children by Richard Ford, whose name she bore for some years, and 10 children by the Duke of Clarence (later William IV). The children by the duke were ennobled under the name of FitzClarence; the eldest was created the earl of Munster. When she and the duke separated by mutual consent in 1811, she received a handsome allowance. In 1815 she went to France and died there the following year, although there is a legend that she returned to England and lived for several more years. She was the subject of portraits by Sir Joshua Reynolds, Thomas Gainsborough, and George Romney.

Jordan, (Ernst) Pascual (b. Oct. 18, 1902, Hannover, Ger.—d. July 31, 1980, Hannover), German physicist who in the late 1920s founded (with Max Born and Werner Heisenberg) quantum mechanics and (with Wolfgang Pauli and Eugene Wigner) quantum electrodynamics. He also originated (concurrently with Robert Dicke) a theory of cosmology that proposed to make the universal constants of nature variable and dependent upon the expansion of the universe.

Jordan was professor of theoretical physics from 1929 to 1944 in Rostock, Germany, in 1944 in Berlin, and after 1947 in Hamburg. His works include, with Max Born, *Elementare Quantenmechanik* (1930; "Elementary Quantum Mechanics").

Jordan River, Arabic NAHR AL-URDUN, Hebrew HA-YARDEN, lowest river in the world, flowing southward from Syria across Israel and into Jordan. It rises on the southeastern slopes of Mount Hermon in Syria (other headstreams rise in Lebanon), flows through a deep trench flanked by high plateaus, and—having crossed the Ḥula Basin and traversed the Sea of Galilee—drains into the Dead Sea at a depth of 1,315 feet (400 m) below sea level. The Jordan is more than 223 miles (360 km) in length, although, because its course is meandering, the actual distance between its source and the Dead Sea is less than 124 miles (200 km).

The Jordan has often served as an international boundary and, since 1948, has marked the frontier between Israel to the west and Jordan to the east from a few miles south of the Sea of Galilee until the Yābis River flows into it from the left bank. Since 1967, however, when Israeli forces occupied the Jordanian territory on the west bank of the river south of its confluence with the Yābis, the Jordan has served as the cease-fire line as far as the Dead Sea.

The river was called the Aulon by the Greeks and is sometimes called ash-Sharī'ah (Watering Place) by the Arabs. Christians, Jews, and Muslims alike revere the Jordan; it was in its waters that Jesus was baptized by St. John the Baptist.

What is generally called the Jordan Valley is, in effect, a rift valley running north and south, forming part of the gigantic rift-valley system that extends from southern Turkey southward via the Red Sea and into East Africa. The valley itself is a long and narrow trough averaging about 6 mi in width but becoming narrower in some places—for example, at each end of the Sea of Galilee—and wider in others, such as the Bet She'an region, where the Ḥarod-Qishon depression gives access to the plains of Haifa to the west; the greatest width occurs in the Jericho region, where its plain is about 15 mi wide.

Throughout its course the valley lies much lower than the surrounding landscape. The valley walls are steep, sheer, and bare, and they are broken only by the gorges of tributary wadis (seasonal watercourses).

The Jordan has three principal sources, all of which rise at the foot of Mt. Hermon. The longest of these is the Ḥāṣbānī, which rises in Lebanon, near Ḥāṣbayyā, at a height of 1,800 ft. From the east, in Syria, flows the Nahr Bāniyās; between the two is the Dan, the waters of which are particularly fresh. These three rivers join together in the Ḥula Basin, into which flow other streams, notably the 'Enot 'Enan. The plain was formerly occupied by a lake and by marshes filled with a dense vegetation composed of papyrus, water lilies, and yellow pond lilies; in the 1950s, however, 15,000 ac (6,000 ha) were drained to form excellent agricultural land, while 800 ac were preserved for their vegetation and animal life. At the southern end of the basin, the Jordan has cut a gorge through a basaltic barrier.

The river then drops sharply down to the Sea of Galilee, which is itself 686 ft below sea level; this lake also serves to govern the river's rate of flow. After crossing the lake, the river valley narrows once more, and the Jordan receives its principal tributary, the Yarmūk, which marks part of the frontier between Syria and Jordan. It is then joined by two more tributaries, the Ḥarod on the right bank and the Yābis on the left. The river's plain then spreads out to a width of about 15 mi and becomes very regular; this is the Ghawr (Ghor) Plain, which is formed of marls (friable earthy deposits consisting of clay and calcium carbonate) and gypsum. Its flat and arid terraces are cut here and there by wadis or rivers into rocky towers, pinnacles, and badlands, a maze of ravines and sharp crests that resemble a lunar landscape and create obstacles to travel. The Jordan has cut a valley into the plain of between about 1,300 and 10,000 ft in width and from between about 50 and 200 ft in depth. Along this stretch, the Jordan's floodplain is known as the Zor; it describes so many meanders that, although it runs for 135 mi, the actual distance it covers between the Sea of Galilee and the Dead Sea is only 65 mi. The Zor, which floods frequently, was formerly covered with thickets of reeds, tamarisk, willows, and white poplars sheltering an abundant wildlife, including boars. Since dams were built to control the river's flow, however, this land has been covered with irrigated fields. Finally, the Jordan drains into the Dead Sea through a vast, gently sloping delta.

Although the bordering plateaus receive a relatively abundant rainfall, the depression itself is not well watered. The Ḥula Basin receives 22 in. (550 mm) a year, whereas only about 3 in. fall north of the Dead Sea. The Jordan is fed by the rains falling on the neighbouring plateaus, the waters then flowing downward through rivers or wadis. The river itself is shallow. Upstream from the Sea of Galilee, the river's annual average flow is about 21,-200,000,000 cu ft (600,000,000 cu m). The Jordan's high-water period lasts from January to March, while its low-water period occurs at the end of the summer and the beginning of autumn.

The rate of flow diminishes downstream as a result of evaporation losses and the seeping away of water. As the average degree of the slopes over which the river flows is comparatively steep, the speed of the current is relatively fast, amounting to about 4½ ft per sec at low water at the Allenby Bridge, a short distance north of the Dead Sea.

The Jordan transports a considerable load of silt, amounting to an average of more than 2 percent of its total flow and to more than 5 percent during the flood period.

The existence of thermal springs, notably in the Tiberiade region on the western side of the Sea of Galilee, as well as the frequency of gypsum, results in the Jordan's waters having a relatively high degree of salinity—averaging 0.77 percent—thus creating problems when the water is used for irrigation.

Where irrigation permits, the Jordan Valley has been settled by Arab and Jewish agricultural communities. Notable settled regions are the Ḥula Valley in the north; the string of agricultural communities south of the Sea of Galilee on the West Bank, including Deganya—the oldest kibbutz (collective agricultural settlement) in Israel, founded in 1909—Afriqim, Ashdot Ya'aqov, and Ḥawwat Shemu'el; the area along the Ghawr Canal on the East Bank; and the area of the Wādī Fāri'ah on the West Bank.

Navigation is impossible because of the river's precipitous upper course, its seasonal flow, and its shallow, twisting lower course. The principal river crossings are those at the Benot Ya'aqov Bridge, on the road from Tiberias to Damascus; the Dāmiyā Bridge, on the road from as-Salṭ to Nābulus; the King Hussein Bridge, on the road from Irbid to 'Afula; the Allenby Bridge, on the highway from Amman to Jerusalem; and the pipeline crossing at al-Manshīyah.

The Jordan waters are of especial importance for irrigation. For a long time the water was not used, except for several oases located in the bordering foothills—for example, at Jericho—which used the waters of springs that fed the river. The Ghawr region was formerly barren, desolate, and uninhabited except in winter by nomadic herdsmen and their livestock, who went up to the plateaus in summer. The Ghawr irrigation canal—43 mi long—was, however, completed in 1967 on the East Bank and has permitted the cultivation of oranges, bananas, early vegetables, and sugar beets in the region. In Israel, apart from the draining of the Ḥula Basin and the construction of a canal from the Sea of Galilee to Bet She'an, a water-supply grid has been constructed that permits 11,300,000,000 cu ft of the Jordan's waters to be pumped each year to the centre and south of Israel.

Jordanes (fl. mid-6th century AD), historian notable for his valuable work on the Germanic tribes.

Jordanes was a Goth who, although not a scholar, devoted himself to writing history in Latin. His first major work, *De origine actibusque Getarum* ("On the Origin and Deeds of the Getae"), now commonly referred to as the *Getica*, was completed in 551. At the time, Jordanes probably lived in a Roman province on the lower Danube River. In the title of the work Jordanes confuses the Goths with the Getae, a wholly distinct people. Jordanes' other extant work is the chronicle *De summa temporum vel origine actibusque gentis Romanorum* ("The High Point of Time or the Origin and Deeds of the Roman People"), also completed in 551 and called the *Romana*. The *Getica* is by far the more valuable work, because it is the major contemporary source on both the Goths and Huns. It is a one-volume summary of the 12-volume history of the Goths by the 6th-century writer Magnus Aurelius Cassiodorus. Jordanes claims that he was able to reproduce only the general sense of Cassiodorus' work because he had access to it for only three days. He states that he added material from certain Greek and Latin authors but that the beginning and the end are entirely his own. Although the book is exceedingly disjointed, it preserves the legends of the origin of the Goths in Scandinavia and traces their migrations and wars through the period of the Ostrogothic king Ermanaric's 4th-century empire in the Ukraine.

Jordanes is especially valuable on the Huns, because his chief source is the work—now known only in fragments preserved by other writers—of the Greek historian Priscus, who had travelled among the Huns in 449. Jordanes cites the beautiful lyric sung by the Huns at Attila's funeral (453) and relates much information about the collapse of his empire in the last half of the 5th century.

The *Romana* is an outline of world history that records the growth of Rome from the time of its legendary founder, Romulus, to the Eastern emperor Justinian (ruled 527–565).

Jørgensen, (Jens) Johannes (b. Nov. 6, 1866, Svendborg, Den.—d. May 29, 1956, Svendborg), writer known in Denmark mainly for his poetry (*Digte 1894–98,* 1898 and *Udvalte Digte,* 1944), but best known in other countries for his biographies of St. Francis of Assisi (1907; Eng. trans., 1912) and St. Catherine of Siena (1915; Eng. trans., 1938).

As a student at the University of Copenhagen, Jørgensen became a follower of the influential critic Georg Brandes but soon became an outspoken critic of Brandes' materialistic realism. He became an advocate of poetic symbolism and, soon after, developed an interest in mystical and religious literature. He converted to Catholicism in 1896 and lived mostly in Italy thereafter. His later life was spent largely writing his autobiography, *Mit livs legende,* 7 vol. (1916–28; *Jörgensen: An Autobiography,* 2 vol., 1928–29).

Jorhāt, town, administrative headquarters of Sibsāgar district, northeastern Assam state, northeastern India, on a tributary of the Brahmaputra River. A road and rail junction, it is the commercial centre of a productive agricultural area. Jorhāt is noted for jewelry manufacture and is the site of Assam Agricultural College. In the late 18th century the town was the capital of an independent Ahom kingdom; the Ahoms, a Tai-speaking people, migrated from Yunnan, China, from *c.* 1st century AD. Pop. (1971) town, 30,247; metropolitan area, 70,674.

Joris, David (b. 1501/02, Ghent or Bruges, Flanders—d. Aug. 25, 1556, Basel, Switz.), religious Reformer, a controversial and eccentric member of the Anabaptist movement. He founded the Davidists, or Jorists, who viewed Joris as a prophet and whose internal dissension led—three years after his death—to the sensational cremation of his body after posthumous conviction as a heretic.

A painter of stained glass by trade, Joris settled in Delft (now in The Netherlands) in 1524. He was soon swept into controversies of the Reformation, then at their peak, and began to engage in outspoken attacks in behalf of Lutheranism against the Roman Catholic Church. Becoming known as an adventurous eccentric, in 1528 he verbally assaulted a religious procession and was condemned by the court at The Hague to a fine, to whipping, tongue boring, and three years' banishment. He was later drawn into struggles between

the pacifist and revolutionary Anabaptists, a sect that stressed the necessity of rebaptizing Christians in adulthood. In an effort at mediation Joris presented himself as a prophet, basing his claim on mystical visions that he was the "third David." After David the king and Christ the son of David, the third David was viewed as a messianic figure who would complete the work of salvation.

In 1543 Joris, accompanied by some of his followers, fled to Basel, where he took the name Jan van Brugge (John of Bruges). In addition to his *Wonder Boeck* (1542, 1551; "Wonder Book"), a ponderous volume of fantasy and allegory, he produced innumerable tracts. He became a wealthy and respected citizen who professed Reformed beliefs, and he moved from visions of a messianic role to more personal mystical experiences. Deprecating dogmatic disputes, he came to view inward, individual religion as the only true faith. As a result, controversy arose in his sect between those who wished to dissolve the movement in the wake of his abdication and those who persisted in their belief that he was the third David. In 1559, three years after his death amid this factionalism, confusion over whether David Joris and Jan van Brugge had been the same person was resolved, and the University of Basel tried and condemned him posthumously as a heretic. His body was then exhumed and burned at the stake. Repeated heresy trials of his followers caused the sect to die out by the end of the century.

Jörmungand, in Germanic mythology, the evil serpent and chief enemy of Thor (*q.v.*).

Jorn, Asger (b. March 3, 1914, Jutland, Den.—d. May 1/2, 1973, Århus), Danish painter whose style, influenced by the Expressionist painters James Ensor of Belgium and Paul Klee of Switzerland, creates an emotional impact through the use of strong colours and distorted forms.



Jorn, 1961

By courtesy of the Royal Danish Ministry for Foreign Affairs

In 1936 Jorn worked with the French painter Fernand Léger, and in 1937 with the Swiss architect Le Corbusier at the Paris International Exposition. Jorn was a member of the German Bauhaus school of Walter Gropius and the founder of the Cobra group (1948–51), whose members painted animals and insects in an abstract style in imitation of primitive art. In 1949 Jorn and the Cobra group were given an exhibition at the Stedelijk Museum in Amsterdam. His "Letter to My Son" (1956–57) illustrates his heavily textured, childlike images.

Jornal do Brasil, O, daily newspaper published in Rio de Janeiro, regarded as one of the eminent newspapers of South America.

It was founded in 1891 by four men, one of whom was Joaquim Nabuco, abolitionist leader and later ambassador to Washington, D.C. Established as an independent paper, the *Jornal* has managed over the years to maintain a high quality of reporting and a degree of news independence despite sporadic government censorship and control. Its content and style are directed at an educated and elite readership. The *Jornal* has a large editorial staff, with bureaus and correspondents in many world capitals.

jōruri, in Japanese literature and music, a type of chanted recitative; often the script for a *bunraku* (*q.v.*) puppet drama. Its name derives from the *Jōrurihime monogatari,* a 15th-century romantic ballad, the leading character of which is Lady Jōruri. At first it was chanted to the accompaniment of the four-string *biwa* (Japanese lute); with the introduction of the three-stringed, plucked samisen (or *shamisen*) from the Ryūkyū Islands in the 16th century, both the music and the scripts developed. When puppets were added at the end of the 16th century, the *jōruri* expanded to add a dramatic quality not present in the first simple recitatives. Themes of loyalty, vengeance, filial piety, love, and religious miracles were included; dialogue and descriptive commentary took an increasingly large role. The chanter was at first more important than the writer of the script, until the appearance of one of Japan's greatest playwrights, Chikamatsu Monzaemon, in the late 17th and early 18th centuries. A 30-year collaboration between Chikamatsu and the chanter Takemoto Gidayū (1651–1714) raised the puppet theatre to a high art. Gidayū himself became so famous that his style, *gidayū-bushi* ("Gidayū music"), became nearly synonymous with *jōruri.*

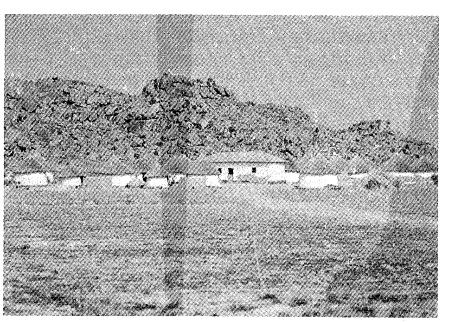
Most *jōruri* are performed by a chanter (*tayū*) and samisen player. One of the world's most highly developed forms of narrative music, *jōruri* still enjoys a popularity, even when separated from the actual drama.

Jos, town, capital of Plateau State, central Nigeria, on the Jos Plateau (altitude 4,250 ft [1,295 m]), on the Delimi River, and near the source of the Jamaari River (called the Bunga farther downstream). Formerly the site of Geash, a village of the Birom people, the town developed rapidly after the British learned, about 1903, of vast tin deposits in the vicinity. Africans had long gathered the metal from the alluvial beds of the Delimi and other plateau streams. In 1905 mining was begun at Naraguta Hausawa (3½ mi [6 km] north), a tin working centre since the 18th century. The metal was sent by headload to the Benue River port of Loko (150 mi southwest), where it was trans-shipped to Forcados in the Niger Delta for export. The Bauchi Light Railway was built in 1914 to carry the tin from Jos and nearby Bukuru to Zaria (114 mi northwest) and thence by mainline to Lagos; the extension of the standard gauge railway from Port Harcourt in 1927 opened a more direct route to the Niger Delta ports, and in 1957 the Bauchi Light Railway was closed. Mining for columbite, of which Nigeria is the world's largest producer, became important during World War II, and, in the early 1960s, smelters were constructed near Jos. Tin and columbite, now obtained by opencast mining, are smelted, cast into ingots, and shipped by railroad to Port Harcourt for export to Europe and the United States. Associated with the tin fields, deposits of kaolin, a clay used in making ceramics, also are worked commercially. Other local enterprises include food processing and beer brewing; cosmetics, soap, rope, jute bags, and furniture are manufactured. Heavy industry produces cement and asbestos cement, crushed stone, rolled steel, and tire retreads. Jos is also a centre for the construction industry and has several printing and publishing firms. The Jos–Bukuru dam and reservoir on the Shen River provide water for the city's industries.

Although some Birom work in the mines and live in the town, the mineral wealth has attracted to Jos large numbers of outsiders, including Hausa, Ibo, Yoruba, and Europeans. Sorghum, millet, and *acha* (a grain known as hungry rice) are the chief staple crops in the area, but neighbouring farmers also cultivate cash crops (yams, potatoes, cassava, corn [maize], and green vegetables) for the Jos market. Milk products are supplied by the dairy at Vom, 18 mi south-southwest.

Jos, with a high elevation and one of the coolest climates in Nigeria, has been a hill resort since the beginning of World War II. Many of its streets are wide and tree lined. The Jos Museum (1952), the nation's oldest, houses examples of terra-cotta figurines produced by the Nok culture, a civilization that probably flourished in the area between 900 BC and AD 200; bronze, brass, wood, and pottery artifacts are also displayed. It also operates (jointly with UNESCO) a school for museum technicians. The town has a 60-ac (24-ha) park with a zoo (1955), an open-air museum of traditional architecture, and an arboretum. The University of Jos, including a teaching hospital opened in 1975, and the Federal School of Medical Laboratory Technology are located in the town. Jos is served by public, private, and religiously sponsored general and specialized hospitals. It lies on the rail spur that joins the railroad to Port Harcourt, 378 mi south-southwest, and has road connections with Lafia, Bauchi, Kaduna, and Zaria. An airfield is 2 mi south. Pop. (1983 est.) 149,000.

Jos Plateau, formerly BAUCHI PLATEAU, tableland in Plateau State, central Nigeria, distinguished by its high bounding scarp and by bare grassland and embracing Africa's chief tin-mining region. Its central area covers about 3,000 sq mi (8,000 sq km) and has an average elevation of 4,200 ft (1,280 m); the surrounding high plains often exceed 3,200 ft. The adjoining highland area on the east is occasionally designated the Bauchi Plateau. The Jos Plateau is composed of eroded gneiss formations, with granite intrusions forming massifs, and has numerous extinct volcanic cones surrounded by basaltic flows, especially around Panyam in the south and around Vom and Miango in the west, including several containing crater lakes. Its highest points are Mt. Shere (5,843 ft) and Peak Sara (5,544 ft) in the Wadi Hills—both near Jos town.



Village on the Jos Plateau, Nigeria

Konran Media Inc.

The plateau has a cool rainy climate and is the source of numerous rivers, including the Kaduna, Karami, and N'gell, which feed the Niger River; the Mada, Ankwe, Dep, She-

manker, and Wase, which flow to the Benue; the Lere, Maijuju, and Bagei, which supply the Gongola; and the Kano, Delimi, Bunga, Jamaari, and Misau, which intermittently nourish Lake Chad. The plateau's steep, irregular southern slopes have many waterfalls, notably the Gurara Falls; several are harnessed for hydroelectric power.

The Jos Plateau has been inhabited since the Acheulean period of the Early African Stone Age, as shown by the hand axes found near Jos town. Discoveries of Nok figurine sculptures in the area since the 1930s have proved that Nok, the best known West African Stone Age culture, flourished there from *c.* 900 BC to AD 200. In the early 19th century, the population of the plateau increased as various non-Muslim groups fled to its hills to escape the ravages of the mounted warriors of the Fulani *jihād* ("holy war"). These small independent groups include the Birom, Jerawa (Jaranci), Mama, Angas, and Ron (Baram) peoples; they were never organized into a traditional state and remain almost entirely non-Muslim.

Although Africans had extracted tin and iron from river and stream beds on the plateau long before the arrival of Europeans, not until 1904, when the British commenced large-scale operations, did the region's immense tin deposits begin to be fully exploited. Since that time the Jos Plateau has been one of the world's major suppliers of tin. The world's largest known deposits of columbite, an ore of niobium found associated with tin, have been exploited since the 1940s. Smaller quantities of tantalite, wolfram (tungsten), kaolin, zircon, uranium, and thorium compounds are also mined. Lead and iron ore are found in the eastern and central parts of Plateau State. At Lafia there are coking coal deposits, and gold and silver deposits are located near the town of Shendam.

The plateau's mineral wealth has attracted numerous Hausa, Ibo, Yoruba, and European migrants in the 20th century; and the absence of the tsetse fly (the carrier of trypanosomiasis [sleeping sickness]) at this elevation has also lured many Fulani herdsmen to the plateau.

Almost all of the plateau is now open savanna grassland because the original forested areas have long been cleared for farming or mining. Cactus hedges grow naturally, but many have been planted around villages and compounds. *Acha* (a grain known as "hungry rice"), sorghum, and millet are the most widely cultivated staple foods; but cash crops, especially potatoes, yams, and green vegetables, are grown for the plateau's largest urban markets at Jos, Bukuru, Pankshin, and Vom. Some eucalyptus plantations established on abandoned tin-mine sites in the 1960s produce small quantities of oil for export. A large number of cattle on the plateau supply milk to a dairy at Vom. Goats and sheep are also raised. By the early 1980s overcultivation and overgrazing pressured some farmers to move off the plateau, but several dam and reservoir projects were constructed to foster land reclamation.

Josaphat: *see* Jehoshaphat.

Josaphat, Israel Beer: *see* Reuter, Paul Julius, Freiherr von.

José (Portuguese, Spanish personal name): *see under* Joseph.

Joseffy, Rafael (b. July 3, 1852, Hunfalu, Hung.—d. New York City, June 25, 1915), Hungarian pianist and teacher and one of the great performers of his day, admired for fluent technique and finely nuanced dynamic control.

Joseffy began piano studies in Hungary and continued them at the Leipzig Conservatory under E.F. Wenzel and Ignaz Moscheles in 1866 and 1867. He moved to Berlin to study with Carl Tausig from 1868 to 1870 and studied with Liszt at Weimar in the summers of 1870 and 1871. After concert tours in Europe in the 1870s, he made his New York City debut in 1879 and settled in the United States. He was among the first to play Brahms's piano music for American audiences. From 1888 to 1906 he taught at the National Conservatory in New York City. In addition to his editions of Chopin and of 19th-century piano studies, he wrote an important piano method (*School of Advanced Piano Playing,* 1902).

Josel OF ROSHEIM, also called JOSELMANN, OF JOSELIN, OF ROSHEIM, OF JOSEPH BEN GERSHON LOANS (b. *c.* 1478, Alsace?—d. March 1554, Rosheim, Alsace), famous shtadlan (advocate who protected the interests and pled the cause of the Jewish people); through persistent legal exertions, he aborted many incipient acts of persecution.

Josel's career as a shtadlan began in the reign of the Holy Roman emperor Maximilian I and lasted through most of that of Charles V. A relative of several religious martyrs, Josel realized keenly the precarious status of German Jewry, which was caught between rival imperial, municipal, and Christian religious sovereignties. By his diplomatic skills, he found listeners at the imperial court, which, through him, sought to strengthen its own hold over the Jewish communities.

Thus, when Rosheim's Jewish community was threatened in 1525 by marauding peasants, Josel, by a combination of bribery and persuasion, elicited their promise to pillage Rosheim last of all the towns. When its time came, the peasants were too tired and sated to sack Rosheim. Soon after the coronation in 1520 of the emperor Charles V, Josel presented him with a memorandum that convincingly refuted the popular accusation that the Jews were allies of the expanding Ottoman Empire; this document averted proposed anti-Semitic measures. In the same year, Josel tried to further reduce anti-Semitism by persuading the government that the Jews unanimously desired better relations with it. As evidence, Josel convoked an assembly of representatives of all German Jewish communities, the decisions of which on Jewish business practices were submitted for approval to the Diet of Augsburg. Josel's writings, including his memoirs, are partially extant.

Joselito, also called JOSELITO EL GALLO, or GALLITO (English: Little Joe the Rooster, or Little Rooster), byname of JOSÉ GÓMEZ (b. May 8, 1895, Gelves, Spain—d. May 16, 1920, Talavera de la Reina), Spanish matador, considered one of the greatest of all time. With Juan Belmonte he revolutionized the art of bullfighting in the second decade of the 20th century.

Joselito came from a family of bullfighters and was the youngest man ever to receive the title of matador (October 1912). Joselito adopted Belmonte's unorthodox style, in which the matador remains almost stationary during the bull's charge, avoiding the animal's horns by skillful manipulation of the cape. Together they became the heroes of the "Golden Age of bullfighting." Joselito was killed in the ring at the age of 25 during a *mano-a-mano* (competitive bullfight) with Belmonte.

Joseph, in the Old Testament, son of the patriarch Jacob and his wife Rachel. As Jacob's name became synonymous with all Israel, so that of Joseph was eventually equated with all the tribes that made up the northern kingdom. According to tradition, his bones were buried at Shechem, oldest of the northern shrines (Josh. 24:32). His story is told in Genesis (37–50).

Joseph, most beloved of Jacob's sons, is hated by his envious brothers. Angry and jealous of Jacob's gift to Joseph, a resplendent "coat of many colours," the brothers seize him and sell him to a party of Ishmaelites, or Midianites, who carry him to Egypt. There Joseph eventually gains the favour of the Pharaoh of Egypt by his interpretation of a dream and obtains a high place in the Pharaoh's kingdom. Driven by a famine, his brothers come to buy food, and in the incidents that follow Joseph shows his preference for his young brother Benjamin. Jacob is invited to come to Goshen, where a settlement is provided for the family and their flocks.

The story of Joseph, often called a novella, is a carefully wrought piece of literary craftsmanship. Though it features the personality of Joseph, it is introduced (Gen. 37:2) as the "history of the family of Jacob." The concluding chapters remind us of this. These passages have led some critics to treat apparently unrelated pieces, exemplified by Gen. 38, as integral to the work and relevant for its interpretation. In form and style the story has affinities with the moral and didactic traditions of Egypt and Israel; it can be viewed as a product of Israel's Wisdom literature movement. It is agreed that parts of the story show dependence upon the Egyptian "Tale of Two Brothers," notably the seduction episode. But, in characteristically Hebraic fashion, the narrator in Genesis has ignored the mythical and magical motifs in the Egyptian tale, and the focus of the outcome is placed on its meaning for the whole house of Israel.

The purpose of the story is to relate the preservation of Israel. Its people live despite their own foolishness and wickedness, indeed, ironically, in part because of these. The story is told as a testimony to the operation of divine providence: "... you meant evil against me; but God meant it for good ..." (50:20) sums up its moral. But while the Lord had turned the provocations of the spoiled son and the jealousy and deceptions of his brothers to good account, he had realized his end through the faithfulness of Joseph, true to Israel's ideals under all circumstances and ever mindful of his obligations to his people. Joseph has served throughout the ages as the model for the "court Jew," the Israelite in a position of power who acts to rescue and help his people.

Joseph, name of rulers grouped below by country and indicated by the symbol •.

Foreign-language equivalents:	
German	Joseph, or Josef
Hungarian	József
Italian	Giuseppe
Portuguese	José
Spanish	José

AUSTRIA

• **Joseph I–II:** *see* Joseph I–II (Germany/Holy Roman Empire).

GERMANY/HOLY ROMAN EMPIRE

• **Joseph I** (b. July 26, 1678, Vienna—d. April 17, 1711, Vienna), Holy Roman emperor from 1705, who unsuccessfully fought to retain the Spanish crown for the House of Habsburg.

The eldest son of the emperor Leopold I, Joseph became king of Hungary in 1687 and king of the Romans, the imperial successor-designate, in 1690. When Charles II, the last Spanish Habsburg, died in 1700, Joseph supported the candidacy of his own younger brother Charles (the future emperor Charles VI) against the French king Louis XIV's grandson Philip (later Philip V of Spain). During the long War of the Spanish Succession (1701–14), Joseph succeeded to the imperial throne, in May 1705. He reorganized Austria's chaotic finances and converted the Viennese city bank into a state institution, measures that made Austria better able to finance its

military struggle, though it continued to depend on foreign subsidies. Joseph's brilliant commander Prince Eugene of Savoy led Austria's armies to victory in Italy, Germany, and



Joseph I, engraving

By courtesy of the Bild-Archiv, Osterreichische Nationalbibliothek, Vienna

the Netherlands, but new enemies constantly threatened his domains. A revolt in Hungary, fomented by Louis XIV and led by Ferenc II Rákóczi, was not finally suppressed until after Joseph's death. In 1707 the Emperor narrowly avoided war with Charles XII of Sweden, who had violated Austrian territory during his struggle with Frederick Augustus I of Saxony (Augustus II the Strong as king of Poland). In 1708 a conflict between the Emperor and the Pope reached a climax when Clement XI recognized Philip as king of Spain. Austrian troops attacked the Papal States until the Pope again supported the Habsburg cause in 1709. The Emperor's sudden death in 1711 deprived the Habsburgs of the Spanish succession, since the European powers would not countenance a revival of Charles V's global empire under Joseph's brother and successor, Charles VI.

• **Joseph II** (b. March 13, 1741, Vienna—d. Feb. 20, 1790, Vienna), Holy Roman emperor (1765–90), at first co-ruler with his mother, Maria Theresa (1765–80), and then sole ruler (1780–90) of the Austrian Habsburg dominions. An "enlightened despot," he sought to introduce administrative, legal, economic, and ecclesiastical reforms—with only measured success.



Joseph II, Holy Roman emperor, detail of a painting by Pompeo Batoni, 1769; in the Kunsthistorisches Museum, Vienna

By courtesy of the Kunsthistorisches Museum, Vienna

Early years. Joseph, the eldest son of Maria Theresa and Francis Stephen of Lorraine (the future emperor Francis I), was strictly and thoroughly educated. When Maria Theresa appointed him to the Council of State, he exhibited unusual intelligence and an intense interest in politics. Joseph's first marriage in 1760 to the Bourbon princess Isabella of Parma, whom he loved passionately, ended in tragedy when she died of smallpox three years later. In 1765 he married Maria Josepha of Bavaria, who in 1767 also died of smallpox. His inability to make decisions necessarily limited his ambition. After his father died, in 1765, he became emperor, but Maria Theresa made all the important decisions.

Domestic reforms. After her death in 1780, Joseph tried to finish her work of reform. The educational system had been consolidated throughout the monarchy. For the University of Vienna, no longer under the influence of the church, Joseph tried to find the best scholars and scientists. The judiciary and the executive had already been separated at the top; Joseph extended this process to the lower administrative levels. In 1786 the Universal Code of Civil Law was issued. Under Maria Theresa the physician Gerard van Swieten had organized a public health service, and in Joseph's time the General Hospital in Vienna was considered one of the best equipped in Europe. The monarchy's finances were balanced. The reorganization of the army secured Joseph's position in Europe. He ordered the abolition of serfdom; by the Edict of Toleration he established religious equality before the law, and he granted freedom of the press. The emancipation of the Jews within a short time endowed cultural life with new vitality. The artistic life of Vienna rose to new heights when the Burgtheater became the German National Theater. By transferring the management of the theatres to the actors, Joseph introduced an artistically fruitful concept.

Joseph's conflict with the Roman Catholic Church, however, posed more difficult problems. He established national training colleges for priests and deprived the bishops of their authority and limited their communications with the Pope. The power of the church was even more affected by the dissolution of more than 700 monasteries not engaged in such useful activities as teaching or hospital work. The 36,000 monks forced to leave their orders were given an annuity or money to return home; those so returning could continue as secular priests. Some measures intended to forestall a relapse into monasticism, such as the foundation of new parishes, bore good results. The Emperor's impatience in turning the monks out of the monasteries, however, caused many works of art to be destroyed. At the climax of the crisis, Pope Pius VI visited the Emperor in Vienna, but the visit changed nothing; nor did a later journey by Joseph to Rome. Joseph's passionate zeal to change everything and to force a new form of life on his subjects met with embittered resistance, chiefly in such strongly traditional countries as the Austrian Netherlands and Hungary.

Failure in foreign affairs. In foreign policy, Joseph had obtained some success even as co-regent with his mother. When a civil war occurred in Poland under King Stanisław II Poniatowski, the lover of Catherine II the Great of Russia who was completely dependent on Russia, Joseph met with Poland's third neighbour, King Frederick the Great of Prussia, to plan the partition of Poland, with each neighbour taking a part of the country and the remaining part to be given a last chance at independence. Frederick took what was later West Prussia, Austria took Galicia, and Catherine took as much border territory as she thought necessary. In a later treaty with Turkey, Joseph annexed Bukovina to his country.

To obtain a personal view of the situation in eastern and western Europe, Joseph visited France, where he was enthusiastically received by the intellectual elite, and then also visited Catherine of Russia. The banquets given in his honour in Paris could not conceal the truth from him: France was headed for catastrophe. His Russian visit gave him the impression of a state retarded in its development compared with the West, but the loyalty of its enormous population to Catherine and her nearly unlimited power seemed to make her the best ally for political manoeuvres in Europe.

After his mother's death, Joseph had involved himself fruitlessly in 1784 in an attempt to force the Dutch to lift their blockade to secure a passage to the sea for the Austrian Netherlands. The Emperor hoped for more success with his unusual plan of exchanging the Austrian Netherlands for Bavaria. The Wittelsbach dynasty had been extinguished in Bavaria, and the heir, the count palatine Charles Joseph, was in favour of moving from Munich to Brussels. But Joseph left Prussia out of his calculations. Frederick protested, and his troops marched into Bohemia. The threat of war ended without a battle being fought, for in 1785 Frederick had formed the Fürstenbund (Princes' League) against Joseph to prevent the exchange. Deeply disappointed, Joseph now saw his only hope in Catherine. Though he was in bad health, he decided to visit her again; the Austrian Netherlanders and Hungarians, enraged at his reforms, resisted the move. Both publicly and secretly Catherine proposed a complete sharing of power in the east and southeast. Joseph signed an alliance giving her a free hand for her far-reaching plans and the conquest of Constantinople and the Dardanelles and assuring Austria of substantial territorial gains. When Catherine declared war on Turkey sooner than expected, Joseph raised an army of 250,000 men. Yet, despite careful preparations, the organization of this large army was weak. Revolutionary unrest in the Austrian Netherlands and Hungary grew in the belief that preoccupation with the war would prevent the Emperor from taking on the revolutionaries as well. Joseph spent several months with his army; but both his illness and the domestic crisis made progress dangerous, and he had to return to Vienna before a victory could be won. There the Emperor attempted to establish peace in the Austrian Netherlands by delaying negotiations, but he failed in this as he did in Hungary, where his refusal to be crowned had deprived him of a legal foundation for his reign.

In Hungary topographical surveys and the replacing of Latin by German as the official legal language drove the Hungarian gentry into opposition, and in the Austrian Netherlands immigrants who had fled from Holland opened hostilities against the occupation forces, and finally the country declared its independence.

Assessment. When Joseph died, deserted by all his friends, his efforts to achieve freedom and general welfare for his subjects seemed to have been in vain. Today, however, Joseph is generally judged differently. He is considered the benefactor of his subjects, the people's emperor, who by his many voyages and inspections devoted himself to all matters of greater or lesser importance. In his century he had predicted there would be a time when general welfare took precedence over individual prosperity. But he was born one century too soon. (F.Sc.)

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biography; Saul K. Padover, *The Revolutionary Emperor: Joseph the Second, 1741–1790* (1934), shows the significance of Joseph's reign in the context of German and European history; Harold W.V. Temperley, *Frederic the Great and Kaiser Joseph,* 2nd ed. (1968), a very good analysis of the contrast in character, temper, and significance between the two great opponents.

HUNGARY

• **Joseph I–II:** *see* Joseph I–II (Germany/Holy Roman Empire).

NAPLES

• **Joseph:** *see* Bonaparte, Joseph.

PORTUGAL

• **Joseph** (b. June 6, 1714, Lisbon—d. Feb. 24, 1777, Lisbon), king of Portugal from 1750 to 1777, during whose reign power was exercised by his minister, Sebastião de Carvalho, marquês de Pombal.

Joseph's father, John V, enriched by the gold and diamonds of Brazil, had enjoyed unchallenged authority and gave Joseph no responsibility. Thus, after his accession, Joseph was content to leave decisions to his ministers, devoting himself to his pleasures, the opera and the chase. He appointed Sebastião de Carvalho, who soon gained an ascendancy over him and became all-powerful after the Lisbon earthquake of 1755.

Carvalho's regalistic policies were intended to assert the power of the crown and to create a mercantile class; this brought him into conflict with the nobility and the church. In 1758 an attempt on Joseph's life gave Carvalho the opportunity to persecute influential noble families, and in 1759 the Jesuits were expelled. Joseph unquestioningly accepted Carvalho's version of these events.

In 1775 the quarter-centenary of the reign was celebrated by the inauguration of the equestrian statue of Joseph, which still adorns the Terreiro do Paco. Carvalho, now the marquês de Pombal, seized the opportunity to advertise the reign's achievements, but when Joseph fell ill in February 1777 it was already evident that his death would end the minister's power. Joseph's daughter, Maria I, at once dismissed him.

SPAIN

• **Joseph:** *see* Bonaparte, Joseph.

Joseph, FATHER, byname THE GRAY EMINENCE, French PÈRE JOSEPH, or L'ÉMINENCE GRISE, original name FRANÇOIS-JOSEPH LE CLERC DU TREMBLAY (b. Nov. 4, 1577, Paris—d. Dec. 18, 1638, Rueil, Fr.), French mystic and religious reformer whose collaboration with Cardinal de Richelieu (the "Red Eminence") gave him powers akin to those of a foreign minister, especially during Richelieu's ambitious campaign to finance France's participation in what became known as the Thirty Years' War.



Father Joseph, engraving by an unknown artist after a portrait by Michel L'Asne

Harlingue—H. Roger-Viollet

In 1599 Joseph joined the Capuchins, a strict branch of the Franciscans, and devoted himself to prayer, preaching, and the conversion of heretics. While reforming part of Notre-Dame de Fontevrault abbey (near Saumur) into a new order of nuns, he met Richelieu, who in 1611 made him his secretary. Joseph's ambition to convert European Protestants to Roman Catholicism coincided with Richelieu's political plans for French domination of Europe. Thus, Joseph devoted himself to a policy that imposed on Europe the miseries and crimes of the Thirty Years' War. He died hated by his countrymen. Aldous Huxley's *Grey Eminence* appeared in 1941.

Joseph, SAINT (fl. 1st century AD, Nazareth, Galilee, region of Palestine; principal feast day March 19, Feast of St. Joseph the Worker May 1), in the New Testament, Jesus' earthly father, the Virgin Mary's husband, and in Roman Catholicism patron of the universal church. His life is recorded in the Gospels, particularly Matthew and Luke.

Joseph was a descendant of the House of King David. After marrying Mary, he found her already pregnant and, being "a just man and unwilling to put her to shame" (Matt. 1:19), decided to divorce her quietly; but an angel told him that the child was the son of God and was conceived by the Holy Ghost. Obeying the angel, Joseph took Mary as his wife. After Jesus' birth at Bethlehem (modern Bayt Laḥm, Jordan) in Judaea, where the holy family received the Magi, an angel warned Joseph and Mary about the impending violence against the child by King Herod the Great of Judaea, whereupon they fled to Egypt. There the angel again appeared to Joseph, informing him of Herod's death and instructing him to return to the Holy Land.

Avoiding Bethlehem out of fear of Herod's successor, Joseph, Mary, and Jesus settled in Nazareth (Matt. 2:22–23) in Galilee, where Joseph taught his craft of carpentry to Jesus. Joseph is last mentioned in the Gospels when he and Mary frantically searched for the lost Jesus in Jerusalem, where they found him in the Temple (Luke 2:41–48). Like Mary, Joseph failed to comprehend Jesus' ironic question, " 'How is it that you sought me? Did you not know that I must be in my Father's house?' " The circumstances of Joseph's death are unknown, except that he probably died before Jesus' public ministry began and was certainly dead before the Crucifixion (John 19:26–27).

Some of the subsequent apocryphal narratives concerning Joseph are extravagantly fictitious. The 2nd-century *Protevangelium of James* and the 4th-century *History of Joseph the Carpenter* present him as a widower with children at the time of his betrothal to Mary, contributing to the confusion over the question of Jesus' brothers and sisters. The allegation that he lived to be 111 years old is spurious. Reliable information about Joseph, therefore, is found only in the Gospels, for the later pious stories distort his image and helped delay his commemoration.

Although the veneration of Joseph seems to have begun in Egypt, the earliest Western devotion to him dates from the early 14th century, when the Servites, an order of mendicant friars, observed his feast on March 19, the traditional day of his death. Among the subsequent promoters of the devotion was Pope Sixtus IV, who introduced it at Rome *c.* 1479, and the celebrated 16th-century mystic St. Teresa of Avila. Already patron of Mexico, Canada, and Belgium, Joseph was declared patron of the universal church by Pope Pius IX in 1870. In 1955 Pope Pius XII established the Feast of St. Joseph the Worker as May 1 in countercelebration to the Communists' May Day. Cardinal L.E. Dubois's *St. Joseph* appeared in 1927, followed by F.L. Filas' *Man Nearest to Christ: Nature and Historic Development of the Devotion of St. Joseph* (1944) and *Joseph Most Just* (1956).

Joseph BEN MATTHIAS (Jewish historian): *see* Josephus, Flavius.

Joseph CALASANZ, SAINT: *see* Calasanz, Saint Joseph.

Joseph OF ARIMATHEA, SAINT (b. Arimathea, Samaria; fl. *c.* AD 30; Western feast day March 17, Eastern feast day July 31), according to all four Gospels, a secret disciple of Jesus, whose body he buried in his own tomb. In designating him a "member of the council," Mark 15:43 and Luke 23:50 suggest membership of the town council in Jerusalem. Virtuous and rich, he held a high office, and he boldly gained Pontius Pilate's permission to obtain Jesus' body. Mark 15:43 notes his motive for this action as "looking for the kingdom of God." Joseph wished to prevent the body from hanging on the cross overnight and to secure for it an honourable burial, thereby offending Jewish Law, which allowed only a disgraceful burial to the executed.

Joseph is accorded a long history in later literature. In the apocryphal *Gospel of Peter* (2nd century), he is a friend of Jesus and of Pilate. In the apocryphal *Gospel of Nicodemus* (or *Acts of Pilate;* 4th/5th century), Jews imprison Joseph after Jesus' burial, but he is released by the risen Lord, thus becoming the first witness of the Resurrection. In Robert de Boron's verse romance *Joseph d'Arimathie* (*c.* 1200), he is entrusted with the Holy Grail (cup) of the Last Supper. A mid-13th-century interpolation relates that Joseph went to Glastonbury (in Somerset, Eng.), of which he is patron saint, as head of 12 missionaries dispatched there by the Apostle St. Philip. In Sir Thomas Malory's *Morte Darthur* (15th century), when Galahad receives the vision of the grail, he sees Joseph standing at the altar dressed as a bishop. M.G. Finlay's *Joseph of Arimathea and the Grail* appeared in 1951.

Joseph OF VOLOKOLAMSK, SAINT, also called JOSEPH OF VOLOTSK, Russian JVYATOY IOSEF VOLOKOLAMSKY, or VOLOTSKY, original name IVAN SANIN (b. 1439, Volokolamsk, Russia—d. Sept. 9, 1515, Volokolamsk; canonized 1578; feast day September 9), Russian Orthodox abbot and theologian whose monastic reform emphasized strict community life and social work.

Joseph's monastic career came into prominence at the monastery at Borovsk, a wealthy religious foundation supported by the grand prince of Moscow. In 1477 Joseph was made abbot of Borovsk; however, his ascetical reforms soon met with the disapproval of Prince Ivan III Vasilyevich, who had provided the monastery with luxurious surroundings and whose sons used the monastery as a stepping stone to various episcopal benefices. Thus, in 1479, Joseph left the royal abbey to found his own monastery at Volokolamsk. His new abbey, which integrated the splendour of ritual devotion with the simple evangelical poverty of monastic life, soon became a centre of monastic reform, popular devotion, and social action.

Joseph and his followers, sometimes called Josephites, were dedicated to the concept of a unified and uniform Christianity in Russia, persecuting dissenters and heretics to the point of advocating the death penalty for the obstinate. They believed that the best guarantee of religious uniformity was a close alliance between the church and the state; thus, they were willing to make many concessions to the state, granting it a significant role in church government and even defending the theory of the divine right of kingship. In return they insisted that monks be allowed to possess property and wealth to use for charitable, social,

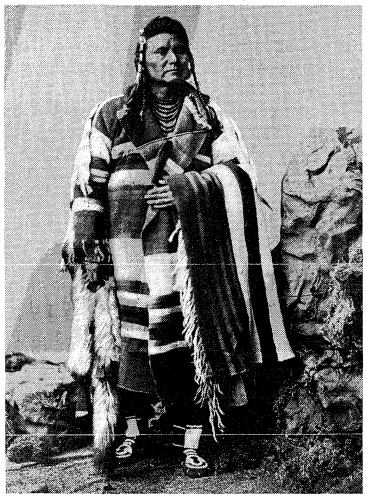
and educational work. This insistence earned them the nickname "the Possessors."

The position of the Possessors was contested by another party of Russian Christians, led by Nikolay Maykov (canonized as St. Nil Sorsky) and St. Maxim the Greek, "the Nonpossessors," as they came to be called, advocated monastic poverty, religious freedom, independence from the state, and loyalty to Constantinople.

Joseph THE LEVITE: *see* Barnabas, Saint.

Joseph, Chief, Indian name IN-MUT-TOO-YAH-LAT-LAT (b. *c.* 1840, Wallowa Valley, Oregon Territory—d. Sept. 21, 1904, Colville Reservation, Wash., U.S.), Nez Percé chief who, faced with settlement by whites of tribal lands in Oregon, led his followers in a dramatic effort to escape to Canada.

The Nez Percé tribe was one of the most powerful in the Pacific Northwest and in the first half of the 19th century one of the most friendly to whites. Many Nez Percé, including Chief Joseph's father, were converted to Chris-



Chief Joseph, photograph by Charles M. Bell, 1878

By courtesy of the Smithsonian Institution, Washington, D.C., Bureau of American Ethnology

tianity and Chief Joseph was educated in a mission school. The advance of white settlers into the Pacific Northwest after 1850 caused the United States to press the Indians of the region to surrender their lands and accept resettlement on small and often unattractive reservations. Some Nez Percé chiefs, including Chief Joseph's father, questioned the validity of treaties pertaining to their lands negotiated in 1855 and 1863 on the ground that the chiefs who participated in the negotiations did not represent their tribe.

When the United States attempted in 1877 to force the dissenting Nez Percé to move to a reservation in Idaho, Chief Joseph, who had succeeded his father in 1871, reluctantly agreed. While he was preparing for the removal, however, he learned that a trio of young braves had massacred a band of white settlers and prospectors; fearing retaliation by the U.S. army, he decided instead to lead his small body of followers (some 200 to 300 warriors and their families) on a long trek to Canada.

For more than three months (June 17–Sept. 30, 1877), Chief Joseph led his followers on a retreat of more than 1,000 miles across Oregon, Washington, Idaho, and Montana, outmanoeuvring the pursuing troops, which outnumbered Joseph's warriors by a ratio of at least ten to one, and several times defeating them in actual combat. During the long retreat, he won the admiration of many whites by his humane treatment of prisoners, his concern for women, children, and the aged, and also because he purchased supplies from ranchers and storekeepers rather than stealing them.

The Nez Percé were finally surrounded in the Bear Paw mountains of Montana, within 40 miles of the Canadian border. On October 5 Chief Joseph surrendered to Gen. Nelson A. Miles, delivering an eloquent speech that was long remembered: "Hear me, my chiefs; my heart is sick and sad. From where the Sun now stands, I will fight no more forever."

Chief Joseph and his band were sent at first to a barren reservation in Indian Territory (later Oklahoma); there many sickened and died. Not until 1885 were he and the remnants of his tribe allowed to go to a reservation in Washington—though still in exile from their valley. Meanwhile, Chief Joseph had made two trips to Washington, D.C., where, presented to Pres. Theodore Roosevelt, he pleaded for the return of his people to their ancestral home. *See also* Nez Percé.

Joseph Bonaparte Gulf, inlet of the Timor Sea, having a maximum width of 225 mi (360 km) and indenting the north coast of Australia for 100 mi. Although its western limit is generally agreed to be Cape Londonderry in Western Australia, its eastern limit is variously placed between Cape Scott and Point Blaze in Northern Territory.

The Ord, Durack, Pentecost, and Forrest rivers enter the Joseph Bonaparte Gulf via an estuarine division called Cambridge Gulf, which is the site of Wyndham, the area's principal port. The Victoria River flows into the gulf's Queen's Channel and the Fitzmaurice River into Keyling Inlet. Aboriginal reserves are on the east and west shores. The gulf was entered (1644) by the Dutch navigator Abel Tasman. In 1803 it was visited by Nicolas Baudin, a Frenchman who named it after the eldest brother of Napoleon I. The name was discarded by Capt. Phillip Parker King of the Royal Navy when he conducted a coastal survey in 1817, but it was revived during World War II.

Joséphine, original name MARIE-JOSÈPHE-ROSE TASCHER DE LA PAGERIE, also called (1779–96) VICOMTESSE (viscountess) DE BEAUHARNAIS, or (1796–1804) JOSÉPHINE BONAPARTE (b. June 23, 1763, Trois-Îlets, Martinique—d. May 29, 1814, Malmaison, Fr.), consort of Napoleon Bonaparte and empress of the French.



Joséphine, detail of an oil painting by François Gérard; in the Musée National de Malmaison, Paris

Giraudon—Art Resource/EB Inc.

Joséphine, the eldest daughter of Joseph Tascher de La Pagerie, an impoverished aristocrat who had a commission in the navy, lived the first 15 years of her life on the island of Martinique. In 1779 she married a rich young army officer, Alexandre, vicomte de Beauharnais, and moved to Paris. Although she bore him two children, Hortense and Eugène, the vain Alexandre was ashamed of her provincial manners and lack of sophistication and declined to present her at the court of Marie-Antoinette at Versailles; his indifference grew so great that in March 1785 she obtained a separation. She remained in Paris three years, learning the ways of the fashionable world, and went back to Martinique in 1788. In 1790 a slave uprising on the island forced her to return to Paris, which was then in the throes of the Revolution. She frequented high society, but her life was endangered when her husband, who had been serving in the Revolutionary army, fell out of favour with the left-wing Jacobins and was guillotined in June 1794. Joséphine herself was imprisoned; but after the coup d'état of 9 Thermidor (July 27) put an end to the Terror, she was released and by the time of the inauguration of the Directory was a leader of Paris society.

No longer unsophisticated, Joséphine was able to catch the fancy of Bonaparte, then a rising young army officer. She agreed to marry him after he had been appointed commander of the Italian expedition. Married in a civil ceremony on March 9, 1796, Joséphine was an indifferent wife, declining to answer the future emperor's passionate love letters and, while he was campaigning in Egypt in 1798–99, flirting with another army officer in a most compromising manner. Bonaparte threatened to divorce her, but her children dissuaded him, and he eventually forgave her, even agreeing to pay the enormous debts she had accumulated. During the Consulate (1799–1804) she was careful to cause no more scandals and used her social position to advance her husband's political fortunes. After Napoleon became emperor of the French in May 1804, she persuaded him to marry her anew with religious rites; the ceremony, which the Emperor arranged most reluctantly, took place on Dec. 1, 1804. The following day she attended Napoleon's coronation by the Pope in Notre-Dame as empress.

Joséphine's place in the world now seemed secure. The marriages of her children Hortense (to Napoleon's brother Louis) and Eugène (to the daughter of the King of Bavaria) seemed to establish her position; but her extravagance and, above all, her inability to give Napoleon a son put a strain on their marriage. Hoping to make a politically convenient marriage with Marie-Louise, daughter of Emperor Francis I of Austria, Napoleon in January 1810 arranged for the nullification of his 1804 marriage on the grounds that a parish priest had not been present at the ceremony. This slight technical irregularity, which seems to have been premeditated, enabled him to dispose of Joséphine without having to resort to a divorce, which would have displeased both the church and the Austrian emperor.

Joséphine retreated to her private residence at Malmaison, outside Paris, where she continued to entertain lavishly, with the Emperor paying the bills. After Napoleon's abdication she won the protection of the Russian emperor Alexander I but died soon after.

Josephson, Brian D(avid) (b. Jan. 4, 1940, Cardiff, Glamorgan, Wales), British physicist whose discovery of the Josephson effect while a 22-year-old graduate student won him the 1973 Nobel Prize for Physics.

He entered Trinity College, Cambridge, in pursuit of an education in physics and received his bachelor's (1960) and master's and Ph.D. degrees (1964) there, publishing his first work while still an undergraduate; it dealt with certain aspects of the special theory of relativity and the Mossbauer effect. He was elected a fellow of Trinity College in 1962. He was a brilliant and assured student; one former lecturer recalled a special need for precision in any presentation to a class that included Josephson—otherwise, the student would confront the instructor politely after class and explain the mistake.

While still an undergraduate, Josephson be-

came interested in superconductivity, and he began to explore the properties of a junction between two superconductors that came later to be known as a Josephson junction. Josephson extended earlier work in tunnelling, the phenomenon by which electrons functioning as radiated waves can penetrate solids, done by Leo Esaki and Ivar Giaever (with whom he shared the 1973 Nobel Prize). He showed theoretically that tunnelling between two superconductors could have very special characteristics, *e.g.*, flow across an insulating layer without the application of a voltage; if a voltage is applied, the current stops flowing and oscillates at high frequency. This was the Josephson effect. Experimentation confirmed it, and its confirmation in turn reinforced the earlier BCS theory (*q.v.*) of superconductor behaviour. Applying Josephson's discoveries with superconductors, researchers at International Business Machines Corporation had assembled by 1980 an experimental computer switch structure, which would permit switching speeds from 10 to 100 times faster than those possible with conventional silicon-based chips, increasing data processing capabilities by a vast amount.

He went to the United States to be a research professor at the University of Illinois in 1965–66 and in 1967 returned to Cambridge as assistant director of research. He was appointed reader in physics in 1972 and professor of physics in 1974. He was elected a fellow of the Royal Society in 1970.

Josephson had turned to ice skating and walks in the mountains for physical recreation, and a few years before the Nobel award he grew interested in the possible relevance of Eastern mysticism to scientific understanding. In 1980 he and V.S. Ramachandran published an edited transcript of a 1978 international symposium on consciousness at Oxford under the title *Consciousness and the Physical World.*

Josephson, Matthew (b. Feb. 15, 1899, Brooklyn, N.Y., U.S.—d. March 13, 1978, Santa Cruz, Calif.), U.S. biographer whose clear writing was based on sound and thorough scholarship.

As an expatriate in Paris in the 1920s, Josephson was an associate editor of *Broom* (1922–24), which featured both American and European writers. He had believed that the American artist who wished to avoid being absorbed by industrialism had no choice but exile; soon, however, Josephson returned to America to watch what he described as the battle between mechanism and ideas. After coming close to a breakdown while working on Wall Street, he went back to writing and became an editor for the Paris-based magazine *transition* (1928–29).

His first book was a well-researched and authoritative biography of Emile Zola, *Zola and His Time: The History of His Martial Career in Letters* (1928). Other highly praised biographies followed. His interest in 19th-century French literature appears in such works as *Victor Hugo* (1942) and *Stendhal* (1946), which helped to regenerate American interest in Stendhal's work. He addressed another favourite topic, American economics, in what is perhaps his best known work, *The Robber Barons: The Great American Capitalists, 1861–1901* (1934). The book chronicles the lives of John D. Rockefeller, Andrew Carnegie, and other barons of industry in the late 19th century. A late work is *The Money Lords: The Great Finance Capitalists, 1925–1950* (1972).

Josephson effect, flow of electric current between two pieces of superconducting material separated by a thin layer of insulating material. Superconductors are materials that lose all electrical resistance when cooled below a certain temperature near absolute zero. The English physicist Brian D. Josephson predicted the flow of current in 1962 on the basis of the BCS theory (*q.v.*) of superconductivity. The subsequent experimental verification of the Josephson effect lent support to the BCS theory.

The Josephson current flows only if no battery is connected across the two superconductors. If a battery is inserted, the current oscillates very rapidly so that no net current flows. The presence of magnetic fields near the superconductors influences the Josephson effect, allowing it to be used to measure very weak magnetic fields.

According to the BCS theory, superconductivity is a result of the correlated motion of electrons in the superconducting solid. Part of this correlation is the formation of pairs of electrons called Cooper pairs. According to Josephson, under certain circumstances these Cooper pairs move from one superconductor to the other across the thin insulating layer. Such motion of pairs of electrons constitutes the Josephson current, and the process by which the pairs cross the insulating layer is called Josephson tunnelling.

Josephus, Flavius, original name JOSEPH BEN MATTHIAS (b. AD 37/38, Jerusalem—d. *c.* AD 100, Rome), Jewish priest, scholar, and historian who wrote valuable works on the Jewish revolt of 66–70 and on earlier Jewish history. His major books are *History of the Jewish War* (75–79), *The Antiquities of the Jews* (93), and *Against Apion.*



Josephus before Vespasian, detail of a miniature from a Josephus manuscript, 14th century; in the Hessische Landesbibliothek, Fulda, W.Ger.

By courtesy of the Hessische Landesbibliothek, Fulda, W.Ger.

Early life. Flavius Josephus was born of an aristocratic priestly family in Jerusalem. According to his own account, he was a precocious youth who by the age of 14 was consulted by high priests in matters of Jewish law. At age 16 he undertook a three-year sojourn in the wilderness with the hermit Bannus, a member of one of the ascetic Jewish sects that flourished in Judaea around the time of Christ.

Returning to Jerusalem, he joined the Pharisees—a fact of crucial importance in understanding his later collaboration with the Romans. The Pharisees, despite the unflattering portrayal of them in the New Testament, were for the most part intensely religious Jews and adhered to a strict though nonliteral observance of the Torah. Politically, however, the Pharisees had no sympathy with the intense Jewish nationalism of such sects as the military patriotic Zealots and were willing to submit to Roman rule if only the Jews could maintain their religious independence.

In AD 64 Josephus was sent on an embassy to Rome to secure the release of a number of Jewish priests of his acquaintance who were held prisoners in the capital. There, he was introduced to Poppaea Sabina, Emperor Nero's second wife, whose generous favour enabled him to complete his mission successfully. During his visit, Josephus was deeply impressed with Rome's culture and sophistication—and especially its military might.

Military career. He returned to Jerusalem on the eve of a general revolt against Roman rule. In AD 66 the Jews of Judaea, urged on by the fanatical Zealots, ousted the Roman procurator and set up a revolutionary government in Jerusalem. Along with many others of the priestly class, Josephus counselled compromise but was drawn reluctantly into the rebellion. Despite his moderate stance, he was appointed military commander of Galilee, where (if his own untrustworthy account may be believed) he was obstructed in his efforts at conciliation by the enmity of the local partisans led by John of Giscala. Though realizing the futility of armed resistance, he nevertheless set about fortifying the towns of the north against the forthcoming Roman juggernaut.

The Romans, under the command of the future emperor Vespasian, arrived in Galilee in the spring of AD 67 and quickly broke the Jewish resistance in the north. Josephus managed to hold the fortress of Jotapata for 47 days, but after the fall of the city he took refuge with 40 diehards in a nearby cave. There, to Josephus' consternation, the beleaguered party voted to perish rather than surrender. Josephus, arguing the immorality of suicide, proposed that each man, in turn, should dispatch his neighbour, the order to be determined by casting lots. Josephus contrived to draw the last lot, and, as one of the two surviving men in the cave, he prevailed upon his intended victim to surrender to the Romans.

Led in chains before Vespasian, Josephus assumed the role of a prophet and foretold that Vespasian would soon be emperor—a prediction that gained in credibility after the death of Nero in AD 68. The stratagem saved his life, and for the next two years he remained a prisoner in the Roman camp. Late in AD 69 Vespasian was proclaimed emperor by his troops: Josephus' prophecy had come true, and the agreeable Jewish prisoner was given his freedom. From that time on, Josephus attached himself to the Roman cause. He adopted the name Flavius (Vespasian's family name), accompanied his patron to Alexandria, and there married for the third time. (Jospehus' first wife had been lost at the siege of Jotapata, and his second had deserted him in Judaea.) Josephus later joined the Roman forces under the command of Vespasian's son and later successor, Titus, at the siege of Jerusalem in AD 70. He attempted to act as mediator between the Romans and the rebels, but, hated by the Jews for his apostasy and distrusted by the Romans as a Jew, he was able to accomplish little. Following the fall of Jerusalem and the destruction of the Temple, Josephus took up residence in Rome, where he devoted the remainder of his life to literary pursuits under imperial patronage.

Josephus as historian. Josephus' first work, *Bellum Judaicum (History of the Jewish War),* was written in seven books between AD 75 and 79, toward the end of Vespasian's reign. The original Aramaic has been lost, but the extant Greek version was prepared under Josephus' personal direction. After briefly sketching Jewish history from the mid-2nd century BC, Josephus presents a detailed account of the great revolt of AD 66–70. He stressed the invincibility of the Roman legions, and apparently one of his purposes in the works was to convince the Diasporan Jews in Mesopotamia, who may have been contemplating revolt, that resistance to Roman arms was pure folly. The work has much narrative brilliance, particu-

larly the description of the siege of Jerusalem; its fluent Greek contrasts sharply with the clumsier idiom of Josephus' later works and attests the influence of his Greek assistants. In this work, Josephus is extremely hostile to the Jewish patriots and remarkably callous to their fate. The *Jewish War* is not only the principal source for the Jewish revolt but is especially valuable also for its description of Roman military tactics and strategy.

In Rome Josephus had been granted citizenship and a pension. He was a favourite at the courts of Vespasian, Titus, and Domitian, and he enjoyed the income from a tax-free estate in Judaea. He had divorced his third wife, married an aristocratic heiress from Crete, and given Roman names to his children. He had written an official history of the revolt and was loathed by the Jews as a turncoat and traitor. Yet despite all of this, Josephus had by no means abandoned his Judaism. His greatest work, *Antiquitates Judaicae (The Antiquities of the Jews)*, completed in 20 books in AD 93, traces the history of the Jews from creation to just before the outbreak of the revolt of AD 66–70. It was an attempt to present Judaism to the Hellenistic world in a favourable light. By virtually ignoring the Prophets, by embellishing biblical narratives, and by stressing the rationality of Judaic laws and institutions, he stripped Judaism of its fanaticism and made it appealing to the cultivated and reasonable man. Historically, the coverage is patchy and shows the fatigue of the author, then in his middle 50s. But throughout, sources are preserved that otherwise would have been lost, and, for Jewish history during the Second Commonwealth, the work is invaluable.

Book XVIII of the *Antiquities* contains a celebrated reference to Christ. But the implication in the text of Christ's divinity could not have come from Josephus, and the passage undoubtedly represents the tampering (if not invention) of a later Christian copyist.

Appended to the *Antiquities* was a *Vita* (*Life*), which is less an autobiography than an apology for his conduct in Galilee during the revolt. It was written to defend himself against the charges of his enemy Justus of Tiberias, who claimed that Josephus was responsible for the revolt. In his defense, he contradicted the account given in his more trustworthy *Jewish War*, presenting himself as a consistent partisan of Rome and thus a traitor to the rebellion from the start. Josephus appears in a much better light in a work generally known as *Contra Apionem* (*Against Apion*, though the earlier titles *Concerning the Antiquity of the Jews* or *Against the Greeks* are more apposite). Of its two books, the first answers various anti-Semitic charges levelled at the Jews by Hellenistic writers, while the second provides an argument for the ethical superiority of Judaism over Hellenism and shows Josephus' commitment to his religion and his culture.

Since *Against Apion* mentions the death of Agrippa II, it is probable that Josephus lived into the 2nd century; but Agrippa's death date is uncertain, and it is possible that Josephus died earlier, in the reign of Domitian, sometime after AD 93.

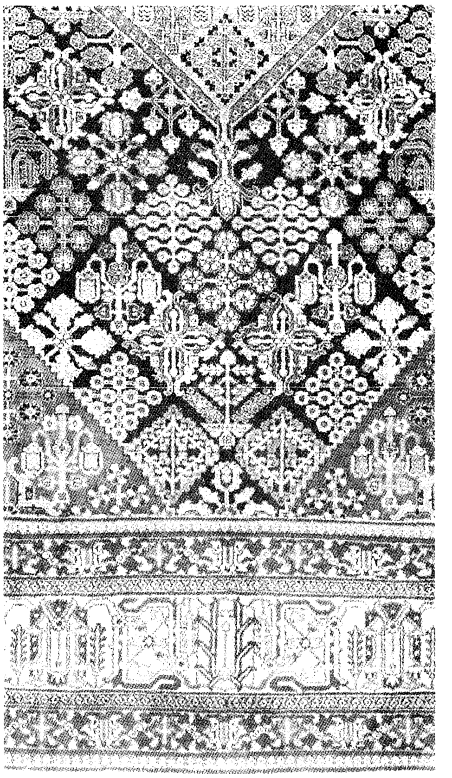
Assessment. As a historian, Josephus shares the faults of most ancient writers: his analyses are superficial, his chronology faulty, his facts exaggerated, his speeches contrived. He is especially tendentious when his own reputation is at stake. His Greek style, when it is truly his, does not earn for him the epithet "the Greek Livy" that often is attached to his name. Yet he unites in his person the traditions of Judaism and Hellenism, provides a connecting link between the secular world of Rome and the religious heritage of the Bible, and offers many insights into the mentality of subject peoples under the Roman Empire.

Personally, Josephus was vain, callous, and self-seeking. There was not a shred of heroism in his character, and for his toadyism he well deserved the scorn heaped upon him by his countrymen. But it may be said in his defense that he remained true to his Pharisee beliefs and, being no martyr, did what he could for his people. (Ga.P.)

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Joses THE LEVITE: *see* Barnabas, Saint.

Joshagan rug, floor covering handmade in the village of Jūshaqān, north of Isfahan in central Iran. An astonishing mélange of rugs has been attributed by various writers to this small place, including Kerman Vase carpets and other silk rugs, together with sundry rugs of pronounced Kurdish characteristics.



Detail of the field and border of a Joshagan rug, 20th century; owned by Wm. Cherkezian and Son, New York City

Reproduced with permission of owner; photograph, Otto E. Nelson—EB Inc.

The one pattern that is known to have been used habitually in Jūshaqān is a subdivision of the field into diamond panels, each of which contains an individual shrub or group of blossoms. This pattern may be adapted to a medallion format or enriched with elongated, bizarrely shaped panels. The border features arabesques. Joshagan rugs are Sehna knotted on a cotton foundation.

Joshua, also spelled JOSUE, Hebrew YEHOSHUA' (Yahweh Is Deliverance), personally appointed successor to Moses (Deut. 31:1–8; 34:9) and charismatic warrior who led Israel in the conquest of Canaan after the Exodus from Egypt. The accounts in Numbers 13–14 and Joshua 10:6–14 suggest that, like the warriors whose exploits the Book of Judges relates, Joshua was a religious devotee with the "gift" of a warrior. Before the rise of the Davidic monarchy the institution of "holy war" was a prominent feature of Israel's social and religious existence; warfare was the vocation of consecrated volunteers. Joshua's career should be viewed in this context. Like the warriors in Judges, he was an inspired fighter because he assumed the Lord himself was a warrior and that he "fought for Israel" (Josh. 10:14).

A careful reading of relevant biblical texts, stimulated by the study of external resources, has led scholars to a general agreement that Israel did not take Canaan by means of a single, comprehensive, calculated plan of conquest. It happened more gradually and more naturally, through progressive infiltration and acculturation. This relatively peaceful development, which went on for a couple of centuries, reached its fulfillment in the rise of David. Until then, for the most part, walled cities remained in Canaanite hands. Even if these cities were razed, as in the case of Hazor (Joshua 11), Israel does not seem to have made military use of them; David's occupation of Jerusalem was a first in this respect. During this long period there were, nevertheless, inevitable and frequent instances of local military confrontation, both with the indigenous population and with rival intruders, such as the Midianites. The accounts of Joshua's campaigns (Josh. 10–11) seem to fit these realities; they are accounts of forays by a mobile community, moving ever westward, that increasingly constituted a force to be reckoned with in the open spaces between the walled cities.

Joshua THE STYLITE (fl. 5th–6th century), monk of the convent of Zuknin and the reputed author of a chronicle covering mainly the period 495–506. Incorporated in a history that some have ascribed to Dionysius Telmaharensis but others regard as anonymous, the chronicle was written at the request of Sergius, abbot of a convent near Edessa (modern Urfa, in Turkey), immediately after the war between the Persian and Byzantine empires (502–506), by one who had lived in Edessa and witnessed many of the events described. It contains an elaborate dedication to Sergius, a brief recapitulation of events from the death of Julian in 363, and a fuller account of the events of his own time.

Joshua, Book of, also spelled JOSUE, the sixth book of the Old Testament, which, along with Deuteronomy, Judges, I and II Samuel, and I and II Kings, belongs to a tradition of Jewish history and law, called Deuteronomic, that was first committed to writing about 550 BC, during the Babylonian Exile. The book, named after its leading character, is the first of the Former Prophets in the Jewish canon. It tells the story of the Israelite occupation of Canaan, the Promised Land. Many ancient traditions are preserved in the book, but they are coloured by the historian's personal point of view.

The book can be divided into three sections: the conquest of Canaan (chapters 1–12), the distribution of the land among the Israelite tribes (chapters 13–22), and Joshua's farewell address and death (chapters 23–24). Because the possession of Canaan was fulfillment of the oft-repeated promise to the patriarchs, the Book of Joshua has usually been regarded as the completion of a literary unit comprising the first six books of the Bible. Scholars who hold this point of view have attempted to identify in Joshua the same source documents that are found in the preceding books (*see* biblical interpretation). There has been, however, a growing tendency to view Joshua as the beginning of a history that continues in the books that follow.

The author of Joshua lived at a time when the

people of Israel were exiles in Babylonia and had lost the land they once possessed. Consequently, his retelling of history is coloured by a hope for the repossession of his homeland. The original conquest of the Promised Land is told with great zeal, and the historian repeatedly emphasizes the help of Yahweh in the conquest. The allotment of the land to various tribes is made to include territory that never belonged to Israel or that came into Israel's possession at a much later time. This account again reflects the historian's hope that the former glory of the Israelite nation will be restored. The farewell address of Joshua (chapter 24) sets forth the conditions for Yahweh's maintenance of Israel in the land. The crux of the matter is this: "If you forsake the Lord and serve foreign gods, then he will turn and do you harm, and consume you, after having done you good" (24:20).

Joshua Tree National Monument, region of colourful granite (pinto gneiss) formations, quartz monzonite boulders, and scenic lookouts in southern California, U.S. It is situated 60 miles (100 km) east of San Bernardino, on the border between the Mojave and Colorado deserts. The national monument has an area of 875 square miles (2,266 square km) and is noted for its variety of desert plant life, including the Joshua tree, the spidery ocotillo, creosote bush, and the Mojave yucca.

Josiah, also spelled JOSIAS, king of Judah (*c.* 640–609 BC), who set in motion a reformation that bears his name and that left an indelible mark on Israel's religious traditions (II Kings 22–23:30).

Josiah was the grandson of Manasseh, king of Judah, and ascended the throne at the age of eight after the assassination of his father, Amon, in 641. For a century, ever since Ahaz, Judah had been a vassal of the Assyrian empire. Imperial policy imposed alien cults that suppressed or obscured the Israelite religious identity. After the death of King Nabopolassar the Assyrian empire fell into chaos; it could no longer assert its authority in Jerusalem. Egypt also was weak, and Judah thus obtained an unusual degree of independence from foreign powers. About 621 Josiah launched a program of national renewal, centred on the temple. A book believed to have contained provisions relating to covenantal traditions of premonarchic times deeply impressed him and gave a decisive turn to the reforms.

In Assyria, Babylonia, long a restive province, led a coalition that sacked Nineveh. The empire was in desperate straits; the Babylonians seemed about to displace it. Hoping to keep Mesopotamia divided, Necho, the Egyptian pharaoh, set out to aid the hard-pressed Assyrians. He landed a force on territory of the northern kingdom of Israel. King Josiah had hopes of a reunification of Judah and Israel, making the latter territory part of his own realm under the aegis of Babylonia. Consequently he challenged the pharaoh to battle; but we are told that "Necho slew him at Megiddo, when he saw him" (II Kings 23:29). Soon thereafter Assyria was completely eliminated, the Egyptians retreated, and Josiah's son, Jehoiakim, whom Necho had placed on the throne of Judah as a vassal, had to submit to Babylonia, the new Mesopotamian empire.

Joškar-Ola (Russian S.F.S.R.): *see* Yoshkar-Ola.

Josquin DES PREZ, des Prez also spelled DES PRÉS, or DESPRÉS (b. *c.* 1445, Condé-sur-l'Escaut?, Burgundian Hainaut [now in France]—d. Aug 27, 1521, Condé-sur-l'Escaut), one of the greatest composers of Renaissance Europe.

Josquin was probably a chorister at the collegiate church of Saint-Quentin and from 1459 to 1472 was a singer in the Milan cathedral. Between 1474 and about 1479 he was in the service of Duke Galeazzo Maria Sforza in Milan and from 1486 to about 1494 was in the papal chapel. Sometime between then and 1499, when he became choirmaster to Duke Ercole I of Ferrara, he apparently had connections with the Chapel Royal of Louis XII of France and with the Cathedral of Cambrai. In Ferrara he wrote, in honour of his employer, the mass *Hercules Dux Ferrariae*, and his motet *Miserere* was composed at the duke's request. He seems to have left Ferrara on the death of the duke in 1505 and later became provost of the collegiate church of Notre Dame in Condé.

Josquin's compositions fall into the three principal categories of motets, masses, and chansons. Of the 20 masses that survive complete, 17 were printed in his lifetime in three sets (1502, 1505, 1514) by Ottaviano dei Petrucci. His motets and chansons were included in other Petrucci publications, from the *Odhecaton* (an anthology of popular chansons) of 1501 onward, and in collections of other printers. Musical laments on his death by Nicolas Gombert, Benedictus Appenzeller, and Hieronymus Vinders are extant. Martin Luther expressed great admiration for Josquin's music, calling him "master of the notes, which must do as he wishes; other composers must do as the notes wish." In his musical techniques he stands at the summit of the Renaissance, blending traditional forms with innovations that later became standard practices. The expressiveness of his music marks a break with the medieval tradition of more abstract music.

In his motets, particularly, Josquin gave free reign to his talent, expressing sorrow in poignant harmonies, employing suspension



Josquin des Prez, drawing by Joris van der Straeten, 16th century

The Bettmann Archive

for emphasis, and taking the voices gradually into their lowest registers when the text speaks of death. Josquin used the old cantus firmus style, but he also developed the motet style that characterized the 16th century after him. His motets, as do his masses, show an approach to the modern sense of tonality.

In his later works he gradually abandoned cantus firmus technique for parody and paraphrase. He also frequently used the techniques of canon and of melodic imitation.

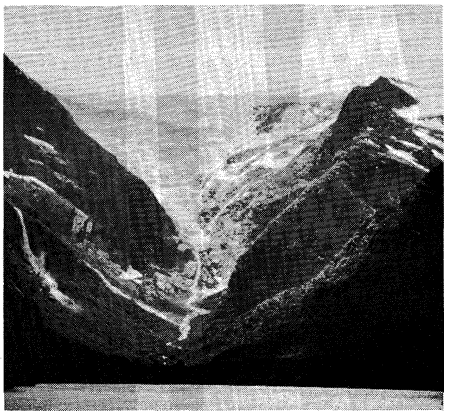
In his chansons Josquin was the principal exponent of a style new in the mid-15th century, in which the learned techniques of canon and counterpoint were applied to secular song. He abandoned the fixed forms of the rondeau and the ballade, employing freer forms of his own device. Though a few chansons are set chordally rather than polyphonically, a number of others are skilled examples of counterpoint in five or six voices, maintaining sharp rhythms, straightforwardness, and clarity of texture.

Jost (German king): *see* Jobst.

Jost Van Dyke Island, one of the British Virgin Islands, in the Lesser Antilles, which separate the Atlantic Ocean and Caribbean Sea. The island lies 4 miles (6 km) west of Tortola and adjoins Little Jost Van Dyke Island on the east. It is roughly tadpole-shaped and has an area of 3.5 square miles (9 square km). The island's terrain is rugged and elevated, reaching 1,054 feet (321 m). The chief settlement is Great Harbour, situated on the southern coast.

The island was probably discovered and first settled by the Dutch, though it was British after 1672. Jost Van Dyke was the birthplace of William Thornton, designer of the U.S. Capitol, and Little Jost Van Dyke was the birthplace of John Lettsom, founder of the Medical Society of London. Pop. (1980 prelim.) 136.

Jostedals Glacier, ice field, Sogn og Fjordane *fylke* (county), north of deeply indented



Jostedals Glacier, Norway

I. Holmasen—Ostman Agency

Sogne Fjord, western Norway. The largest ice field in Europe (excluding Iceland), it is oriented northeast–southwest and extends in an irregular pattern for about 45 miles (75 km). Its width ranges up to 22 miles (35 km), and the total cap area is about 315 square miles (about 815 square km).

The Jostedals Glacier, composed of high plateau ice, covers a series of mountain peaks, the highest of which is the Lodalskåpa, 6,834 feet (2,083 m). Glaciers flow from the Jostedals Glacier into many adjacent valleys. The region around the ice field is sparsely populated.

jota, courtship dance traditional in northern Spain, particularly Aragon; also a genre of folk song that precedes and accompanies the dance or is sung only. The dancing couple hold their



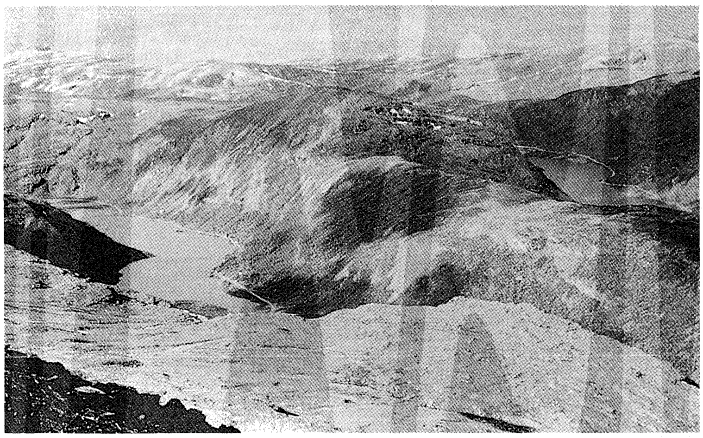
Jota from "Aragón," oil painting by Joaquín Sorolla y Bastida; in the collection of the Hispanic Society of America, New York City

By courtesy of the Hispanic Society of America, New York City

arms high and click castanets as they execute lively, bouncing steps to guitar music and singing. The singing consists of *coplas,* improvised verses of satire, love, or piety. The verse form varies but is frequently a four- or seven-line stanza of eight-syllable lines. The music is in $\frac{3}{4}$ or $\frac{3}{8}$ time.

Closely akin to the fandango, the jota is probably a fertility dance of Aragonese origin, although legend states that it was brought north from Andalusia by the exiled Moorish poet Aben Jot. The *jarana* of Yucatán, danced with whirling scarves, is a Mexican derivative of the jota.

Jotunheim Mountains, mountain range, Oppland *fylke* (county), south-central Norway. Extending for 80 miles (130 km) between Gudbrands valley (east) and the Jostedals Glacier (west), the chain is surrounded by many lakes. The highest range in Scandinavia, its tallest peaks are Glitter Mountain (8,045 feet [2,452 m]) and Galdhø Mountain (8,100 feet [2,470 m]). The mountains rise dramatically from a comparatively level plain about 3,000 feet (900 m) above sea level. They are geologically related to ancient Caledonian volcanic rocks of Scotland.



The Jotunheim Mountains, Norway

Jacques Jangoux—Photo Researchers/EB Inc.

The Jotunheim Mountains are mentioned in early Norse sagas, but they were not fully explored until the early 19th century. In 1822 they were named Jotunfjell ("Giant's Mountains"), but since the turn of the century they have been known as the Jotunheimen ("Giant's Home"). They have been a popular tourist attraction for more than 100 years, offering excellent hiking and mountain-climbing opportunities. The area was the setting of Henrik Ibsen's prose drama *Peer Gynt.* The lower slopes of the mountains and the level plateau are used as summer pastures for cattle and goats.

Jou-jan (Central Asian people): *see* Juanjuan.

Joubert, Barthélemy-Catherine (b. April 14, 1769, Pont-de-Vaux, Fr.—d. Aug. 15, 1799, Novi Ligure, Italy), French general during the Revolutionary era.

Joubert, son of an advocate, ran away from school in 1784 to enlist in the artillery but was brought back and sent to study law at Lyon and Dijon. In 1791 he joined the volunteers of the Ain and fought with the French army in Italy in 1793. By the end of 1796 he was a general of division. He was in charge of the retaining force at the battle of Rivoli, and in the campaign of 1799 (invasion of Austria) he commanded the detached left wing of Napoleon Bonaparte's army in Tirol and fought his way through the mountains to rejoin his chief in Styria. He held various commands in Holland, on the Rhine, and in Italy, where up to January 1799 he was commander in chief. Resigning the post in consequence of a dispute with the civil authorities, Joubert returned to France. He was almost immediately summoned to take over the command in Italy from General Victor Moreau; but he persuaded his predecessor to remain at the front and was largely guided by his advice. The odds against the French troops in the disastrous campaign of 1799 were too great. Joubert and Moreau were compelled to give battle by the Russian commander A.V. Suvorov, and Joubert fell at the Battle of Novi, which was a victory for the Austrians and Russians.

Joubert died before it could be determined whether his genius was of the first rank, but he was marked out as a future great captain by Napoleon, and his countrymen associated him with the French Revolutionary generals Lazare Hoche and F.-S. Marceau as a great leader.

Joubert, Petrus Jacobus, also called PIET JOUBERT (b. Jan. 20, 1831, near Prince Albert, Cape Colony [now in South Africa]—d. March 27, 1900, Pretoria, South African Republic), associate and rival of Paul Kruger who served as commandant general and vice president of the South African Republic.

Joubert was the son of an indigent farmer-missionary who trekked his family north to Natal in 1837. When his father died, the family settled on a farm (Rustfontein) in the Transvaal. With little formal schooling, Joubert educated himself and became a prosperous law and property agent. He began his public career in 1860 as a member of the Volksraad (parliament) and acted as vice president when President Thomas François Burgers visited Europe in 1875–76.

The annexation of the Transvaal by the British in 1877 stirred the patriotism of Joubert. Determined to restore his nation's independence, he and Paul Kruger attempted to negotiate Boer differences with the British by meeting with various officials in South Africa and London. After seemingly exhausting peaceful means, the Boer leaders reluctantly proposed and advocated rebellion in December 1880. While Kruger devoted himself to political affairs, Joubert, as commandant general, led his burghers to victory at Laing's Nek, Ingogo, and Majuba Hill. He took part in negotiating the Pretoria Convention (1881), which restored the independence of the Transvaal.

His more progressive views brought Joubert increasingly into conflict with Kruger, who defeated him decisively in the presidential election of 1883. As vice president and, therefore, acting president during Kruger's absence in London (September 1883 to July 1884), Joubert sought to extend the Transvaal's borders, but Kruger curbed his efforts. Differences between the two widened as Joubert allied himself with the English-speaking community and objected to the influence of Hollanders in Kruger's government. Three more times Joubert unsuccessfully ran for president against Kruger (1888, 1893, and 1898). He came closest in 1893, winning 7,246 votes to Kruger's 7,911.

As war approached with Britain (the South African War, 1899–1902), Joubert advocated a policy of conciliation. Once the war began, he assumed command of the Republic's forces. Though a gallant soldier, Joubert was shortsighted in his preparations, and his extreme caution and inclination to fight a defensive war prevented him from exploiting initial Boer successes. In the middle of the conflict, he suddenly became ill and died.

Jouffroy d'Abbans, Claude-François-Dorothée, marquis de (b. 1751, Roches-sur-Rognon, Fr.—d. 1832, Paris), French engineer and inventor who in 1783 traveled upstream on the Saône River near Lyon in his *Pyroscaphe,* the first really successful steamboat.

At the age of 20 Jouffroy d'Abbans entered the army, and a year later he became involved in a duel that resulted in his banishment to Provence. There he began to work with boats and built a 43-foot (13-metre) steamboat with "duckfoot" paddles. Though he failed in trials on the Doubs River in 1778, five years later he succeeded with his *Pyroscaphe,* a vessel of 182 tons' displacement; it was fitted with a double ratchet mechanism that produced continuous rotation of the paddle wheels. He applied for a patent, but, when the granting of this protection was indefinitely delayed, he stopped his experiments and went into exile for several years. An American inventor, Robert Fulton, meanwhile had developed a successful steamboat, and, although he gave much credit to Jouffroy d'Abbans, the latter died bitter and forgotten.

Jouhaux, Léon (b. July 1, 1879, Paris, Fr.—d. April 28, 1954, Paris), French Socialist and trade-union leader who was one of the founders of the International Labour Organisation.

A worker in a match factory from the age of 16, Jouhaux soon became one of the leading propagandists of revolutionary syndicalism. He was national secretary of the matchworkers' union by 1906 and was appointed secretary general of the Confédération Générale du Travail (CGT; General Confederation of Labour) in 1909. Before World War I he joined with German labour leaders in an attempt to organize an antimilitary movement; but subsequently he supported the French war effort. He attended the Versailles Peace Conference in 1919, which set up the International Labour Legislation Commission, of which he was one of the most active members. From this time he also urged the foundation of the Economic Council, which was set up in 1925. He believed that trade unionism should have a role in directing the economy but insisted that



Jouhaux

Keystone

trade-union action remain independent of political action. He refused to join Léon Blum's Cabinet in 1936 but in that year agreed to the return of the Communists to the CGT, from which they had been split since 1921.

During World War II the Vichy government dissolved the CGT and arrested Jouhaux and turned him over to the Germans; he spent the rest of the war in a concentration camp. Returning to France, he was again secretary general of the reconstituted CGT, but in 1947 he split with the now Communist majority and established in 1948 the Force Ouvrière (Workers' Force), which stood between the Communists and Catholic labour organizations. In 1949 he helped to found the International Confederation of Free Trade Unions, and on Nov. 5, 1951, he received the Nobel Peace Prize.

joule, unit of work or energy in the metre–kilogram–second (SI) system of physical units equal to the work done by a force of one newton acting through one metre. Named in honour of the English physicist James Prescott Joule, it equals 10^7 ergs, or approximately 0.7377 foot-pounds. In electrical terms, the joule equals one watt-second; *i.e.,* the energy released in one second by a current of one ampere through a resistance of one ohm.

Joule, James Prescott (b. Dec. 24, 1818, Salford, Lancashire, Eng.—d. Oct. 11, 1889, Sale, Cheshire), British physicist who established that the various forms of energy—mechanical, electrical, and heat—are basically the same and can be changed, one into another. Thus he formed the basis of the law of conservation of energy, the first law of thermodynamics.

Joule studied with the noted English chemist John Dalton at the University of Manchester in 1835. Describing the "Joule effect" in a paper, *On the Production of Heat by Voltaic Electricity* (1840), he stated that the heat produced in a wire by an electric current is proportional to the product of the resistance of the wire and the square of the current. In 1843 he published his value for the amount of work required to produce a unit of heat, called the mechanical equivalent of heat. He used four increasingly accurate methods of determining this value. By using different materials, he also established that heat was a form of energy regardless of the substance that was heated. In 1852 Joule and William Thomson (later Lord Kelvin) discovered that when a gas is allowed to expand without performing external work, the temperature of the gas falls. This "Joule-Thomson effect" was used to build a large refrigeration industry in the course of the 19th century. The value of the mechanical equivalent of heat is generally represented by the letter *J*, and a standard unit of work is called the joule.

Joule-Thomson effect, the change in temperature that accompanies expansion of a gas without production of work or transfer of heat. At ordinary temperatures and pressures, all real gases except hydrogen and helium cool upon such expansion; this phenomenon often is utilized in liquefying gases. Hydrogen and helium cool upon expansion only if their initial temperatures are very low.

Joule's law, in electricity, mathematical description of the rate at which resistance in a circuit converts electric energy into heat energy. The English physicist James Prescott Joule discovered in 1841 that the amount of heat per second that develops in a wire carrying a current is proportional to the electrical resistance of the wire and the square of the current. He determined that the heat evolved per second is equivalent to the electric power absorbed, or the power loss.

A quantitative form of Joule's law is that the heat evolved per second, or the electric power loss, P, equals the current I squared times the resistance R, or $P = I^2R$. The power P has units of watts, or joules per second, when the current is expressed in amperes and the resistance in ohms.

Jourdan, Jean-Baptise, Comte (Count) (b. April 29, 1762, Limoges, Fr.—d. Nov. 23, 1833, Paris), military commander remembered as the sponsor of conscription during the French Revolutionary regime and as one of Napoleon's marshals of the empire.

After being a soldier in King Louis XVI's army and serving in the West Indies (1778–84), Jourdan retired and became a draper in Limoges. He supported the Revolution, however; and, having been elected lieutenant colonel of volunteers in 1791, rose to general of division (1793). After successes against the Austrians, he was made commander of the Army of the Moselle in March 1794. Executing Lazare Carnot's new strategy of concentrating troops and artillery at points of attack,



Jourdan, detail of an engraving by Gautier after a portrait by Hilaire Le Dru
By courtesy of the Bibliotheque Nationale, Paris

he marched westward to the Sambre and, on June 26, won so decisive a victory of Fleurus, in Hainaut, that Austrian resistance west of the Meuse collapsed. By October, his army was occupying all of Belgium.

Jourdan's campaigns east of the Rhine (1795 and 1796) were less successful; and, in 1797, he was elected to sit as deputy for Haute-Vienne in the council of Five Hundred. He was there responsible for the legalization of mass conscription (Sept. 5, 1798). His subsequent military career was largely unsuccessful, though in 1804 Napoleon appointed him a marshal. He was at last dismissed from command because of his failure to control his troops at the Battle of Vitoria (June 1813).

In 1814 Jourdan favoured Napoleon's abdication and switched his loyalties to Louis XVIII. He was made head of the Army of the Rhine and named count (1816) and a peer of France (1819). He served for a few days as foreign minister during the July Revolution of 1830, then became governor of the Invalides. His *Mémoires,* edited by E.H. de Grouchy, appeared in 1899.

Journal de Genève, daily newspaper published in Geneva. Among French-language newspapers it is generally regarded as the best in Switzerland and one of the best anywhere. It was established in 1826.

Like the German-language *Neue Zürcher Zeitung,* it is a national newspaper, serious in tone and generally liberal in outlook. Its careful and thorough treatment of Swiss and international affairs has brought the paper wide prestige despite its relatively small circulation. The *Journal de Genève* is of tabloid size and is published every day except Sunday.

Journal des Débats, Le (English: The Journal of Debates), former Parisian daily newspaper and one of the most influential organs of the French press in the 19th century. Founded in 1789 by François Jean Baudouin to report the debates of the National Assembly, *Débats* was acquired in 1799 by the Bertin family, which retained control of it until 1871.

Moderately liberal in its viewpoint, *Débats* was critical of the Restoration monarchy and the Second Empire and favourable to Louis-Philippe. Its contributors included such literary figures as François-René de Chateaubriand, Ernest Renan, and Hippolyte Taine. *Débats* continued to be published until August 1944.

journalism, the collection, preparation, and distribution of news and related commentary and feature materials through such media as pamphlets, newsletters, newspapers, magazines, radio, motion pictures, television, and books. The word journalism was originally applied to the reportage of current events in printed form, specifically newspapers, but with the advent of radio and television in the 20th century, the use of the term has broadened to include all printed and electronic communication dealing with current affairs.

History. The earliest known journalistic product was a newssheet circulated in ancient Rome called the *Acta Diurna.* Published daily from 59 BC, it was hung in prominent places and recorded important social and political events. In China during the T'ang dynasty a court circular called a *pao,* or "report," was issued to government officials. This gazette appeared in various forms and under various names more or less continually to the end of the Ch'ing dynasty in 1911. The first regularly published newspapers appeared in German cities and in Antwerp around 1609. The first English newspaper, the *Weekly Newes,* was published in 1622. One of the first daily newspapers, *The Daily Courant,* appeared in 1702.

At first hindered by government-imposed censorship, restrictions, and taxes, newspapers in the 18th century came to enjoy the reportorial freedom and indispensable function that they have retained to the present day. The growing demand for newspapers owing to the spread of literacy and the introduction of steam- and then electric-driven presses caused the daily circulation of newspapers to rise from the thousands to the hundreds of thousands and eventually to millions.

Magazines, which had started in the 17th century as learned journals, began to feature opinion-forming articles on current affairs, such as those in the *Tatler* (1709–11) and the *Spectator* (1711–12). In the 1830s cheap, mass-circulation magazines aimed at a wider and less well-educated public appeared, as well as illustrated and women's magazines. The cost of large-scale news gathering led to the formation of news agencies, organizations that sold their international journalistic reporting to many different individual newspapers and magazines. The invention of the telegraph and then the radio and television brought about a great increase in the speed and timeliness of journalistic activity and at the same time provided massive new outlets and audiences for their electronically distributed products. In the late 20th century satellites were being used for the long-distance transmission on journalistic information.

The profession. Journalism in the 20th century has been marked by a growing sense of professionalism. There were four important factors in this trend: the increasing organization of working journalists; specialized education for journalism; a growing literature dealing with the history, problems, and techniques of mass communication; and an increasing sense of social responsibility on the part of journalists.

An organization of journalists began as early as 1883, with the foundation of England's chartered Institute of Journalists. Like the Ameri-

can Newspaper Guild, organized in 1933, and the Fédération Nationale de la Presse Française, the institute functions as both a trade union and a professional organization.

Before the latter part of the 19th century, most journalists learned their craft as apprentices, beginning as copyboys or cub reporters. The first university course in journalism was given at the University of Missouri (Columbia) in 1879–84. In 1912 Columbia University in New York City established the first graduate program in journalism, endowed by a grant from the New York City editor and publisher Joseph Pulitzer. It was recognized that the growing complexity of news reporting and newspaper operation required a great deal of specialized training. Editors also found that in-depth reporting of special types of news, such as political affairs, business, economics, and science, often demanded reporters with background training in these areas. The advent of motion pictures, radio, and television as news media called for an ever-increasing battery of new skills and techniques in gathering and presenting the news. By the 1950s, courses in journalism or communications were commonly offered in colleges.

The literature of the subject—which in 1900 was limited to two textbooks, a few collections of lectures and essays, and a small number of histories and biographies—became copious and varied by the late 20th century. It ranged from histories of journalism to texts for reporters and photographers to books of conviction and debate by journalists on journalistic capabilities, methods, and ethics.

Concern for social responsibility in journalism is largely a product of the late 19th and 20th centuries. The earliest newspapers and journals were generally violently partisan in politics and considered that the fulfillment of their social responsibility lay in proselytizing their own party's position and denouncing that of the opposition. As the reading public grew, however, the newspapers grew in size and wealth and became increasingly independent. Newspapers began to mount their own popular and sensational "crusades" in order to increase their circulation. The culmination of this trend was the "yellow journalism" (*q.v.*) competition between two New York City papers, the *World* and the *Journal,* in the 1890s.

The sense of social responsibility made notable growth as a result of specialized education and widespread discussion of press responsibilities in books and periodicals and at the meetings of the associations. Such reports as that of the Royal Commission on the Press (1949) in Great Britain and the less extensive *A Free and Responsible Press* (1947) by an unofficial Commission on the Freedom of the Press in the United States did much to stimulate self-examination on the part of practising journalists.

By the late 20th century studies showed that journalists as a group were generally idealistic about their role in bringing the facts to the public in an impartial manner. Various societies of journalists have issued statements of ethics, of which that of the American Society of Newspaper Editors is perhaps the best known.

Present-day journalism. Although the core of journalism has always been the news, the latter word has acquired so many secondary meanings that the term "hard news" has gained currency to distinguish items of definite news value from others of marginal significance. This is largely a consequence of the advent of radio and television reporting, which bring news bulletins to the public with speed that the press cannot hope to match. To hold their audience, newspapers have provided increasing quantities of interpretive material—articles on the background of the news, personality sketches, and columns of timely comment by writers skilled in presenting opinion in readable form. By the mid-1960s most newspapers, particularly evening and Sunday editions, were relying heavily on magazine techniques, except for their content of "hard news," where the traditional rule of objectivity still applied. News magazines in much of their reporting were blending news with editorial comment.

Journalism in book form has a short but vivid history. The proliferation of paperback books during the decades after World War II gave impetus to the journalistic book, exemplified by works reporting and analyzing election campaigns, political scandals, and world affairs in general, and the "new journalism" of such authors as Truman Capote, Tom Wolfe, and Norman Mailer.

The 20th century has seen a renewal of the strictures and limitations imposed upon the press by governments. In countries with Communist governments, the press is owned by the state, and journalists and editors are government employees. Under such a system, the prime function of the press to report the news is combined with the duty to uphold and support the national ideology and the declared goals of the state. This leads to a situation in which the positive achievements of Communist states are stressed by the media, while their failings are underreported or ignored. This rigorous censorship pervades journalism in Communist countries.

In non-Communist developing nations the press enjoys varying degrees of freedom, ranging from the discreet and occasional use of self-censorship on matters embarrassing to the home government to a strict and omnipresent censorship akin to that of Communist countries. The press enjoys the maximum amount of freedom in most English-speaking countries and in the nations of western Europe.

joust, western European mock battle between two horsemen charging each other with levelled lances, each attempting to unhorse the other. Early medieval tournaments consisted of *mêlées,* mock battles between two bodies of armed horsemen; later both the *mêlée* and the joust took place at tournaments, and in the 15th century the joust tended to supersede the *mêlée.* Jousting fell from favour by the beginning of the 16th century. Tilting, or riding, at the rings is a form of jousting in which the horseman rides at full gallop and inserts his lance through small metal rings.



Pairs of mounted knights jousting simultaneously; woodcut, 1565

By courtesy of the Trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

Jouve, Pierre-Jean (b. Oct. 11, 1887, Arras, Fr.—d. Jan. 8, 1976, Paris), French poet, novelist, and critic.

Early in his career, Jouve was influenced by the Abbaye group and for a time published a journal, *Bandeaux d'or.* His earliest verses, *Les Muses romaines et florentines* (1910; "Roman and Florentine Muses"), *Présences* (1912; "Presences"), and *Parler* (1913; "Speaking"), were inspired by Symbolism.

Prevented by ill health from serving in World War I, Jouve spent the war years in Switzerland, serving as a volunteer hospital orderly and writing pacifist verses. Works of this period include *Vous êtes des hommes* (1915; "You Are Men") and *Danse des morts* (1917; "Dance of the Dead"). In 1924 Jouve converted to Roman Catholicism and, concurrently, became fascinated with psychoanalysis—events which caused him to reject his earlier style and adopt the themes that concerned him throughout his life: guilt, sexuality, and death. Spirituality and eroticism were merged in such collections of verse as *Les Mystérieuses Noces* (1925; "Mysterious Weddings"), *Nouvelles Noces* (1926; "New Weddings"), and *Sueur de sang* (1935; "Sweat of Blood"). The same mixture also appears in such prose works as *Paulina 1880* (1925; Eng. trans., 1973), *Le Monde désert* (1927; "The Deserted World"), and *La Scène capitale* (1935; "The Crucial Scene").

Jouve spent the World War II years in Geneva, where he wrote *La Vièrge de Paris* (1944; "The Virgin of Paris"). The postwar years, spent in Paris, saw the publication of other important collections of verse and explorations of language such as *Ode* (1950), *Langue* (1952; "Language"), *Lyrique* (1956), and *Moires* (1962; "Watered Silk"). Jouve also wrote critical essays on 19th-century French writers and artists and was an adept translator. His lifelong interest in music resulted in keen and perceptive music criticism, especially in *Le Don Juan de Mozart* (1942; *Mozart's Don Juan,* 1957). He was awarded the French Academy's Grand Prix de Poésie in 1966.

Jouvenet, Jean (b. 1644, Rouen, Fr.—d. April 5, 1717, Paris), French Baroque painter remembered for his religious works—*e.g.,* "The Miraculous Draught of the Fishes" (Louvre, Paris)—and for his decorative ceiling paintings in the chapels of Versailles and the Invalides.

Jouvenet was the most celebrated of a family of artists and was son and pupil of Laurent Jouvenet. On arriving in Paris in 1661 he attracted the attention of Charles Le Brun, by whom he was employed at Versailles. Under Le Brun's auspices he became a member of the Royal Academy (1675), of which he was elected professor in 1681.

Jouvet, Louis (b. Dec. 24, 1887, Crozon, Fr.—d. Aug. 16, 1951, Paris), actor, director, designer, and technician, one of the most influential figures of the French theatre in the 20th century.

Beginning as a pharmacist at his parents' wishes, he soon turned to his real interest, the theatre, and, after being refused admission



Jouvet
H. Roger-Viollet

several times to the Conservatoire in Paris because of his stuttering, made his Paris debut in 1910 in *The Brothers Karamazov*. He served in World War I and in 1924 became director of the Comédie des Champs-Élysées in Paris, where he remained until 1934, when he was appointed director of the Athénée, a position he retained until his death.

Jouvet introduced the playwright Jean Giraudoux and the designer Christian Bérard to the theatre, brought new insight to the interpretation of Molière's plays, developed lighting techniques, created simplified but highly suggestive settings, and brought new importance to the interpretive power of the actor's voice. His greatest successes as actor-producer-director were *Dr. Knock* (1923), *School for Wives* (1936), and *La Folle de Chaillot* (Eng. title, *The Madwoman of Chaillot*, 1945). He also acted in such motion pictures as *La Kermesse héroique* (Eng. title, *Carnival in Flanders*, 1935), *Volpone* (1940), and *Retour à la vie* (Eng. title, *Life Dances On*, 1949). He was a deeply respected and indefatigable theatre worker, a teacher, lecturer, writer, and an honoured citizen and cultural ambassador of his country when he and his company toured North and South America. *Louis Jouvet, Man of the Theatre* by Bettina Knapp appeared in 1957.

Jovanović, Slobodan (b. Dec. 3, 1869, Neusatz, Austria-Huntary—d. Dec. 12, 1958, London), Serbian jurist, historian, and statesman, prime minister in the Yugoslav government-in-exile during World War II (Jan. 11, 1942–June 26, 1943). Liberal in his social and political views, he was perhaps Yugoslavia's greatest authority on constitutional law; also a master of Serbian prose style, he was for nearly half a century a leader of the Serbian intelligentsia.

After studying law at Geneva, Jovanović entered the Serbian dipolmatic service in 1890. From 1897 to 1939 he was a professor at the University of Belgrade, and on two occasions he was its vice chancellor. In 1941, just before the Axis invasion of Yugoslavia, he was appointed deputy prime minister. In the Yugoslav government-in-exile (in London), he was deputy minister of war as well as prime minister. When, after World War II, the Allies recognized the Communist government of Yugoslavia, Jovanović became president of the Yugoslav National Committee in exile. In July 1946 he was condemned in absentia to 20 years' hard labour.

Besides his prewar historical and other works (collected in 17 volumes, 1932–40), Jovanović wrote *O totalitarizmu* ("On Totalitarianism"; 1952) and *Moji savremenici* ("My Contemporaries"; published posthumously, 1961–62).

Jove (Roman god): *see* Jupiter.

Jovellanos, Gaspar Melchor de (b. Jan. 5, 1744, Gijón, Spain–d. Nov. 27, 1811, Veja), Spanish statesman and author, one of the most important figures of the 18th-century Spanish Enlightenment.

After studying law, Jovellanos was appointed to Judicial posts at Seville (1767) and Madrid (1778). He gained fame for his literary and scholarly activities and for his personal integrity, but from 1790 to 1797, after unsuccessfully intervening on behalf of a disgraced friend, he was banished from Madrid to his native province of Asturias. There he founded an institution to promote Asturian reform and completed his most influential work, *Informe de la sociedad economica de Madrid al real supremo consejo de Castilla en el expediente de ley agaria* (1795; "Report on . . . Agarian Law"). In it he argued for Spanish agricultural reform on the basis of liberal economic principles.

In 1797 Jovellanos served for eight months as minister of justice. His political views, especially his opposition to the Inquisition and advocacy of the emancipation of the Spanish national church from Rome, contributed to his fall and his imprisonment in Majorca in 1801. Released in 1808, he refused office under the French invaders and committed himself to the patriotic party. He then played an important role in the central junta, the national governmental group opposing the French, and played a part in convoking a Cortes, or national assembly. He believed in monarchical sovereignty but advocated a Cortes as a check on arbitrary regal power. After the dissolution of the central junta, he returned to Asturias, but died fleeing the province in the face of the French advance.

Joveynī, ʿAṭā Malek, more complete name ʿALĀʾ OD-DĪN ʿAṬĀ MALEK JOVEYNĪ, also spelled ʿALA AD-DĪN ʿAṬĀ MALEK JUWAYNĪ (b. 1226, Joveyn, Khorāsān—d. 1283, Azerbaijan), Persian historian. Joveynī was the first of several brilliant representatives of Persian historiography who flourished during the period of Mongol domination in Iran (1220–1336).

Born into a well-known and highly respected family of governors and civil servants, Joveynī gained knowledge of the workings of Mongol administrative machinery from his father and visited the Mongol Great Khan's court in Central Asia on two occasions, in 1249–51 and in 1251–53. Early in 1256 he entered the service of Hülegü, the grandson of Genghis Khan. After the fall of Baghdad in 1258, Joveynī was appointed governor of Iraq and Khūzistān, a position he held for more than two decades. On the death of Hülegü, in 1265, he fell from favour and lost much of his former influence. Joveynī's magnum opus, the *Tārīkh-i jehān-gushā* (*A History of the World Conqueror*, 2 vol., 1958), is one of the most important works of Persian historiography. Begun in 1252–53, the history includes sections on the Mongols' two principal Muslim enemies, the Khwārezm-Shāhs (995–1231) and the Ismāʿīlīs of Alamūt (1090–1256), as well as material on Genghis Khan and his successors up to the year 1256. In the compilation of this work, Joveynī drew upon his personal experiences in addition to written sources, many of which have since been lost. Written in an ornate and learned style, the *Tārīkh-i jehān-gushā* became a model of style and was emulated by later historians, thus gaining a position in Persian literary history as well.

Jovian, Latin in full FLAVIUS JOVIANUS (b. *c.* 331, Singidunum, Moesia Superior—d. Feb. 17, 364, Dadastana, Bithynia), Roman emperor from 363 to 364.

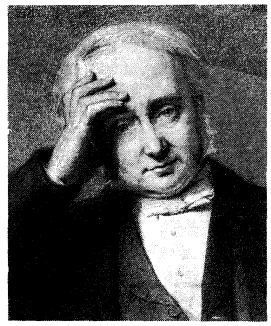
Jovian took part in the expedition of the emperor Julian against Sāsānian Persia and was proclaimed emperor by his troops after Julian was killed on June 26, 363. To extricate his army from Persia, the new ruler immediately concluded a peace, ceding to the Persians all Roman territory east of the Tigris River, together with the cities of Singara (modern Sinjār, Iraq) and Nisibis (modern Nusaybin, Turkey). Some of Jovian's contemporaries, believing that the army could have fought its way out, considered this treaty to be dishonourable.

As a Christian, Jovian suppressed the paganism that had been allowed to flourish under his predecessor. Magical practices were forbidden and gifts to churches restored. While still on his way from the frontier to Constantinople he died at Dadastana on the borders of Bithynia and Galatia and was buried in the church of the Holy Apostles in the capital. He was succeeded as emperor by Valentinian I.

Jovius, Paulus, also called PAOLO GIOVIO (b. April 19, 1483, Como, Milan—d. Dec. 10, 1552, Florence), Italian historian, author of vivid historical works in Latin, and the owner of a famous art collection.

In about 1513 Jovius settled in Rome; he won the favour of Leo X (who compared him to Livy) and of Cardinal Giulio de' Medici, later Clement VII, whom he helped during the sack of Rome in 1527. In 1528 Jovius became bishop of Nocera. He wrote a Latin history of Florence from 1494 to 1547, *Historiarum sui temporis libri XLV* (1550–52), and a series of lives of famous men. Though his work lacks depth and political interest, it is sparkling, elegantly written, and full of useful information. After Clement VII's death (1534), Jovius retired to a villa on Lake Como, where he invested the wealth he had acquired in antiquities, paintings, and curiosities. His collection was one of the first to include pieces from the New World.

Jowett, Benjamin (b. April 15, 1817, London—d. Oct. 1, 1893, Headley Park, Hampshire, Eng.), British classical scholar, considered to be one of the greatest teachers of the 19th century. He was renowned for his translations of Plato and as an outstanding tutor of great influence who became master of Balliol College, Oxford.



Jowett, detail of a drawing by Désiré-François Laugée, 1871; in Balliol College, Oxford
By courtesy of the Master and Fellows of Balliol College, Oxford; photograph, Thomas Photos

Jowett was educated at St. Paul's School, London, and Balliol. He was made a fellow at Balliol in 1838 and was appointed a tutor in the college in 1842, the year in which he was ordained an Anglican deacon. He was ordained priest three years later.

In 1855 Jowett finished his book *The Epistles of St. Paul.* His essay on the atonement was attacked as unorthodox, but in spite of strong opposition he was appointed regius professor of Greek, with an annual salary of £40. His contribution to *Essays and Reviews* (1860) caused his opponents to accuse him of heresy before the vice chancellor's court, but proceedings were eventually dropped. Nevertheless, attempts to augment his salary were opposed, and it was not until 1865 that Christ Church freed endowments to produce a stipend of £500 a year. During this period his lectures on the *Republic* stimulated intense interest in Plato.

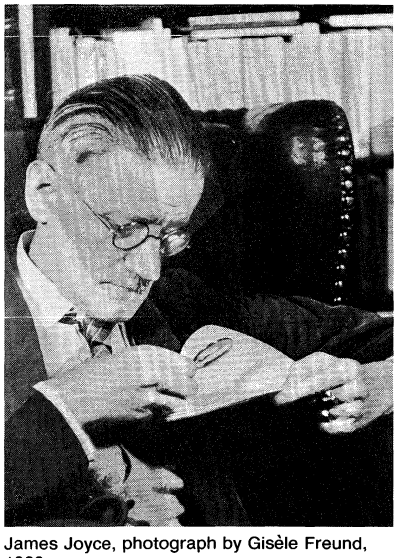
Jowett's election as master of Balliol in 1870 enabled him to rebuild a considerable portion of the college and to establish a hall for

noncollegiate students. During this period he published his translations of *The Dialogues of Plato* (1871) and of Thucydides' *History* (1881). As vice chancellor of the university (1882–86), he encouraged drama and music and completed his translation of Aristotle's *Politics.* His edition of the *Republic,* on which he had worked for 30 years, was published posthumously in 1894.

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Joyce, James (Augustine Aloysius) (b. Feb. 2, 1882, Dublin—d. Jan. 13, 1941, Zürich), Irish novelist noted for his experimental use of language and exploration of new literary methods in such large works of fiction as *Ulysses* (1922) and *Finnegans Wake* (1939). Joyce left Ireland in 1904 and spent the rest of his life in Trieste, Paris, and Zürich.

Early life and work. Joyce, the eldest of 10 children in his family to survive infancy, was sent at age six to Clongowes Wood College, a Jesuit boarding school that has been described as "the Eton of Ireland." Such evidence as survives suggests that he was happy there. But his father was not the man to stay affluent for long; he drank, neglected his affairs, and borrowed money from his office, and his family sank deeper and deeper into poverty. The children became accustomed to conditions of increasing sordidness, subject to visits from debt collectors, having household goods frequently in pawn, and often moving to another house, leaving the rent and tradesmen's bills unpaid. Joyce did not return to Clongowes after the summer vacation of 1891 but—apart from some months at a Christian Brothers' school, which he never afterward mentioned—stayed at home for the next two years and tried to educate himself, asking his mother to check



James Joyce, photograph by Gisèle Freund, 1939

Gisele Freund

his work. In April 1893 he and his brother Stanislaus were admitted, without fees, to Belvedere College, a Jesuit grammar school in Dublin. Joyce did well there academically and was twice elected president of the Marian Society, a position virtually that of head boy. He left, however, under a cloud, as it was thought (correctly) that he had lost his Roman Catholic faith.

He entered University College, Dublin, then staffed by Jesuit priests, although their control was limited by the Royal University Act of 1879. There he was taught neither theology nor philosophy; he studied languages, reserving his energies for extracurricular activities, reading widely—particularly in books not recommended by the Jesuits—and taking an active part in the college's Literary and Historical Society. Greatly admiring Henrik Ibsen, he learned Dano-Norwegian to read the original and had an article, "Ibsen's New Drama"—a review of *When We Dead Awaken*—published in the London *Fortnightly Review* in 1900 just after his 18th birthday. This early success confirmed Joyce in his resolution to become a writer and persuaded his family, friends, and teachers that the resolution was justified. In October 1901 he published an essay, "The Day of the Rabblement," attacking the Irish Literary Theatre (later the Dublin Abbey Theatre) for catering to popular taste. Joyce had previously supported the theatre and had refused to join a students' protest against the "heresy" of William Butler Yeats's *Countess Cathleen.*

He was leading a dissolute life at this time but worked sufficiently hard to pass his final examinations, matriculating with "second class honours in Latin" and obtaining the degree of B.A. on Oct. 31, 1902. Never did he relax his efforts to master the art of writing. He wrote verses and experimented with short prose passages that he called "epiphanies." The word means the manifestations, by the gods, of their divinities to mortal eyes; but Joyce used it to describe his accounts of moments when the real truth about some person or object was revealed. His experiments were useful in helping him to develop a concise style while recording accurate observation.

To support himself while writing, he decided to become a doctor, but, after attending a few lectures in Dublin, he borrowed what money he could and went to Paris. After a fortnight there, during which he found that fees were payable in advance and his Dublin qualifications insufficient, he returned home for a month's holiday. On returning to Paris, he abandoned the idea of medical studies, wrote some book reviews, and, on the proceeds of these and of a few English lessons, with small remittances from his mother, he studied in the Sainte-Geneviève Library and compiled notes on a theory of aesthetics he was evolving from Aristotle, St. Thomas Aquinas, and Gustave Flaubert.

Recalled home in April 1903 because his mother was dying, he tried various occupations, including teaching, and lived at various addresses, including the Martello Tower at Sandycove, now Ireland's Joyce Museum. He had begun writing a lengthy naturalistic novel, *Stephen Hero,* based on the events of his own life, when in 1904 George Russell offered £1 each for some simple short stories with an Irish background to appear in a farmers' magazine, *The Irish Homestead.* In response Joyce began writing the stories published as *Dubliners* (1914). Three stories, "The Sisters," "Eveline," and "After the Race," had appeared under the pseudonym Stephen Daedalus before the editor decided that Joyce's work was not suitable for his readers. Meanwhile Joyce had met a girl named Nora Barnacle, with whom he fell in love on June 16, the day that he chose as what is known as "Bloomsday" (the day of his novel *Ulysses*). Eventually he persuaded her to leave Ireland with him, although he refused, on principle, to go through a ceremony of marriage.

Trieste—1905. Joyce and Nora left Dublin together in October 1904. Joyce obtained a position in the Berlitz School, Pola, Austria-Hungary, working in his spare time at his novel and short stories. In 1905 they moved to Trieste, where James's brother Stanislaus joined them and where their children, George and Lucia, were born. In 1906–07, for eight months, he worked at a bank in Rome, disliking almost everything he saw. Ireland seemed pleasant by contrast; he wrote to Stanislaus that he had not given credit in his stories to the Irish virtue of hospitality and began to plan a new story, "The Dead." The early stories were meant, he said, to show the paralysis from which Dublin suffered, but they are written with a vividness that arises from his success in making every word and every detail significant. His studies in European literature had interested him in both the Symbolists and the Realists; his work began to show a synthesis of these two rival movements. He decided that *Stephen Hero* lacked artistic control and form and rewrote it as "a work in five chapters" under a title—*A Portrait of the Artist as a Young Man*—intended to direct attention to its focus upon the central figure.

In 1909 he visited Ireland twice to try to publish *Dubliners* and set up a chain of Irish cinemas. Neither effort succeeded, and he was distressed when a former friend told him that he had shared Nora's affections in the summer of 1904. Another old friend proved this to be a lie. Joyce's reactions can still be read in a series of letters now in the Cornell University Library. Only the milder passages could be published in the "collected" *Letters of James Joyce;* the series as a whole includes some of the most astonishing examples of erotica ever written. Joyce always felt that he had been betrayed, and the theme of betrayal runs through much of his later work.

Zürich—1915. When Italy declared war in 1915 Stanislaus was interned, but James and his family were allowed to go to Zürich. At first, while he gave private lessons in English and worked on the early chapters of *Ulysses*—which he had first thought of as another short story about a "Mr. Hunter"—his financial difficulties were great. He was helped first by a grant of £75 from the Royal Literary Fund; then by a large grant from Edith Rockefeller McCormick; and finally by a series of grants from Harriet Shaw Weaver, editor of the *Egoist* magazine, which by 1930 had amounted to more than £23,000. Her generosity resulted partly from her admiration for his work and partly from her sympathy with his difficulties, for, as well as poverty, he had to contend with eye diseases that never really left him. From February 1917 until 1930 he endured a series of 25 operations for iritis, glaucoma, and cataracts, sometimes being for short intervals totally blind. Despite this he kept up his spirits and continued working, some of his most joyful passages being composed when his health was at its worst.

Unable to find an English printer willing to set up *A Portrait of the Artist* for book publication, Weaver published it herself, having the sheets printed in the United States, where it was also published, on Dec. 29, 1916, by B.W. Huebsch, in advance of the English Egoist Press edition. Encouraged by the acclaim given to this, in March 1918, the American *Little Review* began to publish episodes from *Ulysses,* continuing until the work was banned in December 1920.

Paris—1920. After World War I Joyce returned for a few months to Trieste, then—at the invitation of Ezra Pound—in July 1920 he went to Paris. *Ulysses* was published there on Feb. 2, 1922, by Sylvia Beach, proprietor of a bookshop called "Shakespeare & Co." The book, already well-known because of the censorship troubles, became immediately famous. Joyce had prepared for its critical reception by having a lecture given by Valery Larbaud who pointed out the Homeric correspondences in it and that "each episode deals with a particular art or science, contains a particular symbol, represents a special organ of the human body, has its particular colour . . . proper technique, and takes place at a particular time." Joyce never published this scheme; indeed, he even deleted the chapter titles in the book as printed. It may be that this scheme was more useful to Joyce when he was writing than it is to the reader. Sometimes the technical de-

vices become too prominent, particularly in the much-praised "Oxen of the Sun" chapter (II, 11) where the language goes through every stage in the development of English prose from Anglo-Saxon to the present day to symbolize the growth of a fetus in the womb. The execution is brilliant, but the process itself seems ill-advised. More often the effect is to add intensity and depth, as, for example, in the "Aeolus" chapter (II, 4) set in a newspaper office, with rhetoric as the "art." Joyce inserted into it hundreds of rhetorical figures and many references to winds—something "blows up" instead of happening, people "raise the wind" when they are getting money—and the reader becomes aware of an unusual liveliness in the very texture of the prose. The famous last chapter, in which we follow the stream of consciousness of Molly Bloom as she lies in bed, gains much of its effect from being written in eight huge unpunctuated paragraphs. Nevertheless, the main strength of the book lies in its depth of character portrayal and its breadth of humour.

In Paris Joyce worked on *Finnegans Wake,* the title of which was kept secret, the novel being known simply as "Work in Progress" until it was published in its entirety in May 1939. In addition to his chronic eye troubles Joyce suffered great and prolonged anxiety over his daughter's mental health. What had seemed her slight eccentricity grew into unmistakable and sometimes violent mental disorder that Joyce tried by every possible means to cure, but it became necessary finally to place her in a mental hospital near Paris. In 1931 he and Nora visited London, where they were married, his scruples on this point having yielded to his daughter's complaints.

Meanwhile he wrote and rewrote sections of his new book; often a passage was revised more than a dozen times before he was satisfied. Every word, every letter was scrutinized and pondered over. He usually began with a simple narrative. Basically the book is, in one sense, the story of a publican in Chapelizod, near Dublin, his wife, and their three children; but Mr. Humphrey Chimpden Earwicker, Mrs. Anna Livia Plurabelle, Shem, Shaun, and Isabel are every family of mankind, the archetypal family about whom all mankind is dreaming. The 18th-century Italian Giambattista Vico provides the basic theory that history is cyclic; to demonstrate this the book begins with the end of a sentence left unfinished on the last page. It is thousands of dreams in one. Languages merge: Anna Livia has "vlossyhair"—*włosy* being Polish for "hair"; "a bad of wind" blows; *bâd* being Turkish for "wind." Characters from literature and history appear and merge and disappear as "the intermisunderstanding minds of the anticollaborators" dream on. On another level, the protagonists are the city of Dublin and the River Liffey which flows enchantingly through the pages, "leaning with the sloothering slide of her, giddygaddy, grannyma, gossipaceous Anna Livia." And throughout the book Joyce himself is present, joking, mocking his critics, defending his theories, remembering his father, enjoying himself.

After the fall of France in World War II (1940), Joyce took his family back to Zürich, where he died, still disappointed with the reception given to his last book. He would be pleased to know that, of the two periodicals now dealing exclusively with his work, one is entirely devoted to *Finnegans Wake.*

(J.S.A./Ed.)

MAJOR WORKS. *Novels and stories: Dubliners* (1914), 15 short stories; *A Portrait of the Artist as a Young Man* (1916); *Ulysses* (1922), see also Hans Walter Gabler, ed., *Ulysses: A Critical and Synoptic Edition,* 3 vol. (1984), with notes on the text, which claims to correct approximately 5,000 errors that appeared in the first edition and were carried to all following editions (this claim has been rejected and the new edition discredited by other scholars); *Finnegans Wake* (1939), sections published as parts of *Work in Progress* from 1928 to 1937.

Verse: Chamber Music (1907); *Pomes Penyeach* (1927); *Collected Poems* (1936).

Play: Exiles (1918).

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Science of symbolism in chapters of *Ulysses*

title	time	scene	bodily organ	art
I. Telemachia				
1 Telemachus	8 AM	tower	—	theology
2 Nestor	10 AM	school	—	history
3 Proteus	11 AM	shore	—	philology
II. Ulysses				
1 Calypso	8 AM	house	kidney	economics
2 Lotus Eaters	10 AM	bath	genitals	botany, chemistry
3 Hades	11 AM	graveyard	heart	religion
4 Aeolus	Noon	newspaper office	lungs	rhetoric
5 Lestrygonians	1 PM	lunch	esophagus	architecture
6 Scylla & Charybdis	2 PM	library	brain	literature
7 Wandering Rocks	3 PM	streets	blood	mechanics
8 Sirens	4 PM	concert room	ear	music
9 Cyclops	5 PM	tavern	muscle	politics
10 Nausicaa	8 PM	rocks	eye, nose	painting
11 Oxen of the Sun	10 PM	hospital	womb	medicine
12 Circe	Midnight	brothel	locomotor apparatus	magic
III. Nostos (Homecoming)				
1 Eumeus	1 AM	shelter	nerves	navigation
2 Ithaca	2 AM	house	skeleton	science
3 Penelope	—	bed	flesh	—

Joyce, William, byname LORD HAW-HAW (b. April 24, 1906, New York City—d. Jan. 3, 1946, London), English-language propaganda broadcaster from Nazi Germany during World War II whose nickname derived from the sneering manner of his speech.

Though his father was a naturalized U.S. citizen, Joyce lived most of his life in Ireland and England. He was active in Sir Oswald Mosley's Fascist organization and was also a cofounder of the National Socialist League. In 1938 Joyce obtained a British passport, claiming to be a British subject. The passport was renewed in August 1939, the month in which Joyce went to Germany to offer his services to Josef Goebbels' Nazi propaganda ministry. His broadcasts to England occasioned amusement more than they sapped morale, but after his arrest in May 1945 he was tried for treason. Though he had never been a British subject, the prosecution argued that he owed his allegiance to Great Britain while in possession of a passport. Joyce was found guilty and hanged.

Joyeuse Entrée, in full JOYEUSE ENTRÉE DE BRABANT (Jan. 3, 1356), charter of liberties granted to the duchy of Brabant, in the Low Countries, confirming the rights of its States (assemblies) and of the towns; this charter inspired the other regions of the Netherlands in coming centuries to resist absolutism.

The charter commemorated a new prince's ceremonial first visit—traditionally the occasion for granting or confirming privileges—known as the *joyeuse entrée* (French: "joyous entry"); in this most famous instance, the visit was made by the popular Duchess Johanna and her husband Duke Wenceslas at the time of their accession. The charter was meant to ensure that Wenceslas, a Luxembourger, would respect Brabanter rights. Its articles guaranteed the indivisibility of Brabant, maintenance of public roads, internal free trade, due process of law, and the advice and consent of the States on questions of coinage and of war and peace. It also confirmed the right of the citizens of the duchy to abjure allegiance to any sovereign failing to adhere to its articles.

Jōyō Daishi (Buddhist monk): *see* Dōgen.

József (Hungarian personal name): *see under* Joseph.

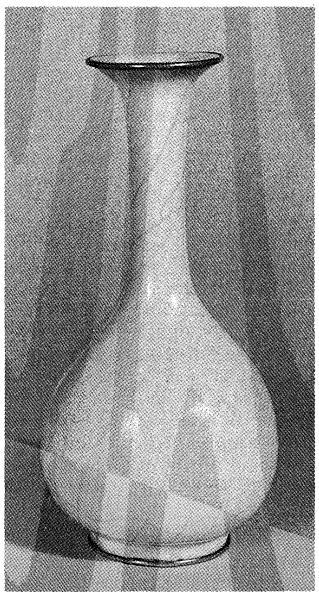
József, Attila (b. April 11, 1905, Budapest—d. Dec. 3, 1937, Balatonszárszó, Hung.), one of the greatest Hungarian poets of the 20th century. Although his first poems were published when he was 17, real renown came only after his death.

József was attracted by Marxist ideology and became a member of the then-illegal Communist Party. In 1932 he launched a short-lived literary periodical, *Valóság,* and in 1936 became one of the cofounders of the review *Szép Szó.* In his own poetry József presented intimate pictures of proletarian life. He immortalized his mother, a poor washerwoman, and made her a symbol of the working class. He created a style of melancholy realism, infused with irrationality, through which he was able to express the complex feelings of modern men and reveal his own faith in life's essential beauty and harmony.

JTSA: *see* Jewish Theological Seminary of America.

Ju Shui (China): *see* Luan River.

Ju ware, Pinyin RU, in Chinese pottery, buff or pinkish-yellow, soft-bodied stoneware, with a soft, dense, greenish-blue, sometimes crackled, glaze. It was made during the Northern Sung period at Ju-chou (now Lin-ju), Honan Province, where the kilns were thought



Ju stoneware bottle with crackled glaze, Northern Sung period; in the Percival David Foundation of Chinese Art

By courtesy of the Percival David Foundation of Chinese Art

to have opened in 1107 and to have stopped production at the time of the flight to the South (1127), after Emperor Hui-Isung's capture by Tatars. It was not reproduced in the Southern Sung period. Only 30 authenticated pieces survive.

Juan (Spanish personal name): *see under* John, except as below.

Juan DE AUSTRIA, also called DON JUAN DE AUSTRIA, English DON JOHN OF AUSTRIA (b. Feb. 24, 1547, Regensburg, Ger.—d. Oct. 1, 1578, Bouges, near Namur, Spanish Netherlands), illegitimate son of the Holy Roman emperor Charles V and half brother of King Philip II of Spain who, as a Spanish military commander, achieved victory over the Turks in the historic naval Battle of Lepanto.

Removed from his mother, a burgher's daughter, at an early age, he was brought up in concealment in Spain. After the death of Charles, Philip II of Spain recognized him as his half brother, provided him with a substantial household, and gave him the name Don Juan de Austria (1559).

Though it was hoped that he would enter the church, the handsome and spirited Don Juan expressed a desire to embark on a military career, and Philip acceded to his wishes. In the summer of 1568 Don Juan had his first brief experience in warfare, fighting Moorish pirates in the Mediterranean, and he was then appointed in March 1569 commander in chief of Spanish forces attempting to subdue the Moriscos, or Christians of Moorish ancestry, in Granada. Philip then appointed him in 1571 to head the naval forces of the Holy League of Spain, Venice, and the pope against the Turks in the eastern Mediterranean.

By the prestige of his royal name, and by his enthusiasm, Don Juan was able to impose a temporary unity of purpose on the quarrelling admirals of the league, and to form the several fleets into an effective fighting unit. In the Battle of Lepanto (Oct. 7, 1571) the allies virtually annihilated the Turkish forces, thereby destroying the myth of Turkish invincibility. The victory of Lepanto also fired Don Juan's personal ambitions for further campaigns against the Turks, but Philip would only allow him to conquer Tunis (1573). The city was, however, reconquered again by the Turks the following year.

For several years Don Juan continued to chafe under the restraints his prudent brother imposed upon him, but in 1576 he was appointed governor general of the Netherlands, then in open revolt against Spanish authority. Don Juan was at first reluctant to accept this difficult post and took it only on condition that he would be allowed to invade England and wed Mary Stuart, the Scottish queen then in captivity in England. In the Netherlands he signed the Perpetual Edict with the rebels (February 1577), by which, in exchange for rebel recognition of Don Juan as governor and restoration of the Catholic religion, Spanish troops were to be removed. The provinces of Holland and Zeeland did not accept the return to Catholicism, and refused to recognize Don Juan's authority. Don Juan then assumed the more congenial role of soldier and resumed the war by capturing Namur.

Don Juan's last months were marred by the murder of his secretary, Juan de Escobedo, who had aroused Philip's enmity. The monarch's complicity in the crime was strongly suspected. Don Juan felt that he had lost his brother's confidence and was also hampered in his war in the Netherlands by lack of adequate financial and military backing.

Juan Carlos, in full JUAN CARLOS ALFONSO VICTOR MARÍA DE BORBÓN Y BORBÓN (b. Jan. 5, 1938, Rome), king of Spain from Nov. 22, 1975, acceding to the throne two days after the death of Francisco Franco.

Juan Carlos was the grandson of the last king, Alfonso XIII, who left Spain in 1931 and died in exile 10 years later, after renouncing his rights in favour of his third son, Juan Carlos Teresa Silverio Alfonso de Borbón y Battenberg, conde de Barcelona (1913–), popularly known as Don Juan. (Alfonso's eldest son had been killed in an auto accident, and his second son had renounced his rights in 1933 for medical reasons.) Don Juan married María de las Mercedes de Borbón y Orleans, and their elder son was Juan Carlos.

Juan Carlos spent his early years in Italy and first came to Spain in 1947 for his education. After his father suggested in 1945 that Franco should step down as leader of the country and generally began opposing Falangist policies, Franco grew resentful and turned with increasing interest to Juan Carlos and his education, especially his military education. In 1955 he entered the Academia General Militar at Zaragoza and later attended the Escuela Naval Militar at Marín in Pontevedra, the Academia General del Aire at San Javier in Murcia, and the University of Madrid.

A 1947 law had abolished the republic and established Spain as a "representative monarchy," but the country remained, throughout Franco's lifetime, without a monarch. Finally, on July 22, 1969, Franco presented to the Cortes (parliament) a law designating Juan Carlos the future king of Spain. Two events facilitated the move: In December 1968 the Carlist pretender, Carlos Hugo de Borbón-Parma, had been expelled from the country; and on Jan. 7, 1969, Juan Carlos said for the first time that he would accept the throne if offered (previously he had maintained that his father's claim preceded his own).

Although the Prince in 1969 swore loyalty to Franco's Movimiento Nacional, he demonstrated far more liberal and democratic principles after his accession in 1975, encouraging the revival of political parties and amnesty for political prisoners. In 1981 Juan Carlos took swift action to deflate a military coup which threatened to topple Spain's democracy and return the government to Franconian reactionary lines; in doing so, he alienated the military sector but preserved the state of democracy that made possible the accession of a Socialist government in late 1982. Also, a liberal divorce law was passed in 1981 and a law granting limited abortion rights in 1983.

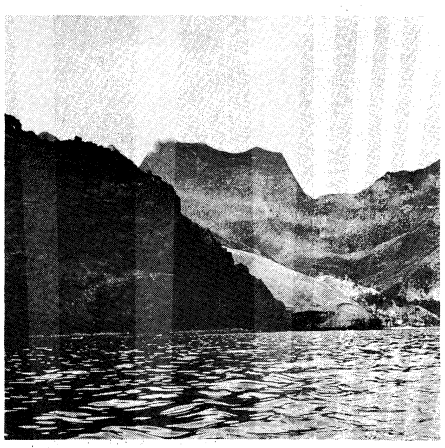
In 1981 Juan Carlos became the first Spanish king to visit the Americas and was the first crowned monarch to make an official visit to the People's Republic of China; in so doing, he became the first Spanish head of state to visit a Communist country. In 1982 Spain entered NATO, and in that year Juan Carlos was awarded the International Charlemagne Award for major contributions toward a united Europe.

Juan Carlos was married in Athens on May 14, 1962, to Princess Sophia of Greece, daughter of King Paul. They had two daughters, Elena and Christina, and a son, Felipe.

Juan de Fuca Strait, narrow passage, 11–17 mi (18–27 km) in width, of the eastern North Pacific Ocean, between the Olympic Peninsula of Washington state, U.S., and Vancouver Island, British Columbia, Can. Part of the United States–Canadian international boundary lies in mid-channel.

From Cape Flattery and the open Pacific, the strait stretches 80–100 mi east to join with Haro Strait and touches Whidbey Island, which blocks the entrance to Puget Sound (south). Mid-channel depths decrease from 900 ft (275 m) at its Pacific entrance to 300 ft in the east. Tidal movements are complicated by northward-moving flood tides from the Pacific coast of Washington entering the strait during part of the time when a conflicting westward-flowing ebb tide is going out. Tidal rips are common off points and over shallows. Strong west or southwest winds are also common. The strait, which is named for a Greek who sailed in the service of Spain and may have visited the passage in 1592, is used by ships bound for Vancouver and Seattle. Settlements along its banks include Victoria, B.C. (northeast) and Port Angeles, Wash. (southeast).

Juan Fernández Islands, Spanish ISLAS JUAN FERNÁNDEZ, small cluster of islands in the South Pacific Ocean, about 400 mi (650 km) west of and administratively part of Valparaíso region, Chile. They consist of the 36-sq-mi (93-sq-km) Isla Más a Tierra (Nearer Land Island, also called Isla Róbinson Crusoe); the 33-sq-mi Isla Más Afuera (Farther Out Island, also called Isla Alejandro Selkirk), 100 mi to the west; and an islet, Isla Santa Clara, southwest of Isla Más a Tierra. The islands are volcanic peaks rising from the Juan



The rugged coast of Isla Más a Tierra, one of the Juan Fernández Islands, Chile

Moore—W.H. Hodge

Fernández submarine ridge. Más a Tierra has a summit 3,002 ft (915 m) above sea level, and Más Afuera rises to 5,415 ft. Bahía Cumberland (Cumberland Bay), on the northern side of Más a Tierra, and Bahía Padre, at the western extremity, are the only fair anchorages.

The islands were discovered about 1563 by Juan Fernández, a Spanish navigator, who received a grant and lived there for some years, stocking them with goats and pigs. After his departure, the islands were visited only occasionally. In 1704, however, Alexander Selkirk (*q.v.*), a Scottish seaman, quarrelled with his captain and demanded to be put ashore at Bahía Cumberland. He remained there alone until 1709 and his adventures are commonly believed to have inspired Daniel Defoe's *Robinson Crusoe.* The islands passed into Chilean possession in the early 19th century. Since then, they have been used as penal settlements on many occasions, particularly for political prisoners. Isla Santa Clara is now uninhabited. Más a Tierra and Más Afuera are sparsely populated, most of their inhabitants being concentrated in the village of Róbinson Crusoe on Bahía Cumberland. Their principal occupation is fishing for lobsters. Pop. (1982 prelim.) 516.

Juan José DE AUSTRIA, English JOHN JOSEPH OF AUSTRIA (b. April 7, 1629, Madrid—d. Sept. 17, 1679, Madrid), the most famous of the illegitimate children of King Philip IV of Spain. He served with some success as a Spanish military commander and from 1677 until his death was chief minister to King Charles II.

Juan José was the son of King Philip IV of Spain and María Calderón, a celebrated actress. He received a princely education and a large income and obtained his first military command in 1647, when he was sent to the Spanish-ruled kingdom of Naples to crush a popular uprising. In 1651 he led the royal forces besieging Barcelona, capital of the rebellious province of Catalonia, and negotiated the terms for its surrender (October 1652). From 1656 to 1658, as governor of the Netherlands, he enjoyed varying success as military commander. Recalled to campaign against the rebellious Portuguese, he was initially victorious but was ultimately defeated at Amexial (June 8, 1663) and relieved of his command. His offensive intimation of his ambition to succeed his father scandalized the King, and he was out of favour at the time of Philip's death in September 1665.

Juan José played an active part in the political intrigues that marked the minority of the feeble new king, his half brother, Charles II. In 1669 he headed a military uprising that forced the queen regent, Mariana, to dismiss her favourite and confessor, Father John Nithard. In early 1677, he drove Mariana and her new favourite, Fernando de Valenzuela, from court and established himself as first minister.

Though highly popular and widely regarded as the saviour of his country, the arrogant and paranoid Juan José soon lost support by his intrigues and his attempts to advance his own prestige, while paying scant attention to compelling public needs. During his tenure the Treaty of Nijmegen was signed with France (1678), which resulted in territorial losses and marked a further decline in Spain's international standing. Shortly before his death, Juan José arranged the ill-fated marriage of Charles II to Marie-Louise of Orléans, niece of the French king Louis XIV, but when he died Juan José's influence was declining, and his reputation badly tarnished.

Juan-juan, also spelled JWEN-JWEN, JOU-JAN, JEU-JEN, or GEOUGEN, Central Asian people of historical importance. Because of the titles of their rulers, *khan* and *khagan,* scholars believe that the Juan-juan were Mongols or Mongol-speaking peoples. The empire of the Juan-juan lasted from the beginning of the 5th century AD to the middle of the 6th century, embracing a wide belt north of China from Manchuria to Turkistan. They were allies of the Hephthalite, or "White," Huns and were in continuous conflict with the Wei dynasty of northern China. In 552 the Turkish tribes living within the empire rebelled and, in alliance with the Wei, destroyed the Juan-juan. Many scholars believe that the Avars, who appeared in Europe in about 558, were remnants of the Juan-juan.

Juan Manuel, Don (b. May 5, 1282, Escalona, New Castile—d. 1348, Córdoba), nobleman and man of letters who has been called the most important prose writer of 14th-century Spain.

The infante Don Juan Manuel was the grandson of Ferdinand III and the nephew of Alfonso X. He fought against the Moors when only 12 years old, and the rest of his life was spent deeply involved in the political intrigues of his time.

Don Juan Manuel is best known for his *Libro de los enxiemplos del conde Lucanor et de Patronio* (1328–35; *Count Lucanor: or, The Fifty Pleasant Stories of Patronio,* 1868), a treatise on morals in the form of 50 short tales, in which Count Lucanor asks questions of his counsellor. The work was written in a lucid and straightforward manner, with an informal and personal prose style, almost completely free of the usual ornate language of the day. It greatly influenced the development of Spanish prose, setting a standard for writers who followed. Of Manuel's 12 books, several are lost. Outstanding among his extant works are *Libro de los estados* ("The Book of States"), a treatise on politics, and *Libro del caballero y del escudero* ("The Book of the Knight and the Squire"), a treatise on society.

Juana (Spanish personal name): *see under* Joan.

Juaneño, ethnolinguistic group of North American Indians of whom no identifiable evidence now exists. The Juaneño originally inhabited a coastal region of southwestern California, near what became the site of the mission San Juan Capistrano, for which the group was named. Their language, also called Juaneño, was a variant of Luiseño, and was included in the Uto-Aztecan language family.

The culture of the Juaneño developed partly under the influence of their northern neighbours, the Gabrieleño. It was from them, for instance, that the Juaneño acquired the cult of the hallucinogenic jimsonweed (*Datura stramonium*) and, in turn, passed it on to the Luiseño.

The Juaneño lived in dwellings made of brush and other plant material and, for food, gathered acorns and other plants, fished, and gathered shellfish. The organization of Juaneño society is not clearly understood. Each village, however, is known to have had a chief, who was accorded a great deal of official respect and deference, though his actual power may have been limited. As among other Indians in southern California, transvestism and homosexuality were socially encouraged. A boy who showed such tendencies was prompted to develop and manifest them. Male transvestites were appreciated as hard workers and often married.

Juárez, formerly CIUDAD JUÁREZ, city, northern Chihuahua state, Mexico, on the Rio Grande (Río Bravo del Norte), opposite El Paso, Texas, with which it is connected by two bridges. It contains the Guadalupe mission, built in 1659, and many modern buildings. Formerly known as El Paso del Norte, it was renamed in 1888 for the Mexican president Benito Juárez, who headquartered there in 1865 during his struggle against the French. The city's importance is due to its border position and its function as the marketing centre for a cotton-growing area. It is a northern terminus of the National Railways of Mexico and has a large transit trade with the United States.



Mission of Nuestra Señora de Guadelupe, Juárez, Mex.

Walter Aguiar—EB Inc.

The meanders of the river between Juárez and El Paso resulted in the century-long El Chamizal border dispute between the United States and Mexico, finally settled in 1963 with the exchange of small portions of territory and formalized in 1967. The Autonomous University of Ciudad Juárez was established in 1973. Pop. (1979 est.) 620,000.

Juárez, Benito (Pablo) (b. March 21, 1806, San Pablo Guelatao, Oaxaca, Mex.—d. July 18, 1872, Mexico City), national hero of Mexico, president of Mexico (1861–72), who, for three years (1864–67), fought against foreign occupation under the emperor Maximilian and who sought constitutional reforms to create a democratic federal republic.



Juárez

By courtesy of the Library of Congress, Washington, D.C.

Early career. Juárez was born of Indian parents, both of whom died when he was three years old. When he was 12 he left the uncle who was caring for him and joined his sister in the city of Oaxaca, where he began his formal education.

He originally studied for the priesthood, but in 1829 he entered the Oaxaca Institute of Arts and Sciences to study law and science. In 1831 he received his law degree and also won his first public office, a seat on the mu-

nicipal council. Impeccably honest, he never used public office for personal gain, and his modest way of life reflected his simple tastes even after his marriage in 1843 to Margarita Maza, a Oaxaca girl 17 years younger than he. Politics soon became his life's work: he was a member of both the state and national legislatures, he became a judge in 1841, and he served as governor of his state, a post that brought him into national prominence.

During these years in politics Juárez began to formulate solutions for his country's many problems. The road to economic health, he concluded, lay in substituting capitalism for the stifling economic monopoly held by the church and the landed aristocracy. He also believed that political stability could be achieved only through the adoption of a constitutional form of government based on a federal system.

But the return of the conservatives to power in the elections of 1853 doomed imminent reform. Many prominent liberals were exiled, including Juárez. From December 1853 until June 1855 he lived in New Orleans in the United States in semipoverty, occupying himself by exchanging ideas with other Mexicans and laying plans to return home. The opportunity to put his ideas into action finally came in 1855 when the liberals took control of the national government, and Juárez left the United States to join the new administration as minister of justice and public instruction.

The liberals carried out three major reforms, all supported by Juárez. As minister of justice he was responsible for the law bearing his name that abolished special courts for the clergy and military, for he felt that juridical equality would help promote social equality. In June 1856 the government published the Ley Lerdo (called after the minister of finance), which, although it forced the church to sell its property, contained no threat of confiscation. By breaking up large landed estates, the government hoped that many Mexicans would be able to acquire property and thus create the middle class that it believed was essential for a strong and stable Mexico. The climax of the reform was the liberal constitution promulgated in February 1857.

In the same year, Ignacio Comonfort was elected president, and the new Congress chose Juárez to preside over the Supreme Court and therefore, according to the constitution, also to serve as the effective vice president of Mexico. The court position was critical in determining his future career, for when the conservatives revolted and ousted Comonfort in January 1858, Juárez had a legal claim to the presidency. Lacking troops to control the area around Mexico City, however, he retired to the eastern port city of Veracruz.

At Veracruz Juárez faced serious difficulties, for he had to create a government and hold it together through quarrels, betrayals, and defeat; to enforce and implement the constitution; to maintain armies in the field and defeat the conservative forces. But he was an extraordinarily tenacious and self-sufficient man, able to concentrate his energy and interest, and he proved himself the master of his government.

Because the clergy was supporting the conservatives against the legal government, Juárez enacted several laws to curb ecclesiastical power. He nationalized all church property, exempting only those buildings actually used for worship and instruction. To weaken clerical influence still further, he also nationalized the cemeteries and put birth registrations and marriages under the civil authority. Finally, the government separated church and state and guaranteed religious liberty to all citizens.

Presidency. By late 1860 the conservatives were faltering, and in January 1861 Juárez was able to return to Mexico City and was constitutionally elected president. He was, however, faced with many serious problems: the opposition's forces still remained intact, the new Congress distrusted its president, and the treasury was virtually empty. As a solution to this latter problem Juárez decided in July 1861 to suspend payment on all foreign debts for two years. To safeguard their investments, England, Spain, and France decided to intervene, and by January 1862 the three countries had landed troops at Veracruz. But when Britain and Spain realized that Napoleon III intended to conquer Mexico and control it through a puppet, Archduke Maximilian of Austria, they withdrew their forces. Despite a major defeat at Puebla on May 5, 1862, reinforcements enabled the French to occupy Mexico City in June 1863, and Maximilian soon followed to take control of the government.

Forced to leave the capital again, Juárez kept himself and his government alive by a long series of retreats that ended only at Ciudad Juárez at the Mexican-U.S. border. Early in 1867, as a result of continued Mexican resistance, increased U.S. pressure, and criticism at home, Napoleon decided to withdraw his troops. Soon afterward, Mexican forces captured Maximilian and executed him.

Juárez then made the greatest mistake of his political eareer. In August 1867, shortly after his return to Mexico City, he issued a call for national elections and for a referendum on whether Congress should make five amendments to the constitution. Public opinion did not object to the President's running for reelection, but the constitutional changes aroused immediate and violent reaction in many quarters, including those sympathetic to Juárez. Both procedure and content of his proposed changes came under fire because amendments enacted by Congress alone were unconstitutional, and the changes would strengthen the executive power. Juárez was reelected, but the controversy had created such a crisis of confidence that the administration did not even bother to count the votes on the amendments.

Despite illness and personal loss—in October 1870 Juárez suffered a stroke and three months later his wife died—he decided to run again in 1871. After a bitter campaign he was reelected, but many of his countrymen, refusing to accept the result as final, took up arms against him. Juárez spent the last few months of his life trying to restore peace. He died of a heart attack in 1872.

Assessment. Juárez' political rise was a continual struggle to transform his liberal ideas into a permanent political reality and to overcome the prevalent social attitudes toward his Indian background. Only in the 20th century did the Mexicans come to admire and respect their Indian heritage; the prejudices of the 19th century serve to emphasize and enhance Juárez' extraordinary qualities and achievements. His domestic reforms, which freed Mexico from the most flagrant remnants of neocolonialism, and his leadership against the French earned Juárez his place in the national pantheon. (W.V.S.)

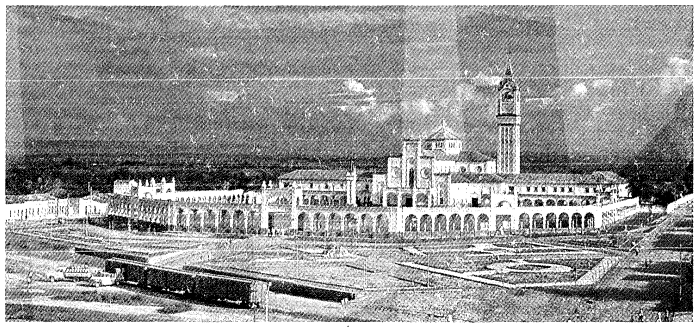
BIBLIOGRAPHY. The best general work on Juárez is Ralph Roeder, *Juarez and His Mexico,* 2 vol. (1947, reprinted 1968). The best biography, although uncritical, is Charles A. Smart, *Viva Juarez* (1963, reprinted 1975), with Juárez' important autobiographical essay, "Notes for My Children." Walter V. Schales, *Mexican Politics During the Juarez Regime, 1855–1872* (1969), is a study of the domestic aspects of the Juárez government.

Juàzeiro, city, northern Bahia state, northeastern Brazil, on the São Francisco River, at 1,224 ft (373 m) above sea level. Juàzeiro became a city in 1878. It is the trade and transportation centre for an agricultural and livestock-raising region that is one of the driest areas of Brazil.

From Juàzeiro southward to Pirapora in Minas Gerais state, the upper course of the São Francisco River is navigable for shallow-draft river vessels. Goods are also transported by rail and highway to coastal Aracaju, 275 mi (443 km) southeast (in Sergipe state), to Petrolina, across the river (there bridged) in Pernambuco state, and to neighbouring communities in Bahia. Pop. (1980 prelim.) 60,940.

Juàzeiro do Norte, city, southern Ceará state, northeastern Brazil, lying in the interior uplands, at 1,310 ft (400 m) above sea level. Located at the foot of the 2,953-ft Chapada do Araripe, Juàzeiro do Norte and Crato are the dominant urban areas of northern Brazil's interior.

Juàzeiro do Norte was given city status in 1914. Its economy depends primarily on sugar milling and cotton processing. Cereal grains are also grown in the area. The city (about 20 mi [32 km] east of Crato) is on the Fortaleza–Crato railroad and has highway connections with nearby communities in Ceará, Pernambuco, and Paraíba states. It has an airport. Pop. (1980 prelim.) 125,248.



São Francisco Sanctuary, Juàzeiro do Norte, Braz.
Plessner International

Jūbā, town, capital of al-Istiwā'īyah ash-Sharqīyah *mudīrīyah* (province) and Southern Region, southern Sudan, located at an elevation of about 1,500 ft (460 m). It is a port on the west bank of the Baḥr (river) al-Jābal, about 87 mi (140 km) south of Bor. Jūbā is a commercial centre for tobacco, coffee, and chillies produced in the surrounding agricultural area. It is a southern terminus for river traffic in The Sudan, and it is also a highway hub, with roads radiating into Uganda, Kenya, and Zaire. It has a domestic airport and three branch banks. Jūbā is the headquarters of the University of Jūbā, founded in 1975.

At a conference in Jūbā in 1947, representatives of the northern and southern parts of The Sudan agreed to unify the country, thus dashing Britain's hopes of adding the southern part of the country to Uganda. As the headquarters of southern Sudan, Jūbā became the spearhead of southern resistance to alleged northern dominance of the country. Beginning with a mutiny of southern troops at Jūbā in 1955, southern unrest led to a Sudanese civil war that was not settled until 1969. Pop. (1973) 56,737.

juba, dance of Afro-American slaves, found as late as the 19th century from Dutch Guiana to the Caribbean and the southern United States. It was danced by a circle of men around two men who performed various steps (*e.g.,* the juba, the long dog scratch, the pigeon wing) in response to a rhythmic call and to the clapping (patting juba) of the other dancers. As a refrain, after each new step the circle danced counterclockwise using the juba step. The juba contained features that persist in Afro-American dances, notably improvisation, shuffle steps, supple body movements, and sharp rhythms and was probably related to the African *giouba.*

"Patting juba"—slapping the hands, legs, and body to produce complex, rapid rhythms—survived the dance and still appears occasionally in areas where the dance had flourished.

Juba I, Juba also spelled IUBA (b. *c.* 85 BC—d. 46 BC, near Thapsus), king of Numidia who sided with the followers of Pompey and the Roman Senate in their war against Julius Caesar in North Africa (49–45 BC).

Succeeding his father, Hiempsal II, sometime between 63 and 50, Juba became bitterly hostile toward Caesar because of a personal insult (probably in 63). In addition, one of Caesar's supporters, the tribune Curio, in 50 unsuccessfully proposed the incorporation of Numidia as a Roman province. In 49, Curio landed in Africa to expel Pompey's forces but was defeated and killed by Juba, who thereupon considered himself the potential master of all North Africa.

Pompey died the following year, but African resistance continued under Metellus Scipio (to whom Juba was allied). In 46, Caesar himself came to subdue them. Juba had to divide his substantial army of infantry, cavalry, and elephants because his kingdom had been invaded from the west by Caesar's ally Bocchus, king of Mauretania, and an Italian adventurer, Publius Sittius. Juba was defeated with the other adherents of Pompey at Thapsus, and his general in the west was killed by Sittius. Repulsed from Utica by Cato (Uticensis) and expelled from his temporary capital Zama by its inhabitants, Juba committed suicide.

Juba II (b. *c.* 50 BC—d. *c.* AD 24), son of Juba I and king of the North African states of Numidia (29–25 BC) and Mauretania (25 BC–AD 24). Juba also was a prolific writer in Greek on a variety of subjects, including history, geography, grammar, and the theatre.

As a child of about five Juba was paraded in Rome in Caesar's triumphal procession after the death of Juba I but subsequently was given a good education in Italy. Octavian (the future emperor Augustus) befriended Juba when he was a young man and in 29 BC installed him as king of Numidia, which had been a Roman province since the defeat of Juba I in 46. In 25 Juba was made ruler of Mauretania, which he governed until his death. His first wife, Cleopatra Selene, daughter of Mark Antony and Cleopatra, exercised great influence on his policies.

Succeeding generations praised his scholarly work, but from the meagre fragments that survive it seems that, though his interests were extremely wide, he had little originality. He was content to excerpt or rearrange material from earlier authors, which he collected in a substantial library at his capital city of Caesarea (formerly Iol, now Cherchel, Alg.).

Jubayl (Lebanon): *see* Byblos.

Jubayl, al-, also spelled JUBAIL, also called JUBAIL INDUSTRIAL CITY, port city, eastern Saudi Arabia, on the Persian Gulf north of az-Ẓahrān, near the 'Abd al-'Azīz naval base. In the early 1970s the Saudi government chose al-Jubayl, an ancient fishing and pearling village, to be the site of a major industrial complex. Its location on the Persian Gulf would yield an ample water supply for cooling the large industrial plants and would also promote ease in shipping various products to and from the city. It was also near important oil fields. Although the fishing village remains nearby, the new city of al-Jubayl based on heavy and hydrocarbon industries vastly overshadows it.

In the mid-1970s the Bechtel Company of San Francisco was commissioned to engineer the construction of the new port, one of the largest civil-engineering projects in the world. The core of the new city, developed under the direction of two Saudi government agencies, the General Petroleum and Mineral Organization (PETROMIN) and the Saudi Basic Industries Corporation (SABIC), is composed of some 16 primary industries. These industries include factories producing steel, gasoline, diesel fuel, petrochemicals, lubricating oil, and chemical fertilizers. In addition to these plants, secondary and support industries were provided for. The entire industrial zone covers about 51 square miles (132 square km). Housing for workers was separated from the industrial area by greenbelts irrigated with desalinated gulf water. Miles of module paths and cooling-water canals were built throughout the city. Altogether the sectors of the city covered nearly 365 square miles (945 square km). Major roads connect al-Jubayl with az-Ẓahrān and ad-Dammān. It also has an airport.

Jubba River, also spelled JUBA, also called GANANE, or GENALE, Italian GIUBA, principal river of Somalia in northeastern Africa. Originating via its headwater streams in the Mendebo Mountains of southern Ethiopia, it flows about 545 miles (875 km) from Doolow on the Ethiopian frontier to the Indian Ocean just north of Kismaayo, one of Somalia's three main ports.

Fed by rainfall in its source area, where the main rainy season coincides with the dry season along its lower course, the Jubba is the only river in the area with a reliable flow all year round. Although it is low from December to mid-April and from June to October, it is navigable by shallow-draft vessels from its mouth to about 20 miles (32 km) above Baardheere (Bardera), Somalia. Below the mountainous region of the headwaters, the Jubba flows through country that is arid, except for vegetation growing close to its banks. In the lower reaches the soils are chalky and mineral-rich, with considerable tracts of mangrove forest. Cotton, peanuts (groundnuts), corn (maize), sisal, sesame, bananas, and fruit grow on the low-lying, narrow fertile belt that stretches inland for almost 300 miles (about 480 km). Game is plentiful along the banks.

Jubbulpore (India): *see* Jabalpur.

jube (from the French *jubé*), construction marking off the chancel, or sanctuary, of a church from the rest of the interior. Its mature medieval form consisted of three basic elements: a screen (known in England as a rood screen); a gallery, or loft, from which the words *Jube, Domine, benedicere* (hence *jubé*) were spoken; and a crucifix (rood) surmounting the whole. *See* rood screen.

Jubilee, Year of, also called HOLY YEAR, in the Roman Catholic church, a celebration that is observed on certain special occasions and for 1 year every 25 years, under certain conditions, when a special indulgence is granted to members of the faith by the pope and confessors are given special faculties, including the lifting of censures. It resembles the Old Testament Jubilee—in which, every 50 years, the Hebrews celebrated a year of perfect rest, emancipated slaves, and restored hereditary property—but does not seem to be based on it.

Pope Boniface VIII established the Holy Year in 1300 as a centenary observance. In 1342 Clement VI reduced the interval to 50 years, and in 1470 Paul II further reduced it to 25 years. The year begins on Christmas Eve, with the opening of the Holy Doors at the Roman basilicas of St. Peter, St. John Lateran, St. Paul Outside-the-Walls, and St. Mary Major, and ends with their closing on the following Christmas Eve. Since 1500 the Jubilee has been extended to the whole world during the year following the Holy Year, and certain churches in each diocese are designated for visitation.

Since at least 1560, special jubilees have been declared. That year the occasion was the Council of Trent, for which the guidance of the Holy Spirit was invoked. Special jubilees have been declared for a pope's 50th anniversary in the priesthood (Pope Pius XI, 1929), at the close of the second Vatican Council (1965) to promote the knowledge and application of the council's achievements, and on many other occasions.

Jubilee diamond, flawless, clear white diamond weighing almost 651 carats in rough form, as it was found in the Jaegersfontein mine in South Africa in 1895. It was faceted into a cushion brilliant of about 245 carats in 1897, the year of Queen Victoria's Diamond Jubilee, from which it takes its name.

Consult the INDEX *first*

Jubilees, Book of, also called the LITTLE GENESIS, pseudepigraphal work (not included in any canon of scripture), most notable for its chronological schema, by which events described in Genesis on through Exodus 12 are dated by jubilees of 49 years, each of which is composed of seven cycles of seven years. The institution of a jubilee calendar supposedly would ensure the observance of Jewish religious festivals and holy days on the proper dates and, by setting Jews apart from their Gentile neighbours, would emphasize the Old Testament picture of Israel as the covenant community of God.

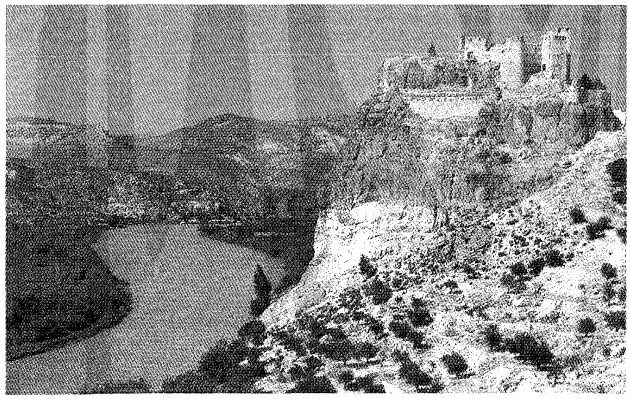
In addition to paraphrasing and embellishing on Genesis, *Jubilees* also relates stories explaining the origin of contemporary Jewish laws and customs. An older (hence, to the Hellenistic mind, more sacred) origin is attributed to the Mosaic Law and many of the legal precepts in Leviticus by asserting that the patriarchs in Genesis observed laws and festivals that actually came into existence after the age of the patriarchs.

Jubilees, in its final form, was likely written about 100 BC, though it incorporates much older mythological traditions. Its isolationist religious spirit and its strictness led the Essene sect of Jews at Qumrān in Palestine to quote extensively from it in the *Damascus Document,* one of their major works. *Jubilees* is also closely connected with the *Genesis Apocryphon,* which also parallels Genesis and was favoured by the Qumrān community. Several fragments of the original Hebrew edition of *Jubilees* were found in the Qumrān library.

Jubilees is preserved in its entirety only in an Ethiopic translation, which was derived from a Greek translation made from the Hebrew. Fragments of the Greek and Hebrew texts are also extant.

Júcar River, river in eastern Spain, rising in the Universales Mountains north of Cuenca. It flows in a southerly, then easterly, direction for 309 miles (498 km) through Cuenca, Albacete, and Valencia *provincias* and into the Gulf of Valencia, at Cullera. Beyond Cuenca its valley widens and then narrows into a series of gorges as the river plunges over the edge of the Central Mesa (Meseta Central).

The Alarcón dam is in its upper course. The waters of the Júcar irrigate a large section of the plain of La Ribera from Alberique to the



The Júcar River flowing past a 14th-century castle at Cofrentes, Spain
Robert Frerck/Odyssey Productions

lagoon of La Albufera, mostly under orange groves and rice fields. The stream has had a great tendency to flood.

Juchen DYNASTY (China): *see* Chin dynasty.

Juchereau de Saint-Denis, Louis *see* Saint-Denis, Louis Juchereau de.

Juchitán, in full JUCHITÁN DE ZARAGOZA, city, southeastern Oaxaca *estado* ("state"), southern Mexico. It is on the Juchitán River (or De los Perros River), near the southern coast of the Isthmus of Tehuantepec, at 125 feet (38 m) above sea level. Juchitán has long been one of the principal centres of the Zapotec Indians.

Tourism is important to Juchitán. Visitors are attracted there by the scenery, the availability of regional handicrafts, and the religious festivals. Juchitán is also a commercial and manufacturing centre for its agricultural hinterland. Sesame is the main crop, but corn (maize) and beans are also widely cultivated. Cattle, pigs, goats, and sheep are raised. The city is situated on that section of the Pan-American Highway linking Mexico City with Guatemala City and also on the railroad leading from the trans-isthmian route to the Guatemalan border. It also has an airfield. Pop. (1970) 30,218.

Jud, Jakob (b. Jan. 12, 1882, Wängi, Switz.—d. June 15, 1952, Rütli), Swiss linguist who used comparative linguistics to reconstruct cultural history. He taught French at the lyceum of Zürich from 1906 to 1922 and afterward was professor of Romance languages at the University of Zürich.

Jud mediated imaginatively between the linguistic traditions of Germany–Austria, France, and Italy, concentrating on the Rhaeto-Romance dialects, French, Provençal, and Italian; he preferred subtle lexicology to rigid historical grammar. His monographs depict early contacts among Latin, Celtic, and Germanic peoples; the linguistic effects of the Christian religion; and the changing Swiss linguistic configuration. He worked closely with another noted Swiss Romance linguist, Karl Jaberg, on the monumental work *Sprach- und Sachatlas Italiens und der Südschweiz,* 8 vol. (1928–40; "Italian and Southern Swiss Linguistic and Fact Atlas").

Jud, Leo (b. 1482, Germar, Alsace [now in France]—d. June 19, 1542, Zürich), Swiss religious reformer, biblical scholar, and translator, and an associate of Huldrych Zwingli and Heinrich Bullinger in the Zürich Reformation. He collaborated in drafting the first Helvetic Confession (a fundamental Reform creed; 1536).

After studying medicine at the University of Basel, Jud turned to theology and held several pastorates in Alsace and in Zürich. In 1523 he married a former nun. Much of his career was given to the support of his intimate friend Zwingli, both in the latter's theological struggles and in his literary efforts. Jud believed in the mutual independence of church and state. The state should not hinder the church in its task of saving and disciplining, nor should there be any compulsion in matters of faith.



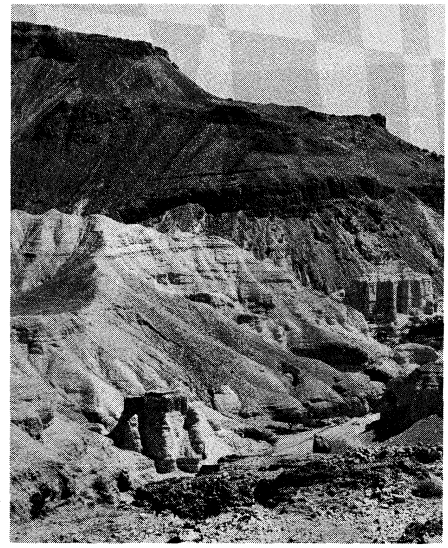
Leo Jud, engraving
Bavaria-Verlag

He made many translations, including a translation of the Bible into German (the Zürich Bible) and of the Old Testament into Latin.

Judaea, also spelled JUDEA, or JUDAH, Hebrew YEHUDAḤ, the southernmost of the three traditional divisions of ancient Palestine; the other two were Galilee in the north and Samaria in the centre. No clearly marked boundary divided Judaea from Samaria, but the town of Beersheba was traditionally the southernmost limit. The region presents a variety of geographical features, but the real core of Judaea was the upper hill country, known as Har Yehuda ("Hills of Judaea"), extending south from the region of Bethel (at present-day Rām Allāh) to Beersheba and including the area of Jerusalem, Bethlehem, and Hebron.

Before the Israelite conquest of Palestine, the Canaanites dominated the region, and the town of Hebron was an important centre. When the tribes of Israel invaded the country, the tribe of Judah claimed the entire area from just south of the site of Jerusalem into the Negev region (the area south of Beersheba). The tribes of Simeon, Benjamin, and Dan also at one time or another settled some small areas of the region. When David became king of Judah (10th century BC), he captured the old Canaanite (Jebusite) stronghold, Jerusalem, and made it the capital of the united kingdom of the tribes of Israel. After the death of David's son, King Solomon (10th century), the 10 northern tribes separated from Judah, and Jerusalem remained the capital of the kingdom of Judah, which continued until 586, when the Babylonians conquered it and destroyed Jerusalem. Later, however, Persian kings permitted captive Jews to return from Babylonia to their native land and to rebuild their temple and the walls of Jerusalem.

After Alexander the Great's conquest of the Middle East, Judah came first under the rule of the Ptolemies and later under that of the Seleucids. Opposition to the Seleucid attempt to suppress the Jewish ancestral faith led to the rise of the family of Jewish leaders known as the Maccabees, who gradually drove the Seleucids from the country and set up a revived kingdom of Judaea. Family disputes, however, led to Roman intervention in 63 BC. Under Roman control, Herod the Great was made king of Judaea in 37 BC and later of all Palestine (20–4 BC). After Herod's death the country was ruled alternately by Herod's direct descendants and by Roman procurators. As a result of the Jewish revolt that broke out in AD 66, the city of Jerusalem was destroyed (AD 70). The name Judaea is still used to describe approximately the same area in modern Israel.



Naḥal Zohar, a dry river course, in the Judaean desert near the Dead Sea
By courtesy of the Government Press Office, State of Israel, Tel-Aviv

Judaea and Samaria: *see* West Bank.

Judah, one of the 12 tribes of Israel, descended from Judah, who was the fourth son born to Jacob and his first wife, Leah. It is disputed whether the name Judah was originally that of the tribe or the territory it occupied and which was transposed from which.

After the Israelites took possession of the Promised Land, each was assigned a section of land by Joshua, who had replaced Moses as leader after the latter's death. The tribe of Judah settled in the region south of Jerusalem and in time became the most powerful and most important tribe. Not only did it produce the great kings David and Solomon but also, it was prophesied, the Messiah would come from among its members. Modern Jews, moreover, trace their lineage to the tribes of Judah and Benjamin (absorbed by Judah) or to the tribe, or group, of clans of religious functionaries known as Levites. This situation was brought about by the Assyrian conquest of the Kingdom of Israel in 721 BC, which led to the partial dispersion of the 10 northern tribes and their gradual assimilation by other peoples. (Legends thus refer to them as the Ten Lost Tribes of Israel.)

The southern Kingdom of Judah flourished until 587 BC, when it was overrun by the Babylonians, who carried off many of the in-

habitants into exile. When the Persians conquered Babylonia in 538 BC, Cyrus the Great allowed the Jews to return to their homeland, where they soon set to work to replace the magnificent Temple of Jerusalem that the Babylonians had destroyed. The history of the Jews from that time forward is predominantly the history of the tribe of Judah.

Judah Aryeh: *see* Modena, Leone.

Judah ben Samuel, also called JUDAH THE ḤASID OF REGENSBURG, OR YEHUDA THE ḤASID (d. 1217), Jewish mystic and semilegendary pietist, a founder of the fervent, ultrapious movement of German Ḥasidism. He was also the principal author of the ethical treatise *Sefer Ḥasidim* (published in Bologna, 1538; "Book of the Pious"), possibly the most important extant document of medieval Judaism and a major work of Jewish literature. Judah is not to be confused with the commentator Judah Sir Leon of Paris (1166–1224), also called ha-Ḥasid, or the 17th-century messianic enthusiast Judah Ḥasid ha-Levi, nor is the Ḥasidic movement of his time directly related to the 18th-century Ḥasidic movement founded by the Ba'al Shem Ṭov.

The facts of Judah's life, like those of other major Jewish mystics, are obscure. He was the son of Samuel the Ḥasid, also a mystic, and belonged to the eminent Kalonymos family, which provided medieval Germany with many of her mystics and spiritual leaders. It is known that in about 1195, possibly because of German persecution, he left Speyer for Regensburg, where he founded a yeshiva (academy) and gathered such disciples as the mystic Eleazar of Worms (also a member of the Kalonymos family) and the codifiers Isaac ben Moses of Vienna and Baruch ben Samuel of Mainz. Most of Judah's life, however, is clothed in legend; *e.g.,* it is stated that he was ignorant of Jewish law until, at 18, sudden enlightenment enabled him to work such miracles as reviving the dead and visiting the prophet Elijah.

The *Sefer Ḥasidim* is a compilation of the writings of Judah, of his father Samuel, and of Judah's disciple Eleazar of Worms. Judah's teachings, however, appear to give a distinctive stamp to the entire work. The treatise, although disorganized and poorly written, is invaluable for giving a realistic picture of the concerns and problems of a medieval Jewish community; religion is revealed in its practical workings, rather than as disembodied theories. Dealing with man's relations with God and his fellowman, his business practices, the sabbath, social intercourse with Gentiles, penitence, and a host of other subjects, the book is a detailed manual of conduct.

Judah also wrote a mystic work surviving only in citations dealing with the *kavod* ("divine glory"), the aspect of God that man can experience, as distinguished from the ultimate reality of God, which is beyond man's experience or comprehension. Judah was also the author of liturgies and responsa (authoritative answers, or responses, to questions of Jewish law).

Judah ben Saul ibn Tibbon: *see* ibn Tibbon, Judah ben Saul.

Judah ha-Levi, Hebrew in full YEHUDA BEN SHEMUEL HA-LEVI (b. *c.* 1075, Tudela, Kingdom of Pamplona [Navarre]—d. July 1141, Egypt), Jewish poet and religious philosopher. His works were the culmination of the development of Hebrew poetry within the Arabic cultural sphere. Among his major works are the poems collected in *Dīwān,* the "Zionide" poems celebrating Zion, and the *Sefer ha-Kuzari* ("Book of the Khazar"), presenting his philosophy of Judaism in dialogue form.

Life. Judah ha-Levi was born in the town of Tudela in northern Spain. At the time of his birth, most of Spain, including his native town, was still under Muslim rule, but the Reconquista, the Christian sovereigns' struggle to regain the territories lost to the Muslims, was already under way. In 1085 King Alfonso VI of Castile conquered Toledo and made it his capital, and the exploits of the Cid, the celebrated national hero of Spain, also fall into the same period. Judah ha-Levi, whose poetic gifts manifested themselves unusually early, spent his childhood in the Christian part of the country, but even as a boy he felt himself drawn to Muslim Spain, then one of the principal cultural centres of Europe.

He went to Andalusia in southern Spain some time before 1090, where he established contact with local Hebrew poets and intellectuals, and justly attracted considerable attention by his impressive talent. The most famous Hebrew poet of the time, Moses ibn Ezra from Granada, invited Judah ha-Levi to visit him, and the two sealed a bond of lifelong friendship. His stay in Granada, enjoyed in the company of Ibn Ezra, was a period of success and happiness. He expressed his good spirits in several poems. This pleasant period ended in 1090 when Granada was stormed by the Almoravids, North African Berber disciples of a zealous Muslim movement, who now established an orthodox and intolerant regime in Andalusia. It is not known with any certainty whether Judah ha-Levi witnessed the Almoravid invasion in Granada or elsewhere, but the event greatly influenced the remainder of his life and his world view.

In his youth he also spent time in other Jewish centres of Andalusia, for example, in Lucena, a town of predominantly Jewish population in which a noted yeshiva, or academy, for Jewish theological studies was located. He composed a poetic epitaph when Isaac Alfasi, the head of the institution, died in 1103 and maintained very friendly relations with his successor, Joseph ibn Migash, for whom he even wrote letters. Judah ha-Levi also spent a certain amount of time in Seville, where he was poorly received by some wealthy Jews, on whom he revenged himself by denouncing their greed and ignorance in biting satirical verses. There are intimations in his poems that he must once have known material distress and depended on the good will of generous patrons.

He finally made his way, however, and became independent. Disappointed with the Almoravid regime, he turned toward Christian Castile and settled in its capital city of Toledo. There he worked untiringly as a physician, one of the professions open to Jews in Christian surroundings, a profession which in fact brought them into close contact with those surroundings.

As a resident of Toledo he celebrated prominent Castilian Jews in his verses, particularly the successful courtier Joseph ibn Ferruziel, better known by his Hispano-Arabic sobriquet Cidellus, who distinguished himself as a physician and adviser to King Alfonso VI. Judah ha-Levi for a while believed that the fortunes of his sorely tried people would flourish in Castile, but his hopes were destroyed by successive disappointments. Solomon ibn Ferruziel, a nephew of Cidellus who was also actively in the service of the Castilian state, was to return to Toledo from an important mission in Aragon. Along the way he was assassinated by Christian Spaniards on May 3, 1108. Judah ha-Levi had already composed a very elaborate poem to celebrate the reception of the Jewish statesman, which he had to set aside. He composed a long official elegy for the murdered man, ending it with a curse against the "Daughter of Edom," sinful Christianity. Additional acts of violence were committed against Jews in Castile, and, still worse, it was often they who suffered in the clashes between the Almoravid realm and the Christian kingdoms in Spain. Distrusted, plundered, and slain by both sides, it was as though they were between hammer and anvil. Judah ha-Levi recognized the complete hopelessness of their situation and portrayed it in his poems.

Medieval Jews tried again and again to decipher the mysterious dates of their deliverance cited in the Book of Daniel and sought to apply them to their own time. Judah ha-Levi's works contain a reference to Daniel in a prophetic poem, in which the poet said that he had learned in a dream of the impending collapse of the Muslim empire in 1130. In the last years of his life he apparently returned in resignation to Muslim Spain and lived in Córdoba, which remained an important centre of Jewish culture even in the period of decline. Judah ha-Levi had a very wide circle of acquaintances and maintained relationships with many famous contemporaries in Spain as well as abroad. He managed to gain a certain prosperity and lived in his house surrounded by a loving family and a few disciples. Yet he was thoroughly dissatisfied with his life. As old age approached he felt an increasing need to travel to Jerusalem, writing about it at length in verse and prose. The epilogue of the *Kuzari* explains his attachment to Zion and sounds like a farewell to Spain. Among his many poems celebrating the Holy Land is "Zionide" ("Ode to Zion"), his most famous work and the most widely translated Hebrew poem of the Middle Ages. He also carried on a heated controversy in verse with the opponents of his Zionist ideas.

He thought about and prepared for his journey to the Holy Land for many years. He was aided by a good friend, Halfon ha-Levi-Aldamyati, a very rich and cultivated Egyptian Jew whose trade relations extended as far as Yemen and India and who also frequently visited Spain. Judah ha-Levi left Spain in 1140. According to his carefully laid plans, he was first to embark for Egypt and then to proceed from there via the land route to Palestine. Aboard ship he composed a whole series of sea songs, which in both theme and mood represented a considerable innovation in Hebrew literature. His ship entered Alexandria harbour on May 3, 1140, where he, along with a large Jewish party, was splendidly received. He was lodged in the magnificent home of Aaron ibn al-'ammānī, a noted Jewish physician and judge, and stayed in Egypt for several months. Many prominent Jews of the country came to admire him and to make his acquaintance, and he acquired many friends. From Alexandria he went to Cairo, or Fustat, the city where lived Samuel ben Hananiah, the Nagid, or head, of all Egyptian Jews, and there he was further acclaimed. Judah ha-Levi felt deep awe and humility in the land in which some of the biblical miracles had occurred and at the same time a kind of delight in all the beauties that revealed themselves to him. It seemed to him that his youth was restored; creative forces stirred within him, and he wrote prolifically and easily. But he certainly always bore in mind his sacred destination and was often disturbed by the thought that death might yet intervene.

He did not in fact go beyond Egypt, although it is not known what detained him there. He died in 1141 and was deeply mourned in Egypt. His death was romantically embellished in a legend that arose much later, according to which he was slain by a hostile Muslim just as he had arrived in Zion and was reciting his famous "Zionide." The legend found wide circulation and was repeated in detail by two well-known 19th-century poets, in German by Heinrich Heine in the *Romanzero* of 1851 and in Hebrew by Micah-Joseph Lebensohn in *Rabbi Yehudah ha-Levi* in 1869.

Writings. Judah ha-Levi was strongly influenced by Arabian literature, elements of which he ingeniously assimilated. His great

collection of poems entitled *Dīwān* includes secular and religious poetry, both of which express passionate attachment to Zion (the land of Israel). For the poet, the Holy Land was not only a site where the Jewish people would one day gather after their deliverance from exile; immigration and settlement in Palestine would also hasten the coming of the Messiah. He celebrated Jerusalem in song as had none of his medieval predecessors. He also expounded his views on the nature of Judaism in an Arabic prose work consisting of dialogues between a learned Jew and the Khazar king who was converted to Judaism in the 8th century. It was widely circulated in Hebrew translation under the title *Sefer ha-Kuzari.*

(J.Sc.)

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Judah ha-Nasi (b. *c.* AD 135—d. *c.* 220), one of the last of the tannaim, the small group of Palestinian masters of the Jewish Oral Law, parts of which he collected as the Mishna (Teaching). The Mishna became the subject of interpretation in the Talmud, the fundamental rabbinic compendium of law, lore, and commentary. Because of his holiness, learning, and eminence, Judah was variously called *ha-Nasi* ("the prince"), *rabbi* ("teacher"), *rabbenu* ("our teacher"), and *rabbenu ha-qadosh* ("our saintly teacher"). A descendant of the great sage Hillel, Judah succeeded his father, Simeon ben Gamaliel II, as patriarch (head) of the Jewish community in Palestine and, consequently, of the Sanhedrin as well, at that time chiefly a legislative body (in earlier times, the Sanhedrin had been primarily a court). As patriarch at Bet She'arim and later at Sepphoris (both located in Galilee, a Palestinian region of historic importance), he maintained a liaison with the Roman authorities and, according to the Talmud, was a friend of one of the Antonine emperors (either Antoninus Pius or Marcus Aurelius), with whom he discussed such philosophic questions as the nature of reward and punishment. When Judah died, he was buried at Bet She'arim.

Because the Written Law of the Jews (found in the Pentateuch, or Five Books of Moses) could not cover all exigencies, over the centuries a body of Oral Law had developed. In order to preserve this tradition, Judah spent some 50 years in Bet She'arim sifting the Oral Law, which he then compiled into six orders dealing with laws related to agriculture, festivals, marriage, civil law, the temple service, and ritual purity. His purpose was not only to preserve a storehouse of tradition and learning but also to decide which statement of Halakhot (laws) was normative. Although he edited the six orders of the Mishna by subject matter, according to the method of two earlier *tannaim,* Rabbi Akiba and Akiba's pupil Rabbi Meïr, Judah made profound contributions of his own. He determined which rabbinic opinions were authoritative, at the same time carefully preserving minority opinions in case laws should be changed in the future and a precedent for these changes be required. On the other hand, he omitted laws that were obsolete or otherwise lacking in authority. The Mishna became the subject for commentaries by subsequent sages in Palestine and Babylonia called amoraim; these commentaries became known as the Gemara (Completion), which, along with the Mishna, make up the Babylonian and Palestinian Talmuds. (The term Talmud is also used alternatively for the commentaries, instead of Gemara.)

Judaism, the religion of the Jews, a monotheistic religion that holds that God's presence is experienced in human actions and history. It is the expression of a set of beliefs and values that is discerned in patterns of action, social order, and culture.

A brief treatment of Judaism follows. For full treatment, *see* MACROPAEDIA: Judaism.

Judaism maintains that the Jewish community was directly confronted by the divine; that the relationship, *berit* ("covenant"), then established is continual; and that that relationship is significant for all mankind. God is viewed as the divine "Giver of Torah"—in its broadest traditional sense, the Hebrew Scriptures and Judaism's oral traditions (Mishna and Talmud), theological affirmations, historical recollections, ethical obligations, ritual and ceremonial observances, and interpretations of its authoritative texts (Midrash). By choosing the Jews as the object of the divine blessing, God also chose them as its channel to all mankind, requiring them to obey the structures of the Torah and to act as witness for the other peoples of the world.

Abraham, the founder of Judaism, is believed to have left Harran in northern Mesopotamia for Canaan (roughly modern Israel and Lebanon) in the mid-20th century BCE (Before the Common Era). From there, the seminomadic descendants of Abraham and his sons Isaac and Jacob—by then, 12 Hebrew families—migrated to Egypt, where they were enslaved for several generations before the Exodus in the 13th century BCE and the Israelites' return to Canaan. The religion of the patriarchs, like Judaism throughout the ages, was therefore exposed to crosscurrents of foreign thought that included influences from Mari, Babylonia, Mesopotamia, Ugarit, and Egypt.

The God of Israel is identified as the Creator of the world, who was not discovered by Abraham but who entered into a covenant with him. God fulfilled his promises to Abraham through Moses, who led the Exodus, imposed further covenantal obligations on Israel at Mt. Sinai, and brought his people to Canaan. In the patriarchal stories, settlement in Canaan is an integral part of God's fulfillment of the Covenant. The experience of the Egyptian captivity reaffirmed this belief but also the belief that the God of Israel was Lord of all the Earth, regardless of territory.

Further features of Judaism emerged with Moses, including the basic belief that it is the ability to make an ethical choice that defines mankind. All men are, therefore, in a covenant relationship with God, a relationship that Jews advance by example and witness. Mankind has a dual nature of obedience (good impulse) and disobedience (evil impulse) to God's law and, within this context, exercises ethical freedom in making choices between the two. Sin is viewed as deliberate disobedience of the Law, or Torah, and the return to Torah is considered a deliberate choice. Also, mankind's ethical nature extends to, and is interwoven with, the establishment of a just society.

The conquest of Canaan was remembered as part of God's intervention and aid at the Exodus. New enemies, such as the Philistines, then appeared, and the period of upheaval described in the Book of Judges began. The religious bond between the 12 decentralized Israelite tribes allowed them to act together under the leadership of elders or champions. Numerous sanctuaries and altars were established on both sides of the Jordan River, and the ark of the Covenant, although usually housed in the sanctuary at Shiloh, was considered to be a movable object.

Out of the need for continuous leadership that was felt during the period of the Judges arose the call for a monarchy. Despite conservative religious opposition, Saul was anointed king *c.* 1021 BCE, but religious objections to a monarchy were not overcome until the reign of David *c.* 1000. It was David who conquered Jerusalem, established it as the national capital, and brought the ark to it as a shrine for the national God. The First Temple was built by David's son, Solomon, whose development of the kingship into a monarchy of international consequence gave rise to religious and secular opposition and the secession of the northern tribes *c.* 922 BCE.

According to the Book of Kings, during the next 200 years foreign cults came to influence the Jewish religion. Approbation was brought especially against the northern kingdom (Israel), where a religious capital, Samaria, had been established in rivalry with Jerusalem. When King Ahab allowed his Tyrian wife, Jezebel, to worship her foreign gods in Israel, the prophet Elijah declared the entire north to be apostate. He further claimed, in one of the first equations of prosperity with God's interest, that a three-year drought was punishment for this sin.

From the mid-9th to the mid-8th century BCE, Israel was engaged in chronic warfare with Aram. One result was the polarization of Israel's society between the wealthy few and the impoverished masses. Out of this situation arose the literary, or classical, prophets, the first of whom was Amos. He introduced the idea that violations of the socio-moral injunctions of the Covenant would set God against the community. When Assyria moved against Israel in the late 8th century, Hosea interpreted the new troubles as a result of the forgetting of God. The submission of King Ahaz of Judah to Assyria led the prophets Isaiah and Micah to introduce the eschatological theme into Jewish prophecy, telling of a future, truly holy community functioning on Earth as a normal sociopolitical unit under the leadership of an ideal ruler. The conquest of Judah by Babylonia and the subsequent Exile (from 597 BCE) led to an emphasis of the element of the future in this vision, as in the prophecies of Jeremiah and Ezekiel, and to the idea that the restoration of Israel would be a means of converting the world to Israel's God, as foretold by Deutero-Isaiah.

The defeat of Babylon by Persia led to the end of the Exile and the restoration of Judah (from 538 BCE). Messianic hopes remained unfulfilled, however, and the prophetic period ended with Malachi's admonitions to follow the Torah of Moses. The Torah was recognized as the law of the land by Artaxerxes I in 444 BCE in a charter that required its publication. This fixing of the Torah then gave rise to the vast edifice of the Oral Law that is characteristic of Judaism.

The conquest of Palestine by Alexander the Great in 332 BCE introduced the period of Hellenistic Judaism (4th century BCE–2nd century CE [Common Era]). Greek influence on Jewish religion and culture was obvious by the early 2nd century BCE, when Hellenizing Jews came into control of the high priesthood itself. Decrees against the practice of Judaism by Antiochus IV Epiphanes resulted in the re-

volt by the Maccabees, from which dates the figure of the martyr in Judaism and Christianity. Despite the revolt, Hellenism continued apace, reaching its apogee during the reign (37–4 BCE) of Herod I of Judaea. Also during this period arose two groups of religious leaders, the Pharisees, who came to believe in the divine authorship of the Oral Law, and the Sadducees, who held to the written word of the Torah.

During the Hellenistic period, there were major centres of Judaism in Syria, Asia Minor, Babylonia, and most particularly in Alexandria, Egypt. The Pentateuch was translated into Greek—producing the much Hellenized Septuagint—and a considerable literature of history, poetry, drama, and philosophy was produced in Egypt.

Roman rule, from 63 BCE to 135 CE, was marked by the attempt to establish an independent Jewish state. This aim was sought by the Herodians, the Zealots, and several quasi-monastic groups, each noted for its strict observance of the Torah. The rise of Christianity was by far the most important "sectarian" development of the Roman period, at a time when Israel's hope for the restoration of divine sovereignty over all mankind centred on the idea of an idealized king.

Although Roman rule began auspiciously, increasingly hostile edicts from Rome led to a series of unsuccessful revolts, during the first of which (66–73) the Second Temple was destroyed. From these disasters, Judaism turned inward to the continued development of the Talmud.

Rabbinic Judaism, under which this development of the Talmud took place, stretched from the 2nd to the 18th century. In what is called the age of the *tannaim* ("teachers"), a high court in Palestine was headed by the patriarchs Simeon ben Gamaliel (*c.* 135–*c.* 175) and Judah ha-Nasi (*c.* 175–*c.* 220), who is credited with producing the final version of the Oral Law, called the Mishna.

Promulgation of the Mishna initiated the age of the *amoraim* ("lecturers," or "interpreters"). Taking the Mishna as the standard text, the *amoraim* of Palestine (*c.* 220–*c.* 400) and Babylonia (*c.* 200–*c.* 650) elucidated it, harmonized it with other texts, and applied its principles to new situations. They produced the Palestinian Talmud and the Babylonian Talmud, the latter becoming the central code of Jewish life. Although the death of the last patriarch, Gamaliel IV, *c.* 425 resulted in the political fragmentation of Mediterranean Jewry, the rules of the maintenance of the Jewish calendar and the rabbis ensured continuity of the Jewish community in Europe.

In Babylonia the office of exilarch ("head of the Exile") continued in symbiosis with the rabbinate from *c.* 100 until the mid-11th century. The rabbinate, transplanted from Palestine, successfully adapted the core and values of the Jewish legal-theological system to a new land. Following the expansion of Islām in the 7th and 8th centuries, the Babylonian religious leaders, or *geonim*, mediated their tradition to all Jewish communities.

Despite a common religious basis, two branches of Jewish culture evolved during the Middle Ages. The Sefardic (Andalusian–Spanish) community traced its cultural affiliation to Babylonia and was influenced by its Arabic-Muslim surroundings (*see* Sefardi).

The Ashkenazic (Franco-German) community developed within the Latin-Christian culture of Europe and traced its background to Rome and Palestine (*see* Ashkenazi). Two forms of Jewish mysticism, in turn, emerged during this period—so-called medieval Ḥasidism (*see* Ḥasidism) among German Ashkenazim of the 12th century and a speculative brand of Kabbala (*q.v.*) among the Talmudic academies of Provence and northern Spain in the 13th century.

The cultures of the Sefardim and Ashkenazim clashed in Provence and northern Spain. Resolution of the conflict was prevented, however, by attacks on the Talmud by Christian authorities and by the expulsion of the Jews from France in 1306, and the two strains of orthodoxy have continued to exist uneasily side by side. Persecutions of Jews in Europe, continuing into the 18th century, led to apostasy, marranism (ostensible conversion to Christianity), and the rise of extreme sects such as those of the pseudo-messiahs Shabbetai Tzevi and Jacob Frank.

The 18th century was the time of the Haskala, or Jewish Enlightenment, in central and eastern Europe. In this period, Jews turned away from messianic beliefs and began to seek personal or national fulfillment on this Earth during their own lifetimes. Especially important was Moses Mendelssohn, whose *Jerusalem* (1783) defended the validity of Judaism and of his belief in a universal religion of reason. Together with Naphtali Herz Wessely, he produced a German Bible that served to introduce central European Jewry to German culture.

The Haskala also had influence in eastern Europe and especially in Russia, where it was characterized by anti-clericalism and a call for practical social and economic reforms. Hebrew- and Russian-language literature flourished among writers who declared themselves to be Russians by nationality and Jews by religion. Yiddish literature, which had begun in the 12th and 13th centuries in eastern Europe, flowered in the late 19th and early 20th centuries. The pogroms of 1881, however, had brought an end to the movement.

Out of the Haskala came Jewish religious reform, which began in western Europe during the Napoleonic period (1800–15). In France the reform was of doctrine, while in Germany it centred upon the aesthetic aspects of worship. German Reform became institutionalized in the 1840s and, although it was unsuccessful in most of Europe, it was imported readily into the United States, where it melded with earlier trends toward reform.

From the Reform movement, in turn, came Conservative Judaism, which began in Germany in 1845. It also conceived of Judaism as a developmental religion but came to largely traditional conclusions about observance.

Most European Jews rejected the reform movements. Although some—most notably the Ḥasidim—continued to reject westernization entirely, most of them remained Orthodox in their religion while becoming Western in their manners and culture. As westernization developed, scholars began the secular study of Jewish history and literature and of Judaism's contributions to science, medicine, and mathematics. Jewish philosophers attacked the problem of continuity in a time when the Oral Law was no longer considered by most Jews to be divinely ordained. Among various answers, they posited Judaism as the bearer of the historical or of the moral process, as a very intense form of personal encounter with God, or as religious nationalism.

Zionism (*q.v.*), in its secular aspects, can also be viewed as a result of the reform movement. Drawing upon 19th-century European nationalism and reacting to a virulent form of anti-Semitism, Zionists put forth a program of national regeneration and resettlement that culminated in the establishment of the state of Israel in 1948.

Since the Holocaust of World War II, Judaism has become a non-European religion centred in Israel, the Soviet Union, and the United States. World Jewry has come into conflict with the Arab and Communist nations, while within each community Judaism has been faced with increasing secularization. Nonetheless, there were signs of deep religious fervour and attachment to Judaism's traditions and sense of history.

Judas, SAINT, also called JUDE, THADDAEUS, and LEBBAEUS (fl. 1st century AD; Western feast day October 28, Eastern feast days June 19 and August 21), one of the original Twelve Apostles. He is distinguished in John 14:22 as "not Iscariot" to avoid identification with the betrayer of Jesus, Judas Iscariot. Listed in Luke 6:16 and Acts 1:13 as "Judas of James," some Biblical versions (*e.g.,* Revised Standard and New English) interpret this designation to mean "son of James" (*i.e.,* probably the Apostle St. James, son of Alphaeus), while others (*e.g.,* Authorized and Douay) call him "brother of James." Judas is more probably identified with Thaddaeus (Lebbaeus) in Mark 3:18 and Matt. 10:3 and less probably with Jesus' "brother" Judas (Mark 6:3, Matt. 13:55), reputed author of the canonical Letter of Jude that warns against the licentious and blasphemous heretics.



Saint Judas, detail of oil painting by Peter Paul Rubens, 1618; in the Prado, Madrid

Archivo Mas, Barcelona

According to John 14:22–23, Judas, after Jesus completed the Last Supper and announced his manifestation to his disciples, asks, "Lord, how is it that you will manifest yourself to us, and not to the world?" After Jesus' ascension, Judas' history is unknown. Like the Apostle St. Simon, he seems to have come from the Zealots, the Jewish nationalistic party prior to AD 70. Legends first appearing in the 4th century credit Simon and Judas with missionary work and martyrdom in Persia (noted in the apocryphal Passion of Simon and Jude). Thus, since the 8th century, the Western Church has commemorated them together on October 28. The Greek Orthodox Church, however, distinguishes Judas from Thaddaeus, celebrating Judas, brother of the Lord, on June 19, and Thaddaeus the Apostle on August 21. The devotion to Judas (Jude) as patron of desperate causes began in France and Germany in the late 18th century.

Judas ISCARIOT (d. *c.* AD 30), one of the Twelve Apostles, notorious for betraying Jesus. Judas' surname is more probably a corruption of the Latin *sicarius* ("murderer" or "assassin") than an indication of family origin, suggesting that he would have belonged to the Sicarii, the most radical Jewish group, some of whom were terrorists. Other than his apostleship, his betrayal, and his death, little else is revealed about Judas in the Gospels. Always the last on the list of the Apostles, he was their treasurer. John 12:6 introduces Judas' thievery by saying, ". . . as he had the money box he used to take what was put into it."

He disclosed Jesus' whereabouts to the chief priests and elders for 30 pieces of silver. They provided the armed guard that he brought to the Garden of Gethsemane, near Jerusalem,

where Jesus went to pray with the other 11 Apostles after the Last Supper. There he identified Jesus with a kiss, addressing him as "master." Matt. 26:14–16 and John 12:6 designate Judas' motive as avarice, but Luke 22:3–6 ascribes his action to the entrance of Satan into his body, paralleling John 13:27, where, after Judas took the bread at the Last Supper, "Satan entered into him." Jesus then says, "What you are going to do, do quickly." This is the culmination of John 6:70–71, which, after Jesus says, "Did I not choose you, the Twelve, and one of you is a devil?" discloses that he meant "Judas the son of Simon Iscariot, for he, one of the Twelve, was to betray him."

There are variant traditions about Judas' death. According to Matt. 27:3–10, he repented after seeing Jesus condemned to death, then returned the silver and hanged himself (traditionally from the Judas tree). In Acts 1:18, he "bought a field with the reward of his wickedness; and falling headlong he burst open in the middle and all his bowels gushed out," implying that he threw himself down, rather than that he died accidentally. Apocryphal gospels developed the point in Acts that calls the spot of his death the place (field) of blood. The 1st/2nd-century Apostolic Father Papias is quoted to have given macabre details about Judas' death, presumably to show that Gospel prophecies were literally fulfilled. His account appears in numerous legends, particularly in Coptic works, and in medieval literature. In Dante's *Inferno* Judas appears in the deepest chasm of hell with Julius Caesar's assassins, Brutus and Cassius.

In Muslim polemic literature, however, Judas ceases to be a traitor; instead, he supposedly lied to the Jews in order to defend Jesus (who was not crucified). The 14th-century cosmographer ad-Dimashqī maintains that Judas assumed Jesus' likeness and was crucified in his place. The 2nd-century apocryphal *Gospel of Judas* favourably evaluates him. His name has subsequently become associated with traitor (a Judas) and treacherous kiss (a Judas kiss). J.M. Robertson's *Jesus and Judas* appeared in 1927, followed by G. Buchheit's *Judas Iskarioth* (1954).

Judas tree: *see* redbud.

Judd, Charles Hubbard (b. Feb. 20, 1873, Bareilly, India—d. July 18, 1946, Santa Barbara, Calif., U.S.), U.S. psychologist and exponent of the use of scientific methods in the study of educational problems. His research dealt with psychological issues of school curriculum, pedagogical methods, and the nature of reading, language, and number.

Judd was brought to the United States as a child. He received his doctorate from the University of Leipzig (1896), where he studied experimental psychology under Wilhelm Wundt. He taught at several U.S. universities and in 1901–02 was professor of psychology and pedagogy at the University of Cincinnati (Ohio). There he wrote *Genetic Psychology for Teachers* (1903), which launched his career as an analyst of the psychology of school curriculums. He became director of the psychological laboratory at Yale University (1907–09), then became director of the department of education at the University of Chicago, retiring in 1938.



Charles Hubbard Judd
The University of Chicago Archives

Among Judd's published works are *Psychology of Social Institutions* (1926), which further developed the ideas of social psychology introduced in *Genetic Psychology for Teachers,* and *Education as Cultivation of the Higher Mental Processes* (1936).

Judd, Gerrit P(armele) (b. April 23, 1803, Paris, N.Y., U.S.—d. July 12, 1873, Honolulu), U.S. missionary to Hawaii who played a crucial role in governing the islands.

The son of a physician, Judd studied medicine in his father's office and at a medical school in Fairfield, N.Y. He was graduated in 1825 but the following year underwent a religious experience and decided to become a missionary. In 1827 the American Board of Commissioners for Foreign Missions appointed him physician to the Sandwich Islands Mission, and in 1828 he arrived in Honolulu.

Until 1842 Judd occupied himself primarily with his missionary responsibilities, although he gradually came to be involved with the government—first as translator and interpreter, later as an adviser. On May 10, 1842, King Kamehameha III appointed Judd a member of the treasury board. Judd later became minister of foreign affairs (1843), minister of the interior (1845), and minister of finance (1846). Actually, he was the prime minister, actively directing nearly all aspects of the Hawaiian government. Judd represented the monarch on the committee that drew up the liberal constitution of 1852. He then returned to his life as a missionary but maintained an active interest in Hawaiian politics. He won a seat in the legislature in 1858 and took part in the constitutional convention of 1864—opposing King Kamehameha V's attempts to increase monarchical power. From 1863 until his death, Judd served on the board of the Hawaiian Evangelical Association.

Juddah (Saudi Arabia): *see* Jidda.

Jude, SAINT: *see* Judas, Saint.

Jude, Letter of, brief New Testament letter written to a general Christian audience by one who called himself "Jude, a servant of Jesus Christ and brother of James"; the author's identity is uncertain. The letter appeals to Christians to "contend for the faith which was once for all delivered to the saints" and to be on their guard against "ungodly persons who pervert the grace of our God into licentiousness and deny our only Master and Lord, Jesus Christ." The cultivated Greek style is notable for numerous figures of speech and references to both the Old and New Testaments and to other sources. References to apocryphal literature, however, may have contributed to a 3rd-century dispute about the letter's authenticity, but its canonical status in the early church is nonetheless well attested. The letter was probably composed, at an unknown place, during the first quarter of the 2nd century.

Judea: *see* Judaea.

Judeo-Spanish language: *see* Ladino language.

Judges, Book of, an Old Testament book that, along with Deuteronomy, Joshua, I and II Samuel, and I and II Kings, belongs to a specific historical tradition (Deuteronomic history) that was first committed to writing about 550 BC, during the Babylonian Exile. The judges to whom the title refers were charismatic leaders who delivered Israel from a succession of foreign dominations after their conquest of Canaan, the Promised Land.

The introduction is an account of the conquest of Canaan (1:1–2:5) and a characterization of the period of the judges (2:6–3:6). The main body of the book consists of narratives about the judges. The book concludes with supplements about the migration of the tribe of Dan to the north (chapters 17–18) and about the sins of the Benjaminites (chapters 19–21).

Because the author was an exile in Babylonia, foreign domination was a matter of deep concern. The retelling of Israel's experiences during the period of the judges is thus coloured by the experiences of the present. The historian emphasized that Israel's subjugation to foreign powers and its loss of freedom and prosperity were caused by the people's worship of Canaanite gods. Recurring throughout the book is the stereotyped formula: "The people of Israel did what was evil in the sight of the Lord . . . and he sold them into the hand of. . . ." After each period of subjection, the historian introduces another formula: "But when the people of Israel cried to the Lord, the Lord raised up a deliverer for the people. . . ." Clearly, the historian schematized the accounts of the judges according to an apostasy–deliverance pattern. This arrangement of historical materials was designed to influence a course of action for the deliverance of the Israelites held captive in Babylonia. In addition to the apostasy–deliverance schema, the historian takes the history of individual tribes and gives an "all Israel" scope. This technique likewise reflects the author's exilic perspective, for the deliverance of all Israel, he believes, is possible if the people return to their worship of Yahweh.

judgment, also spelled JUDGEMENT, in all legal systems, a decision of a court adjudicating the rights of the parties to a legal action before it. A final judgment is usually a prerequisite of review of a court's decision by an appellate court, thus preventing piecemeal and fragmentary appeals on interlocutory (provisional) rulings (*see* interlocutory decree).

A judgment generally operates to settle finally and authoritatively matters in dispute before a court. Judgments may be classified as *in personam, in rem,* or *quasi in rem.* An *in personam,* or personal, judgment, the type most commonly rendered by courts, imposes a personal liability or obligation upon a person or group to some other person or group. This obligation may be to pay a sum of money, to perform some act, or to refrain from doing so. On the other hand, the judgment may be for the defendant, negating the plaintiff's claim for relief.

An *in rem* judgment imposes no personal liability on anyone but adjudicates the interests of all persons in a specific thing or property in the custody of the court or otherwise subject to its jurisdiction. The designation *quasi in rem* describes a judgment that affects the interests of one particular party, rather than all parties, in a thing or property within the control or jurisdiction of the court. Once a judgment has been rendered, there are various bars to relitigation by the parties involved on the issues adjudicated (*see* res judicata).

A judgment is valid and of legal effect only if the court that issued it had competence to decide the questions of law presented by the case, as well as jurisdiction over the persons or things involved (*see* competence and jurisdiction). Jurisdiction over a person is obtained by service of a writ or warrant (*qq.v.*) or by some other type of notification. Jurisdiction over property, a necessity for any valid judgment that disposes of the property itself, may be obtained by seizure or attachment of the property by the court. If the court deals with the legal status of the parties before it, as in an action for divorce, it is generally required that at least one of the parties be a resident of the jurisdiction in which the court is located.

Questions of a court's competence to de-

cide a case are determined in most cases by the details of the particular country's court structure. In general, lesser courts may not hear cases involving more than a fixed sum of money. Further, probate, family law, and criminal matters are often handled exclusively by specialized courts.

In many instances the successful party to a lawsuit does not need to take any additional action to enforce his rights under the judgment, as when the judgment merely disposes of property in the physical custody of the court. When a judgment imposes a personal obligation on one party to another, however, the latter may have occasion to resort to a variety of remedies that the law provides for the enforcement of his rights. If the judgment orders one party to perform some act (other than the payment of money) or to refrain from some type of conduct, the court has at its disposal the full range of its powers to punish for contempt to ensure that its orders will be carried out (*see* injunction).

In the case of debt, a money judgment acts as a lien on all of the debtor's property and on all property that he has transferred away to escape his creditors. The judgment creditor may also garnish wages or other sums owed to the debtor. In many jurisdictions, moreover, a judgment debtor may still be imprisoned for failure to pay alimony or support ordered by the court, for example, or for failure to satisfy judgment for damages. *See also* appeal.

Judgment, Day of (Judaism): *see* Rosh Hashana.

judgment tale (African short story): *see* dilemma tale.

Judicature Act of 1873, in England, the act of Parliament that created the Supreme Court of Judicature (*q.v.*) and also, *inter alia*, enhanced the role of the House of Lords to act as a court of appeal. Essentially, the act was a first modern attempt to reduce the clutter—and the consequent inefficiency—of courts that had specific powers of jurisdiction throughout England and Wales.

Originally, the Judicature Act of 1873 brought together several tribunals and created five important divisions to function under the Court of Appeal in the Supreme Court of Judicature, or the High Court of Justice. These divisions were: (1) Queen's (or King's) Bench, (2) Chancery Division, (3) Common Pleas Division, (4) Exchequer Division, and (5) Probate, Divorce, and Admiralty Division. In 1880 an Order in Council incorporated the functions of Common Pleas and Exchequer into Queen's Bench.

The act of 1873 reaffirmed the status of the House of Lords as the final court of appeal. It also set in motion the proceedings that would evolve into the act of 1876 providing for the installation, in the House of Lords, of the law lords, members of the body who are also capable lawyers, judges, and legal scholars.

Many legal historians today point to the act of 1873 as the first step toward the modernization of the courts of England and Wales. The Courts Act of 1971 continued the modernization with the abolition of quarter sessions and assizes.

Judicial Committee of the Privy Council, a British tribunal composed of certain members of the Privy Council that, on petition, hears various appeals from the United Kingdom, the British crown colonies, and members of the Commonwealth that have not abolished this final appeal from their courts.

The tribunal's authority derives from the Judicial Committee Act of 1833, but its origins lie much further back in English history. From the earliest times the king has been accounted the supreme source of justice, and his council has always had judicial as well as advisory functions. In the later Middle Ages, when courts for all ordinary causes were well established, a form of residual justice remained with the king for some matters and was dealt with by the king's council working in committees. These committees were the source of some of the prerogative courts that fell into disrepute in the 17th century and were abolished or no longer used by 1689. After this date, appeals to the sovereign, especially from overseas, were dealt with by a general committee of the Privy Council. In 1833 the special judicial tribunal known as the Judicial Committee was created, to be made up of the lord chancellor, the lord of appeals in ordinary, any privy councillors who have held such offices in the past, and the president and former presidents of the Privy Council. Judges from British colonies and independent Commonwealth countries are also included.

The committee may sit in divisions and hear various cases simultaneously and is in no way bound by previous decisions. Its judgment is made in the form of a report to the sovereign, and this decision may be implemented by an order in council. The sovereign retains the power to refer any question to the committee, and such special references are still made.

Judicial Conference of the United States, an administrative body, presided over by the chief justice of the U.S. Supreme Court, with the assistance of an administrative assistant. The conference—which also includes the chief judge from each of the separate courts of appeals and a district judge from each one of the separate circuits—acts as a body of general oversight and recommendation, studying the workings of the different courts, including their budgets and work loads and matters concerning the health and "good behaviour" of judges.

The Judicial Conference has recommended, and in most instances it has implemented, the assignment of additional law clerks to assist in the growing case loads being handled by the federal judiciary. Among one of its most controversial recommendations designed to lighten judiciary loads is the recommendation to reduce the size of juries. The conference has also recommended using more computers for data processing and eliminating three-judge courts, with direct appeals to the Supreme Court.

judicial review, power exerted by the courts of a country to examine the actions of the legislative, executive, and administrative arms of the government and to ensure that such actions conform to the provisions of the constitution. Actions that do not conform are unconstitutional and, therefore, are null and void. The institution of judicial review is predicated upon the existence of a written constitution that is changeable only by some extraordinary process of legislation or referendum.

As a constitutional practice, judicial review is usually considered to have begun with the assertion by John Marshall, chief justice of the United States, in *Marbury* v. *Madison* (*q.v.*) in 1803, of the power of the Supreme Court to invalidate legislation enacted by Congress. There was, in fact, no express warrant for Marshall's assertion of the power of judicial review in the actual text of the Constitution, although there was some precedent for it in the British Privy Council review of colonial legislation; its success rested ultimately on the Supreme Court's own ruling, plus the absence of effective political challenge to it.

A number of the constitutions drafted in Europe and Asia after World War II incorporated judicial review in various forms: in France, where the Cour de Cassation, the supreme court, has no power of judicial review, a constitutional committee of mixed judicial-legislative character was established; Germany and Italy provided more directly for special constitutional courts; Japan, India, and Pakistan set up supreme courts exercising judicial review on the general United States and British Commonwealth pattern.

Widespread pressures after World War II for the adoption of judicial review stemmed from the feeling, strongly influenced by U.S. constitutional ideas, that a system of constitutional checks and balances is an essential condition of democratic government. Some observers concluded that the concentration of government power in the executive, substantially unchecked by other agencies of government, contributed to the rise of totalitarian regimes in Germany and Japan in the era between World War I and World War II.

In the United States there has been a constantly changing emphasis on the role of the Supreme Court in relation to the coordinate arms of government, and also frequent divisions of opinion among the justices themselves as to the proper function of the high court in exercising judicial review. Up until the late 1930s the court was hesitant in allowing Congress to interfere with constitutionally guaranteed property rights and, in the early 1930s, struck down much New Deal legislation. Since that time the court's emphasis has shifted to questioning legislative, executive, and judicial actions of the various states, particularly with regard to their observance of constitutional guarantees of liberty and equal protection of the laws (*see* due process).

In some areas the court has been unanimous, or nearly unanimous, as in its numerous decisions since 1954 striking down school segregation and in voting-rights cases. It has also been nearly unanimous in dealing with intrusions by the executive branch of the federal government on the First Amendment guarantees of free speech, as seen in the 1971 ruling preventing the government from interfering with publication of Defense Department studies on the war in Vietnam.

The experience of judicial review in some other countries has shown a tendency to favour economic and property interests, accompanied by a firm insistence that the judges' task is one of interpretation alone. Germany, on the other hand, has adopted the judicial activism of its American model (*see* Federal Constitutional Court).

judiciary, that branch of the government whose task is the administration of justice.

A brief treatment of the judiciary follows. For full treatment, *see* MACROPAEDIA: Judicial and Arbitrational Systems.

The principal work of the judiciary is the adjudication of controversies. The court must decide all questions of law; and, if the case is not before a jury, the court must also rule on the facts. Not all of the work of the judiciary is to decide controversies, however. Many matters brought before it are uncontested. The majority of civil cases—such as those involving divorce, child custody, or the interpretation of contracts—never come to trial and are settled out of court. In such cases, the court's function is administrative.

When it does have to decide controversies, a body of regulations governs what parties are allowed before the court, what evidence will be admitted, what trial procedure will be followed, and what types of judgments may be rendered. Any judicial proceeding involves the participation of a number of people. Although the judge is the central figure, along with the parties to the controversy and the lawyers who represent them, there are other individuals involved, including witnesses, clerks, bailiffs, administrators, and jurors when the proceeding involves a jury.

Rules govern the types of things that may be accepted as evidence; the code pertaining to this is known as the law of evidence. The judicial proceeding itself follows another set

of rules, and the types of judgments that may be rendered are established by legislation.

Although the stated function of the courts is to administer justice according to rules enacted by the legislative branch, courts also unavoidably make law. In deciding, for instance, how the legislative provisions are to be applied to specific cases, the courts make law. They also make law, in effect, by laying down rules for future cases; this is known as the doctrine of precedent.

After a court decision is made, it may or may not require enforcement. In many cases the parties accept the judgment of the court and conform their behaviour to it. In other cases, a court must order a party to cease a particular activity. In such cases, an injunction is issued, and, if it is disobeyed, the court may find the nonconforming party in contempt, sentencing him to jail or levying a fine. The enforcement of such injunctions, however, is carried out by the executive branch.

In the early Middle Ages, judicial functions were not separated from the legislative or executive ones, all governmental functions being carried out by the monarch or other ruler. Starting around the 12th century, however, both rulers and church heads began to entrust decisions involving the administration of justice to professionals. The church's highest central court, for instance, called the rota, was formed of professional lawyers. The rise of a class of civilians trained in law at a university contributed to the gradual separation of judicial from administrative functions. Today in most judicial systems the enforcement function is left to the executive branch, while the courts administer justice.

Judith, Book of, apocryphal work excluded from the Hebrew and Protestant biblical canons but included in the Septuagint (Greek version of the Hebrew Bible) and accepted in the Roman canon.

The book relates that Nebuchadrezzar, king of Assyria, sent his general Holofernes on an expedition against Palestine. At the siege of the Jewish city of Bethulia, a general named Achior warned Holofernes of the danger of attacking the Jews. A beautiful Jewish widow named Judith left the besieged city in pretended flight and foretold to Holofernes that he would be victorious. Invited into his tent, she cut off his head as he lay in drunken sleep and brought it in a bag to Bethulia. A Jewish victory over the leaderless Assyrian forces followed.

The work's historicity is suspect because of numerous historical and chronological errors. Some scholars have suggested that the existence of similar accounts in the Bible (*e.g.,* Jael in the Book of Judges) and in the interpretive stories of the Midrash point to an early, common source (perhaps from the 6th century BC) now lost. Others, however, view the story as sheer fiction and attribute it to an anonymous Palestinian Jew who wrote shortly after the end of the Maccabean revolt (2nd century BC). According to this view, Judith was meant to be the female counterpart of Judas Maccabeus, leader of the revolt, and the book, discussing a contemporary situation in the guise of an ancient historical setting, was written to encourage the Judaean Jews in the uneasy period of independence following the wars precipitated by the Maccabean uprising.

The work has apocalyptic overtones insofar as the enemy attack against Palestine was seen as a combat between the forces of evil and the people of God. Religion and patriotism are equated, and emphasis is also placed on the beliefs that disobedience to the Law will bring certain punishment and that faith must remain strong in times of stress. God's Providence is shown as working through human instruments, in this case, Judith, not through the intervention of divine beings. As a work of literature, Judith maintains a constant dramatic tension, and its popularity in antiquity is attested by its preservation in several Hebrew, Greek, Syriac, and Latin editions.

judo, Japanese JŪDŌ (from Chinese: "gentle way"), system of unarmed combat, now primarily a sport. Sporting judo rules are complex; the objective is to throw the opponent cleanly, or pin him, or master him by applying pressure to arm joints or to the neck. Techniques are generally intended to turn an opponent's force to one's own advantage rather than to oppose it directly. A ritual of courtesy in practice is intended to promote an attitude of calm readiness and confidence. The usual costume is a loose jacket and trousers of strong white cloth. White belts are worn by



National Championship judo match, Japan
By courtesy of Kodo-Kan, Tokyo

novices and black by masters, with intermediate grades denoted by other colours. Kanō Jigorō (1860–1938) collected the knowledge of the old jujitsu schools of the Japanese samurai and in 1882 founded his Kōdōkan School of judo, the beginning of the sport in its modern form. By the 1960s judo associations had been established in most countries and affiliated to the International Judo Federation with headquarters in Paris. Judo was included in Olympic Games competition for the first time at Tokyo in 1964. *See also* martial arts. For world judo championships, *see* Sporting Record: *Judo;* and for Olympic champions, *see* Olympic Games.

Judson, Adoniram (b. Aug. 9, 1788, Malden, Mass., U.S.—d. April 12, 1850, at sea, Indian Ocean), American linguist and Baptist missionary in Burma, who translated the Bible into Burmese and wrote a now standard Burmese dictionary.

At Andover Theological Seminary, Massachusetts, Judson acquired a zeal for evangelism. In 1810 six seminary students, with a petition drafted by Judson, succeeded in getting the General Association of Massachusetts (Congregational) to establish the American Board of Commissioners for Foreign Missions. The new board sent Judson to England to confer on affiliation with the London Missionary Society. He was delayed by the capture of his vessel by a French privateer, and growing international tensions on the eve of the War of 1812 prompted the American board to act independently.



Adoniram Judson, detail from an engraving by Alfred Jones after a painting by Chester Harding, 1846
By courtesy of the Library of Congress, Washington, D.C.

In 1812 Judson and his wife, Ann Hasseltine (1789–1826), along with four other missionaries, set out for India. Anticipating a meeting with Baptists at Serampur, India, they made a study of Baptism while they were aboard ship and were won over to the Baptist point of view. They were baptized by immersion and left the U.S. board to join a new board formed in 1814; thus began what is now called the American Baptist Foreign Mission Society. When the British East India Company opposed them in India, the Judsons relocated to Rangoon in 1813; there Judson mastered the Burmese language and literature and learned Pāli, the Buddhist canonical language.

Adapting local customs to evangelism, Judson opened his first public preaching place in 1819. He soon founded a Burmese church, established schools, and trained preachers. From his pioneering efforts there eventually arose a Baptist Christian community composed of Burmese, Karen, and other peoples amounting to about 500,000. During the First Burmese War with Britain (1824–26), Judson was imprisoned by Burmese forces and suffered extreme torture. His wife's heroism during the period became a legend. She died soon after he was freed from prison. Judson continued to combine translation and literary work with evangelism, and in 1834 he completed the task of translating the Bible into Burmese. His *Dictionary,* which was first issued in 1826, came out in revised editions in 1849 (English–Burmese) and in 1852 (Burmese–English).

Judson, E(dward) Z(ane) C(arroll), pseudonym NED BUNTLINE (b. March 20, 1823, Stamford, N.Y., U.S.—d. July 16, 1886, Stamford), American adventurer and writer, an originator of the so-called dime novels that were popular during the late 19th century.

Judson's earlier stories were based on the exploits of his own picaresque career, which began as a cabin boy in the U.S. Navy. He rose to the rating of midshipman but in 1844 left the Navy, reputedly to serve in the Seminole War and travel in the West. He contributed stories to the *Knickerbocker Magazine* and in 1844 established the short-lived *Ned Buntline's Magazine* in Cincinnati, Ohio. After capturing two fugitives wanted for murder in Kentucky, he went to Nashville, Tenn., and founded a sensational newspaper, *Ned Buntline's Own.* He transferred its operations to New York City after a narrow escape from a lynching while being arraigned for the killing of his supposed mistress' husband.

In 1849 he led the American actor Edwin Forrest's adherents in the "Astor Place riot" in New York City and was imprisoned for a year. He became an important organizer of the Know-Nothing Party. Judson joined the Union Army during the Civil War but was dishonourably discharged in 1864 for drunkenness. He later met William F. Cody, whom he styled "Buffalo Bill" and portrayed as the hero of a number of his dime novels. He also wrote a play for Cody, *The Scouts of the Plains* (1872), patterned on his life. In 1871 Judson retired to Stamford, N.Y., where he continued to produce his profitable fiction. He also became a hymn writer and lecturer for the temperance movement.

His hundreds of dime novels and serials were sensational stories of swashbuckling heroes and violence and had such titles as *The Mys-*

teries and Miseries of New York (1848); *Ned Buntline's Life Yarn* (1848); *Stella Delorme, or The Comanche's Dream* (1860); *Red Ralph: The Ranger* (1870); and *Buffalo Bill's First Trial; or Will Cody, the Pony Express Rider* (1888). His career is detailed in *The Great Rascal* (1952) by James Monaghan.

jue (Chinese vessel): *see* chüeh.

Juel, Niels (b. May 8, 1629, Christinia, Nor.—d. April 8, 1697, Copenhagen), naval officer who guided the development of the Danish Navy in the late 17th century and led the Danish fleet to important victories over Sweden in the Scanian War (1676–79).

Juel learned naval warfare under the Dutch admirals Maarten Tromp and Michiel de Ruyter during the Anglo-Dutch War of 1652–54. He later served with distinction in the Swedish-Danish wars of 1658–60. In the 15



Juel, detail from a portrait by Jacob Coning

By courtesy of the Nationalhistoriske Museum paa Frederiksborg, Denmark

years of peace that followed, Juel was admiral of the fleet and director of the royal shipyard (Holmen), in which capacity he greatly improved the Danish Navy.

Juel introduced certain tactical innovations during the Scanian War that led to victories in such battles as Jamund and Øland (1676) and the Bay of Køge (1677). After the war Juel continued to develop the Danish fleet. In 1683 he was named president of the admiralty.

juge d'instruction (French: "judge of inquiry"), in France, magistrate responsible for conducting the investigative hearing that precedes a criminal trial. It is in this hearing that the major evidence is gathered and presented, witnesses heard, and depositions taken. If at the end of the proceedings the *juge d'instruction* is not convinced that there is sufficient evidence of guilt to warrant a trial, then no trial will occur. This process differs from the grand jury hearing in the Anglo-American system, under which the grand jury need find only probable cause in order to return an indictment for trial.

The preliminary investigative procedure was developed in France as early as the 17th century, but the position of *juge d'instruction* was not instituted until the mid-19th century. He is appointed by the president upon the recommendation of the Ministry of Justice; he holds his position for three years, and his appointment may be renewed. The *juge d'instruction* may take on a case only if ordered to do so by the *procureur* (public prosecutor) or when requested to do so by a private citizen. Once the *juge d'instruction*'s investigation begins, the accused must be supplied with counsel, who must be given access to all documents and evidence. The hearing is structured to ensure the protection of the accused; although he has a right to be heard, he may also choose to remain silent.

The *juge d'instruction* has a wide range of powers available to him in conducting the hearing. He may issue warrants allowing the authorities to search the accused's residence and seize necessary evidence. He may also issue warrants requiring certain people to appear as witnesses, or he may request experts to testify. If there is conflicting testimony, then witnesses are confronted with each other and often with the accused. At the end of the hearing, the *procureur* may, if he chooses, present his opinion, in the form of a plea.

The evidence collected and the testimony of witnesses make up the dossier of the case. It serves as a guide for the judge in open court, particularly to verify testimony. It is available to the defense in its entirety so that the element of surprise, so prevalent in common-law trials, is eliminated from the main hearing. It is not, however, available to the jury, which must base its decision on the facts presented in open court. It is on the strength of this file that the *juge d'instruction* bases his decision as to whether to commit a case to trial. He may issue an order of *non-lieu,* meaning "no case." If he decides there is enough evidence for a trial, he will commit a case involving a serious misdemeanour or a lesser felony to the criminal court, whereas a major felony must first go to the chamber of accusation of the Court of Appeal (Cour d'Appel), the pretrial hearing. If it supports the *juge*'s recommendation, it will turn the case over to the Assize Court (Cour d'Assise), the only court in France with a jury.

Jugendstil, artistic style that arose in Germany about the mid-1890s and continued through the first decade of the 20th century, deriving its name from the Munich magazine *Die Jugend*, which featured Art Nouveau designs. Two phases can be discerned in Jugendstil: an early one, before 1900, that is mainly floral in character, rooted in English Art Nouveau and Japanese applied arts and prints; and a later, more abstract phase, growing out of the Viennese work of the Belgian-born architect and designer Henry van de Velde. *See* Art Nouveau.

juggler (Latin *joculare:* "to jest"), entertainer who specializes in balancing and in feats of dexterity in tossing and catching items such as balls, plates, and knives. Its French linguistic equivalent, jongleur (*q.v.*), signifies much more than just juggling, though some of the jongleurs may have turned to juggling when their original role fell out of fashion.

Juggling was a highly developed art long before the medieval period, according to evidence found in ancient Egyptian, Greek, and Roman sculpture, coins, and manuscripts. Comparison with these ancient records reveals that although juggling has advanced in technical perfection, the underlying principles are still the same. In an early manuscript, for example, a bear is shown standing on its hind legs and juggling with three knives. (A similar feat is performed in the modern Russian circus with the bear lying in a small cradle and juggling a flaming torch with its hind legs).

In the 17th and 18th centuries the juggler found a living in the fairs, but it was not until the 19th century that he came into his own in the circus and in the music hall. These new fields provided a unique training ground for fresh talent and before long had produced such outstanding artists as Severus Scheffer, Kara, Paul Cinquevalli, and Enrico Rastelli (who could juggle with 10 balls, an almost miraculous accomplishment in the juggling world). Juggling large numbers of balls is no longer popular because much the same effect can be achieved with three balls by a juggler with a sense of style as with seven or eight. The modern tendency is more spectacular presentation of the juggling act: *e.g.*, blindfolded on horseback, on a perch or high wire, or, as done by Rudy Horn, on a unicycle.

Juglandales, the walnut order of flowering plants, consisting of two families belonging to the class called dicotyledon (*q.v.*; characterized by two seed leaves). Members of this order are trees bearing inconspicuous flowers, usually aggregated into conelike, pliable catkins. Walnut, pecan, and hickory (*qq.v.*) are among the many trees of Juglandales that are prized for both their edible nuts and their strong, attractive woods.

A brief treatment of Juglandales follows. For full treatment, *see* MACROPAEDIA: Angiosperms.

The Rhoipteleaceae family consists of only a single species growing in northern Vietnam and in China. The large and economically important Juglandaceae family comprises 8 genera and about 60 species distributed mainly in the North Temperate Zone, but extending through Central America along the Andes Mountains to Argentina and, in scattered stands, from temperate Asia to Java and New Guinea.

Whether growing in forests of temperate regions, in mountainous areas, or along seashores of the tropics, members of Juglandaceae require a reliable level of soil moisture. Those thriving on dry hillsides depend on well-spaced rains. A few species grow along water courses in moist canyons and in fog belts of mountains. Walnuts and hickories seldom grow in solid stands; instead, they are intermingled with understory shrubs and oaks in deciduous forests as in the eastern United States and eastern Mexico.

Stems of black walnut trees attain heights of 175 feet (53 metres). Massive trunks are also developed by pecans and some hickories. Tree stems consist almost entirely of secondary wood, *i.e.*, wood produced by a cambial cylinder composed of cells that differentiate inwardly, to add to the wood already present. Cambium, also present in roots, is active mainly in the spring.

Woods of this family are especially noted for their grain patterns and for the lustre of local bands of cells (wood rays) that radiate toward the perimeter of the trunk. Black walnut (*Juglans nigra*) and pecan (*Carya illinoinensis*) are among the Juglandaceae that are in great demand for their stength and beauty; many natural stands have been depleted.

Leaves of the walnut family are pinnately compound. The leaf-stalk (petiole), which is a lateral outgrowth of a twig (stem), continues as an elongate unit (the rachis) from which the oppositely positioned leaflets arise. The rachis is the equivalent of the midrib of a simple leaf. The number of leaflets in *Juglans* ranges from 7 to 23. The undersurface of the leaflets of many members bears yellow dots or tiny, resinous scales that give the species a pungent, characteristic aroma. Buds, flowers, and fruits often are more aromatic than the leaves.

Platycarya, a tree of China, and several species of *Pterocarya,* native to a wide area in Asia and attaining heights of 100 ft, produce roots on buried twigs that eventually are separated from the parent plant. *Pterocarya* and several hickories bear suckers and root sprouts to reproduce the species vegetatively. Otherwise, members of the walnut family multiply by seeds.

The inflorescence (flower cluster) of the Juglandaceae consists of an elongate stalk bearing many flowers. The staminate (male) cluster is a catkin in which stalkless masses of the pollen-producing stamens are associated with small, leaflike bracts. As many as 100 stamens may be produced by a single male flower of a catkin. The pistillate (female) flowers are spaced farther apart to form a spike that, in some genera, consists of only one or two flowers. Both kinds of inflorescences are borne on the same tree, except in *Engelhardtia.* Pollination is achieved by wind.

The fruit of nut-bearing trees is composed of three layers; an outer skin, a middle pulpy

zone, and an inner, stony layer (endocarp); these features typically define a drupe, but it is generally named a drupaceous nut, or simply a nut. In areas where squirrels are present, many nuts are stored underground and are not reclaimed, with the result that, by spring, many seedlings appear.

Juglar, Clément (b. Oct. 15, 1819, Paris, Fr.—d. Feb. 28, 1905, Paris), French physician and economist who made detailed studies of cycles in business and trade.

Juglar qualified as a doctor in 1846. His medical training gave him an interest in population and demography, but it appears to have been the economic disturbances of 1848 that attracted him to the subject of economic fluctuations and crises. In 1851 he began contributing to the *Journal des Économistes,* and in 1860 he submitted an essay, *Des Crises commerciales* (published as a book, 1862; "Business Crises"), to the Academy of Moral and Political Science; it won the Bordin Prize.

Juglar was one of the first to analyze business cycles as fully as possible on the basis of available time series data. His use of statistics in predicting turning points in cycles was so accurate that a later economic cycle theorist, Joseph Schumpeter, wrote of him as being "among the greatest economists of all time." He paid particular attention to the behaviour of bank balances, which he regarded as a barometer of commercial affairs.

Jugoslavija: *see* Yugoslavia.

Jugurtha (b. *c.* 160 BC—d. 104, Rome), king of Numidia from 118 to 105, who struggled to free his North African kingdom from Roman rule.

Jugurtha was the illegitimate grandson of Masinissa (d. 148), under whom Numidia had become a Roman ally, and the nephew of Masinissa's successor, Micipsa. Jugurtha became so popular that Micipsa tried to eliminate his influence by sending him in 134 to assist the Romans in the siege of Numantia (Spain). Jugurtha, however, established close relations with influential Roman senators, who probably persuaded Micipsa to adopt Jugurtha in 120.

After Micipsa's death in 118, Jugurtha ruled Numidia with Micipsa's two sons, Hiempsal and Adherbal, the first of whom Jugurtha assassinated. When Adherbal was attacked by Jugurtha, he fled to Rome for aid—Rome's approval being required for any change in the government of Numidia—but, by bribing Roman officials, Jugurtha's envoys obtained senatorial authorization for a division of Numidia, with Jugurtha taking the western (and richer) half and Adherbal the eastern. Trusting in his influence at Rome, Jugurtha again attacked Adherbal (112), capturing his capital at Cirta, but he made the mistake of massacring a number of Italian businessmen. Popular anger in Rome forced the Senate to declare war on Jugurtha, but in 111 the consul Lucius Calpurnius Bestia made a generous settlement with him. Summoned to Rome to explain how he had managed to obtain the treaty, Jugurtha had a potential rival killed in the capital, and even the best of his Roman friends could no longer support him. When war was renewed, Jugurtha easily maintained himself against incompetent generals. Early in 110 he forced the capitulation of a whole army under Aulus Postumius Albinus and drove the Romans out of Numidia. Anti-senatorial feeling caused the terms of this surrender to be disavowed by Rome, and fighting again broke out. After the arrival of a new consul, Gaius Marius, in 107, Jugurtha continued to achieve successes through guerrilla warfare. Bocchus I of Mauretania, however, encouraged by Marius' quaestor, Lucius Cornelius Sulla, trapped the Numidian king and turned him over to the Romans early in 105. He was executed in 104.

Jui (people): *see* Puyi.

Jui-ti (Chinese emperor): *see* Cheng-t'ung.

Jui-ti (Chinese emperor): *see* Chia-ch'ing.

Jui Tsung, Pinyin RUI ZONG (temple name, or *miao-hao*), personal name (*hsing-ming*) LI TAN (b. 662—d. 716), fifth emperor of the T'ang dynasty, who was placed on the throne by his mother, Wu Hou, in 684, before she decided to set him aside and rule the country herself in 690, the first such usurpation in Chinese history. Although Jui Tsung had been made Wu Hou's heir, his brother Chung Tsung, under the domination of a clique of court officials, succeeded to the throne in 705, after a palace coup overthrew the empress. A further coup led by Jui Tsung's son put Jui Tsung back on the throne in 710. He ruled for two years before abdicating to his son.

Juigalpa, city, central Nicaragua. It is situated on the flanks of the Sierras de Amerrique, in the rift valley in which Lakes Nicaragua and Managua are situated. The city is an agricultural and commercial centre: sugarcane, coffee, grain, and livestock are the principal products. The city contains tanneries, coffee-processing plants, and factories manufacturing beverages. Juigalpa is on the Atlantic Highway, which links Managua, the national capital, with the Caribbean lowlands. Pop. (1985 est.) 25,625.

Juilliard School, formerly JUILLIARD SCHOOL OF MUSIC, internationally renowned school of the performing arts in New York City. It is now the professional educational arm of the Lincoln Center for the Performing Arts. The Juilliard School offers bachelor's degrees in music, dance, and drama, and postgraduate degrees in music.

The school's history began with the foundation of the Institute of Musical Art in 1905. Upon the death of financier Augustus D. Juilliard in 1919, a large bequest was made to the Juilliard Musical Foundation, which was incorporated the following year. The foundation, which was directed to advance musical education in the United States, founded the Juilliard Graduate School in 1924. In 1926 the Institute of Musical Art and the Juilliard Graduate School came under the same board of directors and were combined under the name of the Juilliard School of Music in 1946. In the 1950s dance was added to the curriculum, and in 1968 the name was changed to the Juilliard School, reflecting its broadened activities, which included instruction in acting at the school's drama division. The school is also noted for the Juilliard String Quartet, founded in 1946 and important to the development of chamber music in the United States.

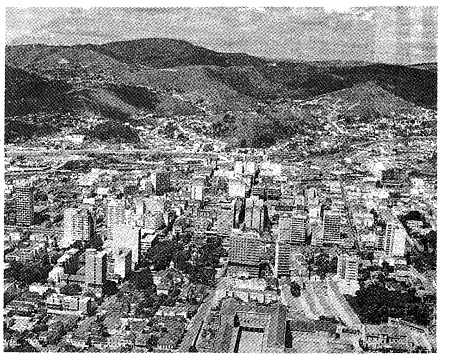
To make the best use of the Britannica, consult the INDEX *first*

Juin, Alphonse(-Pierre) (b. Dec. 16, 1888, Bône, Alg.—d. Jan. 27, 1967, Paris), officer of the French army who became a leading Free French commander in World War II.

The son of a policeman in Algeria, Juin was educated at the military academy of Saint-Cyr and, during World War I, served as captain with Moroccan forces and later as chief of staff to Marshal L.-H.-G. Lyautey. A division commander during the Battle of France in June 1940, he was taken prisoner by the Germans and was released a year later. On Nov. 20, 1941, the Vichy government named him marshal and chief of the French forces in North Africa, replacing General Maxime Weygand. Although compelled to oppose the Allied landings there in November 1942, he quickly switched to the Allied side and subsequently commanded the Free French forces in Tunisia and Italy, leading them into Rome in June 1944.

He was appointed commander in chief of the NATO forces in central Europe in 1951. In 1960, because of his French Algerian origins, he broke with his long-time friend President Charles de Gaulle in protest over the government's Algerian policy. Juin retired in 1962 with the rank of general.

Juiz de Fora, city, southeastern Minas Gerais *estado* ("state"), Brazil. It is situated in the deep Paraibuna River valley between the Orgãos and Mantiqueira ranges. Formerly known as Paraibuna, Juiz de Fora is the centre of a highly developed agricultural region producing rice, bananas, sugarcane, coffee, and other



Juiz de Fora, Braz.
Plessner International

crops and livestock. It is a large manufacturing centre and is known especially for its textiles and plastics. The Mariano Procopio museum and the Federal University of Juiz de Fora (1960) are located there. Juiz de Fora has a commercial airport and is on the main highway and railroad between Rio de Janeiro (80 miles [130 km] south) and Belo Horizonte, the state capital. Pop. (1980 prelim.) 299,728.

jujitsu, Japanese JŪJUTSU, or YAWARA ("gentle art"), method of fighting hand to hand or with a minimum use of weapons that evolved among the warrior class (*bushi,* or samurai) in Japan from about the 17th century. Designed to complement a warrior's swordsmanship in combat, it was a necessarily ruthless style, with the usual object of warfare: crippling or killing an antagonist. "Jujitsu" was a general name for many systems of fighting involving techniques of hitting, kicking, kneeing, throwing, choking, immobilizing holds, and use of certain weapons. Central to these systems was the concept *jū,* from a Chinese character commonly interpreted as "gentle"—gentle, however, in the sense of yielding to an opponent's direction of attack while attempting to control it. Also involved was the use of hard or tough parts of the body (*e.g.,* knuckles, fists, elbows, and knees) against an enemy's vulnerable points. Jujitsu declined after the fall of the Japanese feudal government in the mid-19th century, but many of its concepts and methods were incorporated into such modern fighting arts as judo, karate, and aikido. *See also* martial arts.

juju, type of Nigerian dance music that developed out of highlife. *See* highlife.

jujube, either of two species of small, spiny trees of the genus *Ziziphus* (family Rhamnaceae) and their fruit. Most are varieties of the common jujube (*Z. jujuba*), native to China, where they have been cultivated for more than 4,000 years. This species, 7.6 to 9 metres (25 to 30 feet) high, has alternate, three-veined, elliptical to ovate leaves 2.5 to 7.6 centimetres (1 to 3 inches) long. The small yellow flowers are followed by dark brown, round to oblong fruits the size of small plums.



Jujube (*Ziziphus jujuba*)
Shunji Watari—EB Inc.

The white, crisp pulp surrounds a single large, pointed stone.

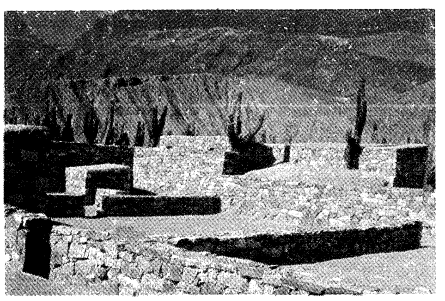
The Indian, or cottony, jujube (*Z. mauritiana*) differs from the common jujube in having leaves that are woolly beneath instead of smooth. The fruits are smaller and not so sweet.

Jujubes are eaten fresh, boiled, stewed, and baked. When made into glacé fruits by boiling in honey and sugar syrup, they resemble Persian dates and are sometimes known as Chinese dates. Juice obtained from the fruits is used in making small candies called jujubes.

Both species thrive in hot, dry climates where winter temperatures do not go below 9.4° C (49° F). Jujubes were introduced into the United States in 1837; superior varieties were obtained from China about 1906. They are cultivated in the southwestern United States but are not grown commercially on a large scale. The trees are resistant to a great number of pests.

Propagation is by seeds, although the commercial varieties must be propagated vegetatively by suckers, root cuttings, or grafting.

Jujuy, province, extreme northwestern Argentina, bordering Chile (west) and Bolivia (north), having an area of 20,548 sq mi (53,219 sq km). It comprises several cordilleras of the Andes (reaching elevations of 16,500 ft [5,000 m] and separated by a 11,500-ft-



The ancient Indian fortress of Pucará in Jujuy province, Argentina
Ernesto Alstadt

high bleak plateau called the Puna de Atacama) that descend on the east to form sub-Andean ranges and valleys. The eastern Andean and sub-Andean ranges are drained by the U-shaped Grande–San Francisco river system, which in its northeasternmost extension, at less than 1,000 ft, is warm and humid. The Quebrada de Humahuaca, in the northwestern part of the system, is a 100-mi-long canyon running northward along the Río Grande from the provincial capital, San Salvador de Jujuy. It was historically important as a trade route up through the Puna de Atacama to Bolivia and Peru.

The region was part of the Inca Empire in the late 15th and early 16th centuries. Jujuy derived its name from a type of Inca provincial governor (*xuxuyoc*) encountered there by the Spanish in the late 16th century. During colonial times the *encomiendas* (estates) of the region produced foodstuffs and mules for the Bolivian silver mines. The province was organized in 1834, when it was separated from Salta province. With the breakup of Los Andes national territory in 1943, it absorbed Susques department.

Jujuy has a high percentage of all mineral resources in Argentina. In the late 20th century the province produced zinc, lead, tin, and silver. High-grade iron ore is mined in the Sierra de Zapla, and a blast furnace operates at the town of Zapla near San Salvador de Jujuy, but inadequate coal supplies and transportation facilities have hindered full development. Small oil and natural gas deposits are also exploited, and cement plants utilize local supplies.

Commercial agriculture (chiefly sugarcane and tobacco) is restricted to the San Francisco and lower Grande valleys. Pack animals (mules, asses, and llamas) are raised, as are sheep, goats, and lesser numbers of cattle. The seasonal influx of thousands of farm workers from Bolivia creates social and economic problems. About 20 unadorned rural chapels, dating from the 16th–18th-century, are extant in the Quebrada de Humahuaca and Puna de Atacama. Pop. (1983 est.) 449,000.

Jukun, a people living on the upper Benue River in Nigeria, commonly believed to be descendants of Kororofa, one of the most powerful Sudanic kingdoms in the late Middle Ages. The ruins of a great settlement to the northeast of the Jukun's present location are thought to be those of the capital of that kingdom, but the claim has not been thoroughly investigated by archaeologists. Many royal families of Nigerian tribes trace their ancestry back to the area and to the Jukun royal family.

The population speak a language of the Benue–Congo branch of the Niger–Congo family. The people comprise a congeries of many smaller groups, each organized on a different basis, although polygynous extended families seem to be the dominant unit.

The Jukun possess a complex system of offices, which have both a political and a religious aspect; the priesthood practices an involved form of religion marked by diurnal and annual rounds of ritual and sacrifice. The king, called Aka Uku, was—until he became a member of northern Nigeria's house of chiefs in 1947—a typical example of a semidivine priest-king.

Jula (people): *see* Dyula.

Julia (b. 39 BC—d. AD 14, Rhegium), the Roman emperor Augustus' only child, whose scandalous behaviour eventually caused him to exile her.

Julia's mother was Scribonia, who was divorced by Augustus when the child was a few days old. She was brought up strictly, her every word and action being watched. After a brief marriage to Marcus Marcellus, who died in 23 BC, Julia wedded Marcus Vipsanius Agrippa, Augustus' chief lieutenant, in 21 BC. Their two eldest sons were adopted by Augustus in 17 BC and given the names Gaius and Lucius Caesar. Julia had a third son, Agrippa Postumus, and two daughters, Julia and Agrippina.

With Agrippa's death in 12 BC, Augustus' wife, Livia, was able to convince him to favour her own sons by a former marriage, Tiberius and Drusus, as possible successors; and Augustus forced Tiberius to divorce his wife and marry Julia in 11 BC. It was an unwanted and unhappy marriage for both of them. Julia began to lead a promiscuous life, her adulteries becoming common knowledge in Rome.

After an infant son by Julia perished in 6 BC, Tiberius went into voluntary exile, leaving Julia in Rome. Finally Augustus discovered how Julia was behaving. After threatening her with death, he banished her to Pandataria, an island off the coast of Campania, in 2 BC. She was later moved to Rhegium. Upon becoming emperor, Tiberius withheld her allowance, and Julia eventually died of malnutrition.

Julia's guilt is not doubted, but she was a witty and intelligent woman and was loved by the people. Augustus showed her no mercy, however, calling her a "disease in my flesh."

Julia Augusta: *see* Livia Drusilla.

Julia Domna (d. 217), second wife of the Roman emperor Septimius Severus (ruled 193–211) and a powerful figure in the regime of his successor, the emperor Caracalla. She was a Syrian, daughter of the hereditary high priest Bassianus at Emesa (now Homs) in Syria and elder sister of Julia Maesa. Domna gathered about her in Rome a group of philosophers and other intellectuals whose activities are best



Julia Domna, marble bust; in the Glyptothek, Munich
The Mansell Collection

known through the writings of Philostratus. In Britain, she questioned Caledonian prisoners about their habits and beliefs. After Severus' death the murderous rancour of her two sons, the joint emperors Caracalla and Geta, culminated in the assassination of Geta by Caracalla in her presence (212). When Caracalla (ruled 211–217) was on campaign, he left her in control of most of the civilian administration. On the news of his murder in 217 she is said to have starved herself to death, either voluntarily or on the orders of the new emperor, Macrinus.

Julia Maesa (d. *c.* 226), sister-in-law of the Roman emperor Septimius Severus and an influential power in the government of the empire who managed to make two of her grandsons emperors.

Julia Maesa was the daughter of the hereditary high priest Bassianus at Emesa (now Homs) in Syria and married a Roman senator, Julius Avitus. Her daughters Soemias and Mamaea were the mothers of Elagabalus (emperor 218–222) and Severus Alexander (emperor 222–235), respectively. After the murder of her nephew, the emperor Caracalla (217), and the succession of Macrinus as emperor, Julia induced the Syrian legions to declare Elagabalus emperor. When his debauched behaviour threatened a speedy end to the Severan dynasty, she persuaded him to adopt his cousin Alexander and designate him as heir. The 14-year-old Alexander became emperor upon the murder of Elagabalus, and Julia



Julia Maesa, marble statue; in the Vatican Museum
Anderson—Art Resource/EB Inc.

Maesa continued to be a power in the imperial government until her death.

Julia Mamaea (d. 235), mother of the Roman emperor Severus Alexander and the dominant power in his regime. Mamaea was the daughter of Julia Maesa and niece of the former emperor Septimius Severus. Maesa



Julia Mamaea, marble bust; in the Museo Nazionale Romano
Alinari—Art Resource/EB Inc.

persuaded her grandson Elagabalus (emperor 218–222) to adopt Mamaea's son Alexander and make him caesar and heir. When Elagabalus was murdered, Alexander, who was 14 years of age, became emperor. Mamaea acted as regent for her son, with the advice of a council of 16 senators. She dominated the boy, secured the appointment of the jurist Ulpian as praetorian prefect, and accompanied the army in the Persian campaign of 232. The failure of the campaign is usually ascribed to her interference. Ancient writers condemn Mamaea for excessive meddling in government. She and her son were murdered by Roman soldiers in 235.

Julia Molina (Dominican Republic): *see* Nagua.

Julian, byname JULIAN THE APOSTATE, Latin JULIANUS APOSTATA, original name FLAVIUS CLAUDIUS JULIANUS (b. AD 331/332, Constantinople—d. June 26/27, 363, Ctesiphon, Mesopotamia), Roman emperor (AD 361–363), nephew of Constantine the Great, and noted scholar and military leader who was proclaimed emperor by his troops. A persistent enemy of Christianity, he publicly announced his conversion to paganism (361), thus acquiring the epithet "the Apostate."

Early life. Julian was a younger son of Julius Constantius, the half brother of Constantine I (the Great), and his second wife, Basilina. When he was five, his father's nephew, also called Constantius, became emperor in the East as Constantius II and in 340, by the death of his brother Constantine II, sole emperor. The army, determined to have none but Constantine I's sons as his successors, murdered the latter's half brothers and other possible aspirants. Constantine I's third son, Constantius II, had Julian's father killed in or just after 337, and an elder brother of Julian was killed in 341. Basilina had died soon after the birth of Julian, who was thus early left an orphan. With his surviving half brother, Gallus, seven years his senior, he was brought up in obscurity, first by Eusebius, bishop of Nicomedia, in Bithynia and later at the remote estate of Macellum in Cappadocia. By the patronage of Eusebia, wife of Constantius II, Julian, when 19, was allowed to continue his education, first at Como and later in Greece.

His physical appearance is described thus by his contemporary and comrade-in-arms, Ammianus Marcellinus:

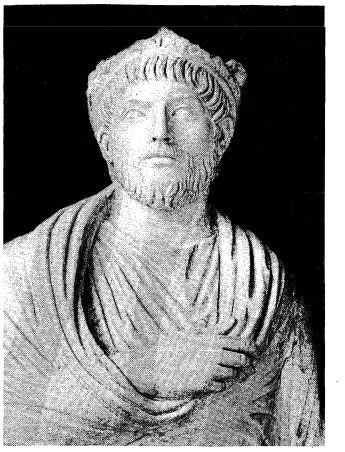
> He was of medium stature, his hair was soft, as if it had been combed, his beard rough and pointed. His eyes were fine and flashing, an indication of the nimbleness of his mind. He had handsome eyebrows, a straight nose, rather a large mouth with a drooping lower lip. His neck was thick and slightly bent, his shoulders broad and big. From top to toe he was well-knit, and so was strong and a good runner.

His statue in the Louvre generally confirms this description, showing him as a stocky, rather diffident-looking philosopher.

Julian's freedom as a student had a powerful influence on him and ensured that for the first time in a century the future emperor would be a man of culture. He studied at Pergamum, at Ephesus, and later at Athens. He was attracted by Neoplatonism and adopted the cult of the Unconquered Sun.

That his literary talent was considerable is demonstrated in his surviving works, most of which illustrate his deep love of Hellenic culture. Julian had been baptized and raised as a Christian, but, although he outwardly conformed until he was supreme, Christianity in its official guise meant to him the religion of those who had murdered his father, his brother, and many of his relations and, as such, was hardly likely to commend itself to him. He found far more solace in his philosophic speculations. This reaction has sometimes been defended as natural but eccentric. Natural it certainly was, but it is a misinterpretation of the age to imagine that Julian was alone in preferring Hellenism to Christianity. Society, and particularly the educated society in which Julian was at home, was in fact still largely if not predominantly pagan. Even bishops were proud of their Greek culture; no one was proud of the exotic degeneracy and extravagance of the court of Constantius. It is not surprising that Julian's austerity, chastity, and enthusiasm for the heritage of Greece found a sympathetic response among many of his cousin's subjects.

Rise to supremacy. In 351 Constantius II, perturbed by the death of his brother Constans and subsequent disorders in the West, appointed Gallus as his caesar; that is, as



Julian the Apostate, detail of a marble statue; in the Louvre, Paris
Giraudon—Art Resource/EB Inc.

his coadjutor and eventual successor. Gallus was a failure and was executed near Pola in Italy (now Pula, Yugos.) in 354. Constantius, again in need of a caesar of his own house, after much hesitation summoned Julian from Greece, whence the latter arrived "still wearing his student's gown." In November 355, at the age of 23, he was duly proclaimed and invested as caesar, an honour which he accepted with justifiable foreboding. The Emperor gave Julian his sister Helena as wife. She died after five years of marriage—the fate of their issue, if any, is unknown. Julian was at once dispatched to Gaul, where he proved a resolute and successful commander. He defeated and expelled the Alemanni and the Franks, feats that aroused the jealousy of Constantius, who kept Julian short of funds and under secret surveillance. In 360, while Julian was wintering at Paris, the Emperor sent a demand for a number of his best troops, ostensibly for service in the East but in reality to weaken Julian. Julian's army thereupon hailed him as Augustus. This naturally infuriated Constantius, who refused any accommodation. Julian, realizing that war between himself and Constantius was now inevitable, decided to move first. But, before the clash could come, Constantius died near Tarsus (November 361), having on his deathbed accepted the inevitable by bequeathing the empire to Julian.

Policies as emperor. Julian, now sole Augustus, greatly simplified the life of the palace and reduced its expenses. He issued proclamations in which he declared his intention to rule as a philosopher, on the model of Marcus Aurelius. All Christian bishops exiled by Constantius were allowed to return to their sees (although the purpose of this may have been to promote dissension among the Christians), and an edict of 361 proclaimed freedom of worship for all religions.

But this initial toleration of Christianity was coupled with a determination to revive paganism and raise it to the level of an official religion with an established hierarchy. Julian apparently saw himself as the head of a pagan church. He performed animal sacrifices and was a staunch defender of pagan orthodoxy, issuing doctrinal instructions to his clergy. Not surprisingly, this incipient fanaticism soon led from apparent toleration to outright suppression and persecution of Christians. Pagans were openly preferred for high official appointments, and Christians were expelled from the army and prohibited from teaching. The latter action led Ammianus, who admired Julian's virtues and was himself an adherent of the traditional religion, to censure the Emperor:

> That was inhumane, and better committed to oblivion, that he forbade teachers of rhetoric and literature to practice their profession if they were followers of the Christian religion.

Julian wrote an attack on Christianity that is known today only by fragmentary citation. "The trickery of the Galileans"—his usual term—has nothing divine in it, he argues; it appeals to rustics only, it is made up of fables and irrational falsehoods. Here perhaps may be detected the sunset snobbery of the Athens of his day. Though professing to be a Neoplatonist and a sun worshipper, Julian himself was an addict of superstition rather than religion, according to Ammianus.

His project to rebuild the Jewish Temple in Jerusalem was designed rather to insult the Christians than to please the Jews, who, for long accustomed to the worship of the synagogue, would have found the revival of animal sacrifice acutely embarrassing. The plan was dropped when it was reported (as it was on both an earlier and a later occasion) that "balls of fire" had issued from the old foundations and scared away the workmen. Christian cities were penalized, and churches were burned in Damascus and Beirut. Bishops, including the great Athanasius, were banished. One was horribly tortured. Bacchus was installed in the Christian basilicas of Emesa (modern Homs, Syria) and Epiphaneia (modern Ḥamāh, Syria). At Antioch, where Julian was preparing for a campaign against the Persians, his closing of the great basilica and the removal of the relics of the martyr Babylas from the sacred grove of Daphne annoyed the Christians. His priggish austerity did not endear him to the pagans, either, and both were equally incensed by his pamphlet entitled *Misopogon* ("Beard Hater"), in which he assailed the Antiochenes for the ridicule that they poured on him for his personal conduct, his religion, and his claim to be a philosopher on the strength of his beard.

The invasion of Persian territory was always a lure in antiquity and one to which Julian was not immune. Motivated by a desire for military glory and a decision to reassert Rome's preeminence in the East, he assembled, despite counsels of prudence from Rome and the Levant, the largest Roman army (65,000 strong and backed by a river fleet) ever to head a campaign against Persia. The Persians, aided by the desert, famine, treachery, and the incompetence of the Romans, once again proved themselves superior. During a disastrous retreat from the walls of Ctesiphon, below modern Baghdad, Julian was wounded by a spear thrown "no one knew whence," which pierced his liver. He died the next night at the age of 31, having been emperor for 20 months.

Julian's religious policy had no lasting effect. It had shown, however, that paganism, as a religion, was doomed. It is perhaps sad, in retrospect, that the odium of proving it should rest on Julian, who with a little less venom and more tact might have been remembered for his many virtues rather than for his two fatal blunders. (S.H.P.)

BIBLIOGRAPHY. *Ancient.* By far the most important source is the history of Ammianus Marcellinus, a contemporary of Julian. He devotes far more space to Julian than to any other character in the extant portion of his history. See books XV, 8 to XXV, 4, in the 3 vol. ed. trans. by J.C. Rolfe (1950–56), which are virtually a biography of Julian. See also Julian's own works, *Juliani imperatoris epistulae . . .*, ed. by J. Bidez and F. Cumont (1922). For English readers the best edition is that of W.C. Wright, 3 vol., "Loeb series" (1953–54), with a very helpful introduction. Of secondary ancient sources the most valuable and balanced is the *Breviarium* of Eutropius.

Modern. Many monographs have been devoted to this controversial prince. Among them may be cited G.H. Rendall, *The Emperor Julian, Paganism and Christianity* (1879); G. Negri, *L'imperatore Giuliano l'Apostata,* 2nd ed. (1902; *Julian the Apostate*); P. Allard, *Julien l'Apostat,* 3 vol., 3rd ed. (1906–10); A. Rostagni, *Giuliano l'Apostata* (1919); J. Bidez, *La Vie de l'empereur Julien* (1930); and G.W. Bowersock, *Julian the Apostate* (1978). H. Mattingly's article on Julian in the *Oxford Classical Dictionary* is to be commended.

Julian OF ECLANUM (b. 380, Eclanum, Italy—d. *c.* 455, Sicily), bishop of Eclanum who is considered to be the most intellectual leader of the Pelagians (*see* Pelagianism).

Julian was married *c.* 402, but upon the death of his wife he was ordained and *c.* 417 succeeded his father, Memorius, as bishop by appointment of Pope St. Innocent I. An early supporter of Pelagius (*q.v.*), he and several other bishops refused to sign the document issued by Pope St. Zosimus excommunicating Pelagius and his disciple Celestius. Julian demanded that a general council of the church consider the problem. His appeal was rejected, and he was deposed and banished from Italy in 421. He was condemned at the Council of Ephesus in 431, and all his attempts to regain his see failed. He eventually settled in Sicily as a teacher.

Julian systematized Pelagian theology and wrote several works (most of which are now lost). His writings are known primarily through long quotations from St. Augustine, who refuted them.

Julian OF NORWICH, also called JULIANA (b. 1342, probably Norwich, Norfolk, Eng.—d. after 1416), celebrated mystic whose *Revelations of Divine Love* is generally considered one of the most remarkable documents of medieval religious experience. She spent the latter part of her life as a recluse at St. Julian's Church, Norwich.

On May 13, 1373, Julian was healed of a serious illness after experiencing a series of visions of Christ's suffering and of the Blessed Virgin, about which she wrote two accounts; the second, longer version was composed 20 or 30 years after the first. Unparalleled in English religious literature, *Revelations* spans the most profound mysteries of the Christian faith—such as the problems of predestination, the foreknowledge of God, and the existence of evil. The clarity and depth of her perception, the precision and accuracy of her theological presentation, and the sincerity and beauty of her expression reveal a mind and personality of exceptional strength and charm. Never beatified, Julian is honoured on the unofficial feast day of May 13. A modern chapel in the Church of St. Julian has been dedicated to her memory. P. Molinari's *Julian of Norwich: The Teaching of a 14th-Century English Mystic* appeared in 1958, followed by J. Walsh's edition of *Revelations* in 1961.

Julian, George W(ashington) (b. May 5, 1817, Wayne County, Ind., U.S.—d. July 7, 1899, Irvington, Ind.), American reform politician who began as an Abolitionist, served in Congress as a Radical Republican during the American Civil War and Reconstruction eras, and later championed woman suffrage and other liberal measures.

After a public school education and a brief stint as a teacher, Julian studied law. He was admitted to the bar in 1840 and thereafter practiced in several Indiana towns. By the mid-1840s Julian was a Whig member of the Indiana state legislature and a frequent author of antislavery newspaper articles. His Abolitionist views prompted him to switch to the Free Soil Party, and in 1848 he won a seat in the U.S. House of Representatives, running on the Free Soil ticket.

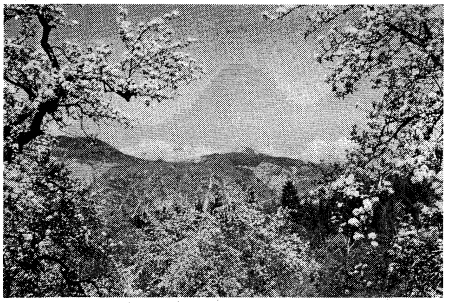
In Congress, Julian opposed the Compromise of 1850. Defeated for reelection that year, he returned to his law practice and antislavery agitation in Indiana. In 1852 Julian was the vice presidential nominee of the Free Soil Party, and four years later he was a prominent figure in the formation of the Republican Party.

Elected to Congress as a Republican in 1860, Julian played an important role in passage of the Homestead Act and in making emancipation a Northern war aim during the Civil War. He served on the Joint Committee on the Conduct of the War, and he became well known for his advocacy of such Radical Reconstruction measures as punishment of Confederate leaders (including confiscation of their lands) and suffrage for the former slaves.

During the Reconstruction era, Julian joined with other Republican Radicals in blocking Pres. Andrew Johnson's Reconstruction policies. In 1867 he was one of seven representatives selected to prepare articles of impeachment against Johnson.

Julian was defeated for renomination in 1870 and two years later broke with the Republican Party to support the Liberal Republicans and their presidential nominee, Horace Greeley. Throughout most of the 1870s and the first half of the 1880s, he championed a number of reform causes—including woman suffrage—primarily as a writer of books and articles.

Julian Alps, Slovene JULIJSKE ALPE, Italian ALPI GIULIE, range of the Eastern Alps, extending southeastward from the Carnic Alps (*q.v.*) and the town of Tarvisio in northeastern Italy to near the city of Ljubljana in northwestern Yugoslavia. Composed mainly of limestone, the mountains are bounded by the Fella River and Sella di (Pass of) Camporosso (northwest) and by the Sava River (north and east). They rise to Triglav (*q.v.*; 9,396 ft [2,864 m]), the highest point in Yugoslavia. Forming part of



Julian Alps in northwestern Yugoslavia
Harrison Forman

the divide between the watersheds of the Adriatic and Black seas, the mountains are separated into two sections by Predel (Slovene) Pass (3,793 ft [1,156 m]), or Passo del Predil (Italian), over which a road crosses the range. Within the mountains lie many valleys and numerous summer resorts. Winter sports and climbing are popular.

Julian calendar, also called OLD STYLE CALENDAR, dating system established by Julius Caesar as a reform of the Roman republican calendar (*q.v.*). Caesar, advised by the Alexandrian astronomer Sosigenes, made the new calendar solar, not lunar, and he took the length of the solar year as 365¼ days. The year was divided into 12 months, all of which had either 30 or 31 days except February, which contained 28 days in common (365-day) years and 29 in every fourth year (a leap year, of 366 days). Because of misunderstandings, the calendar was not established in smooth operation until AD 8.

Sosigenes had overestimated the length of the year by 11 minutes 14 seconds, and by the mid-1500s, the cumulative effect of this error had shifted the dates of the seasons by about 10 days from Caesar's time. Pope Gregory XIII's reform (*see* Gregorian calendar), proclaimed in 1582, restored the calendar to the seasonal dates of AD 325, an adjustment of 10 days. The Julian calendar has gradually been abandoned since 1582 in favour of the Gregorian calendar.

Julian period, chronological system now used chiefly by astronomers and based on the

consecutive numbering of days from Jan. 1, 4713 BC. Not to be confused with the Julian calendar, the Julian period was devised by the scholar Joseph Justus Scaliger in 1582 and named by him for his father, Julius Caesar Scaliger. Joseph Scaliger proposed a period of 7,980 years of numbered days to be used in determining time elapsed between various historical events otherwise recorded only in different chronologies, eras, or calendars. The length of 7,980 years was chosen as the product of 28 times 19 times 15; these, respectively, are the numbers of years in the so-called solar cycle of the Julian calendar in which dates recur on the same days of the week; the lunar or Metonic cycle, after which the phases of the Moon recur on a particular day in the solar year, or year of the seasons; and the cycle of indiction, originally a schedule of periodic taxes or government requisitions in ancient Rome. The epoch, or starting point, of 4713 BC was chosen as the nearest past year in which the three cycles began together.

Juliana, in full JULIANA LOUISE EMMA MARIE WILHELMINA (b. April 30, 1909, The Hague), queen of The Netherlands from 1948 to 1980. The only child of Queen Wilhelmina and Prince Henry of Mecklenburg-Schwerin, Juliana studied law at the University of Leiden



Juliana, detail of an oil painting by W.G. Hofker, 1949

By courtesy of the Iconographisch Bureau, The Hague

(1927–30) and in 1931 helped form the Nationaal Crisis Comité to foster measures by private enterprise to alleviate the economic depression. She married Prince Bernhard of Lippe-Biesterfeld in 1937 and gave birth to four daughters: Beatrix (1938), Irene (1939), Margriet (1943), and Marijke (1947). During World War II Juliana took refuge in Ottawa, while her husband remained with Queen Wilhelmina's London government.

After returning to The Netherlands in 1945, Juliana acted as regent (October–December 1947 and May–August 1948) during Wilhelmina's illness and became queen on Sept. 6, 1948, following her mother's abdication. Her employment of a faith healer in the 1950s caused public concern, and the marriages of Princess Irene to a Spanish Carlist prince (1964) and Princess Beatrix to a German diplomat (1966) aroused political controversy stemming from Dutch memories of World War II. Another crisis involved Prince Bernhard's acceptance of huge sums of money from the U.S. Lockheed Aircraft Corporation in 1976. Juliana withstood these dissensions, however. On April 30, 1980, Juliana, by her own wish, abdicated in favour of Beatrix.

Julianehåb, Greenlandic QAQORTOQ, principal town in southwestern Greenland, on Julianehåb Fjord, an inlet in the Davis Strait. Founded in 1755 by Anders Olsen, a Norwegian merchant, and named for Queen Juliana Maria of Denmark, it is a seaport and trading station. Livestock (mainly sheep) raising, meat-packing, sealing, and fish canning are the chief occupations. During World War II U.S. forces built Bluie West 1, now Narssarssuaq Airport. Just north of the town is the site of Brattahlid (meaning "steep mountain"), Erik the Red's homestead and the first Norse settlement (982) in Greenland. Pop. (1982) 2,636.

Juliani, Petrus: *see* John XXI *under* John (Papacy).

Julianus, Marcus Didius: *see* Didius Julianus, Marcus.

Julião, Pedro: *see* John XXI *under* John (Papacy).

Jülich, French JULIERS, former duchy of the Holy Roman Empire, centred on the town of Jülich, located now in the Aachen district of the *Land* (state) of North Rhine-Westphalia, Germany.

The counts of Jülich inherited or were enfeoffed with most of the lands of the Rhenish Palatinate north of the Eifel Mountains, including control of the imperial city of Aachen, as a result of their support for the Hohenstaufen emperors in the 12th and 13th centuries. William V of Jülich, through his marriage in 1328 to the daughter of Count William III of Holland, became the brother-in-law of Emperor Louis IV, who made Jülich a margravate in 1336, and of Edward III of England, whom he helped to secure an alliance with German princes at the outbreak of the Hundred Years' War. He was also active in the affairs of Holland, extended his territory northward, and acquired ducal rank as William I in 1356 and the hereditary office of marshal of the empire.

In 1423 Jülich was united with Berg and Ravensberg. In 1511 the duchies passed to John III, duke of Cleves (died 1539). John's son, William V the Rich (died 1592), as duke of Cleves-Jülich-Berg, directed the Netherlands-Westphalian circle (*Kreis*) of the Holy Roman Empire. When William's successor, John William, died childless in 1609, John Sigismund, elector of Brandenburg, and Wolfgang William of Palatinate-Neuburg, backed by France, the Dutch, and the German Protestant princes, jointly occupied the duchies (1610). By the Treaty of Xanten (1614), they agreed to a division of the territories. Cleves-Mark and Ravensberg went to John Sigismund, Jülich-Berg and Ravensstein, to Wolfgang William.

Jülich-Berg was inherited by Charles Theodore of Palatinate-Sulzbach (who later became elector of Bavaria). Jülich was absorbed into France during the Napoleonic era; Berg at the same time was made a grand duchy and a member of the Confederation of the Rhine. The whole region became part of Prussia's Rhine province by award of the Congress of Vienna in 1815.

Julijske Alpe (Italy–Yugoslavia): *see* Julian Alps.

Julio-Claudian DYNASTY (AD 14–68), the four successors of Augustus, the first Roman emperor: Tiberius (reigned 14–37), Caligula (37–41), Claudius I (41–54), and Nero (54–68). It was not a direct bloodline. Augustus had been the great-nephew and adopted son of Julius Caesar (of the Julia gens), whereas Tiberius, the adopted son of Augustus, came from the aristocratic Claudia gens. Caligula was a great-grandson of Augustus; Claudius was a nephew of Tiberius; and Nero was the great-nephew and adopted son of Claudius.

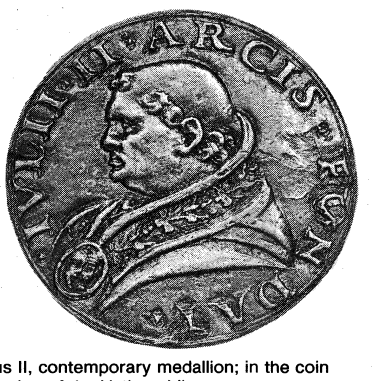
The ablest of the line was Tiberius. He was undoubtedly a capable and vigorous ruler, who enforced justice in the government of the provinces, maintained the integrity of the frontiers, and husbanded the finances of the empire; but he became intensely unpopular in Roman society and in his last years became a cruel tyrant. His successor, Gaius, generally known as Caligula, became known for his wild caprices and uncontrolled passions, which issued in manifest insanity. Upon his assassination he was followed by his uncle, Claudius, whose personal disabilities made him an object of derision to his contemporaries but who had many statesmanlike faculties. His reign left an abiding mark on the history of the empire, for he carried forward its development on the lines intended by Augustus. Client-states were absorbed, southern Britain was conquered, the Romanization of the West received a powerful impulse, public works were executed in Rome and Italy, and the organization of the imperial bureaucracy made rapid strides. Nero, the last of the Julio-Claudian line, has been handed down to posterity as the incarnation of monstrous vice and fantastic luxury. But his wild excesses scarcely affected the prosperity of the empire at large; the provinces were well governed, and the war with Parthia led to a compromise in the matter of Armenia, which secured peace for half a century. The dynasty ended amid rebellion and civil war. Nero died, probably by suicide, and was succeeded by the general Galba, who had been a leader of one of the revolts.

Julius, name of Roman Catholic popes, grouped below chronologically and indicated by the symbol •.

• **Julius I,** SAINT (b. Rome—d. April 12, 352; feast day April 12), pope from 337 to 352. The papacy had been vacant four months when he was elected as St. Mark's successor on Feb. 6, 337. Julius then became the chief support of orthodoxy against Arianism, a heresy that held Christ to have been human, not divine.

In 339 he gave refuge at Rome to Bishop St. Athanasius the Great of Alexandria, who had been deposed and expelled from his see by the Arians. At the Council of Rome in 340, Julius reaffirmed Athanasius' position. Julius then tried to unite the Western bishops against Arianism by convoking in 342/343 the Council of Sardica (now Sofia, Bulg.). The council acknowledged the pope's supreme authority, enhancing his power in ecclesiastical affairs by granting him the right to judge cases of legal possession of episcopal sees. Thus Julius restored Athanasius and refuted all Arian charges; his decision was confirmed by the Roman emperor Constantius II (an Arian) at Antioch. Julius' letters are preserved in Athanasius' *Apology Against the Arians.*

• **Julius II,** original name GIULIANO DELLA ROVERE (b. Dec. 5, 1443, Albisola, Republic of Genoa—d. Feb. 21, 1513, Rome), greatest art patron of the papal line (reigned 1503–13) and one of the most powerful rulers of his age. Although he led military efforts to



Julius II, contemporary medallion; in the coin collection of the Vatican Library

Leonard von Matt—EB Inc.

prevent French domination of Italy, Julius is most important for his close friendship with Michelangelo and for his patronage of other artists, including Bramante and Raphael. He commissioned Michelangelo's "Moses" and paintings in the Sistine Chapel and Raphael's frescoes in the Vatican.

Early life. Giuliano was the son of the impoverished Rafaello della Rovere, Pope Sixtus IV's only brother. In 1468 he became a Franciscan, and in 1471 Sixtus IV made him a cardinal. In this office Giuliano displayed all of the attributes of cupidity and corruption of an unscrupulous Renaissance prince. The Pope lavished on him six bishoprics in France and three in Italy along with an abundance of wealthy abbeys and benefices. The Cardinal, who lacked any interest in spiritual pursuits, became an outstanding patron of the arts. He is shown with his protégés in Melozzo da Forlì's superb fresco of Sixtus IV in the Vatican Museum.

After the death of Sixtus IV, for whom Giuliano commissioned a bronze sepulchre by Antonio Pollaiuolo, now in the Vatican Grotto of St. Peter's, the Cardinal's candidate, the weak Innocent VIII, was elected through bribery. When Rodrigo Borgia, elected pope as Alexander VI in 1492, plotted Giuliano's assassination, Giuliano fled in 1494 to the court of Charles VIII of France. He accompanied the French king on his expedition against Naples in the hope that Charles would also depose Alexander VI. After accompanying Charles on his forced return to France, Giuliano took part in Louis XII's invasion of Italy in 1502. Alexander VI twice attempted to seize him.

Following the death of the Borgia pope in 1503, Giuliano returned to Rome, having been 10 years in exile, and, after Pius III's brief pontificate, was, with the liberal help of simony, elected Pope Julius II in October 1503. Immediately after his election he decreed that all future simoniacal papal elections would be invalid and subject to penalty.

Political activities. Julius II viewed as the main task of his pontificate the restoration of the Papal States, which had been reduced to ruin by the Borgias. Large portions of it had been appropriated by Venice after Alexander VI's death. As a first step as pope, Julius subjugated Perugia and Bologna in the autumn of 1508. Then, in March 1509, he joined the League of Cambrai, an anti-Venetian alliance formed in December 1508 between Louis XII, who then ruled Milan, Emperor Maximilian I, and Ferdinand II of Spain, who had been king of Naples since 1503. The league troops defeated Venice in May 1509 near Cremona, and the Papal States were restored.

Having become an exponent of Italian national consciousness, Julius II proposed to drive the French from Italy, but his second war, which lasted from September 1510 to May 1511, was unsuccessful. Several cardinals defected to Louis XII and called a schismatic council, to which Julius responded by summoning the fifth Lateran Council. After concluding an alliance with Venice and Ferdinand II of Spain and Naples in October 1511, he opened the council in May 1512 at the Lateran Palace. Louis XII had defeated the troops of the alliance at Ravenna in April 1512, but the situation changed when Swiss troops were sent to the Pope's aid. The territories in northern Italy occupied by the French revolted, the French left the country, and the Papal States were augmented by the acquisition of Parma and Piacenza. Toward the end of his life, he viewed with concern the replacement of French by Spanish efforts to attain supremacy in Italy. Julius II was Italy's saviour.

Patron of the arts. The enduring impact of the life of Julius II stemmed from his gift for inspiring great artistic creations. His name is closely linked with those of such great artists as Bramante, Raphael, and Michelangelo. With his wealth of visionary ideas, he contributed to their creativity. Following an overall plan, he added many fine buildings to Rome and laid the groundwork in the Vatican Museum for the world's greatest collection of antiquities. Among the innumerable Italian churches that benefitted from his encouragement of the arts was Sta. Maria del Popolo in Rome, for which he commissioned Andrea Sansovino to create sepulchres for a number of cardinals and Pinturicchio to paint the frescoes in the apse. Donato Bramante became the architect of Julius' fortifications in Latium, of the two galleries that form the Belvedere Court, and of other Vatican buildings. Around 1503 the Pope conceived the idea of building a new basilica of St. Peter, the first model of which Bramante created. Its foundation stone was laid on April 18, 1506.

The Pope's friendship with Michelangelo, begun in 1506, was enduring despite recurrent strains imposed on their relations by the two overly similar personalities. Their relationship was so close that the Pope became, in fact, Michelangelo's intellectual collaborator. Of Julius' tomb only the "Moses" in the church of S. Pietro in Vincoli, in Rome, was completed; the Pope is, however, not interred there but in St. Peter's, along with the remains of Sixtus IV. The famous bronze statue of the Pope for the church of S. Petronio in Bologna, completed in 1508, was destroyed in 1511. In 1508 Michelangelo was prevailed upon by Julius to begin his paintings on the ceiling of the Sistine Chapel, which were unveiled in October 1512. The paintings, which represent a climax in Western art, were, in form and conception, a product of the artistic symbiosis of Michelangelo and the Pope.

By 1509 Raphael, introduced to Julius, had begun his masterpieces for the Pope, the frescoes in three rooms of the Vatican. Spiritual references to the person and the pontificate of Julius II are evident in one of the rooms (the Stanza della Segnatura), where earthly and celestial wisdom are juxtaposed in the "School of Athens" and the "Disputa," while the beauty of creativity is represented in the "Parnassus." The theme of another room (the Stanza d'Eliodoro), which could be called a transcendental "political" biography of the Pope, is still more personal. "The Expulsion of Heliodorus from the Temple" symbolizes the expulsion of the French and the subjugation of all the church's enemies, with Julius II depicted witnessing the scene from his portable throne. Closely related to this is the "Liberation of St. Peter," in which light and darkness serve to symbolize the historic events of the pontificate. The third great fresco in this room, the "Mass of Bolsena," shows the Pope kneeling, rather than enthroned, in commemoration of his veneration of the *corporale* (communion cloth) of Bolsena in the cathedral of Orvieto. In addition to these fresco portraits, there is one by Raphael in the Uffizi gallery in Florence, one of the masterpieces of portraiture, which shows the Pope not as the victorious Moses springing to his feet, as Michelangelo portrayed him, but as a resigned, pensive old man at the end of an adventurous, embattled life. Michelangelo's chalk drawing of the Pope in the Uffizi gallery approaches it in quality.

As cardinal, Julius II fathered three illegitimate daughters, Felice, Clarissa, and Giulia, none of whom achieved any particular distinction. He made four members of the Della Rovere family cardinals, only one of whom achieved any importance. From the marriage of the Pope's only brother, Giovanni, to the daughter and heiress of Duke Federigo of Montefeltro descended the dukes of Urbino.

The Pope added wisely to the church's treasures. Although he had little of the priest in him, he was concerned toward the end only with the church's grandeur. He wished for greatness for the papacy rather than for the pope, and he wished for peace in Italy. The Swiss historian Jacob Burckhardt called him the "saviour of the papacy," because Alexander VI had greatly endangered its existence for the sake of his family interests.

Assessment. Julius had an extraordinarily violent temper, often lost his self-control, and could be rude and often even vulgar in manner. Yet, apart from the avarice and corruption inherent in his office and time as much as in himself, he was incapable of baseness and vindictiveness and despised informers and flatterers; no one was able to influence his decisions. Everywhere he saw and sought out greatness. He lacked the smooth manners of the servile. His faults arose from his relentless candour and uncontrollable temper. He was called *terrible,* an epithet suggesting that he was regarded as sublime, even superhuman.

(H.Kü.)

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• Julius III, original name GIOVANNI MARIA CIOCCHI DEL MONTE (b. Sept. 10, 1487, Rome—d. March 23, 1555, Rome), pope from 1550 to 1555.

As a cardinal, he served as co-president of the Council of Trent in 1545, with cardinals Cervini (later Pope Marcellus II) and Pole.



Julius III, Italian commemorative medallion

By courtesy of the National Gallery of Art, Washington, D.C., the Samuel H. Kress Collection

He was elected pope on Feb. 7, 1550. Aware that a reform of the church was urgent, he appointed a commission that recommended resumption of the Council of Trent, which Julius re-opened on May 1, 1551. He attempted to stop cardinals from receiving too many benefices and to restore monastic discipline.

His interest in the Society of Jesus (a religious order founded by Ignatius of Loyola) influenced him to establish the Collegium Germanicum (1552) to train German priests in Rome under the Jesuits. His patronage of Renaissance thought led him to reform the Roman University, to build the Church of St. Andrew in Rome, and to appoint Palestrina choirmaster of St. Peter's, with Michelangelo as the church's principal architect.

Julius Caesar: *see* Caesar, (Gaius) Julius.

Julius Majorianus: *see* Majorian.

Julius Nepos (Roman emperor): *see* Nepos, Julius.

Jullundur, city, administrative headquarters of Jullundur district, Punjab state, northwestern India. Jullundur is an ancient city; in the 7th century AD it was the capital of a Rājput kingdom. The third largest city in the state, it is an important rail and road junction and a trade centre for agricultural products. Its industries include manufacturing, tanning, weaving, and carpentry, and it has a large sporting-goods industry. Jullundur

is surrounded by several suburbs and has a large cantonment to the south and an airfield 9 mi (14 km) to the east. It has 13 colleges affiliated with Guru Nānak Dev University and several state government offices.

Jullundur district comprises 1,311 sq mi (3,396 sq km) of territory north of the Sutlej River. It is on a level, fertile alluvial plain, 80 percent of which is under cultivation. Principal crops are wheat, corn (maize), cotton, sugarcane, and gram (chick-pea). Pop. (1981) city, 408,196; district, 1,734,574.

July, seventh month of the Gregorian calendar. *See* month.

July, Fourth of: *see* Independence Day.

July Days (French history): *see* July Revolution.

July Days (July 16–20 [July 3–7, old style], 1917), a period in the Russian Revolution during which workers and soldiers of Petrograd staged armed demonstrations against the Provisional Government that resulted in a temporary decline of Bolshevik influence and in the formation of a new Provisional Government, headed by Aleksandr Kerensky. In June dissatisfied Petrograd workers and soldiers, using Bolshevik slogans, staged a demonstration and adopted resolutions against the government. On July 3 protestors, motivated in part by the resignation of the government's Kadet (Constitutional Democratic) ministers, marched through Petrograd to the Tauride Palace to demand that the Soviet of Workers' and Soldiers' Deputies assume formal power. The Bolsheviks, initially reluctant, attempted to prevent the demonstration but subsequently decided to support it.

On July 4 the Bolsheviks planned a peaceful demonstration; but confused armed clashes broke out, injuring about 400 persons. Neither the Provisional Government nor the Soviet could control the situation. But the Soviet refused to take power, and the Bolshevik Party refrained from actually staging an insurrection. Thus, the demonstration was deprived of its political goal, and by nightfall the crowds had dispersed.

To undermine Bolshevik popularity and reduce the threat of a coup d'etat, the government produced evidence that the Bolshevik leader Lenin had close political and financial ties with the German government. A public reaction set in against the Bolsheviks; they were beaten and arrested, their property destroyed, their leaders persecuted. Lenin fled to Finland; but others, including Trotsky, were jailed. The Provisional Government was reorganized, with Kerensky as prime minister. The new government, though largely Socialistic, proved to be only a short-lived concession to the demonstrators' demands for a revolutionary Soviet government. It was subsequently overthrown during the October (November) Revolution.

July Offensive (World War I): *see* June Offensive.

July Plot, also called RASTENBURG ASSASSINATION PLOT, abortive attempt on July 20, 1944, by German military leaders to assassinate Adolf Hitler, seize control of the government, and seek more favourable peace terms from the Allies.

During 1943 and early 1944, opposition to Hitler in high army circles increased as Germany's military situation deteriorated. Plans for the coup, code-named *Walküre* ("Valkyrie") were set late in 1943; but Hitler, increasingly suspicious, became more difficult of access and often abruptly changed his schedule, thus thwarting a number of earlier attempts on his life.

The leaders of the plot included Col. Gen. Ludwig Beck (formerly chief of the General Staff), Major Gen. Henning von Tresckow, Col. Gen. Friedrich Olbricht, and several other top officers. Field Marshal Erwin Rommel, one of Germany's most prestigious commanders, also threw his lot with the conspirators but took no active part after having been seriously wounded on July 17 in an Allied strafing raid. The most stalwart conspirator was Lieut. Col. Claus Philipp Schenk, Graf (Count) von Stauffenberg, who personally carried out the assassination attempt.

On July 20 Stauffenberg left a bomb in a briefcase in a conference room at the Wolfsschanze (Wolf's Lair) field headquarters at Rastenburg, East Prussia, where Hitler was meeting with top military aides. Stauffenberg slipped from the room, witnessed the explosion at 12:42 PM, and, convinced that Hitler was killed, flew to Berlin to join with the other plotters, who were to have seized the Supreme Command Headquarters there. Bad luck and indecisiveness thwarted the plans. An attending officer had nudged the briefcase containing the bomb out of his way to the far side of the massive oak support of the conference table, which thus shielded Hitler from the full force of the explosion. A stenographer and three officers died, but Hitler escaped with only minor injury. Meanwhile, the other conspirators, unsure whether or not Hitler was dead, failed to act until Stauffenberg landed near Berlin more than three hours later. By then it was too late. Rumours of Hitler's survival melted the resolve of many of the key officers. In a counter-coup at Berlin headquarters, Gen. Friedrich Fromm, who had known about and condoned the plot, sought to prove his allegiance by arresting a few of the chief conspirators, who were promptly shot (Stauffenberg, Olbricht, and two aides) or forced to commit suicide (Beck). In subsequent days, Hitler's police rounded up the remaining conspirators, many of whom were tortured by the Gestapo to reveal their confederates and hauled before the Volksgericht (People's Court) to be excoriated by the dreaded Nazi judge Roland Freisler. About 180 to 200 plotters were shot or hanged or, in some cases, viciously strangled with piano wire or hung up on great meat hooks. Even Fromm was eventually arrested, tried, and executed. Hitler had some of the gruesome executions filmed and watched the movies.

July Revolution, French RÉVOLUTION DE JUILLET, also called JULY DAYS (1830), insurrection that brought Louis-Philippe to the throne of France. The revolution was precipitated by Charles X's publication (July 26) of restrictive ordinances contrary to the spirit of the Charter of 1814. Protests and demonstrations were followed by three days of fighting (July 27–29), the abdication of Charles X (August 2), and the proclamation of Louis-Philippe as "king of the French" (August 9). In the July Revolution the upper middle class, or bourgeoisie, secured a political and social ascendancy that was to characterize the period known as the July Monarchy (1830–48). *See also* 1830, revolutions of.

jum'ah, Friday of the Muslim week and the special noon service on Friday that all adult, male, free Muslims are obliged to attend. The *jum'ah,* which replaces the usual noon ritual prayer (*ṣalāt aẓ-ẓuhr*), must take place before a sizable number of Muslims (according to some legal scholars, 40) in one central mosque in each locality.

Muḥammad's choice of Friday as the Muslim day of communal worship was probably based on the pre-Islāmic function of Friday as market day, a natural occasion for dispersed local tribes to gather in a central location. The influence of the Jewish and Christian sabbath was also felt in the institutionalization of the Muslim Friday, though in Islām it was not a day of rest but a convenient setting for the special religious service. In the modern period, however, most Muslim countries have designated Friday as the legal day of rest; Turkey, following Western tradition, has made Sunday the holiday.

Jumilla, city, Murcia province, and autonomous community (region), southeastern Spain. It lies at the foot of Mt. Castillo (near Mt. Carche and Sierra de Santa Ana) and on the Arroyo del Júa, a tributary of the Río Segura, northwest of Murcia city. The Roman author Pliny the Younger mentioned the settlement as Juncellus (after a local reed) in his chronicles. By the Middle Ages the name had become Jumilla or Jumyella. The Arabs called the city Gémina Aamlet or Geminalet ("Country of the Sons of Amlet") until it was taken by Pedro I of Castile in the 14th century and repopulated. In the centre of the city stands the church of Santiago, with its 16th-century Plateresque altarpiece by the Ayala brothers and a Gothic nave.

Known for its red wines, Jumilla also produces olive oil, canned meats, liquors, mosaics, and building materials. Pop. (1981) 20,492.

Jumna (India): *see* Yamuna River.

jump rope, also called SKIP ROPE, game played by individuals or teams with a piece of rope, which may have handles attached at each end. Jump rope, which dates back to the 19th century, is traditionally a girls' playground or sidewalk game in which two players twirl a rope (holding it by its ends and swinging it in a circle) and the other players take turns jumping it while chanting a rhyme or counting. The jumps become more complicated as the game proceeds. Each player is required to move in while the rope is turning, complete the jump, and move out without contacting or stopping the rope. There are many types of jumps, including single, double, backward, crossed-feet, hot pepper, quarter turns, half turns, full turns, and two-at-a-time (jumpers); in double Dutch, two ropes are twirled simultaneously in opposite directions; in criss-cross, performed by one person holding both ends of the rope, the arms are crossed back and forth on alternate twirls. There are countless chants, many originally from Germany and England, associated with jump rope, which often dictate the actions or stunts to be performed, such as:

One, two, touch my shoe
Three, four, touch the floor,
Five, six, pick up sticks,
Seven, eight, double rate,
Nine, ten, out again.

or:

Apples, peaches, pears, and plums,
Tell me when your birthday comes.

The jumper chants the names of the months, then the days up to the date of the birthday. In Chinese jump rope, a stationary rope or string, commonly elastic, is held in a rectangular configuration around two players' legs; the jumper performs designated hops in and out of the rectangle, with the rope being raised on each successive jump.

Single rope jumping or rope skipping is an exercise popular with prizefighters to develop the lungs and legs.

jumping bean, Mexican: *see* Mexican jumping bean.

jumping hare (rodent): *see* springhare.

jumping mouse, any of five species of small, leaping rodents of the genera *Zapus, Eozapus,* and *Napaeozapus,* family Zapodidae. Jumping mice are grayish, golden, or yellowish brown and are about 8 to 10 centimetres (3 to 4 inches) long without the tail. They are typically mouselike, but have long hind legs and exceptionally long tails. When leaping about on their hind legs, they balance with their tails. Jumping mice live in grassy nests on the ground or in shallow burrows. They eat fruit,



Meadow jumping mouse (*Zapus hudsonius*)
Stephen Collins—Photo Researchers

seeds, and insects and hibernate underground during winter.

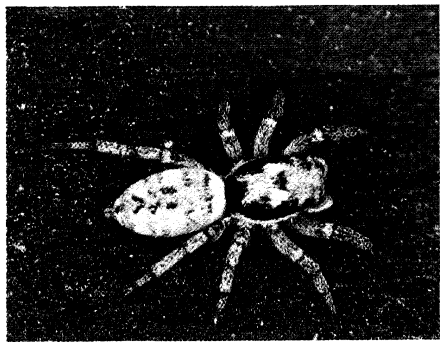
The meadow, Pacific, and western jumping mice (*Zapus hudsonius, Z. trinotatus,* and *Z. princeps*) are found over much of North America, mainly in open woods and meadows. The little-known Chinese jumping mouse (*Eozapus szechwanus*, sometimes considered a member of the genus *Zapus*) inhabits mountain forests. The woodland jumping mouse (*Napaeozapus insignis*) is an inhabitant of eastern North American woodlands.

jumping plant louse, any member of the approximately 2,000 species of the insect family Psyllidae (order Homoptera). The jumping plant louse is about the size of a pinhead. Its head, long antennae and legs, and transparent wings resemble, on a reduced scale, the features of the cicada. Eggs are deposited on leaves or twigs of the host plant; the nymphs, flattened and broadly ovate, usually feed clustered together. Some species are covered with wax; others produce galls on the host plant.

When the insects are abundant, the honeydew, a sweet by-product of digestion, they excrete forms a film over leaves and branches, sometimes dripping from the foliage like rain. The copious, sweet, waxy secretion of the Australian sugar lerp insect has been collected and eaten by Aborigines. The apple sucker (*Psylla mali*) and the pear sucker (*P. pyricola*) are injurious to the plants they infest; the nymphs damage blossoms and shoots and cause a plant's leaves to shrivel.

jumping shrew: *see* elephant shrew.

jumping spider, any member of the family Salticidae (or Attidae, order Araneida). About 3,000 species are known; most are small to medium-sized. They are especially common in the tropics, but many also are found in northern and Arctic regions. The hairy body is often brightly coloured or strikingly patterned. Jumping spiders have keen vision for



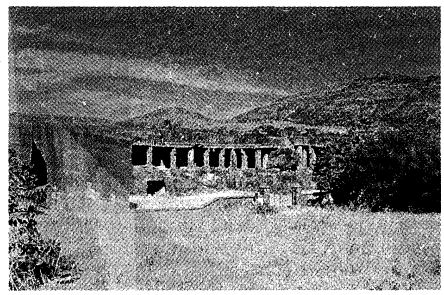
Jumping spider (*Salticus scenicus*)
M.W.F. Tweedie from the Natural History Photographic Agency—EB Inc.

spiders; they are active during the day and are commonly found in sunny areas. At night they hide in closely woven nests under bark, stones, or leaves. Several members of the same species often build nests close together.

The minute jumping spiders, family Oonopidae, are found in the tropics in leaf litter and in buildings.

Junāgadh, town and district, southwestern Gujarāt state, west central India, near the Gīrnār Hills of the Kāthiāwār Peninsula. The many temples and mosques in the vicinity reveal the town's long and complex history. To the east are the Uparkot, an old Hindu citadel; Buddhist caves dating from the 3rd century BC; and the edicts (carved on stone) of the emperor Aśoka. The peaks of the Gīrnār Hills are dotted with Jaina temples. A Rājput stronghold until the 15th century, Junāgadh was captured in 1472 by Maḥmūd Begarā of Gujarāt, who named it Mustafābād and built a mosque, now in ruins. The town is a commercial and manufacturing centre and is served by railroads and a highway.

Junāgadh district occupies 4,095 sq mi (10,607 sq km) of the southwestern Kāthiāwār Peninsula and is bounded southwest by the Arabian Sea. It consists of a level plain except for the Gīrnār Hills and the forested Gīr Hills, where the only wild lions in India survive. Agricultural products include cotton, grains,

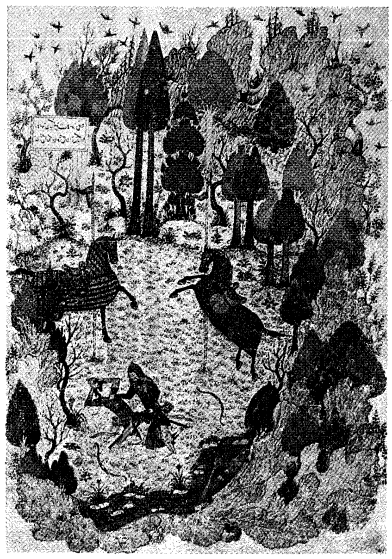


Rock-cut Buddhist caves at Junāgadh, Gujarāt, India
Kaypix—Shostal/EB Inc.

pulses, oilseeds, and sugarcane. The district is well supplied with harbours, the chief being Porbandar. The highways and railways serving the district centre upon Junāgadh town. Pop. (1981) town, 118,646; metropolitan area, 120,416; district, 2,100,709.

Junayd (fl. 14th century, Iraq), painter of miniatures and leading illustrator of the Jalāyirid school. His style, which employed richly dressed figures in formal settings, deeply influenced later developments in Persian painting.

Very little is known about Junayd's life. He was a pupil of the painter Shams ad-Dīn, and from 1382 to 1410 he worked in the service of Sultan Aḥmad of the Mongol Jalāyirid dynasty of Baghdad.



"Fight Between Humāy and Humāyūn," miniature painted by Junayd for the *Khamseh* of Khwājū Kermānī, 1396; in the British Library (MS. Add 18113, fol 23a)
Reproduced by permission of the British Library

He perpetuated the traditions of the great artists of the late Il Khan period of the Tabrīz school, where Shams ad-Dīn had been trained. The result was a jewel-like, multifaceted art that formed some of the basic patterns later adapted by Persian miniature painters.

His work includes illustrations for Khwāju Kermānī's *Khamseh* ("Five Poems"), completed in 1396, and margin illustrations for Sultan Aḥmad's *Dīvān.*

Junayd, Shaykh (b. *c.* 1430, Iranian Azerbaijan?—d. March 4, 1460, near the Kura River), fourth head of the Ṣafavid order of mystics, who sought to transform the spiritual strength of the order into political power.

Little is known of Junayd's early life except that when his father died in 1447 he became the head of the Ṣafavid order, which had its capital at Ardabīl, Iran. Because he was a minor, he was placed under the guardianship of his paternal uncle, Shaykh Ja'far. Before Junayd's time the leaders of the Ṣafavid order were widely respected for their piety and learning. The order was "moderate" in that it was concerned more with meditation and contemplation than with temporal authority. Junayd, however, was headstrong and ambitious. He attempted to convert spiritual respect into temporal power, a policy that led to a split in the order. The moderate majority remained with Shaykh Ja'far, and the remaining members followed Junayd. He was the first Ṣafavid leader to whom the term sultan, indicative of temporal rule, was applied. The arming of his *murīd*s (spiritual followers), who regarded him as an emanation of divinity, brought him into conflict with Jahān Shāh (died 1467), the ruler of Azerbaijan, in northwest Iran, and led to the expulsion of Junayd and his followers from Ardabīl, the traditional centre of the Ṣafavid order, in 1448. The moderate wing of the order remained under the control of Ja'far.

Junayd then attempted to seek a new power base for his extremist wing of the order. When Sultan Murad II, the Ottoman ruler, refused him sanctuary in his domains, Junayd led his followers to Aleppo (now in Syria) but was expelled by the authorities. He next attempted to settle along the southern shores of the Black Sea. In 1456 he led an unsuccessful campaign against the Christian Greek principality of Trabzon (now in Turkey). The attack was motivated by the desire for booty and to attract new recruits to his banner. After the failure of this expedition he sought refuge with the Turkish ruler Uzun Ḥasan, who received him and allowed him to remain in the city of Amid.

Junayd married Uzun Ḥasan's sister, Khadījah Begūm. This alliance revived the fortunes of the extremist wing of the Ṣafavid order and was in line with Uzun Ḥasan's policy of supporting Ṣūfī (mystical) orders to add legitimacy to his rule. Junayd sought an alliance with Uzun Ḥasan's Sunnī Turks, who were enemies of the Shī'ī Jahān Shāh. On leaving Amid in 1459 to retake Ardabīl, Junayd was blocked by the superior forces of Jahān Shāh. Junayd and his 10,000 troops turned north to attack the Christian Circassians in Tabarsaran (now in the Soviet Union), where he was killed in an ambush. His policies of military adventurism combined with Shī'ī and Ṣūfī piety were continued by his son, Ḥaydar, and culminated eventually in the establishment of the Ṣafavid dynasty and of Twelver Shī'ī Islām in Iran under his grandson, Esmā'īl I.

Junaynah, al-, also called GENEINA FORT, town, Dārfūr ash-Shamālīyah *mudīrīyah* (province), Dārfūr region, western Sudan, about 15 mi (24 km) east of the Chad border and about 220 mi west of al-Fāshir, with which it is linked by a road. Located at an elevation of about 2,800 ft (853 m), al-Junaynah

has a domestic airport and is the headquarters of the Dar Masālīṭ Rural Council and the Dar Masālīṭ district. Al-Junaynah also has postal, telegraph, and hospital facilities. Pop. (latest est.) 21,023.

Juncales, order of monocotyledonous flowering plants comprising the families Juncaceae and Thurniaceae, with 10 genera of grasslike plants found in wet, cold-temperate habitats.

The flowers are usually small, greenish, and bisexual and are crowded into dense terminal or lateral clusters. They are pollinated by the wind. The plants grow from a horizontal or upright rootstock that annually produces one leafy shoot.

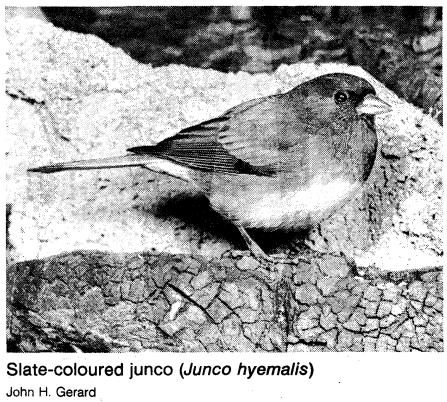


Woodrush (*Luzula multiflora*)
John Kohout from Root Resources—EB Inc.

The family Juncaceae includes the rushes (*Juncus,* 300 species) and woodrushes (*Luzula,* 80 species). Six genera (*Prionium, Oxychloe, Rostkovia, Marsippospermum, Andesia,* and *Distichia*), representing about 16 species, are restricted to the Southern Hemisphere. The family Thurniaceae has only the genus *Thurnia,* with three species distributed in Venezuela and Guyana. The order is considered to be evolutionarily derived from ancestors of the lily order (Liliales).

The plants are used in many parts of the world for weaving chair seats, mats, baskets, and hats. The pith has been used for lamp and candle wicks. Some species are grazed or cut for hay.

junco, any of several birds of the genus *Junco,* small sparrows of the family Fringillidae (sometimes classified as Emberizidae). Juncos are about 15 cm (6 inches) long and variable in colour, though generally a shade of gray; they have white outer tail feathers that are flashed in flight to the accompaniment of snapping or twittering calls. Their bills are generally pinkish. Juncos range from Alaska and Canada to Georgia and northern Mexico; they are common winter birds in the United States. Their favoured habitat is mixed or coniferous forest, though they are often noted in fields, thickets, and city parks. The female lays from three to five brown-spotted, light green eggs per clutch.



Slate-coloured junco (*Junco hyemalis*)
John H. Gerard

The slate-coloured junco (*J. hyemalis*) breeds across Canada and in the Appalachian Mountains; northern migrants are the "snowbirds" of the eastern United States. In western North America there are several forms of junco with brown or pinkish markings; among them is the yellow-eyed Mexican junco (*J. phaeonotus*).

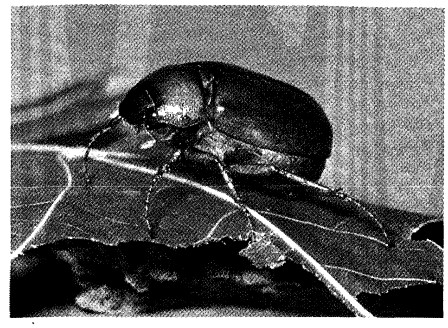
Junction City, city, seat of Geary County, northeastern Kansas, U.S., at the confluence of the Republican and Smoky Hill rivers. Founded in 1858 and named for the river confluence, it developed as a trading centre for nearby Fort Riley, a U.S. military post since 1853 and for many years headquarters of Lieutenant Colonel George A. Custer and his Seventh Cavalry; the fort is also the site of the first territorial capitol building (1855) of Kansas (maintained as a museum). The city is now the wholesale and shipping centre for a grain and dairy area and has railroad shops, feed mills, and dairies. Limestone is quarried from surrounding bluffs. Milford Dam impounds the Republican River. Inc. 1859. Pop. (1984 est.) 19,987.

Jundiaí, city, in the highlands of southern São Paulo state, Brazil, at 2,460 feet (750 m) above sea level on the Rio Jundiaí. Formerly called Porta do Sertão, Mato Grosso de Jundiaí, and Vila Formosa de Nossa Senhora do Destêrro de Jundiaí, it was given town status and made the seat of a municipality in 1865. Both agricultural and industrial activities contribute to the community's economy. Crops include grapes, coffee, cotton, rice, and corn (maize). Steel, textiles, ceramics, and furniture are manufactured, and wine and foodstuffs are processed. Goods are transported by road and rail to São Paulo city, the state capital, 40 miles (65 km) southeast, and to neighbouring cities. An airfield is nearby. Pop. (1980 prelim.) 210,015.

Jundūbah, also spelled JENDOUBA, also called SOUK EL-ARBA, or SŪQ AL-ARAB'A', town, northwestern Tunisia, on the middle Wādī (river) Majardah (Medjerda). The town was developed on the railway from Tūnis to Algeria during the French protectorate (1881–1955) and is now a centre for the cultivation and export of grains, especially wheat. About 5 miles (8 km) north are the ruins of the Numidian, and later Roman, town of Bulla Regia. The surrounding area is the alluvial plain of the middle Majardah Valley, a hot, dry region conducive to the cultivation of grains. Pop. (1984) 23,249.

June, sixth month of the Gregorian calendar. *See* month (table).

June beetle, also called MAY BEETLE, or JUNE BUG, any insect of the *Phyllophaga* species, belonging to the widely distributed, plant-feeding subfamily Melolonthinae (family Scarabaeidae, order Coleoptera). These red-brown beetles commonly appear in the Northern Hemisphere during warm spring evenings and are attracted to lights. The heavy-bodied June beetles vary from 12 to 25 mm (½ to 1 inch) and have shiny wing covers (elytra). They feed on foliage and flowers at night, sometimes causing considerable damage. June beetle larvae, called white grubs, are about



June beetle (*Phyllophaga rugosa*)
Harry Rogers

25 mm long and live in the soil. They can destroy crops (*e.g.,* corn [maize], small grains, potatoes, strawberries), and they can kill lawns and pastures by severing the grasses from the roots.

Each female buries between 50 and 200 small, pearl-like eggs in the soil. After three years of feeding on plant roots, the larvae pupate, emerging as adults in August or September, then burying themselves again for the winter. In the spring the adults emerge once more and feed on available foliage. Adults live less than one year.

A natural enemy of the June beetle is the pyrgota fly larva (*Pyrgota undata*), which feeds on the beetle, eventually killing it. June beetle larvae are considered excellent fish bait. For information on the green June beetle (*Cotinus nitida*), *see* flower chafer.

June Offensive, also called JULY OFFENSIVE (New Style), SUMMER OFFENSIVE, KERENSKY OFFENSIVE, or GALICIAN OFFENSIVE (June [July, New Style], 1917), unsuccessful military operation of World War I, planned by the Russian minister of war Aleksandr Kerensky. The operation not only demonstrated the degree to which the Russian Army had disintegrated but also the extent of the Provisional Government's failure to interpret and/or respond adequately to popular revolutionary sentiment. Temporarily, it also had the effect of strengthening moderate and conservative elements in the country.

Kerensky's timing was particularly inauspicious. After the February (March) Revolution, popular demands for peace had grown more intense, particularly within the army. Soldiers' committees debated military issues and frequently vetoed officers' orders. Discipline degenerated, and many soldiers made their private peace with the Germans and went home. The first coalition Provisional Government (formed in May 1917) continued to honour the alliances made by the deposed imperial government and hesitated to make a separate peace; it did agree, however, to wage only a defensive war.

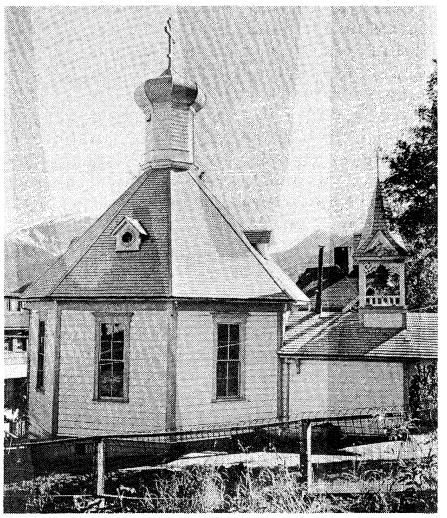
Nevertheless, Kerensky planned an offensive. He speculated that a victory would rally the Russian people behind the Provisional Government and also force the belligerents to make peace. On July 1 (June 18, Old Style), 1917, the Russian Army, commanded by General Aleksey A. Brusilov, attacked the Austro-German forces along a broad front in Galicia and pushed toward Lvov.

Although the Russian effort was initially successful, the soldiers soon refused to leave their trenches and fight. By July 3–4, the offensive had collapsed. On July 6 the Austrians and Germans launched a counteroffensive. They met little resistance and advanced through Galicia and into the Ukraine, halting at the Zbruch River.

The military disaster was immediately overshadowed by the July Days uprising and by the government's fear of a Bolshevik coup d'etat. But the June Offensive had serious political consequences. As a result of the army's failure, Kerensky appointed as commander in

chief Gen. Lavr G. Kornilov—who strongly demanded that army discipline be restored—and thereby laid the groundwork for the development of a conservative, military political force and for Kornilov's alleged attempted coup d'etat, known as "Kornilov's Rebellion."

Juneau, city and borough, capital (since 1900) of Alaska, U.S., in the southeastern part of the state, on the Gastineau Channel. Sheltered from the Pacific by a belt of islands 75 mi (120 km) wide, it lies at the foot of Mts. Roberts



St. Nicholas Russian Orthodox Church in Juneau, Alaska
Bob and Ira Spring—EB Inc.

(3,600 ft [1,097 m]) and Juneau (3,576 ft). It was settled in 1880 when gold was discovered by Joe Juneau and Richard Harris. Mining was important until the Alaska-Juneau gold mine closed in 1944. Fishing, forestry, and government activities then became the economic mainstays, augmented by tourism. Juneau is connected with the Alaska Highway by ferry through the Haines Cut-Off. Winter snowfall seldom accumulates more than a foot, and the port is ice-free. It is the site of a campus of the University of Alaska (1972) and of the Alaska State Museum (1900). Mendenhall Glacier is 13 mi north, with Glacier Bay National Park to the northwest. In 1970 Juneau merged with Douglas, on an island across the channel, to form the largest city in the U.S., with an area of 3,108 sq mi (8,050 sq km). Pop. (1980) 19,528.

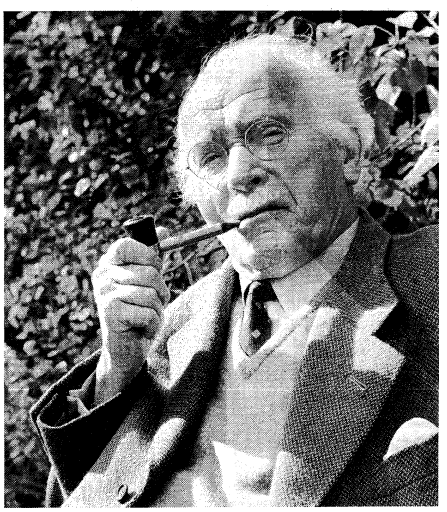
Consult the INDEX *first*

Junee, town, south central New South Wales, Australia, just north of Wagga Wagga in the textile Riverina district. Founded in 1863 as Jewnee, it was known as Jewnee Junction or Loftus when proclaimed a town in 1883 and was gazetted a municipality in 1886. It became a shire in 1981. Its name is Aboriginal for "speak to me." On the main southern rail line from Sydney (216 mi [348 km] northeast), Junee has large locomotive maintenance and storage facilities that were hard hit by dieselization of the railroads. It serves an area of wheat and sheep farms and vineyards. On the Olympic Way to Sydney, the town holds the annual Riverina Schoolboys' Rugby Football Carnival. Pop. (1981) 3,993.

Jung, Carl (Gustav) (b. July 26, 1875, Kesswil, Switz.—d. June 6, 1961, Küsnacht), Swiss psychologist and psychiatrist who founded analytic psychology, in some aspects a response to Sigmund Freud's psychoanalysis. Jung proposed and developed the concepts of the extroverted and introverted personality, archetypes, and the collective unconscious. His work has been influential in psychiatry and in the study of religion, literature, and related fields.

Early life and career. Jung was the son of a philologist and pastor. His childhood was lonely, though enriched by a vivid imagination, and from an early age he observed the behaviour of his parents and teachers, which he tried to resolve. Especially concerned with his father's failing belief in religion, he tried to communicate to him his own experience of God. Though the elder Jung was in many ways a kind and tolerant man, neither he nor his son succeeded in understanding each other. Jung seemed destined to become a minister, for there were a number of clergymen on both sides of his family. In his teens he discovered philosophy and read widely, and this, together with the disappointments of his boyhood, led him to forsake the strong family tradition and to study medicine and become a psychiatrist. He was a student at the universities of Basel (1895–1900) and Zürich (M.D., 1902).

He was fortunate in joining the staff of the Burghölzli Asylum of the University of Zürich at a time (1900) when it was under the direction of Eugen Bleuler, whose psychological interests had initiated what are now considered classical researches into mental illness. At Burghölzli, Jung began, with outstanding success, to apply association tests initiated by earlier researchers. He studied, especially, patients' peculiar and illogical responses to stimulus words and found that they were caused by emotionally charged clusters of associations withheld from consciousness because of their disagreeable, immoral (to them), and frequent sexual content. He used the now famous term complex to describe such conditions.



Carl Jung
Leni Iseley-Nancy Palmer Agency

Association with Freud. These researches, which established him as a psychiatrist of international repute, led him to understand Freud's investigations; his findings confirmed many of Freud's ideas, and, for a period of five years (between 1907 and 1912), he was Freud's close collaborator. He held important positions in the psychoanalytic movement and was widely thought of as the most likely successor to the inventor of psychoanalysis. But this was not to be the outcome of their relationship. Partly for temperamental reasons and partly because of differences of viewpoint, the collaboration ended. At this stage Jung differed with Freud largely over the latter's insistence on the sexual bases of neurosis. A serious disagreement came in 1912, with the publication of Jung's *Wandlungen und Symbole der Libido* (*Psychology of the Unconscious,* 1916), which ran counter to many of Freud's ideas. Though Jung had been elected president of the International Psychoanalytic Society in 1911, he resigned from the society in 1914.

His first achievement was to differentiate two classes of people according to attitude types: extroverted (outward-looking) and introverted (inward-looking). Later he differentiated four functions of the mind—thinking, feeling, sensation, and intuition—one or more of which predominate in any given person. The results of this study were embodied in *Psychologische Typen* (1921; *Psychological Types,* 1923). Jung's wide scholarship was well manifested here, as it also had been in *The Psychology of the Unconscious.*

As a boy Jung had remarkably striking dreams and powerful fantasies that had developed with unusual intensity. After his break with Freud, he deliberately allowed this aspect of himself to function again and gave the irrational side of his nature free expression. At the same time, he studied it scientifically by keeping detailed notes of his strange experiences. He later developed the theory that these experiences came from an area of the mind that he called the collective unconscious, which he held was shared by everyone. This much contested conception was combined with a theory of archetypes that Jung believed were of fundamental importance for the study of the psychology of religion. In Jung's terms, archetypes are instinctive patterns, having a universal character, expressed in behaviour and images.

Character of his psychotherapy. The rest of his life was given over to the development of his ideas, especially those on the relation between psychology and religion. In his view, obscure and often neglected texts of writers in the past shed unexpected light not only on Jung's own dreams and fantasies but also on those of his patients; he thought it necessary for the successful prosecution of their art that psychotherapists become familiar with writings of the old masters.

Besides the development of new psychotherapeutic methods that derived from his own experience and the theories developed from them, Jung gave fresh importance to the so-called Hermetic tradition. He conceived that the Christian religion was part of a historic process necessary for the development of consciousness, but he thought that the heretical movements, starting with Gnosticism and ending in alchemy, were manifestations of unconscious archetypal elements not adequately expressed in the varying forms of Christianity. He was particularly impressed with his finding that alchemical-like symbols could be found frequently in modern dreams and fantasies, and he thought that alchemists had constructed a kind of textbook of the collective unconscious. He drove this home in four large volumes of his *Collected Works.*

His historical studies aided him in pioneering the psychotherapy of the middle-aged and elderly, especially those who felt their lives had lost meaning. He helped them to appreciate the place of their lives in the sequence of history. Most of these patients had lost their religious belief; Jung found that if they could discover their own myth as expressed in dream and imagination they would become more complete personalities. He called this process individuation.

In later years he became professor of psychology at the Federal Polytechnical University in Zürich (1933–41) and professor of medical psychology at the University of Basel (1943). His personal experience, his continued psychotherapeutic practice, and his wide knowledge of history placed him in a unique position to comment on current events. As

early as 1918 he had begun to think that Germany held a special position in Europe; the Nazi revolution was, therefore, highly significant for him, and he delivered a number of hotly contested views that led to his being wrongly branded as a Nazi sympathizer.

To the end of his life he retained his love of simple things: the Swiss countryside in which he had been brought up, the peasant lore, and life in the open air. He and his wife, Emma, had built a beautiful home by the lake of Zürich, where she acted as a hostess to their many distinguished visitors, helped him in his work, and made original contributions of her own. Jung lived to the age of 85.

(M.S.M.F./F.Fo.)

BIBLIOGRAPHY. The authoritative English collection of all Jung's published writings is Herbert Read, Michael Fordham, and Gerhard Adler (eds.), *The Collected Works of C.G. Jung,* trans. by R.F.C. Hull, 20 vol., 2nd ed. (1966–). Examples of Jung's own collections of essays addressed to the general public are: *Modern Man in Search of a Soul* (1933, reprinted 1961), which covers a wide range of topics from dream analysis and literature to the psychology of religion; *Aufsätze zur Zeitgeschichte* (1946; *Essays on Contemporary Events,* 1947; contained in *Collected Works,* vol. 10), which gives an account of his theory of the psychology of mass movement; *Antwort auf Hiob* (1952, rev. ed. 1961; *Answer to Job,* contained in *Collected Works,* vol. 11), the best example of his thinking on religious history; and *Memories, Dreams, Reflections* (1962), fascinating semi-autobiographical reading, partly written by Jung himself and partly recorded by his secretary. Frieda Fordham, *An Introduction to Jung's Psychology,* 3rd ed. (1966), is the most clear and widely read introduction to Jung's theorizing and analytic practice. A fairly good critical assessment is provided by Avis M. Dry in *The Psychology of Jung* (1961).

Jung, Johann Heinrich: *see* Jung-Stilling, Johann Heinrich.

Jung-an (Manchurian leader): *see* Yüan Shih-k'ai.

Jung Bahadur, also spelled JANG BAHADUR (b. June 18, 1817, Kāthmāndu, Nepal—d. Feb. 25, 1877, Kāthmāndu), prime minister and virtual ruler of Nepal from 1846 to 1877, who established the powerful Rana dynasty of hereditary prime ministers, an office that remained in his family until 1951.

Jung Bahadur, a man of great courage and ability, gained control over the government after killing a usurper, Gagan Singh, who in 1846 had plotted with the junior queen to become prime minister and place her son on the throne. Subsequently, he deposed and exiled both the King and the Queen after they had attempted to have him assassinated. He was named prime minister for life and given the hereditary title of Rana. During 1850–51 he visited England. He remained a firm friend of the British throughout his life.

Jung Bahadur's diplomatic skill and conciliatory policy helped Nepal remain independent while the rest of the Indian subcontinent came under British rule. During the Indian Mutiny of 1857–58 he sent a contingent of Gurkha soldiers to aid the British, thus establishing a tradition of Gurkha military service in the British Army. He also did much to improve and modernize the administration of the country and revised the old penal code. Although he attempted to abolish suttee, three of his widows immolated themselves on his funeral pyre.

Once appointed hereditary prime minister, Jung Bahadur believed it essential for the security of the state that he should be succeeded by a fully adult and capable man. Accordingly, he devised an order of succession by which the office passed not from father to son but from brother to brother within the family. In the second generation it passed to the sons of all his brothers in order of age and in a similar manner in succeeding generations. At his death he was thus succeeded by his younger brother Rana Udip Singh. The office of prime minister remained in the Rana family through the first half of the 20th century, the last hereditary prime minister, Mohun, retiring in 1951. The Rana family continued, however, to remain extremely powerful. In February 1970 the crown prince Birendra, who in 1972 became king of Nepal, married a woman of the Rana family, who became his queen.

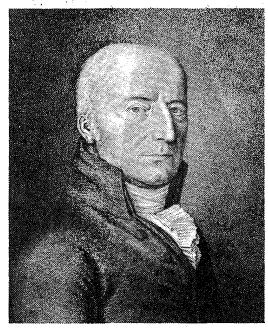
A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Jung-lu, Pinyin RONGLU (b. April 6, 1836, China—d. April 11, 1903, Peking), official and general during the last years of the Ch'ing dynasty who organized and led one of the first brigades of Chinese troops that used Western firearms and drill. He achieved high office as a favourite of the powerful empress dowager Tz'u-hsi, and he ensured that the army remained loyal to her.

In 1898 a reformist group under the Kuang-hsü emperor attempted to modernize the Chinese military, administrative, and educational systems. To counteract the tremendous power of the Empress Dowager and her conservative officials, the Emperor secretly replaced Jung-lu as head of the army with Yüan Shih-k'ai, one of Jung-lu's protégés and later the first president of the Chinese Republic. Yüan was to have mobilized his troops near the capital, eliminated Jung-lu, and then imprisoned the Empress Dowager. But lacking confidence, Yüan confided the plot to Jung-lu, who marched his forces into the capital, threw out the reformers, and imprisoned the Emperor in his palace. Jung-lu then became one of the most powerful ministers of the dynasty.

In the following year (1899) the Empress, under the domination of supporters of the antiforeign Boxer secret societies, ordered all foreigners in China killed. Although Jung-lu did nothing to prevent the spread of the Boxers, he did not press the attack on the besieged foreign diplomats in their legations in Peking. Nevertheless, he fled for his life when foreign troops entered Peking on Aug. 14, 1900. When the court returned in 1902, Jung-lu once again resumed high office.

Jung-Stilling, Johann Heinrich, original name JOHANN HEINRICH JUNG, also called HEINRICH STILLING (b. Sept. 12, 1740, Grund, Westphalia—d. April 2, 1817, Karlsruhe), German writer best known for his autobiography, *Heinrich Stillings Leben* (5 vol., 1806),



Johann Heinrich Jung-Stilling, engraving by L. Schlemmer, 1810

By courtesy of the Osterreichische Nationalbibliothek, Vienna

the first two volumes of which give a vividly realistic picture of village life in an 18th-century pietistic family.

Raised in great poverty, Jung-Stilling became a school-teacher at 14, worked as a tailor, among other jobs, and only after great difficulty and deprivation was able to achieve his goal of becoming a doctor. He studied medicine at Strasbourg, where he met Goethe, who was impressed by him and published the first, and best, two volumes of *Heinrich Stillings Jugend* (1777; "Heinrich Stilling's Youth"). This work with its piety and simplicity was influential in the pietistic tide opposed to the rationalism of the Enlightenment. In 1772 Jung-Stilling settled as a physician at Elberfeld and made a name for himself with his successful operations for cataract. In 1778 he became a lecturer in economics and other related subjects at the Kameralschule in Kaiserslautern and then in 1787 at Marburg. In 1803 he received a pension from the prince-elector of Baden. In addition to his autobiography and economic textbooks, he wrote mystical-pietistic works and novels, the best known of which is the allegorical novel *Das Heimweh* (1794–97; "Homesickness").

Jungbunzlau (Czechoslovakia): *see* Mladá Boleslav.

Jünger, Ernst (b. March 29, 1895, Heidelberg, Ger.), German novelist and essayist, a formerly ardent militarist and nihilist whose outlook in mid-career changed to an equally ardent belief in peace, European federation, and individual dignity. The change was manifested in *Der Friede* (written 1943, pub. 1948; "The Peace"), dedicated to the memory of his son who died fighting in Italy.

Jünger ran away from home in 1912 to join the French Foreign Legion, served with it in Africa, was wounded as a German soldier on the Western Front in World War I, and returned to that front as a captain in World War II. In 1920, before studying philosophy and natural sciences at the universities of Leipzig and Naples, he published *In Stahlgewittern* (*The Storm of Steel,* 1929), which argued that Germany's tribulations in World War I were a prelude to rebirth and victory.

Despite his militarism, he resisted Adolf Hitler's offers of friendship in the late 1920s. Indeed, during Hitler's chancellorship, he wrote an allegory on barbarian devastation of a peaceful land (*Auf den Marmorklippen,* 1939; *On the Marble Cliffs,* 1947), which, surprisingly, passed the censors. In World War II he was indirectly associated with fellow officers who plotted to kill Hitler.

Jünger's later writings include *Gläserne Bienen* (1957; *The Glass Bees,* 1961), a disturbing story of a jobless former soldier in an overmechanized world symbolized by artificial bees and marionettes. Other more recent works include *Siebzig verweht,* 2 vol. (1980–81; "Seventy Drifts Away"), and *Aladins Problem* (1983), a novel in which all social values other than the cult of the dead are denied; its nihilistic hero, sometime German aristocrat and officer in the Polish People's Army, finally finds his vocation organizing funerals.

Jünger is also the author of several essays and the recipient of many German and international awards, including the Schiller-Gedächtnispreis in 1974 and the Prix Europa-Littérature in 1981.

Junges Deutschland (literary movement): *see* Young Germany.

Jungfrau, well-known Swiss peak (13,642 ft [4,158 m]) dominating the Lauterbrunnen Valley and lying 11 mi (18 km) south-southeast of the resort of Interlaken. The scenic mountain separates the cantons of Bern and Valais and is in the Bernese Alps, two other peaks of which (the Finsteraarhorn [14,022 ft] and the Aletschhorn [13,763 ft]) surpass it in height. The first ascent was made in 1811 on the eastern or Valais side by two Swiss brothers, Rudolf and Hieronymus Meyer. It was not until 1865 that two Englishmen made the

first ascent from the difficult western, or Interlaken, side, and in 1927 two guides climbed the south side. One of Europe's highest railways (constructed 1896–1912) cuts a 4.4-mi-long tunnel through the Eiger and Mönch peaks to the Jungfraujoch, a pass (11,335 ft) between the Mönch and Jungfrau peaks.

Jungfrauenbecher (German: "maiden's cup"), silver cup shaped like a girl with a wide-spreading skirt (forming a large cup when inverted) holding a pivoted bowl above her head. The form apparently originated in late 16th-century Germany, but only a few examples survive from the 17th century. *Jungfrauenbecher* were used at nuptial feasts when the bridegroom drank a toast out of the skirt cup and then was supposed to right the figure without spilling the wine in the pivoted bowl, which was to be drunk by the bride. It was also a wager cup—the challenged having to drink from both cups without spilling the contents of either.

A number of *Jungfrauenbecher* were produced in London in 1827 copying the one in the Vintners Hall, and the form was revived in Germany and Holland in the second half of the 19th century.

Junggrammatiker: *see* Neogrammarian.

jungle, tropical forest with luxuriant, tangled, impenetrable vegetation, generally teeming with wildlife; popularly associated with the tropics, such conditions are actually found only when the tree canopy layer of a rain forest has been removed. *See* rain forest.

jungle babbler, any of about 32 species of songbirds constituting the tribe Pellorneini of the babbler family Timaliidae. Found from Africa to Malaysia and the Philippines, these drab birds with slender, often hook-tipped bills skulk in forest undergrowth. An example is the striped jungle babbler, or spotted babbler (*Pelloreum ruficeps*), of Southeast Asia—16 centimetres (6¼ inches) long, with reddish cap, white eyeline, dark-greenish back, and streaked white breast. It is usually detected by its loud two-note whistle.

jungle fowl, any of four Asian birds of the genus *Gallus,* family Phasianidae (order Galliformes). (For Australian jungle fowl, *see* megapode.) *Gallus* species differ from other members of the pheasant family in having, in the male, a fleshy comb, lobed wattles hanging below the bill, and high-arched tail. The red jungle fowl (*G. gallus*) is the ancestor



Red jungle fowl (*Gallus gallus*)
Painting by Murrell Butler

of the domestic fowl. The cock has shining silky plumage, red on the head and back and green-black elsewhere—a pattern seen also in several domestic breeds; the hen is rusty brown with speckled neck and minimal comb. Males meet in a selected arena—natural precursor of the gamecock pit (*see* cockfighting)—where they use their sharp leg spurs in combat, often to the death. In courtship display, the male droops one wing and tilts his head, mantle, and back—his most colourful parts—toward the hen; the domestic rooster behaves similarly. Jungle fowl seem to be monogamous under normal circumstances. The hen lays 5–8 buffy eggs at a time.

The gray jungle fowl (*G. sonnerati*), of southern India, may also have contributed to the ancestry of the domestic fowl, which in some breeds shows a similar grayish and white pattern. Other species inhabit parts of India and are found also in Sri Lanka (Ceylon), Java, and some Indonesian islands.

Junín, city, northern Buenos Aires province, east central Argentina, in the Pampa on the Río Salado. The town grew up around Fuerte (fort) Federación, founded in 1827 to protect colonists from Indian incursions; it was given city status in 1906. Junín is an agricultural (wheat, corn [maize], cattle), commercial, and manufacturing centre. It has railway workshops, breweries, and factories producing ceramics, furniture, and metal goods. Fish from nearby lagoons are sent to markets in Buenos Aires (150 mi [240 km] east). Eva Perón was born at the settlement of Los Toldos, south of Junín. Pop. (1980 prelim.) 62,080.

Junín, department (formed 1853) of central Peru, located largely in the Andes and drained by the headwaters of the Río Mantaro and other major tributaries of the Amazon. Junín, one of the richest Andean departments, occupies an area of 16,751 sq mi (43,384 sq km). The department's mainly urban population is concentrated in an area extending from Huancayo (*q.v.*), the departmental capital, northwest to the cities of Jauja and La Oroya, site of a large copper refinery. Its large intermontane basins are excellent for the cultivation of wheat, barley, potatoes, and other highland crops, and the lower mountain slopes in the east support coffee, cacao, and sugarcane. Mining, refining, and the production of hydroelectric power are important. Railroads and highways link Junín with Andean cities to the north and south and with the Amazon Basin to the east. Pop. (1981) 969,500.

Junior Achievement, an educational organization of the United States and Canada that offers young people of high-school age the opportunity to gain business experience by organizing and operating their own small businesses under the guidance of volunteer advisers from business and industry. The Junior Achievement program was founded by Horace A. Moses of Springfield, Mass., and incorporated in 1926. Its major growth occurred after World War II.

The Junior Achievement company is the basic unit. The boys and girls are its board of directors, labour force, and sales staff. In the autumn the youngsters elect officers, decide on the product the company will make and sell, and determine the amount of working capital that the firm will need to begin production. They sell capital stock to parents, friends, teachers, and others. No one person can own more than five shares, and every member of the company must own at least one. When the company has raised its capital, a bank account is opened, and raw materials are purchased. The company applies for its Junior Achievement charter, pays rent, and buys the small tools that it needs. Complete books are kept. In the spring the companies go out of business. Inventory is sold, all debts are paid, and, if the company has been profitable (most of them are), the stockholders receive their investment back along with a liquidation dividend. Each company is guided by three adult advisers, and average company membership is 15. National headquarters are in New York City.

junior college, also called COMMUNITY COLLEGE, educational institution that provides academic instruction beyond secondary school—the first two years of undergraduate college study—as well as technical and vocational training, to prepare graduates for careers. Commonly publicly supported, such colleges usually also offer a variety of flexible programs that are nontraditional in style and content. They have pioneered in offering part-time study, evening sessions, instruction by television, weekend workshops, and other services for members of their communities.

Roots of the movement may be traced to Chautauqua and other adult education programs after the American Civil War, though the history of the junior college as an organized institution begins early in the 20th century. William Rainey Harper, the first president of the University of Chicago, is the father of the junior college. The educational director of the adult education summer assemblies at Chautauqua, N.Y., from 1883, Harper organized the new university in Chicago into two divisions—a senior and a junior college—in the 1890s. He was later influential in the establishment of junior colleges in Illinois and elsewhere. The first public junior college was founded in Joliet, Ill., in 1901. In 1907 California introduced the public two-year college. Under its state-wide system that makes junior colleges branches of the state university, California enrolled in community colleges nearly half of all its college students. By 1915 there were more than 70 junior colleges in the United States (75 percent privately controlled and often related to a religious denomination). In the early 1920s there were more than 200 such schools, and the American Association of Junior Colleges (later American Association of Community and Junior Colleges) was organized. During the Depression of the 1930s, they helped meet the need for less costly public higher education as they were later to serve demands brought by westward movements of population. Growth after World War II accelerated, stimulated by a large influx of returning veteran-students and of federal funds and local support for higher education and vocational training.

Public community colleges typically follow liberal admissions policies, offering instruction to all who might benefit and charging nominal or no fees and tuition. They provide a wide range of services to residents and organizations of their community or school district. In addition to academic subjects for undergraduates earning credits for graduation or for transfer to a four-year school, a typical community college catalog may offer instruction in such practical topics as auto repair, retirement planning, or computer skills. Many schools will organize a special course on any subject for which there is a demand.

Graduates of community and junior colleges ordinarily earn an associate's degree. The degree most awarded is the associate in arts (A.A.); others include associate in applied science and associate in business administration. Programs following the U.S. model have been introduced in other countries, including Canada, the Philippines, and Japan.

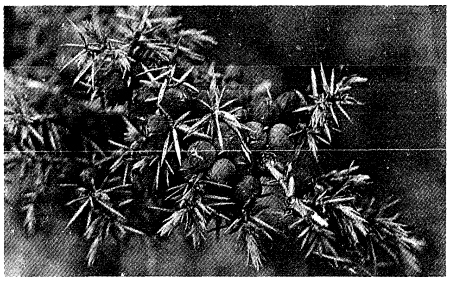
The schools have been criticized for giving too much attention to topics of immediate and practical interest to the disadvantage of rigorous education in the disciplines of higher education. They have been defended, on the other hand, as institutions with faculty more concerned with effective teaching than the prestige associated with scholarly publication and research. Further, it is said, they pro-

vide democratic educational opportunities not available elsewhere, and they serve their communities as resource centres for lifelong learning.

junior high school, in some school systems in the United States, the two or three secondary grades (7, 8, 9) of school following elementary school and preceding high school. Children served by junior high school are approximately 12 to 15 years old. The junior high school may be in a separate building or part of a junior–senior high school. In some systems, a middle school, or upper-grade centre, serves certain grades (6, 7, 8, for example) between elementary and high school.

juniper, common name for about 60 to 70 species of aromatic evergreen trees or shrubs constituting the genus *Juniperus* of the cypress family (Cupressaceae), distributed throughout the Northern Hemisphere. The juvenile leaves of a juniper are needlelike. Mature leaves are awl-shaped, spreading, and arranged in pairs or in whorls of three. Some species have small, scalelike leaves, often bearing an oil gland, which are pressed closely to the rounded or four-angled branchlets. Male and female reproductive structures usually are borne on separate plants. The reddish-brown or bluish cones are fleshy and berrylike and often have a grayish, waxy covering. They mature in 1 to 3 seasons and contain 1 to 12 seeds, usually 3.

Common juniper (*J. communis*), a sprawling shrub, is widely distributed on rocky soils throughout the Northern Hemisphere. Many ornamental varieties have been developed. The fruit, or berry, of this species is used to



Juniper berry (*Juniperus communis*)
Ingmar Holmasen

flavour foods and alcoholic beverages, particularly gin (*q.v.*), which is named after *Juniperus* through the French *genièvre*. Juniper berries have a fragrant, spicy aroma and a slightly bittersweet flavour. Used with venison, they remove the gamey taste. They are also used to season sauces and stuffings, in pickling meats, and to flavour liqueurs and bitters.

An important ornamental and timber tree of eastern North America is the eastern red cedar (*q.v.*; *J. virginiana*), whose fragrant wood is made into cabinets, fence posts, and pencils. The savin (*J. sabina*) of central Europe, Chinese juniper (*J. chinensis*) of eastern Asia, and creeping juniper (*J. horizontalis*) of eastern North America are other popular ornamental species with many horticultural varieties. The wood of incense, or Spanish, juniper (*J. thurifera*), of Spain and Portugal, and of Phoenician juniper (*J. phoenicea*) of the Mediterranean region sometimes is burned to produce incense.

Oil of juniper, distilled from the wood and leaves of several species, is used in perfumes and in medicines such as diuretics. Galls produced by junipers as a reaction to fungal infection are known as cedar apples.

Junius, the pseudonym of the still unidentified author of a series of letters contributed to Henry Sampson Woodfall's *Public Advertiser,* a popular English newspaper of the day, between Jan. 21, 1769, and Jan. 21, 1772. Junius' aims were to discredit the ministries of George III and to unite the opposition. Some 50 "identifications" of Junius have been made, including claims for Sir Philip Francis



Junius, two of his many faces, detail of an engraving by T. Bonner, 1770
By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

(the chief candidate), Edward Gibbon, Edmund Burke, John Wilkes, Lord Chesterfield, and Thomas Paine. Francesco Cordasco's *Junius Bibliography* (1949, with supplements in 1953 and 1957) is a useful listing of articles, bibliographies, and other works.

Junius, Franciscus, THE YOUNGER, French FRANÇOIS DU JON (b. 1589, Heidelberg, Palatinate—d. Nov. 19, 1677, Windsor, Berkshire, Eng.), language and literary scholar whose works stimulated interest in the study of Anglo-Saxon (Old English) and the cognate old Germanic languages.

Son of Franciscus Junius, a French Protestant theologian, he was educated in theology and became a pastor in the Netherlands (1617), but in 1620 he went to England as librarian and family tutor to the noted patron of the arts Thomas Howard, 14th earl of Arundel. Remaining in England for 30 years, he gathered a rich collection of ancient manuscripts, which he edited and annotated and bequeathed to the Bodleian Library, Oxford. During the first two years of his return to the Netherlands (1651–74), he lived in Friesland, the northern part, in order to study the old dialect. In 1674 he returned to England and, in 1676, retired to Oxford.

He prepared an edition (1655) of the Caedmon poems, a fragment of verse attributed to Caedmon, the earliest English Christian poet. Probably his most important work was preparation of the first edition (1665) of the Gothic codex of the 4th-century bishop Ulfilas. His *Etymologicum Anglicanum* (1743; "English Etymology") was used extensively by Samuel Johnson.

Junius Gallio: *see* Gallio, Junius.

Junius manuscript: *see* Caedmon manuscript.

junk, classic Chinese sailing vessel of ancient unknown origin, still in wide use. High-sterned, with projecting bow, the junk carries up to five masts on which are set square sails consisting of panels of linen or matting flattened by bamboo strips. Each sail can be spread or closed at a pull, like a venetian blind. The massive rudder takes the place of a keel, or centreboard. The hull is partitioned by solid bulkheads running both transversely and longitudinally, adding greatly to strength.



Modern junk with traditional matting sails and a European-type jib
BBC Hulton Picture Library

Chinese junks sailed to Indonesian and Indian waters by the early Middle Ages.

Junker (German: Country Squire), landowning class of Prussia and eastern Germany, which, under the German Empire (1871–1918) and the Weimar Republic (1919–33), exercised substantial political power. Otto von Bismarck himself, the imperial chancellor during 1871–90, was of Junker stock and at first was regarded as representing its interests. Politically, Junkers stood for extreme conservatism, support of the monarchy and military tradition, and protectionist policies for agriculture. The German Conservative Party in the Reichstag, or Imperial Assembly, and the extraparliamentary Agrarian League (*q.v.*) represented Junker interests throughout the imperial era. Because the Junkers staffed the Prussian Army, which had brought about Germany's unification, they were accorded great influence, particularly in Prussia, where a highly illiberal constitution remained in force (1850–1918). During the Weimar period, Junkers were continuously hostile to the republic, the collapse of which contributed to the rise of Hitler.

Junker, (Johann) Wilhelm (b. April 6, 1840, Moscow—d. Feb. 13, 1892, St. Petersburg), Russian explorer of the southern Sudan and Central Africa who determined the course of a major Congo tributary, the Ubangi River, together with one of its branches, the Uele.

After journeys to Iceland (1869) and Tunis (1873–74) Junker went to Egypt and the Sudan (1875), where he explored the lower Sobat River and the western tributaries of the White Nile (1876–78). In 1879 he went to Equatoria, the southernmost province of the Sudan, and spent part of the next several years with its governor, Mehmed Emin Paşa. He made ethnographic observations in the country of the Azande tribe, which now lies partly within the Central African Republic, Zaire, and The Sudan. Prevented from returning to Europe through the Sudan because of the Mahdist uprising, Junker, carrying Emin's journals, crossed the heartland of what is now Tanzania and reached Zanzibar in December 1886. He wrote *Reisen in Afrika, 1875–86* (1889–91; Eng. trans., *Travels in Africa,* 1890–92).

Junkers, Hugo (b. Feb. 3, 1859, Rheydt, Prussia—d. Feb. 3, 1935, Gauting, near Munich), German aircraft designer and early proponent of the monoplane and all-metal construction of aircraft.

He patented a flying-wing design in 1910, the same year in which he established an aircraft factory at Dessau. His J-1 Blechesel ("Sheet Metal Donkey") monoplane was the first successful all-metal airplane (1915), and his F-13

was the first all-metal transport (1919). Many Junkers aircraft had a corrugated sheet-metal skin, copied by several U.S. builders, including the Ford Motor Company. The Junkers works also built "Jumo" aircraft engines, designed one of the first turbojet engines during World War II, and played an important part in German airpower during the war, supplying the Luftwaffe with the Ju 52, a trimotor monoplane used as a troop transport and glider tug; the Ju 87 dive bomber (*Sturzkampfflugzeug,* shortened to "Stuka"); and the Ju 88, a twin-engine all-purpose bomber.

Juno, in Roman religion, chief goddess and female counterpart of Jupiter, closely resembling the Greek Hera, with whom she was universally identified. With Jupiter and Minerva, she was a member of the Capitoline



Juno, classical sculpture; in the Museo Archeologico Nazionale, Naples
Alinari—Art Resource/EB Inc.

triad of deities traditionally introduced by the Etruscan kings. Juno was connected with all aspects of the life of women, most particularly married life. As Juno Lucina, goddess of childbirth, she had a temple on the Esquiline from the 4th century BC. In her role as female comforter she assumed various descriptive names. Individualized, she became a female guardian angel; as every man had his *genius,* so every woman had her *juno.* Thus, she represented, in a sense, the female principle of life.

As her cult expanded she assumed wider functions and became, like Hera, the principal female divinity of the state. For example, as Sospita, portrayed as an armed deity, she was invoked all over Latium and particularly at Lanuvium, originally as a saviour of women but eventually as saviour of the state. As Juno Moneta (the Warner), she had a temple on the Arx (the northern summit of the Capitoline Hill) from 344 BC; it later housed the Roman mint, and the words "mint" and "money" derive from the name. According to Plutarch, the cackling of her sacred geese saved the Arx from the Gauls in 390 BC. Her significant festivals were the Matronalia on March 1 and the Nonae Caprotinae, which was celebrated under a wild fig tree in the Campus Martius on July 7. Juno is represented in various guises. Most frequently, however, she is portrayed as a standing matron of statuesque proportions and severe beauty, occasionally exhibiting military characteristics.

Junod, Henri Alexandre (b. 1863, Neuchâtel canton, Switzerland—d. 1934, Geneva), Swiss Protestant missionary and anthropologist noted for his ethnography of the Tsonga (Thonga) peoples of southern Africa.

During Junod's first assignment in the Transvaal (1889–96), in addition to carrying out his missionary office, he collected plant, butterfly, and insect specimens, some named for him, that were sent to museums in Switzerland and South Africa. His interest, however, shifted to ethnographic observation and linguistic study, and he prepared a grammar and analysis of Ronga, a Tsonga dialect (1896), a collection of Ronga folk songs and tales (1897), and a Ronga ethnography (1898).

Subsequent tours of duty (1899–1903 and 1904–09) resulted in a grammar of Tsonga-Shangaan (1907); a study of morals, *Zidgig* (1911); and the work on which his fame rests, translated into English as *The Life of a South African Tribe* (2 vol., 1912, 1913). Junod's work vividly presented customs in relation to the dynamics and trends of the society. It was his conviction that for an ethnography to be scientific, it must be limited to observation of a single tribe in a single geographic area.

Following his last stay in Africa (1913–20), Junod spent the remainder of his life with the Mission Romande, Geneva, and worked on his African materials. The second edition of his great work (1927) provided a pioneer functional analysis of a culture.

Junot, Andoche, DUC (duke) D'ABRANTÈS (b. Oct. 23, 1771, Bussy-le-Grand, Fr.—d. July 29, 1813, Montbard), one of Napoleon's generals and his first aide-de-camp.

Junot, the son of a prosperous farmer, joined the volunteers of the Côte d'Or district in Burgundy during the Revolution in 1792 and served with exemplary courage, being nicknamed La Tempête (The Tempest). While a sergeant at the siege of Toulon in September 1793, he was engaged as secretary by Napoleon, who, impressed by his courage, promoted him to captain and made him his aide-de-camp in 1794. Rising quickly, he became brigadier general in 1797 and divisional general in 1801. He distinguished himself in the Syrian campaign, defeating a large force of Turks with only a small detachment of cavalry at Nazareth in April 1799.

Yet, compared with Napoleon's other generals, Junot was a man of mediocre ability. In campaigns in Portugal in 1806–08 he was eventually defeated by English forces. Junot's fortunes as a general continued to decline, and his incompetence at the Battle of Smolensk in August 1812 cost him the honour of entering Moscow in triumph with Napoleon and the other generals. After he became governor of the Illyrian Provinces in February 1813, his mind gave way, and he committed suicide a few months later.

Junot, Laure, DUCHESSE D'ABRANTÈS, *née* PERMON (b. Nov. 6, 1784, Montpellier, Fr.—d. June 7, 1838, Paris), French author of a volume of famous memoirs.

After her father died in 1795, Laure lived with her mother, Madame Permon, who established a distinguished Parisian salon that was frequented by Napoleon Bonaparte. It was Napoleon who arranged the marriage in 1800 between Laure and his aide-de-camp Andoche Junot, the military governor of Paris. Laure accompanied her husband to Portugal, where he was ambassador (1805–06). The marriage was unhappy, and Laure had affairs with Prince Metternich, Austrian ambassador to Paris (1806–09), and, later, with a Royalist aristocrat named Maurice de Balincourt. Always generous to the Junots, Napoleon became annoyed with Laure's entertaining former émigrés and ordered her to leave Paris after her husband's death (1813). Though she persuaded the minister of police to let her return, the Second Restoration (1815) saw the final collapse of her fortunes. After many years in Rome, she returned to Paris, where she completed her *Mémoires sur Napoléon, la Révolution, le Consulat, l'Empire et la Restauration* (8 vol., 1831–35; Eng. trans., 8 vol., 1831–35). Noted as a vehicle of caustic wit and extravagance, her memoirs, often incorrect, are also often malicious, especially with regard to Napoleon.



Laure Junot, detail of a lithograph by Thierry Frères, after a painting by Jules Boilly, 1836
By courtesy of the Bibliotheque Nationale, Paris

Junqalī, also spelled JONGLEY, *mudīrīyah* (province), Southern Region, southern Sudan, bounded by Ethiopia on the east; Aʿālī an-Nīl province on the northeast, north, and northwest; and by al-Buḥayrah province on the west. Covering an area of 46,967 sq mi (121,644 sq km), it was created from part of former Aʿālī an-Nīl province in 1975. Junqalī province comprises the eastern part of the southern clay plains of as-Sudd region, formed by the Baḥr al-Jābal (Mountain Nile), which enters the province near Bor and extends the length of its western boundary. The river and its numerous tributaries have created swamps of reeds and papyrus that prohibit settlement and severely impede navigation.

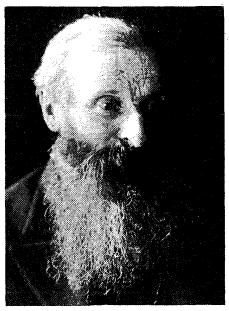
There are traces of Neolithic settlements along the banks of the Baḥr al-Jābal. The Greek scholar Agatharchides (2nd century BC) described the inhabitants of the area as marsh dwellers. The region was conquered by the Egyptians in the first quarter of the 19th century AD. The province was briefly ruled by al-Mahdī, a religious reformer and political leader who led a revolt against the Egyptians, but the Mahdists were overthrown in 1898, leading to joint rule by the Anglo-Egyptian Condominium. From 1930 until 1947 it was part of the partitioned Southern Sudan set up by the Anglo-Egyptian government. Sudan became independent in 1956, and the government effectively checked the demand for a separate Southern Sudan and stepped up the spread of Arabic and Islāmization. In 1972 an agreement was reached between the government and the southern separatists allowing more autonomy for the southern provinces.

Most of the population of the province is engaged in cattle raising on seasonally flooded swamp grassland, in fishing, and in growing subsistence crops such as millet. Traditional handicrafts include leather and woodworking and the primary processing of hides and other animal products. Roads link Bor, the provincial capital, with Pibor Post, Mogogh and Jūbā. The Dinka, Nuer, Shilluk, and Anuak are the major ethnic groups and speak Nilotic languages. Pop. (1976 est.) 300,000.

Junqueiro, Abílio Manuel Guerra (b. Sept. 17, 1850, Freixo de Espada à Cinta, Trás-os-Montes, Port.—d. July 7, 1923, Lisbon), poet whose themes of social protest and reform, expressed in a blend of grandiloquence and satire, have identified him as the poet *par excellence* of the Portuguese Revolution of 1910.

Junquerio was a leader among the revolutionary group of students at the University of Coimbra known as the Generation of Coim-

bra, who accomplished, first, the overthrow of Portuguese literary Romanticism and, later, the overthrow of the monarchy. His reputation as a poet dates from his abandonment of an early Romantic style for the realism of *A Morte de D. João* (1874; "The Death of Don Juan"), in which he portrays the great lover as



Junqueiro
By courtesy of the Portuguese National Information Office, London

a debased seducer, the symbol of false sentimentality perpetuated, like social corruption, by Romanticism. He next caused a stir with *A Velhice do Padre Eterno* (1885; "The Old Age of the Eternal Father"), which attacked the image of God with the same ruthlessness. In a less polemical phase, he celebrated Portuguese rural and village life in *Os Simples* (1892; "The Simple Ones"), in which his lyrical quality, often overdeclamatory, is at its purest.

In 1890, when Portugal was humiliated by a British ultimatum in connection with its South African colonies, Guerra Junqueiro gave expression to the wounded national pride in a dramatic poem *Pátria* (1896), which blamed the Braganza dynasty and delusions of a glorious national past for the country's downfall. Its popularity was immense and, when the republic was established in 1910, Guerra Junqueiro, as a revolutionary hero, was appointed envoy to Bern. In his last years he underwent a religious crisis and embraced the Catholicism he had so irreverently attacked.

junta (Spanish: "meeting"), committee or administrative council, particularly one that rules a country after a coup d'etat and before a legal government has been established. The word was widely used in the 16th century to refer to numerous government consultative committees. The Spanish resistance to Napoleon's invasion (1808) was organized by the *juntas provinciales;* the national committee was the *junta suprema central.* In subsequent civil wars or revolutionary disturbances in Spain, Greece, or Latin America, similar bodies, elected or self-appointed, have usually been called juntas.

juntian (China): *see* equal-field system.

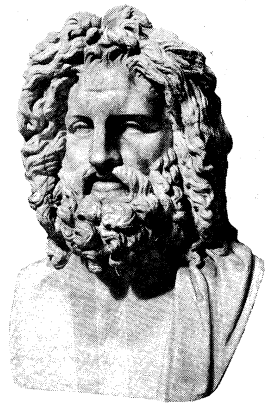
Jupiter, also called JOVE, Latin IUPPITER, IOVIS, or DIESPITER, the chief ancient Roman and Italian god. Like Zeus, the Greek god with whom he is etymologically identical (root *diu*, "bright"), Jupiter was a sky god. One of his most ancient epithets is Lucetius (Light-Bringer); and later literature has preserved the same idea in such phrases as *sub Iove*, under the open sky. As Jupiter Elicius he was propitiated with a peculiar ritual to send rain in time of drought; as Fulgur he had an altar in the Campus Martius, and all places struck by lightning were made his property and guarded from the profane by a circular wall.

Throughout Italy he was worshipped on the summits of hills; thus, on the Alban Hill south of Rome was an ancient seat of his worship as Jupiter Latiaris, which was the centre of the league of 30 Latin cities of which Rome was originally an ordinary member. At Rome itself on the Capitoline Hill was his oldest temple; here there was a tradition of his sacred tree, the oak, common to the worship both of Zeus and of Jupiter, and here, too, were kept the *lapides silices*, perhaps celts, believed to have been thunderbolts, which were used symbolically by the *fetiales,* the Roman priests who officially declared war or made treaties on behalf of the Roman state.

Jupiter was not only the great protecting deity of the race but also one whose worship embodied a distinct moral conception. He is especially concerned with oaths, treaties, and leagues, and it was in the presence of his priest that the most ancient and sacred form of marriage (*confarreatio*) took place. The lesser deities Dius Fidius and Fides were, perhaps, originally identical and certainly were connected with him. This connection with the conscience, with the sense of obligation and right dealing, was never quite lost throughout Roman history. In Virgil's *Aeneid*, though Jupiter is in many ways as much Greek as Roman, he is still the great protecting deity who keeps the hero in the path of duty (*pietas*) toward gods, state, and family.

But this aspect of Jupiter gained a new force and meaning at the close of the monarchy with the building of the famous temple on the Capitol, of which the foundations are still to be seen. It was dedicated to Iuppiter Optimus Maximus (*i.e.,* the best and greatest of all the Jupiters), and with him were associated Juno and Minerva, in a fashion that clearly indicates a Greco-Etruscan origin, since the combination of three deities in one temple was foreign to the ancient Roman religion, while it is found in both Greece and Etruria. Its dedication festival fell on September 13, on which day the consuls originally succeeded to office, accompanied by the Senate and other magistrates and priests; in fulfillment of a vow made by their predecessors, they offered to the great god a white ox, his favourite sacrifice, and, after rendering thanks for the preservation of the state during the past year, they made the same vow as that by which their predecessors had been bound. Then followed the *epulum Iovis*, or feast of Jupiter. In later times this day became the central point of the great Roman games (*ludi Romani*). When a victorious army returned home the triumphal procession passed to this temple.

Throughout the Roman Republic this remained the central Roman cult; and, although Augustus' new foundations (Apollo Palatinus and Mars Ultor) were in some sense its rivals, that emperor was far too shrewd to attempt to oust Iuppiter Optimus Maximus from his paramount position; he became the protecting deity of the reigning emperor as representing the state, as he had been the protecting deity of the free republic. His worship spread over the whole empire.



Jupiter, classical sculpture; in the Vatican Museum
Alinari—Art Resource/EB Inc.

Jupiter, in astronomy, fifth major planet from the Sun, the largest nonstellar object in the solar system. It is named for the ruler of the gods in the Greco-Roman pantheon.

A brief treatment of Jupiter follows. For full treatment, *see* MACROPAEDIA: Solar System.

Jupiter is 318 times as massive as the Earth, and its volume exceeds that of the latter by more than 1,500 times. Jupiter's enormous mass produces strong gravitational effects on other members of the solar system, including the formation of the Kirkwood gaps in the periods of asteroids, the tidal heating of the interior of the volcanic Galilean satellite Io, and the trajectory changes in cometary motions. Jupiter has at least 16 satellites, four of which were discovered by Galileo in 1610. The planet and its moons, in effect, represent a miniature version of the solar system. Jupiter's diffuse ring system, which is less than one kilometre (0.6 mile) thick, was discovered in 1979 by instruments on board the U.S. Voyager spacecraft.

Spectroscopic research conducted over a wide range of the electromagnetic spectrum from Earth-based and Voyager instruments indicates that the planet is fluid, composed mainly of hydrogen and helium in near solar proportions. The planet emits nearly 70 percent more radiation in the infrared portion of the spectrum than it receives from the Sun. Laboratory experiments performed on hydrogen under a pressure of several million atmospheres indicate that the liquid region surrounding an Earth-size rocky core within Jupiter would be a highly conducting metallic allotrope. The planet's rapid rotation (9 hours 55 minutes 29.71 seconds) induces a variation in electric currents in the metallic hydrogen region that results in the largest magnetic field of any known planet, stretching 100 R_J (where R_J is Jupiter's equatorial radius of 71,400 km [44,270 mi]) on the sunward side (the magnetopause) and beyond the orbit of Saturn on the other side (the magnetotail). Charged particles, consisting of electrons, protons, and metallic ions (captured from Io's volcanic debris) are trapped by the magnetic field into narrow regions. This process results in the production of intense (Van Allen) radiation belts whose extent includes the six innermost satellites. The belts emit radio waves at a characteristic period used to define the planetary rotation rate. The interaction of charged particles from a flux tube connecting Io and Jupiter with the upper atmosphere of the planet triggers not only an extensive polar auroral display but also a number of polar electrical storms. Such storms were observed by cameras on board the Voyager spacecraft as lightning "superbolts." The highly coloured appearance of the visible cloud layers in Jupiter's atmosphere is thought to arise from the combined effects of electrical discharges and photochemical reactions (induced by solar radiation) of chemical constituents consisting primarily of ammonia, methane, ethane, ethylene, sulfur, and water vapour. Complex organic molecules have not been spectroscopically observed to date, and the rapid vertical motions at the cloud tops as well as the hostile radiation environment argue against the possible existence of organic life, as is known on the Earth, in Jupiter's atmosphere.

Computer processing of Voyager images has revealed the magnitude and structure of the Jovian winds and the circulation of the atmosphere at the cloud tops. The banded appearance of the clouds is highly correlated with the location of wind speed maxima. In some respects, the global cloud-top circulation behaves like the Earth's atmosphere, with small-scale weather systems redistributing the energy associated with the uneven nature of the external solar heating. On the other hand, the longevity and symmetry of the wind profile around the equator and the breakdown of the regular cloud bands (both occurring

at ± 45° latitude) suggests that stellar models of concentric cylindrical convection are a more plausible explanation of the cloud-top flow being primarily driven by internal heating. Jupiter's cloud bands may therefore more closely resemble the supergranulation cells observed on the Sun. Meteorologic research indicates that the Great Red Spot, the prominent oval-shaped area in the planet's clouds, is only unique for its longevity (over 300 years) and size ($0.4\ R_J \times 0.2\ R_J$), because its internal flow and interaction properties with other storm systems are entirely consistent with observations of all other oval features in the Jovian atmosphere.

Research on the origin and evolution of the solar system has been conducted by using measurements of Jupiter's atmospheric composition, the surface cratering records of its Galilean satellites, and measurements of their physical properties (*e.g.,* density). Such studies suggest that, though surface weathering has effaced much of their very early history, the Galilean satellites suffered meteoritic bombardment at about the same time that the lunar maria were formed.

Jupiter II: *see* Europa.

Jupiter III: *see* Ganymede.

Jupiter Dolichenus, god of a Roman mystery cult, originally a local Hittite-Hurrian god of fertility and thunder worshiped at Doliche (modern Dülük), in southeastern Turkey. Later the deity was given a Semitic character, but, under Achaemenidian rule (6th–4th century BC), he was identified with the Persian god Ahura Mazdā, thus becoming a god of the universe. Through Greek influence he was renamed Zeus Oromasdes; and under that title he was closely associated with the cult of Mithra, another Persian deity. The worship of Jupiter Dolichenus and that of his consort was gradually carried westward to Rome and other military centres, where it became extremely popular during the 2nd and 3rd centuries AD. In the Roman mystery religion he was not only recognized as a god of the heavens but was also believed to control military success and safety. He was usually represented standing on a bull and carrying his special weapons, the double ax and the thunderbolt.

Juppiter (Roman god): *see* Jupiter.

Jura, *département,* Franche-Comté *région,* eastern France, created from the southern part of the old province of Franche-Comté. Its 1,930-square-mile (4,999-square-kilometre) area is bordered on the north by the Ognon River, flowing between Dijon and Besançon. The eastern border, which adjoins Switzerland for 12 miles (19 km), is crossed by the road from Lons-le-Saunier, Jura's capital, to Nyon on Lake Geneva. The Jura Mountains in the southeast, reaching more than 4,905 feet (1,495 m) in Pela Ridge, slope northwestward to the Jura plateau and the fertile plain of the upper Saône River valley. The Doubs River flows southwestward through Dole, before 1674 the capital of Franche-Comté. The Ain River, which rises in eastern Jura, has been dammed to form Vouglans Lake, more than 20 miles (32 km) in length.

In the mountains the winters are long and severe, but in the valleys they are mild and summers are warm. Extensively forested, Jura has well-developed farming in the valleys, in which large quantities of Gruyère cheese are produced. Jura is divided into the *arrondissements* of Lons-le-Saunier, Dole (birthplace of the pioneer microbiologist Louis Pasteur), and Saint-Claude, a centre for production of pipes and plastics and for diamond cutting. Pop. (1988 est.) 244,200.

Jura, fourth largest island of the Inner Hebrides, district of Argyll and Bute, Strathclyde region, Scotland. It is 27 miles (43 km) long and 2–8 miles (3–13 km) wide, almost bisected by Loch Tarbert, a sea loch. A mountain range, culminating in the Paps of Jura (2,571 feet [784 m]), runs the length of the island. Cattle and sheep are raised; and oats, barley, and potatoes are cultivated along the eastern shore, where most of the population is concentrated. There is some fishing at Craighouse, the only village. Pop. (1981) 239.

Jura, *canton,* northwestern Switzerland, comprising the folded Jura Mountains in the south and extending northward to the hilly region of the limestone Jura Plateau, including the districts of the Franches Montagnes and the Ajoie. Bordering France to the north and west, it is bounded on the south by Bern canton and on the east by Solothurn and Bern cantons. Its area of 323 square miles (837 square km) is drained mainly by the rivers Doubs (tributary to the Saône-Rhone) and Birs (tributary to the Rhine).

In 999 the Abbacy of Moutier-Grandval, comprising much of present-day Jura canton, was donated by the king of Burgundy to the bishop of Basel. For more than 800 years, up to the French Revolution, this prince bishopric remained a sovereign state within the Holy Roman Empire, with close ties to the Swiss Confederation after the Treaty of Westphalia in 1648. The Congress of Vienna in 1815 joined the Jura region to Bern canton. Dissension with the rest of predominately Protestant, German-speaking Bern canton and separatist feelings among the mainly French-speaking Roman Catholic Jurassiens led eventually to requests for an independent canton. In 1977 a constitution was accepted, and a year later the Swiss people voted for the creation of Jura canton. In 1979 it officially became the 23rd canton in the Swiss Confederation.

The principal economic activities are agriculture and cattle and horse breeding. Watchmaking and the textile and tobacco industries are important. Delémont is the canton's capital. Pop. (1988 est.) 64,645.

Jura Mountains, also called JURA, system of ranges extending for 225 miles (360 km) in an arc on both sides of the Franco-Swiss border from the Rhône River to the Rhine. It lies mostly in Switzerland, but a good part of the western sector lies in France. The highest peaks of the Jura are in the south, in the Geneva area, and include Crêt de la Neige (5,636 feet [1,718 m]) and Le Reculet (5,633 feet [1,717 m]), both in France; and Mount Tendre and La Dôle, both more than 5,500 feet (1,680 m), in Switzerland. Toward the northeast and along the outer ridges of the arc, the elevations of the crests are lower.

The Jura Mountains were named for their dense forestation, *jura* meaning "forest" (from the Gaulish *jor, juria;* ultimately related to Slavic *gora,* "mountain"). The Jurassic System of rocks was named by Alexander von Humboldt for the mountains' fossil-bearing limestone formations, which date to the period of geologic time from about 208 to 144 million years ago—the so-called Jurassic Period.

The formation of the Jura Mountains began in the early Tertiary Period (beginning about 66.4 million years ago) as a part of the same Earth movements that formed the Alps. The main deformational thrust from the southeast occurred during the Pliocene Epoch (5.3 to 1.6 million years ago). Consequently, the mountain-building process took place in at least two separate thrust phases: the first one formed the outer, French chain of ridges, and the second thrust formed the adjacent, higher inner ranges. Geologically, the Jura is a part of Alpine foreland.

The prevalence of limestone, alternating as it does with softer layers of marl, results in great permeability and consequent deficiency of surface water. Traditionally, each Jura farmstead collected its own cistern water; today, modern supply networks bring water up from the deep gorges of the Doubs and other rivers. Lake Joux has an underground outlet reappearing as a river, the Orbe, about 2 miles (3 km) farther down. Similar underground stream sources are numerous, including the Areuse, Schüss (Suze), and Birs rivers in Switzerland and the Doubs, Loue, and Lizon in France. The largest rivers are the Doubs, the Ain, and the Birs.

Annual precipitation increases to the south and west, reaching more than 80 inches (2,030 mm) on Mount Risouz and Mount Tendre; but the Delsberg Valley and the north-facing corridor of the Ergolz River (Liestal) receive less than 40 inches (1,000 mm). The climate is of the maritime-continental transitional type: it is rawer on the Jura heights, milder in the protected valleys and on the south-facing slopes. Pools of cold air can form in the high valleys in winter.

Natural vegetation is of the forest type throughout. From lower to higher elevations there occur oak groves and beech forests interspersed at higher elevations with firs. In the southern Jura, the firs are replaced by sycamore maple. The crests above the tree line (5,300 feet [1,600 m]) are covered with Alpine grasses. Only over deposits of marl and clay are there also isolated moors. Wildlife is practically extinct.

Pastures on the high plateaus are more characteristic of the Jura than are the cultivated fields in the basins and valleys. The dairy economy is based on cattle raising, and a number of types of cheese are produced. In the west the Jura reaches the vineyard zone of the Saône River valley, and grapes also are grown on the south face of the Jura. The Jura farmer, in addition, raises fruits and ample quantities of potatoes and vegetables but little grain. The most important mineral resource has been granular iron ore.

Villages are found in abundance, especially in the valleys, while larger cities are almost entirely on the margins—Chambéry, Geneva, Neuchâtel, Biel (Bienne), Solothurn, Aarau, Baden, Bourg-en-Bresse, Lons-le-Saunier, Besançon, Montbéliard, Porrentruy, and, on the Rhine, Basel and Schaffhausen.

Centres of the Swiss watchmaking industry in the Jura are La Chaux-de-Fonds, Le Locle, Saint-Imier, Geneva, Biel, Grenchen, and Schaffhausen. Other light industries include gem cutting and polishing; the manufacture of eyeglasses, briar tobacco pipes, music boxes, phonographs, camera equipment, paper, and typewriters; and the processing of tobacco and chocolate.

The beauty of the Jura has attracted a thriving tourist industry, both in the summer and, increasingly, also in winter for skiing. A consequence has been the development of an excellent rail and road transportation network.

Juran: *see* Chü-jan.

Jurassic Period, interval of geologic time from 208 to 144 million years ago. It is often divided into the Early Jurassic Epoch (208 to 187 million years ago), the Middle Jurassic Epoch (187 to 163 million years ago), and the Late Jurassic Epoch (163 to 144 million years ago). The Jurassic Period is one of the three major divisions of the Mesozoic Era and is preceded by the Triassic Period and followed by the Cretaceous Period. The rocks that originated during this period constitute the Jurassic System.

A brief treatment of the Jurassic Period follows. For full treatment, *see* MACROPAEDIA: Geochronology.

Continental rifting had set in near the end of the Triassic Period, signaling the breakup of Pangaea, the enormous supercontinent made up of all the major present-day landmasses. At the outset of the Jurassic, the constituent continental masses were still connected or situated

very close together. Australia, Antarctica, and India were joined together against the eastern coast of Africa, and South America was joined to the southwestern coast of Africa. North America was still joined to western Africa and Europe, and a deep seaway called the Tethys extended from Spain eastward across southern Asia. Most of these continents were farther south than their present positions; South Africa lay within the Antarctic Circle, and the equator intersected southern North America and Europe. As a result, most landmasses currently in the Northern Hemisphere had warmer climates than they do at present. Because of higher temperatures across the globe, there were probably no polar ice caps, and in some areas there were extensive deserts.

By the Middle Jurassic Epoch, North America had begun pulling away from Eurasia and Africa, and the Atlantic Ocean opened. Shallow seas slowly advanced over many continental areas of the world, reached a maximum in Late Jurassic times, and retreated at the close of the period. In the Late Jurassic, the Nevadan Orogeny began on the western margin of North America. This major mountain-building event resulted when the western edge of the tectonic plate bearing North America collided with a complex of island arcs. The southern continents also had begun to separate by the Late Jurassic. South America and Africa split away from each other, and India separated from Australia and Antarctica, which were still joined together.

Among the rocks of the Jurassic System, marine deposits are widespread. These deposits include both shallow-water reef and deep-water pelagic limestones, which are extensive in Europe (where the main stages of the Jurassic were first described and defined), North America, eastern Africa, and western Australia. Tracing the strata from region to region reveals that in some areas these limestones may grade into shales and sandstones. Continental deposits, including coal, are found throughout Asia.

The fossil record of the period indicates that marine invertebrates, notably the ammonites (now extinct cephalopods), flourished and new species evolved rapidly. The shell forms, particularly the suture (line or furrow marking the junction of two adjacent body parts) of the ammonites became more complex, and each species was so characteristic of its time and so widespread that ammonites are now used as guide fossils to define Jurassic stratigraphic zones. The coccolithophores (variety of free-floating marine organisms) appeared on a smaller scale and attained major importance in the later Cretaceous Period (144 to 66.4 million years ago). Coral and sponge reefs were prominent in many areas, and, though fish continued to be of importance, the larger reptiles dominated many marine habitats. These included the plesiosaurs, descendants of the land reptiles; they had long necks and paddle-shaped limbs similar to those of turtles or seals, and they remained near the surface of the water. The plesiosaurs and related species attained great size toward the end of the period. The ichthyosaurs, which resembled the modern dolphin in profile, were better adapted to the seas.

On land, ferns, mosses, cycads, and conifers thrived, some developing flowerlike structures in place of cones. The dinosaurs, evolving from their smaller ancestors of the Triassic, rose to supremacy on land. By the end of the Jurassic the largest species had evolved; the spectacular sauropods were vegetarians, probably favouring a shallow-water habitat; and the theropods included the well-known land carnivore the tyrannosaur. The pterosaurs were another common form. These flying reptiles of the Jurassic were small, some species being only about the size of sparrows or thrushes. Their muscles were not so well developed as those of present-day birds, and they must have glided leisurely on air currents. The archaeopteryx, the first primitive bird, appeared before the end of the period. The first mammals, tiny shrewlike creatures that appeared near the close of the Triassic, managed to survive and evolve throughout the Jurassic Period.

Jurchen DYNASTY, Mongolian JÜRCHED, or JÜRCHID (Manchuria): *see* Chin dynasty.

jurisdiction (law): *see* competence and jurisdiction.

jurisdiction, summary (Anglo-American law): *see* summary jurisdiction.

Jurjānī, al-, in full ʿALĪ IBN MUḤAMMAD AL-JURJĀNĪ, also called AS-SAYYID ASH-SHARĪF (b. 1339, Tājū, near Astarābād, Iran—d. 1413, Shīrāz), leading traditionalist theologian of 15th-century Iran.

Jurjānī received a varied education, first in Harāt and then in Egypt. He visited Constantinople in 1374, and, upon his return in 1377, he was given a teaching appointment in Shīrāz. In 1387 Shīrāz fell to Timur, the famous central Asian conqueror, and Jurjānī, whose fame as a teacher and scholar had reached its height, was taken to Timur's capital of Samarkand (now in the Soviet Union). He stayed in Samarkand until Timur's death in 1405, when he returned to Shīrāz.

Most of Jurjānī's scholarly work was written in Arabic. Of his 31 extant works and commentaries, the best-known work is the *Kitāb at-taʿrīfāt* ("Book of Definitions"), a short dictionary of technical terms from theology, philosophy, and philology (first edited by G. Flügel in 1845).

Jurōjin, in Japanese mythology, one of the Shichi-fuku-jin ("Seven Gods of Luck"), particularly associated with longevity. He is supposed, like Fukurokuju, another of the seven with whom he is often confused, to have once lived on earth as a Chinese Taoist sage. He is often depicted as an old man with a white beard, wearing a scholar's headdress and sometimes accompanied by a stag. He carries a large stick to which is attached a scroll containing the world's wisdom. *See also* Shichi-fuku-jin.

Jurong, town and industrial complex of southwestern Singapore. Jurong estate, one of the largest industrial sites (9,600 acres [3,900 hectares]) in Southeast Asia, occupies drained swampland near the mouth of the Jurong River. It has heavy and light industries and is served by access roads, a spur railway, and its own harbour.

The Jurong project grew out of Singapore's participation in the Malaysia federation (formed in 1963). It was to be the processing centre for the rubber, tin, and palm oil produced in the other states. Although development was slowed by Singapore's secession in 1965, more than 800 companies are now located there. The National Iron and Steel Mill is the industrial core. Other industries include shipbuilding, repair, and breaking yards, a steel-pipe factory, an acid plant, and an oil refinery. Marine-oriented concerns use the facilities of Jurong port on Sembilan Strait of the South China Sea, which is equipped with five deepwater berths.

The town is ringed by resettlement areas and served by Nanyang University and Jurong Park, a large recreational area. The Jurong Town Corporation, established in 1968, manages the land, factories, low-cost housing, and recreational facilities of the area. Pop. (1980) census district, 50,974.

Jurong Bird Park, specialty zoo in Singapore noted for its extensive aviaries. The park, managed by a government-owned company, opened in 1971. It occupies a 20-hectare (48-acre) site on the slopes of Jurong Hill, which is located about 24 km (15 miles) from downtown Singapore. The park's most spectacular exhibit is a 2-hectare (5-acre) free-flight aviary, and there are numerous other aviaries in the park. The park houses some 3,000 birds of more than 300 species. It has breeding groups of various parrots, pheasants, hornbills, birds-of-paradise, and other, mostly Southeast Asian, species. The exhibits are designed to blend in with the lush background, and there is a trackless tram that carries visitors on a tour of the aviaries.

Juruá River, Portuguese RIO JURUÁ, Spanish RÍO YURUÁ, river that rises in the highlands east of the Ucayali River in Loreto department, Peru. It flows northward through Acre state, Brazil. Entering Amazonas state, Brazil, it meanders eastward and then east-northeastward, emptying into the stretch of the Amazon River known as the Solimões River, near Tamaniquá. The most winding river in the Amazon basin, the Juruá is calculated to exceed 2,040 miles (3,283 km) in length; yet it descends from only 1,486 feet (453 m) above sea level. It is navigable for more than 600 miles (950 km) above its junction with the Amazon. Its banks are sparsely inhabited, and many of its tributaries were first mapped via satellite in the late 1970s.

Juruena River, Portuguese RIO JURUENA, river, west-central Brazil, rising in the Serra dos Parecis and descending northward from the Mato Grosso Plateau for 770 miles (1,240 km), receiving the Arinos River and joining the Teles Pires, or São Manuel, to form the Tapajós River, a major affluent of the Amazon. A hydroelectric plant was built on the river during the late 1970s to supply energy for the mahogany lumber industry. For the last 120 miles (190 km) of its course the Juruena marks the boundary between Mato Grosso and Amazonas states. Because of numerous rapids and falls, the river is not navigable.

jury, a group of laymen that decides factual issues in criminal and civil trials. It is predominantly an Anglo-American institution, and its particular characteristics vary among countries, provinces, and states. In general, jury members are randomly selected from the greatest population to which the outcome of a case might apply. The jury can usually consider a case in secrecy and announce its verdict without providing a public explanation.

A brief treatment of juries follows. For full treatment, *see* MACROPAEDIA: Judicial and Arbitrational Systems.

Historical details of the jury's inception are unknown, but it may have originated in England or have been introduced there by the Normans after 1066. The development of jury trials is believed to have been an important factor in centralizing English courts and establishing common law. At the beginning of the 15th century, jury trials had replaced such unreasonable methods of deciding cases as ordeal, through which innocence or guilt was determined by the defendant's ability or inability to endure torture.

The jury system expanded with the British Empire to regions of Africa, Asia, and the Western Hemisphere. The French Revolution precipitated its use for major and political cases in France, the Rhineland, Belgium, Austria-Hungary, Russia, Italy, Switzerland, a few German states, Holland, and Luxembourg. The latter two countries, however, discontinued its use after Napoleon's fall in 1814–15.

The jury in non-Anglo-American countries lost power and became far less common in the 19th and early 20th centuries. For example, its use for treason was discontinued in 1850 in Prussia; and it was abandoned completely in Hungary in 1919 and Germany in 1924.

Also, the jury was abolished in France during the German occupation of the 1940s.

Although it is used in England for certain kinds of cases, jury trials occur most frequently in the United States. Approximately 120,000 are held there annually; these represent 90 percent of all those in the world. Use of the jury in criminal and civil cases in the United States is contingent upon whether it is available and whether or not the defendant or plaintiff wishes to use it. In the case of *Duncan* v. *Louisiana* in 1968, the U.S. Supreme Court ruled that for criminal cases involving a sentence of more than six months, a jury trial is a constitutional right. For the most part, it is also readily available for civil cases.

In the past, there were certain property and competence requirements for jury service; but true random selection became the policy of the U.S. federal courts in 1969 and is presently common in most states. Such professionals as policemen, lawyers, and doctors are exempt from jury service in many areas, and potential jurors are often excused if service will create an undue imposition. *Voir dire,* the process of juror selection by trial counsel, involves elimination of candidates either for alleged partiality or by peremption (without supplied reasons).

Historically, the jury has been composed of 12 members, and unanimity was required in deciding cases. These characteristics have been altered in various capacities over time. The U.S. Supreme Court has upheld the use of six-member juries in cases of lesser importance, and the unanimity requirements have been relaxed for several types of cases. Majority verdicts are frequently acceptable in misdemeanor or civil trials. When the jury cannot reach a verdict (called a "hung jury" in the United States), a mistrial is declared, and the case in question must be retried. In Europe and in U.S. Army court-martial juries, a two-thirds majority must agree that a defendant is guilty, or else he must be acquitted.

The jury's duty is to decide issues of fact in the trial. In civil cases, the jury decides on matters of liability and amount of damages, while in criminal cases, its role is limited to the determination of innocence or guilt, and the judge decides the issue of punishment. In some courts the jury is allowed to declare a sentence within legally specified limits. Also, in jurisdictions in which the death penalty is legal, the jury sometimes decides whether or not it should be imposed. Guilty verdicts and sentencing decisions are usually given simultaneously, but several courts have "second trials" specifically to determine what punishment a guilty defendant should receive.

The jury trial is always overseen by a judge, who decides (to a certain extent) what evidence is appropriate for the jury to hear. Also, if the evidence does not leave a question of fact to be answered, the judge may take the case from the jury. The judge instructs the jury in laws that are applicable to the case at hand. Finally, if the judge finds that a verdict is clearly discordant with the implications of the evidence, he may order a "retrial" of the case. A notable exception to this last rule under Anglo-American law is that criminal acquittal by jury is absolute. The jury is usually not required to supply reasons for its verdict, but in some cases the judge directs it to determine certain specific facts.

jus gentium (Latin: "law of nations"), in legal theory, that law which natural reason establishes for all men, as distinguished from *jus civile,* or the civil law peculiar to one state or people. Roman lawyers and magistrates originally devised *jus gentium* as a system of equity applying to cases between foreigners and Roman citizens. The concept originated in the Romans' assumption that any rule of law common to all nations must be fundamentally valid and just. They broadened the concept to refer to any rule that instinctively commended itself to their sense of justice. Eventually the term became synonymous with equity, or the praetorian law. In modern law, there is a distinction between *jus gentium privatum,* which denotes private international law, otherwise known as conflict of laws, and *jus gentium publicum,* which denotes the system of rules governing the intercourse of nations.

jus Latii (Latin: "right of Latium"), English LATIN RIGHTS, in the Roman Republic and the Empire, certain rights and privileges, amounting to qualified citizenship, of a person who was not a Roman citizen. The rights were originally held only by the Latins, or inhabitants of Latium (the region around Rome), but they were later granted to other areas subservient to Rome.

An essential part of the *jus Latii* was the right to enter into legal contract under Roman law (*commercium*) and the right to legal intermarriage (*conubium*). Upon the decline and depopulation of Latium after 300 BC the application of the *jus Latii* shifted to the Latin colonies, many of whose settlers had been recruited from the Roman citizenry. These colonies were autonomous communities subject to Rome in foreign policy and through which Rome occupied many of the strong points of Italy as it expanded. As Latins they formed an intermediate group between the Roman citizens and the Italian allies. The colonies also eventully became depopulated, however, and after 200 BC the *jus Latii* was granted mainly to foreign peoples that Rome had subjugated by military conquest. Examples of this can be found in its grant in 170 to the children of Roman soldiers and native women in the colony of Carteia in Spain and in 89 to residents of Transpadane Gaul. These fictive Latins adopted the municipal pattern, the language, and the law of Latins. Their demand for Roman citizenship quickly became a political issue in Rome and was granted in 49 by Julius Caesar and Augustus to many native communities in the western provinces, and the process went on until Vespasian gave it to all the organized communities of Spain. Later emperors extended it freely to other provinces of the Empire. The status became in practice an intermediate step in the advancement of native communities to Roman citizenship. Finally, the Edict of Caracalla (AD 212) granted Roman citizenship to almost all inhabitants of the Roman Empire, reducing the distinction between Latin right and Roman citizenship to a mere formality.

Jusserand, Jean(-Adrien-Antoine-)Jules (b. Feb. 18, 1855, Lyon—d. July 18, 1932, Paris), French scholar and diplomat who, as French ambassador to Washington, D.C. (1902–25), helped secure the entry of the United States into World War I.

He was a noted Middle English literature scholar. *En Amérique jadis et maintenant* (1916; *With Americans of Past and Present Days,* 1917) was awarded the first Pulitzer Prize for history (1917). He was ambassador to the United States under five presidents, beginning with Theodore Roosevelt. His major works on medieval English literature include *Les Anglais au moyen âge: l'épopée mystique de William Langland* (1893; *Piers Plowman,* 1894) and *Histoire littéraire du peuple anglais* (vol. 1, 1894, vol. 2, 1904; "Literary History of the English People").

Jussieu, Antoine de (b. July 6, 1686, Lyon—d. April 12, 1758, Paris), French physician and botanist who wrote many papers on human anatomy, zoology, and botany, including one on the flower and fruit of the coffee shrub.

After studying medicine at the University of Montpellier, he travelled through Spain, Portugal, and southern France, making a large collection of plants. In 1708 he went to Paris, where he became director of the Jardin du Roi. His edition of Joseph Pitton de Tournefort's *Institutiones Rei Herbariae,* 3 vol. (1719; "Elements of Botany") won him election to the French Académie des Sciences. Antoine was a brother of Bernard and Joseph.

Jussieu, Antoine-Laurent de (b. April 12, 1748, Lyon—d. Sept. 17, 1836, Paris), French botanist who developed the principles that served as the foundation of a natural system of plant classification.

Antoine-Laurent was brought in 1770 by his uncle Bernard to the Jardin du Roi, where he became demonstrator in botany. In 1773 his paper, presented to the Académie des Sciences, on the Ranunculaceae (crowfoot) family introduced his method of classification. His *Genera Plantarum Secundum Ordines Naturales Disposita, Juxta Methodum in Horto Regio Parisiensi Exaratam, Anno 1774* (1789; "Genera of Plants Arranged According to Their Natural Orders, Based on the Method Devised in the Royal Garden in Paris in the Year 1774") extended his method of classification, based on the relative value of characters, to the entire plant kingdom. In 1826 he resigned his professorship at the Muséum National d'Histoire Naturelle, which he had helped to organize in 1790 from the former Jardin du Roi.

His son, Adrien-Laurent-Henri de Jussieu (1797–1853), is best known for his *Embryons Monocotylédones* (1844), on which he worked for more than 13 years, and *Cours élémentaire de botanique* (1842–44), which was translated into many languages.

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Jussieu, Bernard de (b. Aug. 17, 1699, Lyon—d. Nov. 6, 1777, Paris), French botanist who founded a method of plant classification based on the anatomical characters of the plant embryo. After studying medicine at Montpellier, he became in 1722 subdemonstrator of plants in the Jardin du Roi, Paris. In 1759 he was invited to develop a botanical garden at the Petit Trianon at Versailles. His arrangement of the plants there reflected the ideas of the Swedish botanist Carolus Linnaeus but was the beginning of a system that his nephew, Antoine-Laurent de Jussieu, later developed into a new system of plant classification. Bernard was a brother of Antoine and Joseph.



Bernard de Jussieu, detail from an engraving
By courtesy of the Ashmolean Museum, Oxford

Jussieu, Joseph de (b. Sept. 3, 1704, Lyon—d. April 11, 1779, Paris), French botanist who accompanied the French physicist Charles-Marie de la Condamine's expedition to Peru

to measure an arc of meridian. He remained in South America for 35 years, returning to Paris in 1771. He introduced the common garden heliotrope (*Heliotropium peruvianum*) into Europe. Joseph was a brother of Antoine and Bernard.

just intonation, in music, system of tuning in which the correct size of all the intervals of the scale is calculated by different additions and subtractions of pure natural thirds and fifths (the intervals that occur between the fourth and fifth, and second and third tones, respectively, of the natural harmonic series; *see* overtone). Supposedly used in medieval monophonic music (melody only, without harmony) and considerably discussed by theorists, just intonation proved impractical for polyphonic (multipart) music and was replaced at least by the year 1500 by meantone temperament.

just war, medieval European concept that a ruler, by proper declaration and with proper motives, might employ armed force outside his normal jurisdiction to defend rights, rectify wrongs, and punish crimes. He could, that is, take up arms for a just cause (which in practice was interpreted according to one's own lights). The concept developed as early as St. Augustine in the 4th century and was still accepted by the Dutch jurist and writer on international law Hugo Grotius in the 17th. Its popularity thereafter declined, though in the 20th century it enjoyed a revival in somewhat new form, with the idea that a nation might resort to armed force in self-defense or in the execution of collective obligations toward international peace-keeping operations.

Justice, High Court of: *see* High Court of Justice.

justice of the peace, in Anglo-American legal systems, a local magistrate empowered chiefly to administer criminal or civil justice in minor cases. A justice of the peace may, in some jurisdictions, also administer oaths and perform marriages.

In England and Wales a magistrate is appointed by the lord chancellor, on behalf of the crown, to keep the peace within a specific district. The duties of the modern-day justices of the peace, who preside in the magistrates' courts of England and Wales, evolved from those first bestowed upon them under the Justice of the Peace Act of 1361. In essence, the justices continue to deal mostly with minor criminal matters and continue to send more serious cases to a higher court for disposition—since 1971, to the Crown Court or any of the courts that make up the High Court of Justice (*q.v.*).

The modern justice of the peace in England and Wales, as formerly, is usually a lay person. But each appointee now undergoes a training course in basic law and in the administrative duties of the magistrates' court. On matters of law, advice is provided by a clerk to the justice. Lay magistrates must number at least three to hear a case. Paid, full-time magistrates may hear cases alone. In some less serious criminal matters, a justice of the peace may sit with a judge of the Crown Court.

In England and Wales there are some 28,500 justices of the peace, one-third of whom are women. The rising case load of juvenile matters now takes a larger proportion of magistrates' court time. The justices who hear these cases, or rule on the care of children, also take special courses in juvenile law.

In Australia the main function of the justice of the peace is to authenticate the execution of documents.

In the United States, justices of the peace are elected or appointed and sit on the lowest of the state courts hearing minor civil matters and petty criminal cases, usually misdemeanors. They officiate at weddings, issue arrest warrants, deal with traffic offenses, and hold inquests.

justiciar, early English judicial official of the king who, unlike all other officers of the central administration, was not a member of the king's official household. The justiciarship originated in the king's need for a responsible subordinate who could take a wide view of the affairs of the kingdom, act as regent when the king was abroad, and on other occasions take charge of those matters with which the king had no time to deal. From the very nature of his office his position was superior to that of any household officer.

Although William I (1066–87) was known to have appointed men to hold such authority while he was in Normandy, their offices had always ended on his return to England. During the reign of Henry I (1100–35) an increase in administrative specialization is thought to have lent his *Justiciarius* some authoritative position among royal judges. It was under Henry II (1154–89), however, and particularly after the chancellor and chief minister Thomas Becket was removed from the scene, that the justiciar became the most important man in the kingdom after the king.

As the volume of judicial work grew each year because of the popularity of Henry II's reforms, the justiciar presided over the bench of judges at Westminster, organized the judicial circuits, heard difficult pleas, gave advice to judges on innumerable points of law, and toured the country to see that the administration was properly conducted. When the king was abroad, the justiciar also raised money for the king's needs and saw that peace was maintained. The loss of Normandy in 1204, however, resulted in the king's spending more time in England, and the office began to lose some of its strength. Despite the fact that it regained appreciable power during the minority of Henry III, the office ceased to exist after 1261.

justification, in Christian theology, either (1) the act by which God moves a person from the state of sin (injustice) to the state of grace (justice); (2) the change in a person's condition as he moves from a state of sin to a state of righteousness; or (3) especially in Protestantism, the act of acquittal whereby God gives contrite sinners the status of the righteous.

The term is a translation of the Greek *dikaiōsis* (Latin *justificatio*), originally a technical legal term derived from the verb "to make [someone] righteous." Justification has had importance in the history of the church and of theology since the time of St. Paul. In his letters to the Galatians and to the Romans, he asks, against the background of the Pharisees' legalistic piety, how one becomes just before God. He answers that it is not by works, nor even by obeying the commandments (the law of God, which in itself is good). A person stands before God not as righteous but as a sinner, entirely dependent on God's grace. It is God who calls the sinner righteous. In human law courts, only the innocent person is justified; but in the tribunal of God, before whom all are sinners, it is precisely the unjust who are declared just by God's merciful verdict. This is no arbitrary pronouncement but is made with reference to Jesus Christ, "who was put to death for our trespasses and raised for our justification" (Rom. 4:25). In this way, the sinner is acquitted from law, sin, and death; is reconciled with God; and has peace and life in Christ through the Holy Spirit—is not merely declared just but is truly made just.

In response, one should accept God's merciful judgment in Christ and place complete trust in the Lord; in short, have faith. The person who has been justified is tempted as before and therefore remains dependent on the grace of God. Faith must not be inactive, but a "faith working through love" (Gal. 5:6); *i.e.,* one must authenticate religious faith by deeds of love.

The Greek Fathers of the church did not emphasize the doctrine of justification, but it became an important theological concept in the thought of Augustine during his controversy with the Pelagians, a heretical group who were teaching an ethical self-sanctification by works. The doctrine received great stress in Martin Luther's struggle against the concept of justification by works current in the late Middle Ages, a struggle that led to a genuine reappraisal of St. Paul's doctrine of justification. It became a capital doctrine for the Reformers. The Council of Trent (1545–63) defined the Roman Catholic position in terms that reflected an anti-Protestant bias and for the next several centuries drew the lines for opposition between Roman Catholics and Protestants in their understanding of the doctrine.

Justin, Latin in full MARCUS JUNIANUS JUSTINUS (fl. 3rd century AD), Roman historian who was the author of *Epitome,* an abridgment of the *Historiae Philippicae et totius mundi origines et terrae situs* by Pompeius Trogus (*q.v.*), whose work is lost. Nothing is known of Justin's personal history other than his work on Trogus' book (chiefly a history of Macedonia and the Hellenistic monarchies, with Parthia), which preserves material that has proved increasingly valuable to students of the Hellenistic world. The book was much used in the Middle Ages.

Justin I (b. *c.* 450, Bederiana, Macedonia Salurtaris—d. Aug. 1, 527), Byzantine emperor (from 518) who was a champion of Christian orthodoxy; he was the uncle and predecessor of the great emperor Justinian.

Born of Illyrian peasant stock, Justin was a swineherd in his youth. At about the age of 20 he went to Constantinople, where he entered the palace guard and rose to be a patrician. Under the Byzantine emperor Anastasius I he became commander of the palace guard, with the title of count.

On the death of Anastasius in July 518, Justin secured the throne. Unlike his predecessor, he supported orthodoxy, and in 518–519 he was instrumental in ending the Acacian schism with Rome and persecuted the dissident Monophysites. In 523 he also issued an edict against Arianism. This offended the Arian king Theodoric of the Ostrogoths, who forced Pope John I to visit Constantinople to plead for a mitigation of the edict. Justin then granted some concessions to the Arians but not enough to satisfy Theodoric.

In the East the struggle with Persia made it important to retain control of Lazica (modern Colchis, a region in Georgian S.S.R.), to secure allies in Mesopotamia and southern Syria, and to counter Persian penetration into Arabia by an understanding with Ethiopia. On the northern frontier the Slavs were already crossing the Danube River and troubling the Balkan provinces, and Justin proved unable to repel them.

Throughout his reign, Justin, though by no means the nonentity often supposed, had the help of his gifted nephew Justinian I. Justinian was formally recognized as his co-emperor only a few months before Justin's death.

Justin II (d. Oct. 4, 578), Byzantine emperor (from 565) whose attempts to maintain the integrity of the Byzantine Empire against the encroachments of the Avars, Persians, and Lombards were frustrated by disastrous military reverses.

A nephew and close adviser of the Byzantine emperor Justinian I, Justin II became emperor in November 565 following his uncle's death. He began his reign on a note of resolution and

common sense; he paid state debts, remitted overdue taxes, and reduced expenditures.

In the early part of his reign, Justin allowed a measure of toleration to the dissident Monophysite Christians. Initially, he hoped to bring about a union of the Monophysite factions and then to unite them with the orthodox church. In March 571, however, he inaugurated a policy of persecution and issued a lengthy anti-Monophysitic creed that all clergy were required to sign under penalty of imprisonment.

In the West, despite an alliance with the Franks, Justin was unable to prevent the Lombards from entering Italy in 568, and parts of that country were soon permanently lost. His relations with the Avars and Persians were marked by similar, though less serious, reverses. Shortly after his accession, determined to abandon Justinian's policy of buying peace, he rejected an Avar request for tribute. In 568 he concluded an alliance with the Western Turks of Central Asia, apparently directed against the Avars and Persians. Yet after campaigning against the Avars, who were ravaging the Danubian frontier, he was forced to come to terms with them in 571. Three years later a treaty was concluded stipulating that the Byzantines pay a yearly tribute to the Avars. In 576 the Western Turks, angered by the treaty, not only broke off their alliance with Justin but also seized a Byzantine stronghold in the Crimea.

In 571 the part of Armenia governed by Persia revolted and requested assistance from the Byzantine Empire. In the late summer of the following year, Justin's forces invaded Persia. The Persians, however, not only repulsed the Byzantines but themselves invaded Byzantine territory, capturing a number of important cities, including Dara, which fell in November 573. After learning of the fall of Dara, Justin became insane, and in 574 the empress Sophia, acting on his behalf, entered into peace negotiations.

Induced by Sophia to adopt as his son the general Tiberius, Justin conferred on him the title of caesar in December 574. Thereafter, Justin, although nominally still emperor, lived in retirement until his death.

Justin MARTYR, SAINT (b. *c.* 100, Flavia Neapolis, Palestine [now Nābulus, Israeli-occupied Jordan]—d. *c.* 165, Rome; feast day April 14), one of the most important of the Greek philosopher-Apologists in the early Christian Church, whose writings represent the first positive encounter of Christian revelation with Greek philosophy and laid the basis for a theology of history.

A pagan reared in a Jewish environment, Justin studied Stoic, Platonic, and other pagan philosophies and then became a Christian in 132, possibly at Ephesus, near modern Selçuk, Tur. Soon after 135 he began wandering from place to place proclaiming his newfound Christian philosophy in the hope of converting educated pagans to it. He spent a considerable time in Rome. Some years later, after debating with the Cynic Crescens, Justin was denounced to the Roman prefect as subversive and condemned to death. Authentic records of his martyrdom survive.

Of the works bearing Justin's authorship and still deemed genuine are two *Apologies* and the *Dialogue with Trypho*. The first, or "Major Apology," was addressed *c.* 150 to the Roman emperors Antoninus Pius and Marcus Aurelius. In the first part of the *First Apology,* Justin defends his fellow Christians against the charges of atheism and hostility to the Roman state. He then goes on to express the core of his Christian philosophy: the highest aspiration of both Christianity and Platonic philosophy is a transcendent and unchangeable God; consequently, an intellectual articulation of the Christian faith would demonstrate its harmony with reason. Such a convergence is rooted in the relationship between human reason and the divine mind, both identified by the same term, *logos* (Greek: "intellect," "word"), which enables man to understand basic truths regarding the world, time, creation, freedom, the human soul's affinity with the divine spirit, and the recognition of good and evil.

Justin asserts that Jesus Christ is the incarnation of the entire divine *logos* and thus of these basic truths, whereas only traces of truth were found in the great works of the pagan philosophers. The purpose of Christ's coming into the world was to teach men the truth and save them from the power of demons. In the third part of the *First Apology,* Justin vividly describes the early Christians' method of celebrating the Eucharist and of administering Baptism.

The *Dialogue with Trypho* is a discussion in which Justin tries to prove the truth of Christianity to a learned Jew named Trypho. Justin attempts to demonstrate that a new convenant has superseded the old covenant of God with the Jewish people; that Jesus is both the messiah announced by the Old Testament prophets and the preexisting *logos* through whom God revealed himself in the Scriptures; and that the gentiles have been chosen to replace Israel as God's chosen people. In his brief *Second Apology* Justin argues that the Christians are being unjustly persecuted by Rome.

Justin's distinctive contribution to Christian theology is his conception of a divine plan in history, a process of salvation structured by God, wherein the various historical epochs have been integrated into an organic unity directed toward a supernatural end; the Old Testament and Greek philosophy met to form the single stream of Christianity.

Justin's concrete description of the sacramental celebrations of Baptism and the Eucharist remain a principal source for the history of the primitive church. Justin serves, moreover, as a crucial witness to the status of the 2nd-century New Testament corpus, mentioning the first three Gospels and quoting and paraphrasing the letters of Paul and 1 Peter; he was the first known writer to quote from the Acts of the Apostles.

Justinian I, Latin in full FLAVIUS JUSTINIANUS, original name PETRUS SABBATIUS (b. 483, Tauresium, Dardania [probably south of modern Niš, Yugos.]—d. Nov. 14, 565, Constantinople), Byzantine emperor (527–565), noted for his administrative reorganization of the imperial government and for his sponsorship of a codification of laws known as the *Codex Justinianus* (534).

Early career. Justinian was a Latin-speaking Illyrian and was born of peasant stock. Justinianus was a Roman name that he took from his uncle, the emperor Justin I, to whom he owed his advancement. While still a young man, he went to Constantinople, where his uncle held high military command. He received an excellent education, though it was said that he always spoke Greek with a bad accent. When Justin became emperor in 518, Justinian was a powerful influence in guiding the policy of his elderly and childless uncle, whose favourite nephew he was. He was legally adopted by Justin and held important offices. In 525 he received the title of caesar and, on April 4, 527, was made coemperor with the rank of augustus. At the same time his wife, the former actress Theodora, who exercised considerable influence over him, was crowned augusta. On Justin I's death on Aug. 1, 527, Justinian succeeded him as sole emperor.

Foreign policy and wars. Two important facets of Justinian's foreign policy were his continuation of the age-old struggle with Persia and his attempt to regain the former Roman provinces in the West from the control of barbarian invaders.

When Justinian came to the throne, his troops were fighting on the Euphrates against the armies of the Persian king Kavadh (Qobād) I. After campaigns in which the Byzantine generals, among whom Belisarius was the most distinguished, obtained considerable successes, a truce was made on the death of Kavadh in September 531. His successor, Khosrow I, finally came to terms, and the Treaty of Eternal



Justinian I, detail of a mosaic, 6th century; in the Basilica of San Vitale, Ravenna

Alinari—Giraudon from Art Resource/EB Inc.

Peace was ratified in 532. The treaty was on the whole favourable to the Byzantines, who lost no territory and whose suzerainty over the key district of Lazica (Colchis, in Asia Minor) was recognized by Persia. Justinian, however, had to pay the Persians a subsidy of 11,000 pounds of gold, and in return Khosrow gave up any claim to a subvention for the defense of the Caucasus.

War broke out again in 540, when Justinian was fully occupied in Italy. Justinian had somewhat neglected the army in the East, and in 540 Khosrow moved into Mesopotamia, northern Syria, and Byzantine Armenia and systematically looted the key cities. In 541 he invaded Lazica in the north. Belisarius, now reappointed commander in chief in the East, launched counteroffensives in 541 and 542 before his recall to Italy. The war dragged on under other generals and was to some extent hindered by bubonic plague. A five-years' truce was made in 545 and renewed in 551 but still did not extend to Lazica, which the Persians obstinately refused to restore, and a fierce struggle continued intermittently in this mountainous region. When the truce was again renewed in 557, however, Lazica was included. Finally, a 50 years' truce was negotiated, probably at the end of 561; Byzantium agreed to pay an annual tribute of 30,000 *solidi* (gold coins), and the Persians renounced all claim to the small Christian kingdom of Lazica, an important bulwark against northern invaders. Justinian had thus maintained his eastern provinces virtually intact in spite of the vigorous offensives of the Persian king, so his policy on this front can hardly be described as a failure.

In the West, Justinian considered it his duty to regain provinces lost to the empire "through indolence," and he could not ignore the trials of Catholics living under the rule of Arians (Christian heretics) in Italy and in North Africa. In the Vandal kingdom of North Africa, Catholics had been subject to frequent persecution. There was also a disputed succession to the throne after the aged Vandal king Hilderich, who had been in alliance with Constantinople and had ceased persecution of the Catholics, was deposed in favour of Gelimer in 530. At the same time,

the Vandals were threatened by the Moorish tribes of Mauretania and southern Numidia. In the face of considerable opposition from his generals and ministers, Justinian launched his attack on North Africa to aid Hilderich in June 533. The fleet of about 500 vessels set out with 92 warships. An unopposed landing was made in August, and by the following March (534) Belisarius had mastered the kingdom and received the submission of the Vandal ruler Gelimer. Northern Africa was reorganized as part of the empire and now included Sardinia, Corsica, the Balearic Islands, and Septem (Ceuta).

In Italy, the mother province of the Roman Empire in which the older capital city (Rome) was situated, Justinian found a situation similar to that in North Africa and particularly favourable to his ambitions. Under his immediate predecessors, Italy had been ruled by a barbarian, the Ostrogoth Theodoric, who, though virtually independent, was the nominal representative of the Byzantine emperor. He was an Arian and, though at first a tolerant and wise ruler, toward the end of his reign had begun to persecute the Catholics. He had no male heir, and on his death there was not only antagonism between Arian Goths and Catholic Italians but also a rift within the ranks of the Ostrogoths, some of whom were violently anti-Byzantine.

Thinking that this was now his opportunity to support his fellow Catholics and to reassert direct control over the province, Justinian dispatched an army and sent Belisarius with a fleet to attack Sicily, while an embassy set off to gain the support of the powerful Franks now settled in Gaul. After the defeat of the Ostrogothic king Witigis and the capture of Ravenna in 540, imperial administration was reestablished in Italy under the praetorian prefect Athanasius. Rigorous financial exactions and the rapacity of the soldiers made the new regime unpopular. Many of the Ostrogoths had never submitted, and after the two short and unfortunate reigns of Hildebad and Eraric, they proclaimed Totila (Baduila) as their king in the autumn of 541. Totila proved an able leader and in 542 took the offensive in southern Italy and in 543 captured Naples. In 544 Belisarius was sent against him with inadequate forces. City after city was captured by the Ostrogoths until only Ravenna, Otranto, and Ancona remained in Byzantine hands. Belisarius could make no headway without adequate reinforcements, and in 549 he was recalled to Constantinople.

Meanwhile, Totila took over the administration of the country, though at the expense of alienating the great landowners. He hoped to come to terms with Justinian, but in 552 a powerful army was sent against him under the eunuch commander Narses. Totila was defeated by superior numbers and strategy and was mortally wounded at the battle of Busta Gallorum. Narses entered Rome and soon afterward defeated Ostrogothic resistance at Mount Lactarius, south of Vesuvius. Pockets of resistance, reinforced by Franks and Alemanni who had invaded Italy in 553, lingered on until 562, when the Byzantines were in control of the whole of the country. Justinian hoped to restore the social and economic well-being of Italy by a series of measures, the Pragmatic Sanction of 554. The country was so ravaged by war that any return to normal life proved impossible during Justinian's lifetime, and only three years after his death part of the country was lost to the Lombard invaders.

On the northern frontier in the Balkans the Roman provinces faced continual attacks from barbarian raiders. Thrace, Dacia, and Dalmatia were harried by Bulgars and Slavs (known as Sclaveni). In 550–551 the invaders even wintered in Byzantine territory, despite the efforts of the army to dislodge them. In 559 the Bulgars and Slavs were joined by the Kotrigur Huns, who got as far south as Thermopylae and eastward through Thrace to the long wall protecting Constantinople. The veteran Belisarius saved the situation by mustering the civilian population. In 561 the Avars joined the raiders but were bought off with a subsidy. These attacks from beyond the Danube did immense damage, and, although fortifications and defense works were built and strengthened in the Balkans and in Greece, the newcomers were neither effectively repulsed nor assimilated by the Byzantines. The Slavs, and later the Bulgars, eventually succeeded in settling within the Roman provinces. Failure to keep them out is one of the criticisms sometimes made against Justinian.

Internal policy. Justinian's best-known work was as a codifier and legislator. He greatly stimulated legal studies, and in 528 he set up a commission to produce a new code of imperial enactments or constitutions, the Codex Constitutionum. This was published in 529, and in 530 a second commission sat to codify the Roman jurists; the work of this commission, known as the Digest (Digesta), appeared in 533. At the same time, a handbook for the use of law students, the Institutes (Institutiones), was prepared and published in 533. A second edition of the Codex Justinianus containing Justinian's own laws up to the date of issue was published in 534. His subsequent legislative work to 565 is known as the Novels (Novellae Constitutiones Post Codicem). Much of this legal activity was inspired and supervised by Tribonian, the emperor's most important judicial minister. (*See* Justinian, Code of.)

Justinian was genuinely concerned with promoting the well-being of his subjects by rooting out corruption and providing easily accessible justice. This involved adequate control over provincial governors and some administrative reorganization. At the same time it was essential to provide revenue for Justinian's various military campaigns, particularly in the West. Justinian knew how to pick his servants. He had two outstanding ministers. One was John of Cappadocia from Asia Minor, and the other was Peter Barsymes, a Syrian. John was praetorian prefect from 531 to 541, Peter from 543.

The first important reform was the prohibition of the *suffragia,* or sale of provincial governorships, in 535, for it was clear that new governors' desire to recoup the heavy initial expense of purchasing their office accounted for much extortion inflicted by them upon the provincial populaces. Instructions were drawn up for provincial governors, and the position of the *defensores civitatis,* the officials whose duty it was to protect the cities, was strengthened and their jurisdiction widened so that provincials did not need to have the expense of going to the governor's court. At the same time, there was a reorganization of the provincial system. Changes were made in the dioceses of Asiana, Pontica, and Oriens and in Egypt involving the abolition of the vicariates (administrative officials) and the regrouping of the provinces, thus effecting some economy. In some cases (*e.g.,* Egypt and Cappadocia, where only purely internal civil disorders might arise), civil and military authority was combined and the governor given the higher rank of *spectabilis* (notable) with final jurisdiction in cases of less than 500, later 750, solidi. But where it might be necessary for the *duces* to defend a strategic point against an enemy, the civil and military powers remained distinct, as in Syria.

These rather piecemeal changes sometimes resulted in situations in which, despite Justinian's efforts, the provincial governor was unwilling or not sufficiently strong to enforce good government; and with the disappearance of the larger unit of the vicariate, there was nothing left but an expensive appeal to Constantinople. In order to meet these difficulties, there was a partial renewal of a different kind of vicariate after John of Cappadocia's fall. Under both John and his successor, Peter Barsymes, finance was of primary concern, since wars and subsidies to foreign powers and barbarian rulers were expensive. Regained provinces, especially in Italy, were often so devastated that they could not pay their way, and income from these provinces was, therefore, irregular. The money was found, however, largely through the financial ability of Justinian's two ministers. Taxes were efficiently collected, accounts audited, misappropriations tracked down, public expenses pruned, and city spectacles and municipal services cut down—thus alienating rich and poor alike both in the provinces and in the capital. One important source of revenue came from trade and industry that had long been vigorously promoted in the Roman Empire, particularly with India, Southeast Asia, and China. Spices, perfumes, and raw silk were among the most important imports. Persian hostility could cause prices to rise or even stop supplies. A feature of this period was the introduction of the silkworm from Sogdiana (Samarkand and Bukhara), so that the Byzantine market eventually achieved an independent supply of silk. The sale of raw material was a government monopoly, and Peter Barsymes, Justinian's finance minister, extended this to silk fabrics, thus creating another lucrative state monopoly.

Government attempts to root out abuses and its attacks on vested interest, whether of rich or poor, were unpopular. In 532 public discontent was voiced most dramatically in Constantinople by the Nika revolt ("Nika"—"Conquer," or "Win"—was the cry of rival factions at the races in the hippodrome). The city parties known as the Greens and the Blues united and attacked and set fire to the city prefect's office and public buildings, as well as to part of the imperial palace and the Church of the Holy Wisdom adjoining it. Then they gathered in the hippodrome, calling for the dismissal of the city prefect and of Justinian's two ministers, John the Cappadocian and the advocate Tribonian. Justinian agreed, but the mob was by now out of control and perhaps exploited by interested parties. The next day the late emperor Anastasius' nephew Hypatius was proclaimed emperor and was supported by certain senators. The crowd and the usurper assembled in the hippodrome. At this point two factors saved Justinian. Theodora persuaded him to stand his ground, and the generals in the city, Belisarius and Mundus, mustered what troops they could and resolutely turned on the mob in the hippodrome. They gained the upper hand, helped by Narses, though only at the cost of a wholesale massacre of the rebellious citizens. Hypatius was executed. The uprising had nearly cost Justinian his throne.

Justinian's wars, the maintenance of an efficient army and navy, and his subsidies to foreign powers and to barbarians were costly, but so was his building program (which is described in detail in Procopius' book *On Buildings* [*De aedificiis*]). This program included public works, such as aqueducts and bridges, the rebuilding of whole cities devastated by earthquakes (a recurring and expensive item throughout the reign), as well as essential fortifications and defenses on the extensive frontiers. It also included buildings such as monasteries, orphanages, hostels, and churches. Two of his churches, Hagia Sophia and SS. Sergius and Bacchus (called Little Hagia Sophia), still stand in Constantinople (now Istanbul). In Hagia Sophia his architects achieved one of the finest and most justly famed buildings in the world.

Ecclesiastical policy. In the Byzantine Empire, church and state were indissolubly linked

as essential aspects of a single Christian empire that was thought of as the terrestrial counterpart of the heavenly polity. It was therefore the duty of Justinian, as it was for later Byzantine emperors, to promote the good government of the church and to uphold orthodox teaching. This explains why so many of his laws deal in detail with religious problems. Pagans, heretics, and Samaritans, for instance, were forbidden to teach any subject whatsoever, and, though fully appreciative of the classical heritage, Justinian expelled pagan teachers from the once-famous Academy at Athens, an action directed against paganism rather than Greek philosophy.

Justinian's main doctrinal problem was the conflict between the orthodox view accepted at the Council of Chalcedon (451), that the divine and human natures coexist in Christ, and the Monophysite teaching that emphasized his divine nature. Monophysitism was strongly held in Syria and Egypt and was closely allied to growing national feelings and resentment of Byzantine rule. Justinian, whose wife, Theodora, was a strong champion of the Monophysites, did not wish to lose the eastern provinces, but he knew, on the other hand, that any concessions to them would almost certainly alienate Rome and the West. Justinian tried to compel the orthodox Western bishops to arrive at a compromise with the Monophysites, and he even went so far as to hold Pope Vigilius against his will in Constantinople and to condemn some writings by important church figures in Antioch in an effort to achieve his aim. The second Council of Constantinople (553) finally reaffirmed the Chalcedonian position and condemned the Antioch suspect writings. Justinian achieved nothing by the episode, however; he did not conciliate the Monophysites, he enraged Antioch by the attack on its teachers, and he aroused Rome particularly by his handling of Pope Vigilius and his attempt to determine doctrinal matters. The decrees of the council were not accepted by Vigilius' successors, and a schism thus occurred between Rome and Constantinople that lasted until 610.

Toward the end of his reign, Justinian to some extent withdrew from public affairs and was occupied with theological problems. He even lapsed into heresy when, at the end of 564, he issued an edict stating that the human body of Christ was incorruptible and only seemed to suffer (the doctrine called Aphthartodocetism). This roused immediate protest, and many ecclesiastics refused to subscribe to it, but the matter was dropped with the emperor's death, at which time the throne passed to his nephew Justin II in 565. To describe Justinian's interest and activity in church affairs as caesaropapism (state in control of the church) is misleading. Justinian, like succeeding Byzantine emperors, regarded himself as the viceregent of Christ, and the Eastern Roman Empire knew no such clear-cut distinction between church and state as developed in Latin Christendom.

Assessment. Justinian was a man of large views and great ambitions, of wonderful activity of mind, tireless energy, and an unusual grasp of detail. In attempting to restore the Byzantine Empire to the territorial extent of the Old Roman Empire, Justinian's aims were those of nearly every Byzantine emperor, even though such plans were generally doomed to failure. It should not be forgotten that Justinian renewed Byzantine rule and Hellenic influence in parts of Italy for several centuries and that, for more than a half century, sound government was given to North Africa, from which came salvation for Constantinople in the person of Heraclius in 610. Justinian's legal work and the magnificent Great Church (as Hagia Sophia was called) have won him unending fame, and the literature, poetry, and philosophical achievements of his contemporaries bear witness to the outstanding quality of 6th-century civilization in the Eastern Roman Empire. (J.M.H./Ed.)

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Justinian II, byname RHINOTMETUS (b. *c.* 669—d. December 711, Asia Minor [now in Turkey]), last Byzantine emperor of the Heraclian dynasty. Although possessed of a despotic temperament and capable of acts of cruelty, Justinian was in many ways an able ruler, who



Justinian II, gold solidus, 7th–8th century; in the British Museum

Peter Clayton

recovered for the empire areas of Macedonia that had previously been conquered by Slavic tribesmen.

On the death of his father, Constantine IV, in September 685, Justinian II became emperor at the age of 16. At the beginning of his reign he made a treaty with the Arabs whereby they paid increased tribute and agreed to joint sovereignty over Cyprus, Armenia, and Georgia. In 688/689 he led a successful expedition into Slav-occupied territory in Thrace and Macedonia, and many Slavs were drafted into the Byzantine army or settled as soldier-farmers in Asia Minor. Disagreement over Cypriot policy, however, provoked the Arabs into attacking the eastern frontier. In 691–692 they defeated the Byzantines at Sebastopolis and conquered Byzantium's Armenian possessions.

At home Justinian held the Quinisext Council, the disciplinary rulings of which were intended to supplement the doctrinal canons of the fifth and sixth ecumenical councils. Pope Sergius I's refusal to recognize them led to friction between him and Justinian.

The emperor's ruthless policy and the merciless extortion by his finance officials led to a revolt in 695 in which a new emperor was proclaimed. Justinian's nose was cut off (hence his byname Rhinotmetus), and he was banished to Cherson on the Crimean peninsula. Several years later, on learning that Emperor Tiberius II Apsimar planned to arrest him, he escaped to the khan of the Khazars, with whom the Heraclians had close ties of friendship. Shortly after Justinian's marriage to the khan's sister, however, the khan was bribed by the Byzantine emperor to kill Justinian. Forewarned by his wife, Justinian fled to the Bulgar kingdom. Gaining the help of their khan and his army, Justinian marched on Constantinople, captured the city, and was once more acclaimed emperor (705).

Justinian's second reign was marked by a reconciliation with the papacy, cemented by Pope Constantine's visit to Constantinople (710–711). The emperor was obsessed, however, with a desire for revenge against his opponents, and the resulting mass executions in turn led to the alienation of many of his former supporters. In 711 a revolt, aided by the Khazars, broke out in Cherson. An Armenian, Bardanes (who ruled as Philippicus), was proclaimed emperor, sailed to Constantinople, and took possession of the city. Justinian and his family were killed.

Justinian MARINA (b. Feb. 22, 1901, Romania—d. March 26, 1977, Bucharest), patriarch of the Romanian Orthodox Church (1948–77) who helped his church become one of the strongest in Eastern Europe.

After completing his studies at the Theological Faculty at Bucharest, Justinian was ordained in 1923 and worked in a parish until he was appointed to the staff of the Theological Seminary at Rîmnicu Vîlcea. Justinian rose through the hierarchy of the church, becoming the director of the seminary; the metropolitan of Moldavia and Suceava in 1947; and the archbishop of Bucharest, metropolitan of Ungro-Vlahia, and patriarch of the Romanian Orthodox Church in 1948.

Justinian's tenure as patriarch was marked by his ability to reconcile Marxist ideology with Orthodox religion. In exchange for acquiescing to formal government control, Justinian's church enjoyed relative prosperity and the freedom to support several thousand parishes, nearly 200 monasteries, and about a dozen religious periodicals.

Justinian was also distinguished for developing strong relationships with other churches, particularly the Anglican Church. In 1965 Anglican archbishop Michael Ramsey visited Romania to present Justinian with the Lambeth Cross for his contributions to Christian unity. As one of his last acts, Justinian approved his church's granting of honorary doctorates to several non-Orthodox foreign churchmen.

Justinian, Code of, Latin CODEX JUSTINIANEUS, formally CORPUS JURIS CIVILIS ("Body of Civil Law"), the collections of laws and legal interpretations developed under the sponsorship of the Byzantine emperor Justinian I from AD 529 to 565. Strictly speaking, the works did not constitute a new legal code. Rather, Justinian's committees of jurists provided basically two reference works containing collections of past laws and extracts of the opinions of the great Roman jurists. Also included were an elementary outline of the law and a collection of Justinian's own new laws.

The Justinian code consists of four books: (1) Codex Constitutionum, (2) Digesta, or Pandectae, (3) Institutiones, and (4) Novellae Constitutiones Post Codicem.

Work on the Codex Constitutionum began soon after Justinian's accession in 527, when he appointed a 10-man commission to go through all the known ordinances, or "constitutions," issued by the emperors, weed out the contradictory and obsolescent material, and adapt all provisions to the circumstances of that time. The resultant 10-book Codex Constitutionum was promulgated in 529, all imperial ordinances not included in it being repealed. In 534 a new commission issued a revised Codex (Codex Repetitae Praelectionis) containing 12 books; the revisions were based partly on Justinian's own new legislation.

The Digesta was drawn up between 530 and 533 by a commission of 16 lawyers, under the presidency of the jurist Tribonian. They collected and examined all the known writings of all the authorized jurists; extracted from them

whatever was deemed valuable, generally selecting only one extract on any given legal point; and rephrased the originals whenever necessary for clarity and conciseness. The results were published in 50 books, each book subdivided into titles. All juridical statements not selected for the Digesta were declared invalid and were thenceforth never to be cited at law.

The Institutiones, compiled and published in 533 under Tribonian's supervision and relying on such earlier texts as those of Gaius, was an elementary textbook, or outline, of legal institutions for the use of first-year law students.

The Novellae Constitutiones Post Codicem (or simply, in English, the Novels) comprised several collections of new ordinances issued by Justinian himself between 534 and 565, after publication of the revised Codex.

Latin was the language of all the works except the Novels, which were almost all published in Greek, though official Latin translations existed for the western Roman provinces.

Justo, Agustín Pedro (b. Feb. 26, 1876, Concepción del Uruguay, Arg.—d. Jan. 10, 1943, Buenos Aires), army officer and president (1932–38) of Argentina.

After studying at military academies, he spent the years from 1903 until 1930 teaching military science, mathematics, and civil engineering at civilian and military colleges in or near Buenos Aires. He rose to the rank of general and for a brief period after the revolution of 1930 served as commander in chief of the army. Gen. Justo held the portfolios of war, agriculture, and public works and climaxed his political career with election to the presidency in November 1931 on a conservative coalition ticket.

During the early years of his administration, he was faced with the political and economic reconstruction of his country, weakened by revolution and the world economic depression. He inaugurated what amounted to a police state, though his presidential acts were considered more moderate than those of his predecessor, José Félix Uriburu. During the second World War, Justo opposed Pres. Castillo's neutrality, urging Argentina to declare war on the Axis powers. After Brazil declared war on Germany and Italy (August 1942), Justo accepted a commission as a general in the Brazilian Army. His death removed Castillo's most formidable foe from the Argentine political arena.

Justus, SAINT (b. Rome—d. probably Nov. 10, 627, Canterbury, Kent, Eng.; feast day November 10), first bishop of Rochester and fourth archbishop of Canterbury, under whose archi-episcopacy Northumbria was converted to Christianity.

In 601 he was sent by Pope St. Gregory I the Great to assist Archbishop St. Augustine of Canterbury in the conversion of England to Christianity. He was consecrated by Augustine as bishop of Rochester when the see was established in 604. Soon the Christian king Aethelberht of Kent built his cathedral, St. Andrew's, at Rochester, and granted him lands nearby. An anti-Christian reaction followed Aethelberht's death (616), and Justus fled to Gaul. He returned in 617, when Aethelberht's successor, Eadbald, recalled him to his bishopric. He became archbishop of Canterbury in 624 on the death of St. Mellitus. There followed the conversion of Northumbria by St. Paulinus, whom Justus consecrated as the first bishop of York. His feast day is kept in the diocese of Southwark, London.

Justus OF GHENT, Flemish JOOS VAN GENT, Italian GIUSTO DA GUANTO, also called JOOS VAN WASSENHOVE, original name JODOCUS (b. *c.* 1435/40—d. *c.* 1480, Urbino?, Duchy of Urbino), painter who introduced the Flemish style into Urbino. He has been identified with Joos van Wassenhove, a master of the painters' guild at Antwerp in 1460 and at Ghent in 1464.



"Communion of the Apostles," panel by Justus of Ghent, *c.* 1473–74; in the Palazzo Ducale, Urbino, Italy

SCALA—Art Resource/EB Inc.

Nothing is known of his training, but he was familiar with the work of Dirck Bouts. In his earliest known painting, the "Crucifixion Triptych" (*c.* 1465; Cathedral of St-Bavon, Ghent), the attenuated, angular figures and the barren landscape articulated by short, taut curves reveal the influence of Bouts. But the features of the distant landscape are rendered in single colours—a method of painting landscapes Justus seems to have originated. The "Adoration of the Magi" (*c.* 1466; Metropolitan Museum of Art, New York City) shows the continued influence of Bouts in its figures. It is especially noteworthy for its sense of space, which suggests knowledge of Italian art.

In 1473–74 Justus of Ghent was in Italy, where he painted the "Communion of the Apostles," now in the Palazzo Ducale at Urbino. This is the only absolutely authenticated picture by the master. It was painted for the brotherhood of Corpus Christi at the bidding of Federico da Montefeltro, duke of Urbino, who was introduced into the picture. Although this work is unmistakably Flemish, it shows that Justus had begun to be influenced by the simplicity of composition and idealization of forms characteristic of the Early Renaissance style in Italy. Several of the 28 portraits of famous men that decorated the Duke's *studiolo* have been definitely attributed to him, and he may have designed some of the other portraits executed by artists such as Pedro Berruguete.

Justus brought his northern traditions to Italy and there combined them with those of the Italian school. His development was gradual, and his later works are difficult to distinguish from those of Italian masters.

Justus, Gaius Pescennius Niger: *see* Niger, Pescennius.

Jute, member of a Germanic people who, with the Angles and Saxons, invaded Britain in the 5th century AD. The Jutes have no recorded history on the Continent, but there is considerable evidence that their home was in the Scandinavian area (probably Jutland) and that those who did not migrate were later absorbed by the Danes. According to the Venerable Bede, the Jutes settled in Kent, the Isle of Wight, and parts of Hampshire. In Kent their name soon died out, but there is considerable evidence in the social structure of that area that its settlers were of a different race from their neighbours. There is archaeological evidence to confirm Bede's statement that the Isle of Wight and Kent were settled by the same people, and their presence in Hampshire is confirmed by place-names.

The Kentish dialect of Old English exhibits closer affinity with Frisian than does any other known Old English dialect, but the similarities are of comparatively late date and are caused by intercommunication after the Norman Conquest of England. Similarly, affinities with the Franks revealed by archaeology and the study of social structure are to be attributed to cultural influences, perhaps strengthened by immigration later than the original settlement.

jute, Hindi PĀṬ, also called ALLYOTT, either of two species of *Corchorus* plants—*C. capsularis*, or white jute, and *C. olitorius*, including both tossa and daisee varieties—all belonging to the family Tiliaceae, and their fibre, one of the group called bast fibres (*q.v.*). It is second to cotton in world fibre consumption.

Export of raw jute from the Indian subcontinent to the Western Hemisphere began in the 1790s. The fibre was used primarily for cordage manufacture until 1822, when commercial yarn manufacture began at Dundee, Scot., which soon became a centre for the industry. India's jute-processing industry began in 1855, Calcutta becoming the major centre. After India was partitioned (1947), much of the jute-producing land remained in East Pakistan (now Bangladesh), where new processing facilities were built. Jute-processing operations began on the European continent during the latter half of the 19th century and in the first half of the 20th century were established in Latin America, where Brazil became the leading producer.

The jute plant, which probably originated on the Indian subcontinent, is an herbaceous annual averaging 10 to 12 feet (3 to 3.6 metres) in height. Most varieties grow best in well-drained, sandy loam and require warm, humid climates with average monthly rainfall of at least 3 to 4 inches (7.5 to 10 centimetres) during the growing season. Crops are harvested by hand, usually after the flowers have been shed but before the fruit is fully mature. After the stalks have been subjected to a retting operation, the fibre is stripped away by hand.

India, China, and Bangladesh are the leading producers. Major importers of raw fibre are Japan, Germany, the United Kingdom, Belgium, and France.

Jutiapa, department, southeastern Guatemala, bounded on the east by El Salvador and on the south by the Pacific Ocean, with an area of 1,243 sq mi (3,219 sq km). Most of the department lies in the southeastern part of the volcanic highlands, but there are lowlands along the Pacific coast. The farmers of Jutiapa raise corn (maize), beans, rice, and hay. Large areas are used to pasture cattle, and there are also plantations growing coffee and sugarcane. The northeast is traversed by a railroad, and the Pan-American Highway runs through Jutiapa (*q.v.*), the departmental capital, and other communities in the central portion. Pop. (1982 est.) 329,185.

Jutiapa, capital, Jutiapa department, southeastern Guatemala, on the southern flanks of the central highlands at an elevation of 2,926 ft (892 m) above sea level. In addition to its administrative role, Jutiapa functions as a commercial and manufacturing centre for the agricultural and pastoral hinterland. The climate is very hot. Jutiapa lies 75 mi (120 km) southeast of Guatemala City and just south of the Pan-American Highway. Pop. (1981 prelim.) mun., 60,149.

Juticalpa, capital, Olancho department, eastern Honduras, at 2,700 ft (823 m) above sea level on the Río Juticalpa, a tributary of the Guayape. Founded *c.* 1620 and given city status in 1835, it was a prosperous commercial centre during the colonial era, trading with Caribbean ports and serving placer mining in

the Guayape. It is an agricultural and trade centre for the hinterland, in which there is lumbering, livestock raising, dairying, and cultivation of coffee, tobacco, rice, and sugarcane. The city has sawmills and a meat-packing plant and also produces cement, shoes, and clothing. Juticalpa is linked by highway with Tegucigalpa, the national capital, and with Puerto Castilla on the north coast, and it has an airfield. Pop. (1983 est.) mun., 55,582.

Jutland, Danish JYLLAND, projection of northern Europe forming the continental portion of Denmark, bounded to the west and north by the North Sea and the Skagerrak and to the east by the Kattegat and the Little Belt. The Chersonesus Cimbrica, or Cimbric Chersonese, of ancient geography, it was subsequently named for the Jutes (a Germanic people) and includes, in its larger sense, the German state of Schleswig-Holstein (*q.v.*). Politically, as the result of the Versailles peace treaty of 1919, Jutland ends southward at Flensborg Fjord and includes the islands north of the Limfjorden, with an area of 11,493 sq mi (29,766 sq km). It is divided into seven administrative *amtskommuner* (counties), of which the southernmost, Sønderjyllands, coincides with the former North Slesvig. Pop. (1981 est.) 2,345,330.

Jutland, Battle of, also called BATTLE OF THE SKAGERRAK (May 31–June 1, 1916), the only major encounter between the British and German fleets in World War I, fought in the Skagerrak, an arm of the North Sea, about 60 mi (97 km) off the coast of Jutland (Denmark).

British naval intelligence had alerted admirals John Rushworth Jellicoe and David Beatty that Adm. Reinhard Scheer had left port with his German High Seas Fleet. Beatty, in command of a scouting force of battle cruisers, spotted a similar German force under Adm. Franz von Hipper and pursued it toward the main German fleet. At about 4 PM both sides opened fire; the British suffered heavy losses and turned back toward the main British fleet, with the Germans in pursuit. After 6 PM the main fleets encountered each other, and the battle raged again. In the dusk the British had the advantage, and Scheer soon turned away as did Jellicoe. But when the German fleet turned once more to head for home, it ran directly into the British fleet. As the two navies passed through each other there were collisions and more sinkings. Both sides claimed a victory—Germany because it had destroyed and crippled many more ships and men, Britain because it retained control of the North Sea.

Jüüngar (Mongol people): *see* Dzungar.

Juvarra, Filippo, Juvarra also spelled JUVARA (b. March 7, 1678, Messina, Sicily—d. Jan. 31, 1736, Madrid), architect and stage designer who attained fame throughout Europe during the early part of the 18th century. He studied in Rome (1703–14) under the architect Carlo Fontana and was commissioned to design scenes for Cardinal Ottoboni's theatre in the Palazzo della Cancelleria. He was also asked to do stage designs for the queen of Poland, Maria Casimira, in her theatre in the Palazzo Zuccari in Rome, and by the emperor Joseph I of Austria for the opera *Giunio Bruto.*

In 1714 Juvarra was appointed architect to the King of Sicily and moved to Turin, the Savoy capital. There he took charge of the third rebuilding and enlargement of Turin. He also designed his two greatest masterpieces there, the royal hunting lodge at Stupinigi (begun 1729) and the Church of the Carmine in Turin (1732). Although his major works were in Italy, he designed the palace at Mafra for John V of Portugal (1719–20).

In his early buildings in Turin, Juvarra favoured static, sharply defined spaces (S. Filippo Neri, 1715; Superga, 1717; Palazzo Madama, 1718) designed in the traditional manner. Late in life his work was influenced by his stage design, and he learned to treat a building as a unified whole. His later work is noted for its concept of space—light and airy spaces producing a fluid, elegant effect. These late works rank among the finest examples of the early Rococo style in Italy.

Juvenal, Latin in full DECIMUS JUNIUS JUVENALIS (b. AD 55–60?, Aquinum, Italy—d. probably in or after 127), most powerful of all Roman satiric poets. Many of his phrases and epigrams have entered common parlance—for example, "bread and circuses" and "who will guard the guards themselves?"

Life. The one contemporary who ever mentions Juvenal is Martial, who claims to be his friend, calls him eloquent, and describes him as living the life of a poor dependent cadging from rich men. There are a few biographies of him, apparently composed long after his death; these may contain some nuggets of fact, but they are brief, ill-proportioned, and sometimes incredible.

From these sparse sources it can be inferred that Juvenal's family was well-to-do, and he became an officer in the army as a first step to a career in the administrative service of the emperor Domitian (AD 81–96) but failed to obtain promotion and grew embittered. He wrote a satire declaring that court favourites had undue influence in the promotion of officers, and for this he was banished—possibly to the remote frontier town of Syene, now Aswān, in Egypt—and his property was confiscated. In 96, after Domitian's assassination, he returned to Rome; but, without money or a career, he was reduced to living as a "client" on the grudging charity of the rich. After some years his situation improved, for autobiographical remarks in Satire 11 show him, now elderly, living in modest comfort in Rome and possessing a farm at Tibur (now Tivoli) with servants and livestock. Although still pessimistic, the later Satires show a marked change of tone and some touches of human kindness, as though he had found some consolation at last. Though no details of his death exist, he probably died in or after 127.

The Satires. Juvenal's 16 satiric poems deal mainly with life in Rome under the much-dreaded emperor Domitian and his more humane successors Nerva (96–98), Trajan (98–117), and Hadrian (117–138). They were published at intervals in five separate books. Book One, containing Satires 1–5, views in retrospect the horrors of Domitian's tyrannical reign and was issued between 100 and 110. (The historian Tacitus, a contemporary of Juvenal, was also embittered by the suspicion and fear of that epoch.) Book Two, the single, enormous Satire 6, contains topical references to the year 115. The third Book, with Satires 7, 8, and 9, opens with praise of an emperor—surely Hadrian, who endowed a literary institute to assist deserving authors—whose generosity makes him the sole hope of literature. There is no datable allusion in Book Four, which comprises Satires 10–12. Book Five, made up of Satires 13, 14, 15, and 16, has two clear references to the year 127.

The Satires attack two main themes: the corruption of society in the city of Rome and the follies and brutalities of mankind. In the first Satire, Juvenal declares that vice, crime, and the misuse of wealth have reached such a peak that it is impossible *not* to write satire, but that, since it is dangerous to attack powerful men in their lifetime, he will take his examples from the dead. He does not maintain this principle, for sometimes he mentions living contemporaries; but it provides a useful insurance policy against retaliation, and it implies that Rome has been evil for many generations. Male homosexuals are derided in two poems: passives in Satire 2, actives and passives together in Satire 9. In the third Satire a friend of Juvenal explains why, abandoning the humiliating life of a dependent, he is determined to live in a quiet country town and leave crowded and uncomfortable Rome, which has been ruined by Greeks and other foreign immigrants; while in the fifth Juvenal mocks another such dependent by describing the calculated insults he must endure on the rare occasions when his patron invites him to dinner. The fourth relates how Domitian summoned his cringing Cabinet to consider an absurdly petty problem: how to cook a turbot too large for any ordinary pan.

Satire 6, more than 600 lines long, is a ruthless denunciation of the folly, arrogance, cruelty, and sexual depravity of Roman women. The seventh Satire depicts the poverty and wretchedness of the Roman intellectuals who cannot find decent rewards for their labours. In the eighth, Juvenal attacks the cult of hereditary nobility. One of his grandest poems is the 10th, which examines the ambitions of mankind—wealth, power, glory, long life, and personal beauty—and shows that they all lead to disappointment or danger: what mankind should pray for is "a sound mind in a sound body, and a brave heart." In Satire 11, Juvenal invites an old friend to dine quietly but comfortably and discourses on the foolishly extravagant banquets of the rich. The 12th is a quiet little poem distinguishing between true and mercenary friendship. In the 13th Juvenal offers sarcastic consolation to a man who has been defrauded of some money by a friend, telling him that such misdeeds are commonplace; while in the 14th he denounces parents who teach their children avarice. Satire 15 tells of a riot in Egypt during which a man was torn to pieces and eaten: a proof that men are crueller than animals. In the 16th Juvenal announces that he will survey the privileges of professional soldiers, an important theme; but the poem breaks off at line 60 in the middle of a sentence: the rest was lost in ancient times.

Technically, Juvenal's poetry is very fine. The structure of the individual Satires is—with a few exceptions—clear and forceful. They are full of skillfully expressive effects in which the sound and rhythm mimic and enhance the sense; and they abound in trenchant phrases and memorable epigrams, many known to people who have never heard of Juvenal: "bread and circuses"; "slow rises worth, by poverty oppressed"; "who will guard the guards themselves?"; "the itch for writing"; "the greatest reverence is due to a child." Vivid, often cruelly frank, remarks appear on almost every page: after describing a rich woman's efforts to preserve her complexion with ointments, tonics, donkey's milk, and poultices, Juvenal asks, "Is that a face, or an ulcer?" He describes striking and disgusting scenes with a clarity that makes them unforgettable: we see the statues of the emperor's discarded favourite melted down to make kitchenware and chamber pots; the husband closing his disgusted eyes while his drunken wife vomits on the marble floor; the emperor Claudius (poisoned by his consort) "going to heaven" with his head trembling and his lips drooling long trains of saliva; the impotent bridegroom whimpering while a paid substitute consoles his wife. Juvenal is not a poet to be relished by soft hearts or optimists, but he has power.

Influence. His work was forgotten for a time after his death. Later it began to be read and quoted, first by the Christian propagandist Tertullian—who lived and wrote about AD 200 and was as full of passionate indignation as Juvenal—then by other Christian authors and also by pagan students of literature. A commentary on the Satires (which

survives) was compiled at some time between 350 and 420, and two editions of the text were produced, based on one master copy: apparently the only copy that had been preserved until then. Thenceforward Juvenal has never ceased to be studied and admired: he has been imitated by many satirists; for instance, by Giovanni Boccaccio, Nicolas Boileau, and Lord Byron. (G.Hi.)

BIBLIOGRAPHY. *Bibliographies.* G. Highet, *Juvenal the Satirist* (1954), pp. 339–346 lists and describes 81 books and articles dealing with many aspects of Juvenal's life and art. A more recent, specialized bibliography appears in sect. 6 of M. Coffey's new introduction to the reissue of J.D. Duff's edition of Juvenal's satires (1970).

Editions. The best text of the satires is that edited by U. Knoche with a critical apparatus in Latin (1950); W.V. Clausen's edition (1959) is also recommended. The best English-language edition with explanatory annotations is by J.D. Duff (1898, reissued 1970). It is expurgated, omitting satires 2 and 9 and parts of 6, as well as occasional sentences elsewhere.

Translations. The first good English verse translation was published by John Dryden and a group of friends, *The Satires of Decimus Junius Juvenalis* (1693), and is still highly readable. Less vivacious but equally vigorous is that by William Gifford, *Satires, with the Satires of Persius* (1802, reissued with revisions by J. Warrington, 1954). G.G. Ramsay's prose version, *Juvenal and Persius* (Loeb series, 1918; rev. ed. 1961), misses much of the poetic values but is reliable as a guide to the meaning. The best modern English verse rendering is by Rolfe Humphries, *Satires* (1958), bright, slangy, rather slapdash. Samuel Johnson adapted satire 3 in his "London" (1738) and satire 10 in "The Vanity of Human Wishes" (1749). There are translations into French, German, Italian, and Spanish.

Biography and criticism. G. Highet's book (cited above) reconstructs the poet's career, analyzes each of the satires individually, estimates their value as poetry, and surveys his influence in later literature. Various aspects of Juvenal's work have recently been examined by W.S. Anderson, "Juvenal and Quintilian," *Yale Classical Studies,* 17:1–93 (1961); M. Coffey, in his new introduction (cited above); H.A. Mason, "Is Juvenal a Classic?" pp. 93–176 in J.P. Sullivan (ed.), *Roman Literature: Satire* (1963); E.J. Kenney, "Juvenal: Satirist or Rhetorician?" and D. Wiesen, "Juvenal's Moral Character," both in *Latomus,* vol. 22 (1963).

Articles are alphabetized word by word, not letter by letter

Juvenal, SAINT (d. 458, Jerusalem; feast day July 2), bishop of Jerusalem from 422 to 458 who elevated the see of Jerusalem—previously under the rule of Caesarea—to a patriarchate. At the Council of Ephesus (431) he attempted to sever Palestine and Arabia from the patriarchate of Caesarea but failed. The Council of Chalcedon (451) recognized the extension of his see. When he returned to Jerusalem, however, the monks—who disapproved of the role he had taken in the Christological controversy at the council—rose against him and elected a new bishop. Imperial force subdued them, and Juvenal reigned as patriarch of all Palestine. He is revered as a saint in some Eastern churches.

Juvenalian satire, bitter and ironic criticism of contemporary persons and institutions that is filled with personal invective, angry moral indignation, and pessimism. The name alludes to the Latin satirist Juvenal, who, in the 1st century AD, brilliantly denounced Roman society, the rich and powerful, and the discomforts and dangers of city life. Samuel Johnson modelled his poem *London* on Juvenal's third satire and *The Vanity of Human Wishes* on the 10th. *Gulliver's Travels* (1726) established Jonathan Swift as the master of Juvenalian satire. In the 20th century, Karl Kraus's indictments of the prevailing corruption in post-World War I Austria and Louis-Ferdinand Céline's impartial dislike of rich and poor are in the Juvenalian tradition.

juvenile court, also called CHILDREN'S COURT, special court handling problems of delinquent or neglected children. The juvenile court fulfills the government's role as substitute parent, and, where no juvenile court exists, other courts must assume the function.

Two types of cases are processed by a juvenile court: civil matters, usually concerning care of an abandoned child or one whose parents cannot support him; and criminal matters arising from antisocial behaviour by the child.

Most statutes provide that all persons under a given age (18 years in many places) must be processed initially by the juvenile court, which can then, at its discretion, assign the case to an ordinary court.

The idea behind the juvenile court system is that children should be treated with special care. Its originators considered it futile and unjust to punish a child for wrongdoing, preferring rehabilitation instead. To accomplish this, the court operates informally and paternally.

The first juvenile court was established in 1889 in Chicago, and the movement spread rapidly throughout the world. They are now found in Europe, Latin America, Israel, Iraq, Japan, and other countries, although there is variation in structure and procedures.

There has been much disagreement, especially in the United States, over whether the juvenile court's informality helps or hurts children. Some argue that, with crowded court calendars and incompetent judges, the court's purpose is thwarted and that the child is stripped of the rights of criminal defendants with no corresponding relaxation in severity of treatment. In response to this, courts in the United States have extended to juveniles such rights as the right to cross-examine witnesses, the right to fair notice of hearings, the privilege against self-incrimination, and the right to legal counsel.

juvenile drama: *see* toy theatre.

juvenile hormone, also called NEOTENIN, a hormone in insects, secreted by glands near the brain, that controls the retention of juvenile characters in larval stages. The hormone affects the process of molting, the periodic shedding of the outer skeleton during development, and in adults it is necessary for normal egg production in females. *See also* thoracotropic hormone.

Juventud, Isla de la, formerly (until 1978) ISLA DE PINOS, English ISLE OF PINES, island and province of Cuba, in the Caribbean Sea. It is bounded on the northwest by the Canal de los Indios and on the north and northeast by the Golfo (gulf) de Batabanó, which separate it from the mainland of Cuba, under whose sovereignty it has been since 1925. Its present name was designated in 1978. With an area of 850 sq mi (2,200 sq km), it is the largest member of the Archipiélago de los Canarreos. The northern two-thirds of the island is an undulating plain of pine forests and savannas, of sandy and rocky soils, and of a few mountains up to 944 ft (303 m) elevation. The main activities are fishing and truck and citrus farming; grapefruit production predominates and is the basis for the economy of the island. The National Reformatory, a prison, is located a few miles from the island's capital and main town, Nueva Gerona (*q.v.*). The section south of Ciénaga (swamp) de Lanier is small, rocky, and isolated, inhabited only by a few fishermen and charcoal makers. Kaolin and marble are extracted on the island. Pop. (1983 est.) 61,103.

Juwaynī, ʿAla ad-Dīn ʿAṭā Malek: *see* Joveynī, ʿAṭā Malek.

Juxon, William (b. 1582, probably Chichester, Sussex, Eng.—d. June 4, 1663, London), archbishop of Canterbury and minister to King Charles I on the scaffold. As lord high treasurer, Juxon was the last English clergyman to hold both secular and clerical offices in the medieval tradition of clerical state service.

A student of law at St. John's College, Oxford, he turned to theology and was ordained a priest before 1615, when he became rector of St. Giles, Oxford. In 1621 he succeeded his friend William Laud as president of St. John's and later was vice chancellor of the university.

He soon became chaplain to Charles I, was made dean of Worcester in 1627, and in 1632 was nominated bishop of Hereford. In 1633, however, he was made bishop of London instead, again succeeding Laud. Juxon was appointed by Charles in 1636 as lord high treasurer, a post last held by a cleric in Henry VII's reign (1485–1509). Resigning his post in 1641, Juxon continued to advise the King during the Civil War, which began the next year and ended in 1648 with Charles's defeat. The following January, Charles was executed, with Juxon the only priest to accompany him to the scaffold. The same year, Juxon was deprived of his bishopric by Oliver Cromwell and went into retirement. On the restoration of Charles II in 1660 he was named archbishop of Canterbury, a position he held until his death. His memoirs were published in 1869 (edited by W.H. Marah).

Južno-Sachalinsk (Russian S.F.S.R.): *see* Yuzhno-Sakhalinsk.

Južnyi Bug (river, Ukrainian S.S.R.): *see* Yuzhny Bug.

Jwen-jwen (Central Asian people): *see* Juan-juan.

Jylland (Denmark): *see* Jutland.

Jyoetsu, city, Niigata *ken* (prefecture), Honshu, Japan, on the lower reaches and mouth of the Ara-kawa (Ara River). The city was formed for reasons of industrial planning by the amalgamation of Naoetsu and Takada.

Takada was a castle town that prospered as a commercial centre after the early 17th century. It served as a garrison from 1868 to the end of World War II. Traditional industries include the manufacture of textiles and agricultural implements. More recently, the city has been known for its production of skis.

Naoetsu was an important port on the Sea of Japan during the Kamakura era (1192–1333). It experienced a decline in the early 1600s and was known merely as an outport for the more prosperous Takada. The arrival of two railway lines in 1898 and 1914 revived the port, and the city rapidly industrialized. Products include chemicals, metal, machinery, and processed foods. Pop. (1983 est.) 128,625.

Jyväskylä, town, capital of Keski-Suomen *lääni* (Keski-Suomi province), south central Finland, at the north end of Lake Päijänne, southwest of Kuopio. The town, chartered in 1837, has three historic educational institutions: the first Finnish teachers' training college (founded 1863; replaced in 1934 by a pedagogical institute [designed by the architect Alvar Aalto] that in 1966 became a university); the Lyceum, the first Finnish-language secondary school (opened 1858); and the first Finnish girls' school (started 1864). The town is the site of the Aalto Museum, and the Museum of Central Finland is in a building designed by Aalto. Jyväskylä is a rail junction; local industry includes paper and plywood mills, metallurgical and wool-dyeing works, foodstuffs and pharmaceutical factories, and a national munitions production centre. The airport is about 12 mi (19 km) north at Tikkakoski. Pop. (1983 est.) mun., 64,508.

K-capture, also called ELECTRON CAPTURE, one of three beta decay processes that affect atomic nuclei. *See* beta decay.

K mart Corporation, formerly (until 1977) S.S. KRESGE CO., major U.S. retail chain, marketing general merchandise primarily through discount and variety stores. Headquarters are in Troy, Mich.

The company originated with a pair of five-and-ten-cent stores in Memphis and Detroit, established in 1897 by Sebastian S. Kresge (*q.v.;* 1867–1966), a traveling hardware salesman, and John G. McCrory, owner of eight similar stores in the East and one of Kresge's customers. Kresge ultimately became sole owner and by 1907 operated S.S. Kresge stores in eight cities between Chicago and Pittsburgh. With Kresge as president (1907–25) and chairman of the board (1913–66), the company expanded steadily. Kresge's at first restricted the price of its merchandise to not more than 10 cents, but inflation triggered by World War I drove the limit to 15 cents, and eventually it was raised to one dollar.

In 1962, under a program designed by company president Harry B. Cunningham, Kresge's entered the large-scale discount retail market with construction of the first K mart outside Detroit. With its success, the company expanded aggressively, erecting an average of 85 discount stores a year over the next two decades throughout the United States and parts of Canada. The corporate name was changed to K mart in 1977 over the objections of Stanley Kresge, the founder's son. In that year K mart passed J.C. Penney to become the second largest retailer in the United States.

In addition to the K mart stores, the company continued to operate Kresge variety stores and Jupiter discount stores. It also owns Planned Marketing Associates insurance and the chain of Furr's Cafeterias in the Southwest.

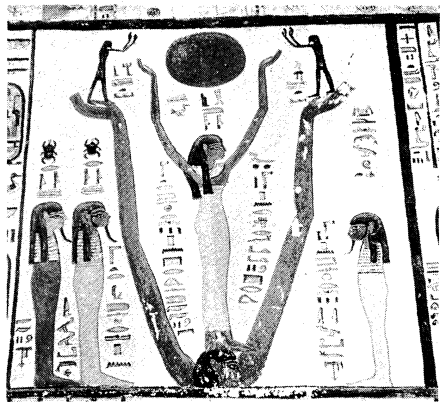
K meson, important member of the meson family of subatomic particles (*see* meson).

K2, also called MOUNT GODWIN AUSTEN, called locally DAPSANG and CHOGORI, the world's second highest peak (28,251 ft [8,611 m]), second only to Mt. Everest. K2 forms part of the Karakoram Range (Himalayas) and lies in Gilgit-Ladākh district on the western side of the Indian–Pakistani line of control in Jammu and Kashmir; it is thus presently under Pakistani administration. The glacier- and snow-covered mountain rises from its base at about 15,000 ft on the Godwin Austen Glacier, a tributary of the Baltoro Glacier. The mountain was discovered and measured in 1856 by Col. T.G. Montgomerie of the Survey of India, and it was given the symbol K2 because it was the second peak measured in the Karakoram Range. The name Godwin Austen is for the peak's first surveyor, Col. H.H. Godwin Austen, a 19th-century English geographer.

The first attempt to reach the summit was made by an Anglo-Swiss expedition in 1902 that ascended to 18,600 ft on the peak's northeastern crest. Other unsuccessful attempts included an Italian expedition in 1909, led by Luigi Amedeo, duca d'Abruzzi, via the southeastern ridge (later called the Abruzzi Ridge) that reached about 20,000 ft. In 1938 a U.S. expedition led by Charles Houston via the Abruzzi Ridge reached about 26,000 ft; in 1939 another U.S.-led expedition following the same route reached about 27,500 ft; and in 1953 another expedition led by Houston reached 25,900 ft on the Abruzzi Ridge. Finally, in 1954 an Italian expedition consisting of five scientists (including the geologist Ardito Desio as leader), a doctor, a photographer, and 12 others, including a Pakistani, managed to conquer the Abruzzi Ridge despite the severe weather conditions. The summit was reached at 6 PM on July 31, 1954, by Achille Compagnoni and Lino Lacedelli. During the ascent, Mario Puchoz, one of the guides, died of pneumonia.

ka (unit of measure): *see* qa.

ka, also spelled KOI, in ancient Egyptian religion, with *ba* and *akh,* a principal aspect of the soul of a human being or of a god. The exact significance of *ka* remains a matter of controversy, chiefly for lack of an Egyptian definition; the usual translation "double" is incorrect. Written by a hieroglyph of uplifted



Ka, depicted with arms upraised and a goddess on its head, wall painting from the tomb of Ramses VI, 20th dynasty; Abydos, Egypt
Eliot Elisofon

arms, it seemed originally to have designated the protecting divine spirit of a person, and later the personified sum of physical and intellectual qualities constituting an "individuality." The *ka* survived the death of the body and could reside in a picture or statue of a person.

Ka-erh, also called KA-ERH-TU, or KA-TA-K'O, Pinyin GAR, GAERDU, or GADAKO, Tibetan GARTOK or SGAR-ḤBROG, town in the Tibetan Autonomous Region (*tzu-chih-ch'ü*), China. It is a county (*hsien*) seat and the main centre of the western part of A-li Prefecture (*ti-ch'ü*). It is located at an elevation of 14,630 ft (4,460 m) at the foot of the Kailas Range on the Ka-erh Ho (river), one of the headwaters of the Yin-tu Ho (Indus River). Ka-erh is an important route centre on the main road through the southern Tibetan region from Lhasa, the capital of Tibet, to Jammu and Kashmir (a region in the northern part of the Indian subcontinent that is in dispute between India and Pakistan). When the frontier with India was open, Ka-erh was an important trade centre for traveling merchants from India and Nepal, who attended the great fairs held there.

In the 18th century Ka-erh, on the frontier of the then-independent kingdom of Ladākh, was a major military garrison. The ruins of ancient fortifications still survive, but in the 1930s there was no town there, merely the residence of the Tibetan governor, the huts of his retinue (around which the merchants set up their tents), and a small temple. Ka-erh was formally opened to foreign trade following the Lhasa Treaty (between the United Kingdom and Tibet) of 1904 and the subsequent Anglo-Chinese Convention of 1906 and was thereafter visited by a British commercial agent.

Since the Chinese occupation of Tibet in 1959, the area has been the scene of considerable road building to provision the disputed Ladākh border area to the south and west. Pop. (mid-1970s est.) fewer than 10,000.

K'a-shih (China): *see* Kashgar.

Ka-ta-k'o (Tibet): *see* Ka-erh.

Kaaba (Muslim shrine): *see* Ka'bah.

Kaahumanu (b. *c.* 1772, Maui, Hawaii—d. June 5, 1832, Hawaii), favourite queen of Kamehameha I and acting regent of Hawaii (1823–32).

After her husband's death in 1819, Kaahumanu became *kuhina nui* (premier) to his successor, Liholiho Kamehameha II, and instigated many reforms that she continued in her own regency. She urged the new king to end many of the traditional tabus and to welcome the Christian missionaries from New England. When Liholiho went to England, Kaahumanu was appointed regent until Kaukeouali Kamehameha III should come of age. To ensure the Kamehameha line, she married the two leading contenders for the throne, King Kuamalii of Kauai and his son. She worked closely with the Christian missionaries and was baptized in 1825, after which she was known as the "New Kaahumanu."

Kaali järv Craters, group of eight meteorite craters on Saaremaa Island in the Baltic Sea, 12 mi (20 km) northeast of Kingisepp, Estonian Soviet Socialist Republic. The largest is 333 ft (110 m) in diameter, with a rim 20–23 ft above the surrounding land. Thought to be an explosion crater because of this high rim and uplifted surrounding strata, it holds a pond about 53 ft deep. The other craters are dry and range from 40 to 143 ft in diameter. In these small craters the dolomite bedrock was mechanically crushed into fragments by the force of the impact. Many small iron meteorite fragments and some meteoritic dust have been found in the area. Mollusk fossils in the fillings of the small craters indicate the craters are 4,000–5,000 years old.

Kaapprovinsie (South Africa): *see* Cape of Good Hope.

Kaapstad (South Africa): *see* Cape Town.

Kabābīsh, nomadic Arab people of the desert scrub of northern Kordofan province, Sudan, numbering about 70,000. Of mixed origins, they have been described as a loose tribal confederation; its composition, since the time of the Turkish occupation in 1821, has undergone a number of changes.

During the 19th century the Kabābīsh not only carried trade goods between the Nile and Darfur but also took imposts from caravans traversing their country. During the revolt of the Mahdī in 1881, a part of the tribe joined the revolution, but a strong section, anxious at the loss of trade, sided with the old government.

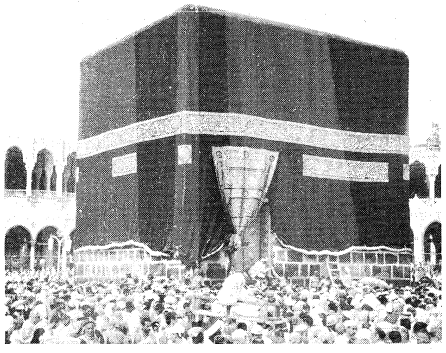
The traditional Kabābīsh cultivate very little and depend on their camels, sheep, and goats. With the coming of the dry season, they congregate at well centres in Dar Kabābīsh, moving camels and sheep south to Central Kordofan and Darfur to meet the early rains. During the rains they rejoin the households that have once again moved northwestward. In years of good rains, the livestock, particularly camels, travel deep into northern Darfur and Chad to feed on the *gizzu* plant. In modern times more and more Kabābīsh have come to work outside their own traditional communities.

Ka'bah, also spelled KAABA, small shrine located near the centre of the Great Mosque in Mecca and considered by Muslims everywhere to be the most sacred spot on Earth. Muslims orient themselves toward this shrine during the five daily prayers, bury their dead facing its meridian, and cherish the ambition of visiting it on pilgrimage, in accord with the command of God in the Qur'ān.

The cube-shaped structure, constructed of gray stone and marble, is oriented so that its corners roughly correspond to the points of the compass. The interior contains nothing but the three pillars supporting the roof and a number of suspended silver and gold lamps.

During most of the year the Ka'bah is covered with an enormous cloth of black brocade, the *kiswah* (*q.v.*). Every Muslim who makes the pilgrimage is required to walk around the Ka'bah seven times, during which process he kisses and touches the Black Stone of Mecca, which, according to tradition, was given to Adam on his expulsion from paradise in order to obtain forgiveness of his sins. When the month of pilgrimages (Dhū al-Ḥijjah) is over, a ceremonial washing of the Ka'bah takes place; religious officials as well as pilgrims take part.

In the period before the rise of Islām, the Ka'bah was revered as a sacred sanctuary. The Qur'ān says of Abraham and Ishmael that they "raised the foundations" of the Ka'bah. The shrine has been destroyed, damaged, and subsequently rebuilt several times. Early in his prophetic ministry Muḥammad seems to have disregarded the Ka'bah, but after his emigration to Medina and his difficulties there with the Jews, he changed the direction toward which the prayer is recited from Jerusalem to the Ka'bah. When he took Mecca (630), he caused the pagan idols within and surrounding the sanctuary to be destroyed and had the building cleansed of the pagan pictures covering its interior.



Ka'bah, shrine in the Great Mosque at Mecca
Mehmet Biber—Rapho/Photo Researchers

Kabala, town, northern Sierra Leone, West Africa, on the road from Faranah (Guinea) to Freetown at a gap in the Wara Wara Mountains. It is a trade centre (in peanuts [groundnuts], cassava, and cattle) among the Limba, Mande, and Fulani peoples. The nomadic Fulani have made the town a collecting point for cattle on their way to the Freetown market, 136 miles (219 km) southwest. Government and church schools and a hospital are located in the town, and an airfield was opened at Kabala in 1975. Pop. (1984 est.) 11,163.

Kabala (Judaism): *see* Kabbala.

Kabalevsky, Dmitry (Borisovich) (b. Dec. 30, 1904, St. Petersburg [now Leningrad]—d. February 1987), composer of music in a nationalistic Russian idiom, whose music also found an international audience.

In 1918 Kabalevsky moved with his family to Moscow, where he studied at the Scriabin Music School (1919–25), and in 1925 he entered the Moscow Conservatory. In 1932 he was appointed to the conservatory's faculty. He developed an excellent reputation as a music teacher. Kabalevsky began to compose at the age of 18, at first mostly works for the piano. He made several European tours after World War II, playing his own music. He won numerous awards in the Soviet Union, both for his music and for his teaching.

Kabalevsky's early music shows the influence of his teachers, the Russian composers



Kabalevsky, 1963
N. Maximov—Novosti Press Agency

Aleksandr Scriabin and Nikolay Myaskovsky; later his own personal style, characterized by clear tonality and energetic rhythm, emerged. Early works include the *Piano Sonata No. 1* (1928) and the *Second Piano Concerto* (1935), one of his finest compositions. He is perhaps best known for the overture to his opera *Colas Breugnon* (1936, after the novel by Romain Rolland; rev. 1953, 1969) and for his suite *The Comedians* (1940). Later compositions include the operetta *The Sisters* (1967) and the oratorio *Letter to the 30th Century* (1972). In addition to operas and piano music, Kabalevsky wrote concerti, chamber music, symphonies, and dramatic pieces.

kabane (Japanese: "family name"), hereditary title that denoted the duty and social rank of an individual within the Japanese sociopolitical structure from the late 5th to the late 7th century. Titles, or *kabane,* included the categories *omi, muraji, tomo no miyatsuko,* and *kuni no miyatsuko.*

The Imperial Japanese Yamato line arose as the most powerful members of this *kabane* system, though during the 6th century AD, many leaders, especially those with the high ranks of *omi* and *muraji,* overshadowed the Yamato rulers, causing many of them to become no more than figurehead sovereigns.

One of the first acts of the Taika reform, which reasserted Imperial rule in AD 645, was the abolition of the *kabane* system. In 684 a system of eight noble ranks, assigned by the emperor, was instituted in its stead. The most important of these new titles were granted to friends or loyal supporters of the emperor.

The Japanese use of *kabane* probably derived from the similar Korean bone-rank system.

Kabardian language, also called CIRCASSIAN, language spoken in the Kabardino-Balkar A.S.S.R. in the western part of the northern Caucasus and related to the Abkhaz, Abaza, Adyghian, and Ubykh languages, which constitute the Abkhazo-Adyghian, or Northwest Caucasian, language group. These languages are noted for the great number of consonant distinctions and the small number of vowel distinctions in their sound systems. Since the October Revolution of 1917, Kabardian has been a written language. The Roman alphabet was the first system used, but from 1936 the language was written in Cyrillic.

Kabardino-Balkar Autonomous Soviet Socialist Republic, also called KABARDINO-BALKARIYA, administrative division of the southwestern Russian S.F.S.R., on the northern flank of the Great Caucasus Range. Occupying an area of 4,825 square miles (12,500 square km), it is divided into three main relief regions. In the south is the Great Caucasus, the crest of which forms the boundary. Four mountain ranges—Glavny, Peredovoy, Skalisty, and Chornye—run parallel. The highest peaks are Elbrus (18,510 feet [5,642 m]), Dykh-Tau (17,073 feet), Koshtan-Tau (16,899 feet), Dzhangi-Tau (16,594 feet), and Shkhora (16,627 feet). There are many, often extensive, glaciers, from which rise swift-flowing rivers. In the second region, descending below the ice fields, are alpine meadows, coniferous forests, and deciduous forests (beech, oak, alder, hornbeam, maple, ash, and poplar). North of the ranges are foothills that reach 1,650–2,300 feet in height. These have deciduous forests, with meadows occupying the wider parts of the valleys. The third region (north and northeast) is the level Kabardin Plain, across which the Terek River system converges to include the Cherek, Chegem, Baksan, and Malka tributaries. West and east of the Terek are the Bolshaya and Malaya Kabardin plains. Natural vegetation consists of meadow and feathergrass steppe on rich soils, mostly under cultivation. The generally continental climate is varied by the relief: the Kabardin Plain is dry, with about 20 inches (500 mm) of rain a year. In the mountains rainfall is up to 30 inches or more. Summers are warm, with an average temperature in July of 75° F (24° C), while the average in January is 25° F (−4° C).

Three-fifths of the population is urban, living in seven cities and eight urban settlements, including Nalchik (*q.v.*), the capital. Most of the rural population are concentrated in the Kabardin Plain and in the main valleys. The Kabardins are a Caucasian nationality, related to the Circassian (Russian Cherkess) ethnic group. Their language belongs to the Abkhazo-Adyghian, a group of the Ibero-Caucasian languages; their religion is usually Muslim.

The Kabardins, mostly plains people, allied themselves with the Russians as early as 1557, and Kabarda formed part of the Terek Cossack district. A Russian fortress was built at Terek on the river, and another, in 1818, at Nalchik. Many of the Russians now living in the republic are of Cossack descent. The Balkars of the high mountains long resisted Russian incursion. The area was organized as the Kabardin autonomous *oblast* (administrative region) in 1921 and extended in 1922 through amalgamation with Balkariya to form the Kabardino-Balkar autonomous *oblast,* which was constituted as an autonomous republic in 1936. In 1943 the Balkars, accused of collaborating with the Germans, were deported; their area, the upper Baksan valley, was ceded to the Georgian S.S.R., and the remaining area was renamed Kabardinian A.S.S.R. In 1956 the Balkars were returned, and in 1957 the area was reconstituted the Kabardino-Balkar A.S.S.R.

Mining is widespread; the area around Tyrnyauz in the Baksan Valley yields molybdenum and tungsten. A small coal-mining industry is centred at Ugolny. Rich deposits of gold, chromium, and nickel are in the Malka Valley, and in the extreme northeast is a small oil field. Manufacturing is concentrated in Nalchik (oil-drilling equipment, timber, furniture, textiles, clothing, shoes, and cement and glass products) and Prokhladny (engineering). Agricultural products are processed in most of the cities. One of the largest hydroelectric stations in the Caucasus was completed on the Sulak River in the 1970s. Farming, mostly irrigated, is concentrated in the Kabardin Plain. Crops include wheat, corn (maize), sunflowers, hemp, and fruits. Sheep and cattle are raised in the mountains. The breeding of Kabardin horses is still carried on.

Transportation includes the main Rostov–Baku railway across the northern part of the republic through Prokhladny, whence a branch line runs to Ordzhonikidze, with a feeder to Nalchik. A main motor road runs from Pyatigorsk to Nalchik, and most other roads follow the valleys. Pop. (1985 est.) 715,000.

Kabarega Falls, also spelled KABALEGA, also called MURCHISON FALLS, waterfall on the lower Victoria Nile River in northwestern

Uganda, 20 miles (32 km) east of Lake Albert. The Victoria Nile passes through many miles of rapids before narrowing to a width



Kabarega Falls on the lower Victoria Nile in Uganda
Gerald Cubitt

of about 20 feet (6 m) and dropping about 400 feet (120 m) in a series of three cascades. The initial fall of 130 feet (40 m) is generally recognized as Kabarega (Murchison) Falls. The cataract forms the central feature of the Kabarega (Murchison Falls) National Park (established 1952), which occupies an area of 1,483 square miles (3,840 square km) of rolling grassland. The English traveler Sir Samuel White Baker visited the falls in the mid-1860s and named them for the geologist Sir Roderick Murchison.

Kabba, town, Kwara state, south-central Nigeria, in the Yoruba Hills (elevation 1,300 feet [400 m]). It lies near the Osse River, at the intersection of roads from Lokoja, Okene, Ikare, Ado-Ekiti, and Egbe. It is a trade centre for yams, cassava, corn (maize), sorghum, shea nuts, peanuts (groundnuts), beans, cotton, and woven cloth and serves the local Yoruba, Igbira, and Bunu (Kabba) peoples. Some gold is found in the streams of the surrounding region. An agricultural college (1963) and a teacher-training college for women are located in the town. It is also served by a hospital. Pop. (latest est.) 25,804.

Kabbala, also spelled KABALA, KABBALAH, CABALA, CABBALA, OR CABBALAH (Hebrew: "Tradition"), esoteric Jewish mysticism as it appeared in the 12th and following centuries. Kabbala has always been essentially an oral tradition in that initiation into its doctrines and practices is conducted by a personal guide to avoid the dangers inherent in mystical experiences. Esoteric Kabbala is also "tradition" inasmuch as it lays claim to secret knowledge of the unwritten Torah (divine revelation) that was communicated by God to Moses and Adam. Though observance of the Law of Moses remained the basic tenet of Judaism, Kabbala provided a means of approaching God directly. It thus gave Judaism a religious dimension whose mystical approaches to God were viewed by some as dangerously pantheistic and heretical.

The earliest roots of Kabbala are traced to *Merkava* mysticism. It began to flourish in Palestine in the 1st century AD and had as its main concern ecstatic and mystical contemplation of the divine throne, or "chariot" (*merkava*), seen in vision by Ezekiel, the prophet (Ezekiel 1). The earliest known Jewish text on magic and cosmology, *Sefer Yetzira* ("Book of Creation"), appeared sometime between the 3rd and 6th century. It explained creation as a process involving the 10 divine numbers (*sefirot; q.v.*) of God the Creator and the 22 letters of the Hebrew alphabet. Taken together, they were said to constitute the "32 paths of secret wisdom."

A major text of early Kabbala was the 12th-century *Sefer ha-bahir* ("Book of Brightness"), whose influence on the development of Jewish esoteric mysticism and on Judaism in general was profound and lasting. The *Bahir* not only interpreted the *sefirot* as instrumental in creating and sustaining the universe but also introduced into Judaism such notions as the transmigration of souls (*gilgul*) and strengthened the foundations of Kabbala by providing it with an extensive mystical symbolism.

Spanish Kabbala. In the following century, the *Sefer ha-temuna* ("Book of the Image") appeared in Spain and advanced the notion of cosmic cycles, each of which provides an interpretation of the Torah according to a divine attribute. Judaism, consequently, was presented not as a religion of immutable truths, but as one for which each cycle, or eon, was said to have a different Torah.

Spain also produced the famous *Sefer ha-zohar* ("Book of Splendour"), a book that in some circles was invested with a sanctity rivaling that of the Torah itself. It dealt with the mystery of creation and the functions of the *sefirot,* and it offered mystical speculations about evil, salvation, and the soul.

Following their expulsion from Spain in 1492, the Jews were more than ever taken up with messianic hopes and eschatology, and Kabbala found wide favour.

Lurianic Kabbala. By the mid-16th century the unchallenged centre of Kabbala was Safed, Galilee, where one of the greatest of all Kabbalists, Isaac ben Solomon Luria, spent the last years of his life. According to Gershom Gerhard Scholem, a modern Jewish scholar of Kabbala, Luria's influence was surpassed only by that of the *Sefer ha-zohar.* Lurianic Kabbala developed several basic doctrines: the "withdrawal" (*tzimtzum*) of the divine light, thereby creating primordial space; the sinking of luminous particles into matter (*qellipot:* "shells"); and a "cosmic restoration" (*tiqqun*) that is achieved by the Jew through an intense mystical life and unceasing struggle against evil. Lurianic Kabbalism was used to justify Shabbetaianism, a Jewish messianic movement of the 17th century.

Lurianic Kabbala also profoundly influenced the doctrines of modern Ḥasidism, a social and religious movement that began in the 18th century and still flourishes today in small but significant Jewish communities.

Kabelvåg, historic village of the Lofoten island group, Nordland *fylke* (county), northern Norway. It is on the southern shore of Austvågøya island, just southwest of Svolvær, chief town of the Lofoten. Kabelvåg was founded as Vågan in the early 12th century by King Øystein, who built a church and fishermen's hostel there. For many centuries the small port, situated at the base of steep, picturesque cliffs, was important in the traditional cod fisheries. The port has now fallen into disuse, and Kabelvåg is now known chiefly as a summer resort. Near the village is a statue of Øystein. The *herredskommune* (rural commune), which includes Kabelvåg, is named Vågan after the ancient settlement. Pop. (latest census) 1,179.

Kabia (Indonesia): *see* Selayar.

Kabinda (Angola): *see* Cabinda.

Kabīr (b. 1440, Benares, Jaunpur, India—d. 1518, Maghar), Indian mystic and poet who attempted to bridge or unite Hindu and Muslim thought and preached the essential unity of all religions and the essential equality of all men. He was a forerunner of Sikhism, established by his disciple Nānak.

The birth of Kabīr (Arabic: "Great") remains to this day shrouded in mystery and legend. Authorities disagree on both when and to whom he was born. One legend proclaims a divine virginal birth. His mother was reputed to have been of the Brahman caste and to have become pregnant after a visit to a Hindu shrine. Because she was unwed, she abandoned Kabīr, who was found and adopted by a Muslim weaver. That his early life began as a Muslim there is no doubt, although he later became influenced by a Hindu ascetic, Rāmānanda.

Kabīr, instead of choosing the Hindu religion or Islām, took what seemed to him to be the best tenets of both and preached his own religion, called *sahaja-yoga* ("simple union"). He thus became the forerunner of a number of cults, of which Kabīrpanth is the most important, as well as of a separate religion, Sikhism. From Hinduism he accepted the ideas of reincarnation, or transmigration, and the law of karma, but he rejected idolatry, asceticism, and the caste system. From Islām he accepted the idea of one God and the equality of man before God. The ideas of the Muslim mystics, called Ṣūfīs, also influenced Kabīr greatly.

In the Kabīrpanth and several other cults, as well as in Sikhism, the following elements predominate: One God is venerated; all religious writing is in the vernacular; the position of the guru (religious teacher) is central to the faith and greatly esteemed; and caste is completely rejected.

Kabīr's verses in the Hindi language, with no thought to grammar or elegance, struck a responsive chord in the heart of the common man. His aim was communication. Some of his poetry was incorporated into the *Ādi Granth,* the sacred book of the Sikhs. A book called *Bījak* (account book), composed of his verses and observations, was completed by a disciple about 1570. *The Kabir Book,* with versions by Robert Bly of 44 poems by Kabīr, was published in 1977.

Kabīr, Wādī al- (Iberian Peninsula): *see* Guadalquivir River.

kabuki, popular Japanese entertainment that is a rich blending of realism and formalism, of music, dance, mime, and spectacular staging and costuming. In modern Japanese, the word is written with three characters; *ka,* signifying "song"; *bu,* "dance"; and *ki,* "skill."

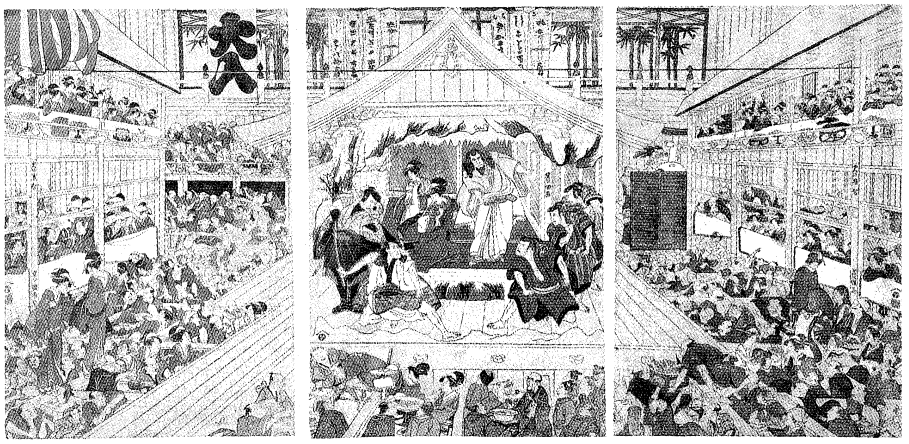
Kabuki's highly lyrical plays are regarded, with notable exceptions, less as literature than as vehicles for its actors to demonstrate their enormous range of skills in visual and vocal performance. These actors have carried the traditions of kabuki from one generation to the next with only slight alterations. Many of them trace their ancestry and performing styles to the earliest kabuki actors and add a "generation number" after their names to indicate their place in the long line of actors.

Traditionally, a constant interplay between the actors and the spectators took place in the kabuki theatre. The actors frequently interrupted the play to address the crowd, and the latter responded with appropriate praise or clapped their hands according to a prescribed formula. They also could call out the names of their favourite actors in the course of the performance.

Because kabuki programs ran from morning to evening and many spectators often attended for only a single play or scene, there was a constant coming and going in the theatre. At mealtimes food was served to the viewers. The programs incorporated themes and customs that reflected the four seasons or inserted material derived from contemporary events. Unlike most Western theatres, in which since the late 17th century a proscenium arch has separated actors and audience, the kabuki performers constantly intruded on the audience. When two *hanamichi,* elevated passageways from the main stage to the back of the auditorium, were used, the audience was fenced in by three stages.

The kabuki form dates from the late 16th

century, when a former priestess, Okuni, achieved popularity with parodies of Buddhist prayers. She assembled around her a troupe of men who danced as women and women who danced as men. Okuni's kabuki was the first dramatic entertainment of any importance that was designed for the tastes of the common people in Japan. Because of its frivolous, bold, and sensuous character, kabuki was banned by the government in 1629. Young boys dressed as women then performed the programs, but this type of kabuki was suppressed in 1652. Immediately, older men took over the roles, and it is this form of all-male entertainment that has endured down the centuries to the present day. With mature men performing all the roles, including those of women, kabuki plays grew in stature and the acting became more subtle.



Interior of a kabuki theatre, coloured woodcut triptych by Utagawa Toyokuni, *c.* 1800; in the British Museum
By courtesy of the trustees of the British Museum

Eventually, by the early 18th century, kabuki had become an established art form that was capable of the serious, dramatic presentation of genuinely moving situations. As merchants and other commoners in Japan began to rise on the social and economic scale, kabuki, as the people's theatre, provided a vivid commentary on contemporary society. Actual historical events were transferred to the stage; the great play cycle "Chushingura" (1748), for example, was an essentially faithful dramatization of the famous incident of 1702 in which 47 lordless knights, after having waited patiently for a year, wreaked their revenge upon the man who had enforced the suicide of their lord. Similarly, nearly all the "lovers' double suicide" plays of the playwright Chikamatsu Monzaemon were based on actual suicide pacts made between some commoner and his beloved.

Bugaku, the dance ceremony of the Imperial court, and the nō theatre (*q.v.*), both of great antiquity, were long the exclusive domain of the nobility and the warrior-aristocrats known as samurai; kabuki became the theatre of the townspeople and the farmers. *Bugaku* and nō have a fragile elegance and an extreme subtlety of movement. Kabuki is somewhat coarse and unrestrained, and its beauty is gaudy and extravagant. It appeals to the senses rather than to the intellect.

The strongest ties of kabuki are to the nō and to *jōruri,* the puppet theatre that developed during the 17th century. Kabuki derived much of its material from the nō, and when kabuki was banned in 1652, it reestablished itself by adapting and parodying *kyōgen* (plays that provided comic interludes during nō performances). During this period a special group of actors, called *onnagata,* emerged to play the female roles; these actors often became the most popular of their day.

Kabuki subject matter creates distinctions between the historical play (*jidaimono*) and the domestic play (*sewamono*). A kabuki program generally presents them in that order, separated by one or two dance plays featuring ghosts, courtesans, and other exotic creatures. It ends with a lively dance finale (*ōgiri shosagoto*) with a large cast.

Although the basic purposes of kabuki are to entertain and to allow the actors to demonstrate their skills, there is a didactic element, an ideal represented by the notion of *kanzen-chōaku* ("reward the virtuous and punish the wicked"). Thus the plays often present conflicts involving such religious ideas as the transitory nature of the world (from Buddhism), and the importance of duty (from Confucianism), as well as more general moral sentiments. Tragedy occurs when morality conflicts with human passions. Structurally, the plays are typically composed of two or more themes in a complex plot, but they lack the strong unifying element for which Western drama strives. Kabuki plays include a variety of intermingled episodes, which develop toward a final dramatic climax.

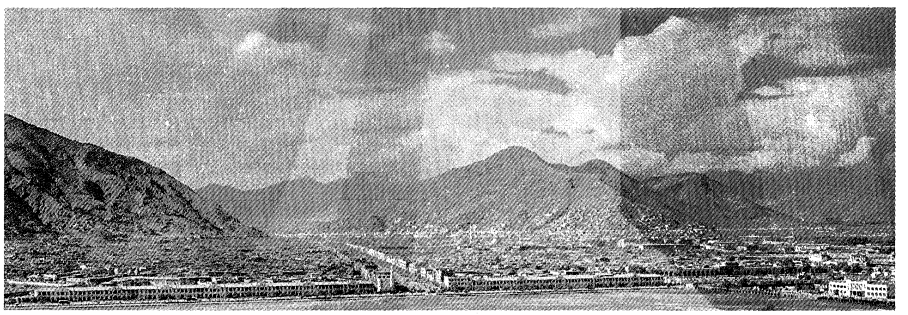
Despite the ease with which it can assimilate new forms, kabuki is a very formal theatre. It retains numerous conventions adapted from earlier forms of theatre that were performed in shrines and temples. Kabuki dance is probably the best-known feature of kabuki. Rarely is an opportunity missed to insert dancing, whether the restrained, flowing movement of the *onnagata* or the exaggerated posturings of the male characters. The acting in kabuki can be so stylized that it becomes virtually indistinguishable from dancing.

At present, regular performances are held at the Kabuki Theatre (Kabuki-za)—with a capacity of 1,600—and the National Theatre, both in Tokyo. Other theatres have occasional performances. Troupes of kabuki actors also perform outside of Tokyo. There are several such companies, but their memberships often overlap. At the Kabuki Theatre, the length of an average program is about five hours; at the National Theatre it is about four. The Kabuki Theatre upholds the actors' traditional position by adopting a conservative approach, planning its program around the major stars. The National Theatre stresses the importance of the play itself, trying to maintain the historical tradition and to preserve kabuki as a classical form.

Kabul, Persian KĀBOL, capital and largest city of Afghanistan. It lies along the Kābul River at an elevation of about 5,900 feet (1,800 m). The nation's cultural and economic centre, the city lies in a triangular valley between the two steep Asmai and Sherdawaza mountain ranges. Roads connect it to most other areas of Afghanistan, with the Soviet Union to the north, and with Pakistan to the east.

Kabul has existed for more than 3,000 years. It is mentioned in the Rigveda (early Indian scriptures; *c.* 1500 BC), and Ptolemy, the Alexandrian astronomer, geographer, and mathematician, knew of it in the 2nd century AD. The city owes its long preeminence to its location commanding the passes from the north through the mountains of the Hindu Kush and from the south through the towns of Ghaznī and Gardēz. It also commands the main approaches through the Khyber Pass to Pakistan and India. Kabul first became a regional seat of government in the 8th century, a position it held for about 80 years until captured by a hostile ruler. In the 13th century the Mongol invader Genghis Khan inflicted considerable damage on the city. Kabul was the capital (1504–26) of the Mughal Empire, under Bābur, and it remained under Mughal rule until 1738, when Nāder Shāh of Iran took it.

Kabul has been the capital of Afghanistan since 1776; during the First Anglo-Afghan War, British garrisons were massacred there (1842). It was the centre of much military and guerrilla activity after the Soviet Union invaded Afghanistan in 1979 in an effort to shore up a Marxist regime there; the invasion started when the Soviet Union began a large-scale airlift of combat troops into Kabul city. Early in 1980 a Soviet military command was established there. Fighting between Afghan guerrillas and Soviet and Afghan army units continued intermittently in the city, its suburbs, and nearby Paghmān, a guerrilla stronghold, into the 1990s. The Kabul airport was improved by the Soviets to take all kinds of aircraft in all weather, and military housing was built there.



Kabul city, overlooked by the Asmai and Sherdawaza mountains, Afghanistan
J. Allan Cash—EB Inc.

Modern Kabul is a blend of old and new buildings and in recent times has grown constantly. Much of the old city has been destroyed and rebuilt on modern lines. Kabul has many historical monuments, including the tombs of some of its rulers, and a number of fine gardens. Bābur's garden, including his tomb, is a popular resort near the western extremity of the old city at the base of the Sherdawaza. The Dār ol-Amān palace houses the parliament and government departments. The University of Kabul was founded in 1931.

Industries include food-processing plants, rayon and wool mills, a furniture factory, a foundry, and a marble works. Kābul's population is mainly Dari- (Persian-) speaking, although there is a large proportion of Pashtuns. Pop. (1982 est.) 1,036,407.

Kābul River, Ancient Greek COPHES, river in eastern Afghanistan and northwestern Pakistan, 435 mi (700 km) long, of which 350 mi are in Afghanistan. Rising in the Sanglākh Range 45 mi west of Kābul, it flows east past Kābul and Jalālābād, north of the Khyber Pass into Pakistan, and past Peshāwar; it joins the Indus River near Islāmābād. It has four major tributaries, the Lowgar, the Panjshēr, the Konar (Kunar), and the Alīngār.

Much of the Kābul's course is tapped for irrigation, so much so that west of Kābul city the river often dries up in summer. Irrigation is also extensive in the Jalālābād and Peshāwar areas. A few miles below the junction with the Panjshēr, a hydroelectric plant has been built. The Kābul River Valley is a natural route for travel between Afghanistan and Pakistan; the Macedonian Alexander the Great used it to invade India in the 4th century BC. Since 1945 the Peshāwar–Jalālābād–Kābul Highway has occupied the valley. The river itself is navigable by flat-bottomed vessels below Kābul city.

Kaburagi Kiyokata, original name KABURAGI KENICHI (b. Aug. 31, 1878, Tokyo—d. March 3, 1972, Kamakura, Japan), Japanese painter known for his works depicting Tokyo and its people in the Meiji era (1868–1912).

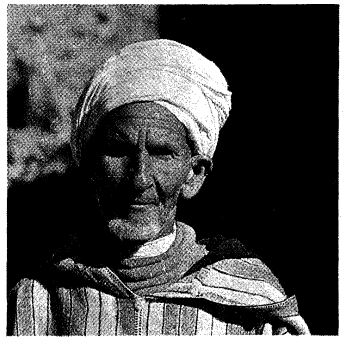
The son of a novelist-journalist, he began the study of painting in 1891 under Mizuno Toshikata, a painter in the tradition of Ukiyo-e (paintings and wood-block prints of the "floating world"). Around the age of 17 he became a well-known illustrator for newspapers, and in 1900 he organized a group of painter friends, called Ugōkai ("the Rabble"), and aimed at improving the art of Ukiyo-e, which had deteriorated into superficial genre painting and illustration. He succeeded in producing paintings of the new Tokyo and its daily life, giving it psychological depth and freshness. Among his representative works are "Ichiyō joshi no haka" ("The Grave of the Authoress Higuchi Ichiyō"), "Hareyuku murasame" ("The Clearing Up of a Passing Shower"), and "Tsukiji Akashichō" (*i.e.*, a section of Tokyo).

Kabwe, formerly BROKEN HILL, town, central, Zambia, East Africa. It is an important communications and mining centre north of Lusaka on the Great North Road, at an altitude of 3,871 ft (1,180 m). The Rhodesian Broken Hill Development Company (formed 1903) was instrumental in opening the country to foreign mining interests. After the mine was sunk for extraction of the high-grade zinc, vanadium, and lead ores, the first railway in Rhodesia (now Zimbabwe) was built. The need for power resulted in one of Africa's early hydroelectric power stations, opened in 1924 on the Mulungushi River, 32 mi (51 km) southeast. Kabwe is the headquarters of Zambia Railways and of Central African Road Services (a major trucking firm). Corn (maize) and tobacco are cultivated in the large farming area surrounding the town. In 1921 fossils of animal and human bones (Rhodesian man, or *Homo sapiens rhodesiensis*) and stone implements were found in the mines. Pop. (1980 prelim.) 143,365.

Kabwe man, originally called RHODESIAN MAN, also called BROKEN HILL MAN, extinct human being known from fossil remains (almost complete skull, maxillary fragment, sacrum, portions of pelvis and limb bones), found at Broken Hill, Northern Rhodesia (now Kabwe, Zambia). Although in the past authorities have disagreed about the classification of these specimens, scholars now usually attribute them to the extinct subspecies *Homo sapiens rhodesiensis*. The skull is massive and flattened in profile, the browridges are very large and continuous across the nasal bridge; there is a large occipital torus, an inflated maxilla, and a very large palate—traits reminiscent of Neanderthal man. The cranial capacity and limb bones are indistinguishable from those of modern man.

In 1935 at Saldanha Bay, Hopefield, north of Cape Town, S.Af., a second skull of the Kabwe type was found with Abbevillian tools and late Pleistocene animal remains. The specimen was originally called Saldanha, or Hopefield, man. Geological evidence indicates that this skull may antedate the Kabwe fossils.

Kabyle, Berber people of Algeria inhabiting a partially mountainous region stretching from the Mediterranean Sea to the southern slopes of the Grande Kabylie mountains and from Dellys to Râs (Cape) Aokas. Numbering about 2,000,000 in the late 1970s, they are mainly Muslims with a few Christians, and predominantly agricultural, growing grains and olives and herding goats. Their language, Kabyle (also called Zouaouah, or Zwāwah), is a Berber language of the Hamito-Semitic family.



Kabyle man
Paul Almasy

Traditionally, each village was administered by an assembly of adult males (those old enough to observe the fast of Ramaḍān). A code of customary law dealt with all questions of property and persons as well as crimes and general offenses.

Villages are divided into rival clans, and the society is organized into castes, with smiths and butchers ordinarily kept at a distance, and a serf (earlier slave) class.

Traditional dress for men includes a loosely flowing robe, a woollen burnoose draped over a woollen skullcap, and a broad-brimmed straw hat. Women wear bright cotton garments, usually woven in serpent-like stripes, and a silk scarf covers the head.

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Kabylie, also spelled KABYLIA, mountainous coastal region in northern Algeria, between Algiers and Skikda. It comprises: (1) the Grande Kabylie (Great Kabylia) or Djurdjura (mountains) bounded on the west by the Oued (stream) Isser and on the southeast by the Oued Soummam; (2) the Petite Kabylie (Kabylie des Babors, or Little Kabylia) around the Golfe (gulf) de Bejaïa (Bougie); and (3) the Kabylie de Collo, forming the hinterland of Cap (cape) Bougar'oun. The Kabylie is joined to the Tell Atlas on the west by Djebel (mountains) Bou Zagga.

Grande Kabylie is separated from the coastal hills by the Oued Sebaou valley, through which runs the Algiers–Bejaïa road, and rises southward in a serrated chain of two lines of crests extending east–west for about 25 mi (40 km). The main peaks are Tamgout de Lalla Kredidja (7,572 ft [2,308 m]), Akouker (7,562 ft), and Haïzer (6,998 ft). The mountains are well watered, with an annual rainfall of 40–60 in. (1,000–1,500 mm) and snow throughout the winter. They embrace the Djurdjura and Akfadou national parks (72 sq mi [186 sq km]) containing wild boar, hyenas, wildcats, monkeys, and cedar and conifer forests. Natural woodland is much reduced, and the landscape is harsh: bare, scree-girt ridges scored by the deep gorges of swirling streams offer sparse seasonal pasturage for the nomadic flocks. Population densities, however, are high, with overcrowded villages clustered on ridges of the eastern slopes and in the Sebaou and Soummam valleys. Subsistence cultivation is carried out on minutely subdivided plots beneath the trees. Poverty is widespread, and emigration throughout Algeria and to France is traditional. Tizi Ouzou, a railhead 55 mi east of Algiers, is the chief town. The Grande Kabylie area is known for its handicrafts—basketry and wood carving from Djama-n-Saharidj and cabinetry, cutlery, and jewelry from Beni Yenni.

The Petite Kabylie stretches in steep cliffs close to the sea around the Golfe de Bejaïa. Traversed by the road south from Bejaïa to Sétif through the deep, 5-mi-long Chabet el-Akra (Gorge of Death), the Massif des Babors rises to its highest peaks in the Djebel Babor (6,575 ft) and Djebel Ta Babor (6,430 ft). The range is forested and supports the only occurrence of Algerian fir (*Abies numidica*) in North Africa. Thinly populated, the area is poorly served by communications. Scattered mineral deposits and springs occur, and there are fruit plantations in the valleys. Several hydroelectric power stations have been built, the largest, the Barrage (dam) d'Irhil Emda (1954), on the Oued Agrioun near Sétif. The chief centre is Aïn el-Kebira (Perigotville), 58 mi southeast of Bejaïa.

The Kabylie de Collo extends from Jijel to Skikda and reaches its highest point at Djebel el-Goûfi (3,880 ft). The chain is cut by deep, steep river gorges, including that of the Oued Rhumel (later, the Oued el-Kebîr). Oak forests with tangled undergrowth have limited population; most settlements are composed of temporary dwellings and tents with minimal agricultural production. The region's economic mainstay is cork, which is shipped from Collo.

In the Kabylie (from the Arabic *qabīlah*, "tribe"), and especially in the Grande Kabylie, the Berber people and their culture have survived in purest form. The mountain strongholds were never fully subdued by the Romans, Arabs, or Turks, and they offered fierce resistance to the French in the 1850s. Ft. National (now L'Arbaa Naït Irathen) was founded in 1857 to control the area. The last Berber uprising was quelled in 1870–71, allowing French farmers to colonize the area.

Kacew, Romain: *see* Gary, Romain.

Kachemak culture, a culture found around the Kachemak Bay of the southern Kenai Peninsula in central southern Alaska. It is divided into three phases, the oldest of which may date back as far as the 8th century BC and the most recent lasting until historic times. The first phase was more distinctly Eskimo in character than the later ones.

The Kachemak people lived in coastal settlements and hunted caribou, moose, bears, seals, and other sea mammals. They caught fish, birds, and mollusks. Whaling was probably practiced, although perhaps not at the beginning of the first phase. In the early period, stone (including slate) implements were usually retouched; later they were ground. Round or oval stone lamps and realistic human fig-

ures of carved stone are found. Copper tools and pottery appeared in the third stage. Rock paintings were generally highly stylized representations of men and animals.

Little is known of the earliest dwellings, but in the second stage houses were built of stones and whale vertebrae; later they were semisubterranean log structures. Dogs were kept during all three phases. Burials have been found with the body in a crouched position and with associated grave goods. During the final stage artificial bone or ivory eyes were placed over those of the deceased. Cultural connections with eastern Asia as well as those with adjacent land areas and with Kodiak Island have been suggested.

Kachh (India): *see* Kutch.

Kachh, Rann of (mud flats, India–Pakistan): *see* Kutch, Rann of.

Kachin, tribal peoples occupying parts of northeastern Myanmar (Burma) and contiguous areas of India (Arunachal Pradesh and Nāgāland) and China (Yunnan). The greatest number of Kachin live in Myanmar (roughly 150,000), but some 93,000 live in China and a few thousand in India. Numbering about 245,000 in the late 20th century, they speak a variety of languages of the Tibeto-Burman group and are thereby distinguished as Jinghpaw, or Jingpo (Chingpaw [Ching-p'o], Singhpo), Atsi, Maru (Naingvaw), Lashi, Nung (Rawang), and Lisu (Yawyin). The majority of Kachin are Jinghpaw speakers, and Jinghpaw is one of the officially recognized minority languages of China. Under the British regime (1885–1947), most Kachin territory was specially administered as a frontier region, but most of the area inhabited by the Kachin became after Burmese independence a distinct semiautonomous unit within the country.

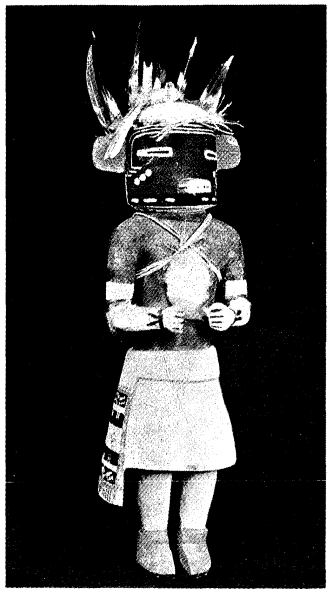
Traditional Kachin society largely subsisted on the shifting cultivation of hill rice, supplemented by the proceeds of banditry and feud warfare. Political authority in most areas lay with petty chieftains who depended upon the support of their immediate patrilineal kinsmen and their affinal relatives. The Kachins live in mountainous country at a low population density, but Kachin territory also includes small areas of fertile valley land inhabited by other peoples of Myanmar. The valley people are Buddhists; the traditional Kachin religion is a form of animistic ancestor cult entailing animal sacrifice. About 10 percent of the Kachin are Christian.

Kachin Hills, heavily forested group of highlands situated in the northeasternmost section of Myanmar (Burma). They range north–south and are bordered on the northwest by Arunachal Pradesh state of India, on the north by the Tibet autonomous region of China, and on the east by Yunnan province of China. The hills blend with the Kumon Range to the west. The Kachin Hills are drained by the Mali and Nmai rivers, which are headstreams of the Irrawaddy River. The upper basin of the Chindwin River lies to the west.

The Kachin Hills are chiefly inhabited by the Kachin people, who employ slash-and-burn cultivation to grow hill rice on the slopes. They are a Sino-Tibetan group with a patrilineal tribal organization. The steep river valleys of the southern part of the Kachin Hills region are mainly inhabited by Shans and Burmans. Rice, vegetables, tobacco, and cotton, and sugarcane are their main crops. Opium is a cash crop among the hill people. The main population centres in the Kachin Hills are the towns of Myitkyinā, Mogaung, and Putao. The railroad north from Yangon (Rangoon) ends at Myitkyinā. The rivers in the area are used extensively for travel.

Since the 18th century successive Chinese governments have laid claim to the northeasternmost segment of the Kachin Hills. The political boundary remained in dispute until the early 1960s, when Myanmar relinquished the eastern villages of Hpimaw, Gawlam, and Kanfang to China. The remote, isolated area comprising the Kachin Hills was never under the control of the Burmese kings, and the British administered the area directly. The area was granted a large measure of autonomy under the 1947 constitution, but subsequently the Myanmar government integrated the area more fully into the country.

kachina, in Pueblo Indian religious practice, any of more than 500 divine ancestral spirits who act as intermediaries between man and god. Each tribe has its distinct forms and variations. Kachinas are believed to reside with the tribe for half of each year. They will allow themselves to be seen by the community if the men properly perform a traditional ritual while wearing kachina masks. The being depicted on the mask is thought to be actually present with the performer, temporarily transforming him. Kachinas are also depicted in small, ornamented carved-wood dolls, which are made by the men of the tribe and presented to the children. These wooden dolls are intended both as playthings and as devices to teach the identities of the kachinas and the symbolism of their costumes. The identity of the spirit is depicted not by the form of the doll, which is usually simple and flat, but primarily by the applied colour and elaborate feather, leather, and, occasionally, fabric ornamentation of its mask.



Hopi kachina of *laqán,* or squirrel spirit, *c.* 1950; in the Museum of the American Indian, Heye Foundation, New York City

By courtesy of the Museum of the American Indian, Heye Foundation, New York City

K'achta (Russian S.F.S.R.): *see* Kyakhta.

Kadamba FAMILY, minor dynastic power that held sway in an area to the northwest of Mysore city on the Indian subcontinent between the 4th and 6th century AD.

Their chroniclers claim that the family migrated from northern India, but other records suggest that they were indigenous to Kuntala (Northern Kanara). An early inscription, the accuracy of which is unknown, describes the dynastic founder, Mayūraśarman, as a learned Brahman who, after being insulted by a Pallava official, took up a military career and acquired sufficient territory to bargain with the Pallavas for a feudal principality on the western coast. His son Kangavarman, who assumed the title Dharmamahārājadhirāja ("Lawful King of Kings"), was probably the king of Kuntala defeated by the Vākāṭeka king Vindhyaseva. His grandson Kakusthavarman (reigned *c.* 425–450) was a powerful ruler involved in many marriage alliances with the Guptas and other kingly families. After his death the southern part of the kingdom was established as an independent principality under his younger son, Krishnavarman. A period of warfare between the two branches of the family followed, during which the junior branch initially triumphed but was quickly forced to acknowledge the suzerainty of first the Pallavas and then the senior branch. The Kadamba kingdom came to an end with Pulakeśin II's capture of Banavāsi during the reign of Ajavarman.

Kadar, small tribe of southern India residing along the hilly border between Cochin in the state of Kerala and Coimbatore in the state of Tamil Nādu. They appear Australoid and may be Negrito.

The Kadar live in the forests and do not practice agriculture, building shelters thatched with leaves and shifting location as their employment requires. They prefer to eat rice obtained in trade or as wages rather than to subsist on food of their own gathering. They have long served as specialized collectors of honey, wax, sago, cardamom, ginger, and umbrella sticks for trade with merchants from the plains. Many Kadar men work as labourers.

The Kadar population is estimated at several hundred. They speak the Dravidian languages of Tamil and Kannaḍa. They worship jungle spirits and their own kindly creator couple as well as local forms of the Hindu deities. Marriage with cross-cousins is permitted, preferably with the father's sister's daughter.

Kadár, Ján (b. April 1, 1918, Budapest—d. June 1, 1979, Los Angeles), motion-picture director who was important in the "New Wave" of Czechoslovak cinema of the early 1960s.

Kadár attended Charles University, Prague, and the Film School at Bratislava, Czech. (1938). During World War II he was interned in a Nazi labour camp, after which he spent a short time as a scriptwriter and assistant director, first at the Koliba Studios in Bratislava and from 1947 at the Barrandov Studios, Prague. While at Bratislava he made the outstanding documentary *Life Is Rising from the Ruins* (1945). In 1950 Kadár directed the comedy *Katka* (U.S. title, *Katya*), his first independent feature and a milestone in the postwar Czechoslovak cinema. It was followed by a series of important films co-directed with Elmar Klos. They include *Únos* (1952; *Kidnap*); *Smrt si říká Engelchen* (1963; *Death Is Called Engelchen*), a picture granted first prize at the Moscow Film Festival; *Obžlovaný* (1964; *The Accused*, or *The Defendant*); and the internationally acclaimed *Obchod na korze* (1965; U.S. title, *The Shop on Main Street;* U.K. title, *The Shop on High Street*), the realistic drama of an ordinary Czechoslovak citizen who is confronted with a personal moral decision regarding the Nazi persecution of the Jews. This film won the New York Film Critics Award and the Academy Award for best foreign-language film.

Kadár immigrated to the United States in 1968. His later films include *The Angel Levine* (1970), based on a story by Bernard Malamud; *Adrift* (1971); and *Lies My Father Told Me* (1975). In 1976 he was made dean of the American Film Institute's film school.

Kádár, János, original name JÁNOS CZERMANIK, Czermanik also spelled CSERMANEK (b. May 26, 1912, Fiume, Hung. [now Rijeka, Yugos.]—d. July 6, 1989, Budapest), premier of Hungary (1956–58, 1961–65) and first secretary (1956–88) of Hungary's Communist Party who played a key role in Hungary's transition from the 1956 anti-Soviet government of Imre Nagy to the pro-Soviet regime

that followed. Kádár managed to convince the Soviet Union to withdraw its troops and allow Hungary a modicum of internal independence after quelling a popular revolt in his country.



János Kádár, 1963
AP/Wide World Photos

Trained as a skilled mechanic, Kádár became a member of the then-illegal Communist Party in 1931 and was arrested several times in the following 12 years. He was admitted to the Central Committee of the party in 1942 and the Politburo in 1945. After the war he became minister of the interior (1949), but in 1950 he came into conflict with the Stalinists and consequently was expelled from the party, jailed (1951–53), and allegedly tortured.

Rehabilitated in 1954, Kádár joined Imre Nagy's short-lived government. Nagy, who pledged the liberalization of the Communist regime and the evacuation of Soviet troops from Hungary, had been brought to power on the strength of the Hungarian revolt (started Oct. 23, 1956). After Soviet troops took over the country on November 4, Kádár deserted Nagy and formed a new government under Russian auspices, serving as premier until 1958. Unable to implement Nagy's reforms, Kádár resorted to repressive measures to curb the revolt. He served another term as premier from 1961 to 1965.

In foreign policy Kádár as party leader steered a course close to Moscow's, while trying to raise the Hungarians' standard of living and maintain more liberal internal policies. In contrast to such Stalinist predecessors as Mátyás Rákosi, Kádár minimized political surveillance in Hungary and eventually permitted limited freedoms of expression. Hungary's cultural life benefited from the greater political tolerance experienced under Kádár's pragmatic rule. To achieve faster economic growth, Kádár's government in the late 1960s adopted a new system of decentralized economic management in which plant managers and farmers were given greater freedom to make basic decisions in the operation and development of their enterprises. The profit motive was thus partially introduced into many sectors of the state-run economy, with the result that Hungary became the most prosperous nation in eastern Europe.

Kádár's government slowed and eventually stopped the pace of reform in the mid-1970s, and by the 1980s Hungary's economy had entered a state of stagnation. Consequently, Kádár was removed from his post as general secretary of the Hungarian Communist Party in 1988 and was given the largely ceremonial post of party president until May 1989, when he was removed from the party presidency and from the Central Committee.

Kadavu, also spelled KANDAVU, island of Fiji, in the South Pacific, 50 miles (80 km) south of Vitu Levu, across the Kadavu Passage. It was visited by the British naval captain William Bligh in 1792. Volcanic in origin, Kadavu has an area of 158 square miles (409 square km) and is bisected by a central mountain ridge with fertile slopes; it rises to 2,749 feet (838 m) at Ndelainambukelevu (Mount Washington). Timber from the forested central and eastern areas is milled at Naikorokoro, and cultivated crops include bananas and copra. The main town and capital on Kadavu is Vunisea, on the northern coast. The population is almost entirely Melanesian. Pop. (1986) Kadavu and small adjacent islands, 9,805.

Kadazan (people): *see* Dusun.

Kaddish, also spelled QADDISH, in Judaism, a doxology (hymn of praise to God) that is usually recited in Aramaic at the end of principal sections of all synagogue services. The nucleus of the prayer is the phrase "Glorified and sanctified be God's great name throughout the world which He has created according to His will. May He establish His kingdom in your lifetime and during your days." The congregation responds: "May His great name be blessed forever to all eternity." The prayer's main idea goes back to ancient times and is reflected in the Lord's Prayer of Christians.

Originally the Kaddish was recited in the rabbinical academies at the conclusion of public study or after the sermon of the preacher. In time it became a regular feature of the synagogue service. The prayer expresses, in addition to the praise of God, the plea for the speedy realization of the messianic age; and, because the resurrection of the dead is associated with the coming of the Messiah, the Kaddish eventually became the prayer of mourners. It is recited by the mourners for a period of 11 months and one day after the death of a parent or close relative. There are longer and shorter forms of the Kaddish.

Kaden-Bandrowski, Juliusz (b. Feb. 24, 1885, Rzeszów, Galicia [now in Poland]—d. Aug. 6 or 10, 1944, Warsaw), Polish novelist and short-story writer whose experimental realist works savagely satirized Polish society after World War I.

After studying music, he joined the 1st Brigade of the Piłsudski Legions in 1914 and between 1918 and 1920 served as chief of the press service of the Polish army. The novels for which Kaden-Bandrowski is best known include *Czarne skrzydła* (1928–29; "Black Wings") and *Mateusz Bigda* (1933; "Matthew Bigda"), works that describe society in Poland's coal-mining regions and life in Polish government circles. An earlier volume of short stories, *Miasto mojej matki* (1925; "My Mother's Town"), consists of childhood reminiscences.

Kadesh, modern TALL AN-NABĪ MIND, ancient city on the Orontes (al-ʿĀṣī) River in western Syria. The site is located about 15 miles (24 km) southwest of Ḥimṣ. It was the site of two battles in ancient times.

Kadesh is mentioned for the first time in Egyptian sources when Thutmose III (1479–1426 BC) defeated a Syrian insurrection under the leadership of the Prince of Kadesh at Megiddo in Palestine. Kadesh remained an outpost of Egyptian influence until it came under Hittite rule (*c.* 1340).

During the 13th century BC, Kadesh occupied a strategic position in the path of Egyptian expansion in Syria. The Egyptian king Seti I captured Kadesh, and it was later the scene of a famous battle (1275 BC) between Ramses II and the Hittite Muwatallis. Although Ramses claimed victory, the actual result was a truce between the two nations. Upon the invasion of the Sea Peoples (*c.* 1185 BC), Kadesh disappeared from history.

Kadesh, Battle of (1275 BC), major battle between the Egyptians under Ramses II and the Hittites under Muwatallis, in Syria, southwest of Ḥimṣ, on the Orontes River. Seeking to recapture the Hittite-held city of Kadesh in Syria, Ramses II invaded Syria with four divisions and an auxiliary force. Muwatallis gathered a large alliance among his vassal states and, hiding his army behind the city mound, sent out false reports that he was at Aleppo, farther north. Ramses, falling into the trap, hurried his army toward Kadesh, his units stretched along the Orontes valley road. Toward evening, the king with the first division reached Kadesh and set up camp. Too late, two captured Hittite scouts confessed the actual situation. The Hittites forded the river and, after routing the second division, stormed the Egyptian camp. His first division destroyed, Ramses was saved mostly by his auxiliary force that struck the attacking Hittites in the rear. Pushing the Hittites into the river, the mauled Egyptians retained the battlefield. The next day, after indecisive fighting, Ramses was compelled to withdraw his battered army; and, in the aftermath, the Hittites advanced south to the region of Damascus, halting the Egyptian resurgence into Syria. The biased Egyptian version of the battle was recorded on numerous temples by Ramses, but a Hittite version excavated at Boghazköy has enabled a truer assessment of the battle.

Kadet, member of the CONSTITUTIONAL DEMOCRATIC PARTY, also called PARTY OF PEOPLE'S FREEDOM, Russian KONSTITUTSIONNO-DEMOKRATICHESKAYA PARTIYA, or PARTIYA NARODNOY SVOBODY, a Russian political party advocating a radical change in Russian government toward a constitutional monarchy like Great Britain's. It was founded in October 1905 by the Union of Liberation and other liberals associated with the zemstvos, local councils that often were centres of liberal opinion and agitation.

The Kadets dominated the first Duma (May 10–July 21, 1906, New Style), but the tradition of despotic rule, the dislocations caused by World War I, and the growth of revolutionary fervour and agitation caused other groups to claim the nation's attention. Succeeding Dumas saw a weakening of Kadet strength. Four of the members of the Provisional Government's first cabinet were Kadets, but the Bolsheviks, seizing power, declared the Kadet organization illegal on Dec. 11, 1917.

kadi (Muslim judge): *see* qadi.

Kadijevka (Ukrainian S.S.R.): *see* Stakhanov.

Kaḍiri, Hinduized kingdom in eastern Java, established about the 11th century. Little is known of the kingdom. According to the *Pararaton* ("Book of Kings"), a mighty king of eastern Java, Airlangga, divided his kingdom between his two sons before he died in 1049: the western part was called Kaḍiri, or Panjalu, with Daha as its capital, while the eastern part was called Janggala. Jayabhaya of Kaḍiri (reigned 1135–57) successfully annexed Janggala. Under Jayabhaya's rule an old Indian epic, *Bharatayuddha,* was rewritten in Javanese, and the story was adapted to the Javanese situation. Jayabhaya and succeeding kings of Kaḍiri expanded their territories to non-Javanese areas, including coastal areas of Borneo and the island of Bali. Kaḍiri could not control Sumatra, however, because the Śrivijaya empire, though by now in decline, was still predominant in the region. The last king of Kaḍiri was Kertajaya, who reduced the power of the Brahmans and hence came into conflict with them. A rebel, Ken Angrok, later the king of Singhasāri, made a secret agreement with the Brahmans and in 1222 defeated Kertajaya at Ganter. In the place of Kaḍiri, the kingdom of Singhasāri was established. *See also* Kediri.

Kadoma, city, Ōsaka *fu* (urban prefecture), Honshu, Japan, bordering Ōsaka city. The city is located on the left bank of the Yodo River and is known for its cultivation of lotus flowers. After the establishment of a railway connection to Ōsaka in 1909, industrialization was rapid. The Matsushita Electric Industrial Company moved to Kadoma in

1933 to establish factories producing electrical machinery, appliances, plastics, and building materials. Pop. (1987 est.) 141,496.

Kadoma, formerly GATOOMA, town, central Zimbabwe. Named for nearby Kadoma (Gatooma) Hill, it was constituted a village in 1907 and received municipal status in 1917. Located in a fertile area and on the main road and railway between Harare (formerly Salisbury) and Bulawayo, the town is a commercial centre for agricultural products (cattle, cotton, corn [maize], and tobacco) and manufactures cotton textiles. Zimbabwe's largest gold mine is 5 miles (8 km) east-northeast at Eiffel Flats. Chrome, nickel, and pyrites are also mined. Kadoma (agricultural) Research Station was founded in 1925. The Agricultural Research Council of Central Africa's Cotton Pest Research Agency is in the town. Pop. (1982) 44,600.

Kadoya Shichirobei (b. March/April 1610, Matsuzaka, Ise province, Japan—d. Feb. 7, 1672, Annam [now part of Vietnam]), Japanese trader who became a leader in the overseas Japanese community of Annam (modern Vietnam). Kadoya left Japan for Annam in 1631 and settled in a Japanese community near Tourane (now Da Nang). When, two years later, the Tokugawa shogunate issued a decree forbidding Japanese subjects to travel or trade abroad, Kadoya chose to remain in Annam. He married an Annamese noble's daughter and built a Shinto temple for the Japanese community. He never returned to Japan but, about 30 years later, was able to resume trade with Japan.

Kaduna, state, north-central Nigeria. Its area of approximately 17,600 square miles (45,600 square km) includes the traditional emirate of Zaria and Jemaa town. Much of the state suffered greatly in the past from Hausa and Fulani slave raids from the north, and many walled settlements remain in the vicinity of Zaria. There are presently about 30 different ethnic groups in the state, not all Muslim, of which the largest is the Gbari (Gwari).

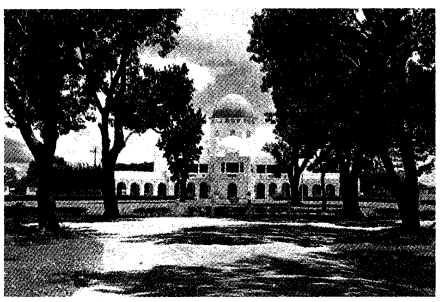
Kaduna state's natural vegetation consists largely of savanna woodlands. The state produces cotton and peanuts (groundnuts) for export. Other cash crops include shea nuts, ginger, and peppers; vegetables grown in the riverine floodplains, brown sugar processed locally from sugarcane, onions, and soybeans are trucked to other parts of the country. Tobacco is a major cash crop around Zaria (where cigarettes are manufactured), and sorghum is utilized by a brewery in Kaduna. Sorghum and millet are staple foods. Cattle, chickens, guinea fowl, and sheep are raised, and hides and skins are tanned for export.

Kaduna, the state capital, is Nigeria's largest textile manufacturing centre; it also has an oil refinery, automobile assembly plant, a steel-rolling mill, cement plant, and factories producing metal, plastic, and ceramic goods. It is served by an oil pipeline from Warri. Another major industrial centre, Zaria (the state's largest city), processes tobacco and cotton seed and manufactures textiles, bicycles, and printed matter. Traditional crafts, especially cotton weaving and dyeing (with locally grown indigo), leather processing, raffia weaving, and pottery designing (notably among the Gbari), also retain considerable economic importance. Tin mining continues near Kafanchan on the western edge of the Jos Plateau, and tantalite is also found there.

Zaria has the Ahmadu Bello University (1962) and agricultural, livestock, and education institutes. Kaduna has several colleges as well as institutes for trypanosomiasis (sleeping sickness) and eye diseases, and the National Museum (1975), with archaeological and ethnographic exhibits, is also in the town. Kafanchan is also a centre for higher education.

Kaduna and Zaria are major railway centres in the state, with lines from Lagos and Port Harcourt (south) serving both towns, and lines running to Kaura Namoda, Jos, and Nguru (north and east). Kafanchan is also a railway junction, being served by the line from Maiduguri (northeast) and the main line from Port Harcourt (south). The main highway network serves Kaduna and Zaria. Pop. (1988 est.) 3,296,200.

Kaduna, town, capital of Kaduna state, north-central Nigeria, on the Kaduna River (a major tributary of the Niger). Sir Frederick (later Lord) Lugard, the first British governor of Northern Nigeria, selected the railroad bridge site (known as Mile 570) on the Lagos–



Lugard Hall, Kaduna, Nigeria
Picturepoint, London

Kano Railway for a town, and building began in 1913. In 1917 Kaduna (a Hausa word for "crocodiles") replaced Zungeru, 100 miles (160 km) west-southwest, as the capital of the Northern Provinces; it also served as capital of the Northern Region from 1954 to 1967, when Northern Nigeria was divided into six states. Lugard Hall, the legislative assembly building constructed in simplified Islāmic style, stands at the head of the main street. The assassination in Kaduna of Sir Ahmadu Bello, *sardauna* ("sultan") of Sokoto and northern premier, in an Ibo military coup (January 1966), led to the Nigerian civil war (1967–70).

Since the late 1950s, Kaduna has become a major industrial, commercial, and financial centre for the northern states of Nigeria. It has a branch of the Nigerian Stock Exchange. Most industries are grouped south of the Kaduna River near the main railway junction. The town's cotton textile spinning and weaving mills are Nigeria's largest and among the largest in Africa; knit fabrics are also produced in Kaduna. The food industry produces beer, soft drinks, baked goods, and processed meat. Light manufactures include leather goods, plastics, ceramics, pharmaceuticals, furniture, and televisions; and there are several printing and publishing firms. The town's heavy industries make steel and aluminum products, cement, asbestos cement, concrete blocks, electrical motors, ordnance, and explosives. There is a steel-rolling plant, an automobile assembly factory, and an oil refinery (supplied by a 377-mile- [607-kilometre-] long oil pipeline from the Niger delta oil fields). A petrochemicals plant began operations in the early 1980s.

Kaduna is also a centre for the construction industry. A number of shipping agencies have offices in Kaduna, and it serves as a collecting point for cotton, peanuts (groundnuts), shea nuts, and hides and skins; there is a considerable local trade in sorghum, millet, corn (maize), kola nuts, goats, poultry, and cattle. The government's Livestock Services Training Centre with headquarters at Kaduna serves the stock-raising enterprises of the northern states.

The Kaduna Polytechnic and the Nigerian Defense Academy are located in the town; it also is the site of Christian teacher-training colleges and the Kaduna State Library. The Geological Survey of Nigeria (1930) has its headquarters there, and a museum exhibiting the fossils, minerals, and rocks of Nigeria is found in Kaduna. The National Museum, also located there, features exhibitions on the art, handicrafts, and ethnography of the northern Nigerian states. Kaduna is served by radio and television broadcasting stations, a racecourse, the Ahmadu Bello Stadium (1964), and several hospitals. The Nigerian Institute for Trypanosomiasis (sleeping sickness) Research (1951) and the National Eye Centre are located in Kaduna.

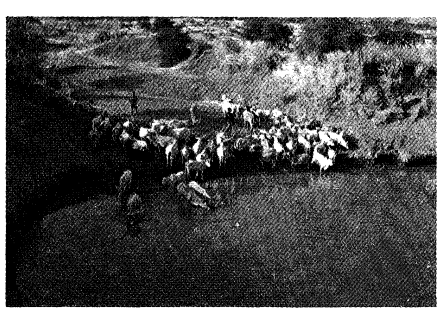
The trunk railways from Lagos, Port Harcourt, and Zaria form a junction in the southern part of Kaduna, and the Lagos–Kano highway passes through the town. There is also an airport 5 miles (8 km) north of the town. Pop. (1988 est.) 280,100.

Kaduna River, main tributary of the Niger River, in central Nigeria. It rises on the Jos Plateau 18 miles (29 km) southwest of Jos town near Vom and flows in a northwesterly direction to a bend 22 miles (35 km) northeast of Kaduna town; it then adopts a southwesterly and southerly course before completing its 340-mile (550-kilometre) flow to the Niger at Mureji (opposite Pategi). Most of its course passes through open savanna woodland, but its lower section has cut several gorges (including the 2-mile [3-kilometre] granite ravine at Shiroro) above its entrance into the extensive Niger floodplains.

The Kaduna (meaning "crocodiles" in the Hausa language) is subject to great seasonal fluctuations and is navigable below Zungeru from July to October for light craft; it is used for fishing and for transport of local produce. Gbari (Gwari) people have utilized the Kaduna's upper floodplains for swamp rice cultivation, but in the southern plains, in Nupe tribal territory, rice and sugarcane production has become a major economic activity. Near Bida, the Edozhigi and Badeggi natural irrigation projects are major rice-growing ventures. There are rail bridges at Zungeru and at Kaduna, the largest towns on the river.

Kāduqlī, town, south-central Sudan, situated 149 miles (240 km) southwest of al-Ubayyid. Lying at an elevation of 1,685 feet (513 m), it is located at the northern edge of the White Nile plain. It is a trading centre for gum arabic and livestock. Industries include textiles, soap factories, and the production of leather goods. The city has a road link to Dilling and is also served by a domestic airport. Kāduqlī came under the Egyptian rule in the early 19th century and was probably a centre for recruiting slaves for the Egyptian army. Pop. (1973) 18,468.

Kaédi, town, southern Mauritania, western Africa. It lies along the right bank of the Sénégal River where it is joined by the Gorgol. The



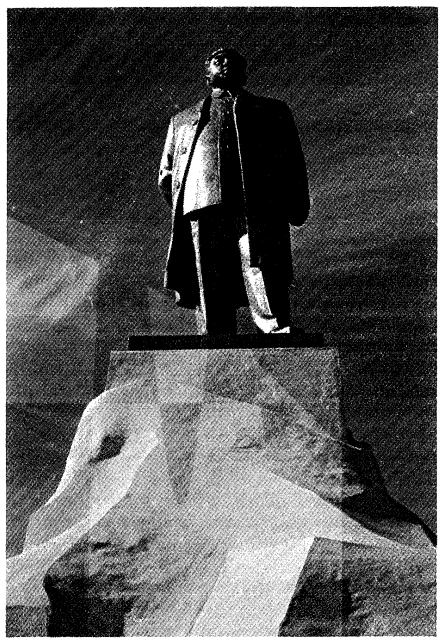
Watering zebu cattle at Kaédi, Mauritania
Caracciolo–Banoun—M. Grimoldi

banks of these streams and other tributaries are seasonally inundated and cultivated and support the densest settled population in the nation. The remainder of the area, which receives more rainfall than regions farther north,

is grazed by zebu cattle, sheep, and goats, the hides and skins of which are exported. Pop. (1977) 21,848.

Kaema Highlands, Korean KAEMA-KOWŎN, tableland, northern North Korea. Called the roof of the Korean Peninsula, the Kaema Highlands are bounded on the north by Paektu Mountain (9,003 feet [2,744 m]), on the west by the Nangnim Mountain Range, on the east by the coast of the Sea of Japan (East Sea), and on the south by the northern tip of the T'aebaek Mountains. The heights rise 3,300–6,600 feet (1,000–2,000 m) and are approximately 15,500 square miles (40,000 square km) in extent. Agriculture in the highlands depends upon traditional burning of the fields for cultivation of millet, beans, oats, and potatoes. There are abundant reserves of underground and forest resources.

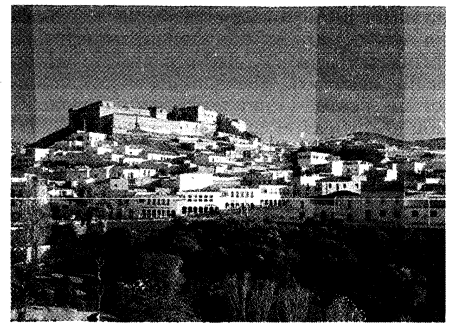
Kaesŏng, autonomous special city, southwestern North Korea, just south of the 38th parallel, northwest of Seoul, South Korea. One of the oldest cities of Korea, it was the



Massive bronze statue of the North Korean statesman Kim Il-sung overlooking Kaesŏng
Jan Lonn—Ostman Agency

capital of the Koryŏ dynasty (935–1392). It was formerly called Songdo ("City of Pine"), so named because it is surrounded by pine-covered mountains: Songak (2,506 feet [764 m]), Osŏng (3,483 feet), Nam (584 feet), and Mansu (754 feet). A castle city enclosed by a stone wall with four gates, it was overrun by North Korean forces during the Korean War (1950–53). In 1951 it was chosen as the site of the first truce talks. After the war Kaesŏng was included in North Korea. Although some of the Koryŏ monuments were destroyed during the war, many temples, tombs, and palaces remain, including some that have been restored. The medicinal herb ginseng is a famous product of the area that has been exported to China and Southeast Asian countries since ancient times; textiles have become the most important modern industry. Kaesŏng is a notable cultural and educational centre. Pop. (1981 est.) 240,000.

Kāf, al-, also spelled EL-KEF, or LE KEF, town, northwestern Tunisia. The town is situated at an elevation of 2,559 feet (780 m) on the slopes of the Haut (high) Tell, 22 miles (35 km) from the Algerian border. It occupies the site of an ancient Carthaginian town and later Roman colony—Sicca Veneria. Al-Kāf ("The Rock") was an important stronghold during Turkish rule and is now a regional marketplace and strategic road junction on the route



The town and Casbah (citadel) of al-Kāf, Tunisia
A.F. Kersting

to Algeria. There are remains of a rampart, Roman baths, and a temple, as well as large cisterns below the Turkish Casbah (citadel), which crowns a rocky hill in the town's centre.

Al-Kāf is surrounded by a region of grain and cattle raising and mining. Inhabitants of this area include sedentary groups of Berbers. Pop. (1984) 34,509.

Kafanchan, town, southern part of Kaduna State, central Nigeria, near a branch of the Mada River (a tributary of the Benue). Formerly called Jema'a Mallam ("Followers of a Learned Man [named] Mallam"), it developed after the construction in 1927 of a branch railway to the tin-mining centre of Jos, 44 miles (71 km) northeast. Selected in 1933 by the Emir of Jemaa (11 miles [18 km] south-southeast) to be the emirate headquarters, Kafanchan was the largest town of the traditional emirate. It is now the headquarters of the Jemaa Local Government Council.

Kafanchan lies at the centre of a major ginger-producing region, and it is also a collecting point for peanuts (groundnuts) and cotton for export; sorghum and millet are the staple food crops grown by its Kagoro and Gbari (Gwari) inhabitants. Tin and columbite mining are important around both the towns of Kafanchan and Kagoro (5 miles [8 km] to the east). Kafanchan has a Roman Catholic teacher-training college and a hospital. It is connected by road to Jemaa and Jos, and it lies at the junction of rail lines that lead to Jos and Maiduguri, Kaduna, and Port Harcourt. Pop. (latest census) district, 7,016.

Kaffeklubben Island, island and one of the world's northernmost points of land, in the Arctic Ocean, 37 km (20 nautical miles) east of Cape Morris Jesup, Greenland. Kaffeklubben (Danish: "Coffee Club") was discovered in 1900 by Robert E. Peary, the American Arctic explorer. The island was visited in 1921 by the Danish explorer Lauge Koch, who named it for the Kaffeklub at the Mineralogical Museum in Copenhagen. In 1969 a Canadian expedition determined that the island's northernmost point was 750 m (826 yards) farther north than Cape Morris Jesup, which had been thought to be the world's most northerly land point. Unconfirmed measurements by the Danish Geodetic Institute, however, indicated yet another island (unnamed) even farther north than Kaffeklubben.

Kaffir, also spelled KAFIR, Arabic KĀFIR ("Infidel"), member of a group of southern African Bantu-speaking peoples (*see* Xhosa); also, member of a people of the Hindu Kush in northeastern Afghanistan (*see* Nūristāni). Use of the term for either group reflects a negative opinion. Especially in South Africa, *kaffir* (not capitalized) is used in a generally pejorative way to mean any African black.

kaffir bread: *see* bread palm.

Kaffir cat: *see* Caffre cat.

Kaffir language, Kaffir also spelled KAFIR: *see* Xhosa language.

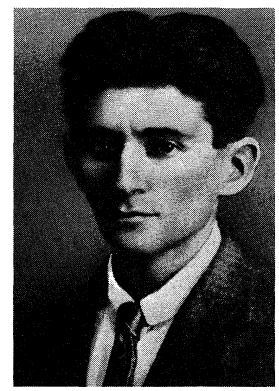
Kaffir Wars, Kaffir also spelled KAFIR: *see* Cape Frontier Wars.

Kaffraria (from Arabic *kāfir,* "infidel"), the territories along the southeast coast of Africa that were colonized by the Portuguese and British. The term became applied more specifically in the 19th century to those lands inhabited by the Xhosa-speaking peoples of the Transkei and Ciskei. Although now considered pejorative, Kaffir was used in the 19th century as a synonym for Xhosa. In 1847, during the Cape Frontier Wars, the British government annexed the territory between the Keiskama and Kei rivers (inhabited by the Ngqika group of the Xhosa peoples, the Thembu, and the Mfengu) as the crown colony of British Kaffraria. After 1857 this area was opened to white settlement and was finally incorporated by a reluctant Cape Colony in 1865.

Kāfiristān (Afghanistan): *see* Nūrestān.

Kafka, Franz (b. July 3, 1883, Prague—d. June 3, 1924, Kierling, near Vienna), Czech-born German writer of visionary fiction, whose posthumously published novels—especially *Der Prozess* (1925; *The Trial*) and *Das Schloss* (1926; *The Castle*)—express the anxieties and alienation of 20th-century man.

Life. Franz Kafka, the son of Julie Löwy and Hermann Kafka, a merchant, was born



Kafka
Archiv fur Kunst und Geschichte, West Berlin

into a middle-class Jewish family. After two brothers died in infancy, he became the oldest child, remaining forever conscious of his role as older brother; Ottla, the youngest of his three sisters, became the family member closest to him. Kafka strongly identified with his maternal ancestors because of their spirituality, intellectual distinction, piety, rabbinical learning, eccentricity, melancholy disposition, and delicate physical and mental constitution. He was not, however, particularly close to his mother, a simple woman devoted to her children. Subservient to her overwhelming, ill-tempered husband and his exacting business, she shared with her spouse a lack of comprehension of their son's unprofitable and possibly unhealthy dedication to the literary "recording of [his] . . . dreamlike inner life."

The figure of Kafka's father overshadowed Kafka's work as well as his existence; the figure is, in fact, one of his most impressive creations. For, in his imagination, this coarse, practical, and domineering shopkeeper and patriarch, who worshiped nothing but material success and social advancement, belonged to a race of giants and was an awesome, admirable, but repulsive tyrant. In Kafka's most important attempt at autobiography, "Brief an den Vater" (written 1919; "Letter to His Father"), a letter that never reached the ad-

dressee, Kafka attributed his failure to live—to cut loose from parental ties and establish himself in marriage and fatherhood—as well as his escape into literature, to the prohibitive father figure, which instilled in him the sense of his own impotence. He felt his will had been broken by his father. The conflict with the father is reflected directly in Kafka's story *Das Urteil* (1916; *The Judgment*). It is projected on a grander scale in Kafka's novels, which portray in lucid, deceptively simple prose a man's desperate struggle with an overwhelming power, one that may persecute its victim (as in *The Trial*) or one that may be sought after and begged in vain for approval (as in *The Castle*). Yet the roots of Kafka's anxiety and despair go deeper than his relationship to his father and family, with whom he chose to live in close and cramped proximity for the major part of his adult life. The source of Kafka's despair lies in a sense of ultimate isolation from true communion with all human beings—the friends he cherished, the women he loved, the job he detested, the society he lived in—and with God, or, as he put it, with true indestructible Being.

The son of a would-be assimilated Jew who held only perfunctorily to the religious practices and social formalities of the Jewish community, Kafka was German both in language and culture. He was a timid, guilt-ridden, and obedient child who did well in elementary school and in the Altstädter Staatsgymnasium, an exacting high school for the academic elite. He was respected and liked by his teachers. Inwardly, however, he rebelled against the authoritarian institution and the dehumanized humanistic curriculum, with its emphasis on rote learning and classical languages. Kafka's opposition to established society became apparent when, as an adolescent, he declared himself a socialist as well as an atheist. Throughout his adult life he expressed qualified sympathies for the socialists; attended meetings of the Czech Anarchists (before World War I); and, in his later years, showed marked interest and sympathy for a socialized Zionism. Even then he was essentially passive and politically unengaged. As a Jew, Kafka was isolated from the German community in Prague, but as a modern intellectual he was also alienated from his own Jewish heritage. He was sympathetic to Czech political and cultural aspirations, but his identification with German culture kept even these sympathies subdued. Thus, social isolation and rootlessness contributed to Kafka's lifelong personal unhappiness. Kafka did, however, become friendly with some German-Jewish intellectuals and literati in Prague, and in 1902 he met Max Brod; this minor literary artist became the most intimate and solicitous of Kafka's friends, and eventually he emerged as the promoter, saviour, and interpreter of Kafka's writings and as his most influential biographer.

The two men became acquainted while Kafka was indifferently studying law at the University of Prague. He received his doctorate in 1906, and in 1907 he took up regular employment with an insurance company. The long hours and exacting requirements of the Assicurazioni Generali, however, did not permit Kafka to devote himself to writing. In 1908 he found in Prague a job in the seminationalized Workers' Accident Insurance Institute for the Kingdom of Bohemia. There he remained until 1917, when tuberculosis forced him to take intermittent sick leaves and, finally, to retire (with a pension) in 1922, about two years before he died. In his job he was considered tireless and ambitious; he soon became the right hand of his boss, and he was esteemed and liked by all who worked with him.

In fact, generally speaking, Kafka was a charming, intelligent, and humorous individual, but he found his routine office job and the exhausting double life into which it forced him (for his nights were frequently consumed in writing) to be excruciating torture, and his deeper personal relationships were neurotically disturbed. The conflicting inclinations of his complex and ambivalent personality found expression in his sexual relationships. Inhibition painfully disturbed his relations with Felice Bauer, to whom he was twice engaged before their final rupture in 1917. Later his love for Milena Jesenská Pollak was also thwarted. His health was poor and office work exhausted him. In 1917 he was diagnosed as having tuberculosis, and from then onward he spent frequent periods in sanatoriums.

In 1923 Kafka went to Berlin to escape from his paternal family and devote himself to writing. In Berlin he found new hope in the companionship of a young Jewish socialist, Dora Dymant, but his stay was cut short by a decisive deterioration of his health during the winter of 1924. After a brief final stay in Prague, where Dora Dymant joined him, he died in a clinic near Vienna.

Works. Sought out by leading avant-garde publishers, Kafka reluctantly published a few of his writings during his lifetime. These publications include two sections (1909) from *Beschreibung eines Kampfes* (1936; *Description of a Struggle*); *Betrachtung* (1913; *Meditation*), a collection of short prose pieces; and other works representative of Kafka's maturity as an artist—*The Judgment,* a long story written in 1912; two further long stories, *Die Verwandlung* (1915; *Metamorphosis*) and *In der Strafkolonie* (1919; *In the Penal Colony*); and a collection of short prose, *Ein Landarzt* (1919; *A Country Doctor*). *Ein Hungerkünstler* (1924; *A Hunger Artist*), four stories exhibiting the concision and lucidity characteristic of Kafka's late style, had been prepared by the author but did not appear until after his death.

In fact, misgivings about his work caused Kafka before his death to request that all of his unpublished manuscripts be destroyed; his literary executor, Max Brod, disregarded his instructions. Brod published the novels *The Trial, The Castle,* and *Amerika* in 1925, 1926, and 1927, respectively; and a collection of shorter pieces, *Beim Bau der chinesischen Mauer* (*The Great Wall of China*), in 1931. Such early works by Kafka as *Description of a Struggle* (begun about 1904) and *Meditation,* though their style is more concretely imaged and their structure more incoherent than that of the later works, are already original in a characteristic way. The characters in these works fail to establish communication with others; they follow a hidden logic that flouts normal, everyday logic; their world erupts in grotesque incidents and violence. Each character is only an anguished voice, vainly questing for information and understanding of the world and for a way to believe in his own identity and purpose.

Many of Kafka's fables contain an inscrutable, baffling mixture of the normal and the fantastic, though occasionally the strangeness may be understood as the outcome of a literary or verbal device, as when the delusions of a pathological state are given the status of reality, or the metaphor of a common figure of speech is taken literally. Thus, in *The Judgment,* a son unquestioningly commits suicide at the behest of his aged father. In *The Metamorphosis* the son wakes up to find himself transformed into a monstrous and repulsive insect; he slowly dies, not only because of his family's shame and its neglect of him but because of his own guilty despair.

Many of the tales are even more unfathomable. *In the Penal Colony* presents an officer who demonstrates his devotion to duty by submitting himself to the appalling (and clinically described) mutilations of his own instrument of torture. This theme, the ambiguity of a task's value and the horror of devotion to it—one of Kafka's constant preoccupations—appears again in "A Hunger Artist." The fable "Vor dem Gesetz" (1914; "Before the Law," later incorporated into *The Trial*) presents both the inaccessibility of meaning (the "law") and man's tenacious longing for it. A group of fables written in 1923–24, the last year of Kafka's life, all centre on the individual's vain but undaunted struggle for understanding and security.

Many of the motifs in the short fables recur in the novels. In *Amerika,* for example, the boy Karl Rossmann has been sent by his family to America. There he seeks shelter with a number of father figures. His innocence and simplicity are everywhere exploited, and a last chapter describes his admission to a dreamworld, the "nature-theatre of Oklahoma"; Kafka made a note that Rossmann was ultimately to perish. In *The Trial,* Joseph K., an able and conscientious bank official and a bachelor, is awakened by bailiffs, who arrest him. The investigation in the magistrate's court turns into a squalid farce, the charge against him is never defined, and from this point the courts take no further initiative. But Joseph K. consumes himself in a search for inaccessible courts and for an acquittal from his unknown offense. He appeals to intermediaries whose advice and explanations produce new bewilderment; he adopts absurd stratagems; squalor, darkness, and lewdness attend his search. Resting in a cathedral, he is told by a priest that his protestations of innocence are themselves a sign of guilt and that the justice he is forced to seek must forever be barred to him. A last chapter describes his execution as, still looking around desperately for help, he protests to the last. This is Kafka's blackest work: evil is everywhere, acquittal or redemption is inaccessible, frenzied effort only indicates man's real impotence.

In *The Castle,* one of Kafka's last works, the setting is a village dominated by a castle. Time seems to have stopped in this wintry landscape, and nearly all the scenes occur in the dark. K. arrives at the village claiming to be a land surveyor appointed by the castle authorities. His claim is rejected by the village officials, and the novel recounts K.'s efforts to gain recognition from an authority that is as elusive as Joseph K.'s courts. But K. is not a victim; he is an aggressor, challenging both the petty, arrogant officials and the villagers who accept their authority. All of his stratagems fail. Like Joseph K., he makes love to a servant, the barmaid Frieda, but she leaves him when she discovers that he is simply using her. Brod observes that Kafka intended that K. should die exhausted by his efforts, but that on his deathbed he was to receive a permit to stay. There are new elements in this novel; it is tragic, not desolate. While the majority of Kafka's characters are mere functions, Frieda is a resolute person, calm and matter-of-fact. K. gains through her personality some insight into a possible solution of his quest, and when he speaks of her with affection, he seems himself to be breaking through his sense of isolation.

Kafka's stories and novels have provoked a wealth of interpretations. Brod and Kafka's foremost English translators, Willa and Edwin Muir, viewed the novels as allegories of divine grace. Existentialists have seen Kafka's environment of guilt and despair as the ground upon which to construct an authentic existence. Some have seen his neurotic involvement with his father as the heart of his work; others have emphasized the social criticism, the inhumanity of the powerful and their agents, the violence and barbarity that lurk beneath normal routine. Some have found an imaginative anticipation of totalitarianism in the random and faceless bureaucratic terror of *The Trial.* The Surrealists delighted in the

persistent intrusions of the absurd. There is evidence in both the works and the diaries for each of these interpretations, but Kafka's work as a whole transcends them all. One critic may have put it most accurately when he wrote of the works as "open parables" whose final meanings can never be rounded off.

But Kafka's oeuvre is also limited. Each of his works bears the marks of a man suffering in spirit and body, searching desperately, but always inwardly, for meaning, security, self-worth, and a sense of purpose. Kafka himself looked upon his writing and the creative act it signified as a means of "redemption," as a "form of prayer" through which he might be reconciled to the world or might transcend his negative experience of it. The lucidly described but inexplicable darkness of his works reveal Kafka's own frustrated personal struggles, but through his powerless characters and the strange incidents that befall them the author achieved a compelling symbolism that more broadly signifies the anxiety and alienation of the 20th-century world itself.

At the time of his death, Kafka was appreciated only by a small literary coterie. His name and work would not have survived if Max Brod had honoured Kafka's testament—two notes requiring his friend to destroy all unpublished manuscripts and to refrain from republishing the works that had already appeared in print. Brod took the opposite course, and thus the name and work of Kafka gained worldwide posthumous fame. This development took place first during the regime of Adolf Hitler, in France and the English-speaking countries—at the very time when Kafka's three sisters were deported and killed in concentration camps. After 1945 Kakfa was rediscovered in Germany and Austria and began to greatly influence German literature. By the 1960s, this influence extended even to the intellectual, literary, and political life of Communist Czechoslovakia.

MAJOR WORKS. *Novels* (all published posthumously). *Der Prozess* (1925; *The Trial*); *Das Schloss* (1926; *The Castle*); *Amerika* (1927)—all translated by Willa and Edwin Muir.

Stories. Betrachtung (1913; *Meditation* in *In the Penal Settlement: Tales and Short Prose Works*); *Das Urteil* (1916; *The Sentence,* also trans. as *The Judgment*); *Die Verwandlung* (1915; *Metamorphosis* in *Metamorphosis and Other Stories*); *In der Strafkolonie* (1919; *In the Penal Colony* in *Metamorphosis and Other Stories*); *Ein Landarzt* (1919; *A Country Doctor*); *Beim Bau der chinesischen Mauer* (published posthumously, 1931; *The Great Wall of China* in *Description of a Struggle and The Great Wall of China*).

BIBLIOGRAPHY. Useful bibliographies include Harry Jarv, *Die Kafka-Literatur* (1961), most comprehensive; and Angel Flores, *A Kafka Bibliography 1908–1976* (1976).

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Biography. The most important biographies are the intimate, congenial, basic (if biased) account of Max Brod, *Franz Kafka* (1937); and the more factual and detailed study of Kafka's youth by Klaus Wagenbach, *Franz Kafka: Eine Biographie seiner Jugend, 1883–1912* (1958). Ernst Pawel, *The Nightmare of Reason: A Life of Franz Kafka* (1984), is a later biography that corrects many misinterpretations of previous biographies.

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Kafr ash-Shaykh, also spelled KAFR EL-SHEIKH, *muḥāfaẓah* (governorate) in the central Nile Delta, Lower Egypt, with the Rosetta Branch of the river to the west and ad-Daqahlīyah governorate to the east. It was created in 1949 out of al-Gharbīyah *muḥāfaẓah,* just south, and named Fu'ādīyah *mudūīyah* (province) after Fu'ād I, sultan (1917–22) and king (1922–36) of Egypt. After the Egyptian monarchy was overthrown in 1952, the area was renamed in 1955. Buḥayrat al-Burullus, which is a large saltwater coastal lagoon about 35 miles (56 km) long and is separated from the sea by a narrow sandbar, is at the north. Fed by canals and minor branches of the Nile, the lagoon is bordered by extensive salt marshes from which large tracts have been reclaimed for rice cropping; the fishing village of Balṭīm is on the eastern shore. The *muḥāfaẓah*'s area is 1,327 square miles (3,437 square km).

The region's principal crops, which are irrigated by the Ziftā barrage on the Damietta Branch of the Nile, are cotton, rice, corn (maize), and wheat. Sugar beets were introduced in the early 1980s, and fish farming was also begun. Important market towns having industries linked with agriculture (cotton ginning, rice milling, and sugar beet processing) are Disūq and Biyalā. Other industries are carried on in the capital, Kafr ash-Shaykh (*q.v.*). The coastal lighthouse located north of the east end of the Burullus lagoon was erected by order of Khedive (viceroy) Ismā'īl Pasha (ruled 1863–79) as one of four associated with the construction of the Suez Canal. Pop. (1985 est.) 1,795,000.

Kafr ash-Shaykh, also spelled KAFR EL-SHEIKH, town, capital of Kafr ash-Shaykh *muḥāfaẓah* (governorate) of the central Nile Delta, Lower Egypt, bordering the Mediterranean. The town is situated in a fertile plain about 25 miles (40 km) north-northwest of Ṭanṭā. Industries in the town include cotton-processing plants and factories producing cigarettes, rice strawboard, rice chaff oil, and chemical products. A former royal palace of King Farouk I (reigned 1936–52) is located there. The city has rail links to Rosetta and Cairo by a branch connecting the main rail system at al-Maḥallah al-Kubrā. Pop. (1985 est.) 98,800.

kaftan: *see* caftan.

Kafue, town, south-central Zambia, about 25 miles (40 km) south of Lusaka, the national capital. The town is located on the northern bank of the Kafue River, whose water is diverted northward by channel to Chilanga and Lusaka. The town's industrial area, which gets its power supply from the Kafue hydroelectric scheme, houses an ammonium nitrate fertilizer plant, a textile mill, an iron and steel complex, a firm producing fibreglass fishing boats, a leather tannery, a pulp and paper mill, a copper-processing unit, a bag and sacking plant, and an assembly and equipment repair plant. A greenbelt separates Kafue's industrial zone from its residential area, where use is made of higher-density housing, a phenomenon that is comparatively rare in Zambian urban settlements. The Great North Road and a railway route pass through Kafue, linking it to Mazabuka and Lusaka. Pop. (1980) 29,794.

Kafue National Park, park, south-central Zambia. Established in 1950 and located about 200 miles (322 km) west of Lusaka, the park covers an area of 8,650 square miles (22,400 square km) and consists of a vast and gently undulating plateau, situated along the middle reaches of the Kafue River and its two tributaries, the Lufupa and the Lunga. The vegetation is lush and green, varying from mixed forest, thicket, woodland, and grass in the south to broad alluvial grassland and patches of evergreen forests in the north. Perennial swamps in the northwest drain into the Lufupa River via the Busanga floodplains. The park's wildlife includes hippopotamus, buffalo, zebra, elephant, black rhinoceros, lion, sable, oribi, kudu, impala, roan antelope, eland, lechwe, gnu, sitatunga, duiker, and crocodile. There are numerous bird species, including openbill, saddlebill, wattled crane, crested crane, jucana, cormorant, Ross's lourie, Boehm's bee eater, black barbed barbet, fish eagle, marabou stork, and vulture. There are camps at Ngoma, Kalala, Nanzhila, Chunga, Kafwala, Lufupa, Moshi, and Ntemwa; safaris are conducted on foot.

Kafue River, river rising on the Zaire–Zambia border. It meanders generally southward until it turns west near the Lukanga Swamp (which it drains). The river then flows south and finally east through the Kafue Flats and Kafue Gorge to join the Zambezi River near Chirundu, Zimbabwe, after a course of 600 miles (960 km). One of Zambia's major rivers, its waters are used for irrigation. Its basin, containing Kafue National Park, abounds with game. The river system cuts through the plateau of central Zambia, particularly at Meshi Teshi Gap and Kafue Gorge, site of a hydroelectric power project. Waterfalls and rapids restrict navigation to light craft. There is a bridge at Kafue, 25 miles (40 km) south-southwest of Lusaka.

Kāfūr, Abū al-Misk (d. AD 968), Ethiopian slave who, as vizier under the Ikshīdid dynasty, was de facto ruler of Egypt from 946 to 966 and de jure ruler from then until his death.

Kāfūr was originally a slave belonging to the founder of the Ikshīdid dynasty, Muḥammad ibn Ṭughj. Muḥammad recognized Kāfūr's talent, made him tutor to his children, and promoted him to an officer. Kāfūr showed outstanding military abilities in the campaigns he conducted in Syria and the Hejaz. On his deathbed Muḥammad appointed Kāfūr guardian of one of his two sons, and thus Kāfūr became the real ruler of Egypt during the reign of Ūnūjūr (946–961) and his brother and successor, 'Alī (961–966). Kāfūr ruled in his own name thereafter, but soon after his death in 968, Ikshīdid power in Egypt was overturned by the Fāṭimids.

The luxury and magnificence of Kāfūr's court became legendary, but it accorded poorly with the general condition of Egypt, which had suffered from plague, famine, and a major earthquake during his rule. Kāfūr was a genuine scholar, however, and a patron of the greatest Arabic poet of the time, al-Mutanabbī, whose friend he was for a time.

Kafzeh, also spelled QAFZEH, rock shelter south of Nazareth, Israel, where the remains of 11 fossil hominid skeletons—dating from between 45,000 and 60,000 years ago—were recovered. The Jebel Kafzeh site was first excavated in the early 1930s by R. Neuville, the French consul general in Jerusalem. More recent excavations were carried out in the 1960s and early '70s by Bernard Vandermeersch of the University of Paris.

The remains, the largest group yet recovered for this period in the Middle East, are associated with the Mousterian (stone tool) industry, normally found associated with Neanderthal man in Europe. The remains at Kafzeh, however, have been classified by Vandermeersch as belonging to *Homo sapiens sapiens, i.e.,* modern man, and therefore Kafzeh contains the re-

mains of the earliest *Homo sapiens sapiens* yet recovered. Other authorities, however, classify these remains as "nonclassical" Neanderthal.

Kaga, city, Ishikawa *ken* (prefecture), Honshu, Japan. It lies along the Daishōji River. The city was created in 1958 by the amalgamation of the city of Daishōji with several towns, including the hot-spring resorts of Katayamazu and Yamashiro.

The former city of Daishōji is now the central part of Kaga. An old temple town, it grew around a castle built by the Maeda family in the early Tokugawa period (1603–1867). Industrialization began after World War II; products include electrical machinery, pottery, silk and synthetic textiles, and bicycle chains.

Kaga is important as a tourist centre. The Enuma Shrine contains a tea-ceremony house founded by the master Kobori Enshū (1574–1647). There are several temples in the city, and its hot-spring areas and scenic surroundings are strong attractions for tourists. Pop. (1985) 68,630.

Kagame, (Abbé) Alexis, Alexis also spelled ALEGISI (b. May 15, 1912, Kiyanza, Rwanda), Rwandan poet, historian, and Roman Catholic priest who introduced the written art, both in his own language, Kinyarwanda, and in French, to his country.

Kagame, the son of a deputy chief of the Tutsi people, was baptized in 1928 and ordained a priest in 1941. His considerable activity before and after taking his doctorate at the Pontifical Gregorian University in Rome in 1955 included teaching, editing the journal *Kinyamateka* ("The Herald"), and research that resulted in a number of scholarly works. He then resided at the Catholic Mission in Butare, where he divided his time between priestly duties and scholarly pursuits.

Kagame's major books include *Inganji Karinga* (1943; "The Victorious Drums"), a history of the ancient Rwandans; *Isoko y'Amäjyambere,* 3 vol. (1949–51; "Sources of Progress"), an epic poem; *La Poésie dynastique au Rwanda* (1951; "Dynastic Poetry of Rwanda); and *Introduction aux grands genres lyriques de l'ancien Rwanda* (1969; "Introduction to the Great Lyrical Poems of Ancient Rwanda"). His masterwork, however, a long narrative Christian epic conceived in 1941, is *Umulirimbyi wa Nyili-ibiremwa,* 3 vol. (1950– ; "The Singer of the Lord of Creation"), which consists of 35,000 lines arranged into 150 cantos. Lesser-known works include a novella, *Matabaro Ajya Iburayi* (1938–39; "Matabaro Leaves for Europe"); a historical poem, *Umwaduko w'Abazungu muli Afrika yo hagati* (1947; "The Arrival of the Europeans in Central Africa"); and the lighter, humorous *Icara nkumare irungu* (1947; "Sit Down and Let Me Entertain You"), *Indyohesha-birayi* (1949; "The Seasoner of Potatoes"), and *Iyo wiliwo nta rungu* (1949; "How to Spend the Day Pleasantly").

Kagamigahara, city, Gifu *ken* (prefecture), Honshu, Japan, east of Gifu city. Upon the Meiji Restoration in 1868, an army base was established in the city. It was taken over by the U.S. Army after World War II and is now used by the Japanese Air Self-Defense Force. The city contains aircraft and transport equipment factories and textile mills. It is included in the Chukyo Industrial Region. Pop. (1988 est.) 128,600.

Kaganovich, Lazar Moiseyevich (b. Nov. 22 [Nov. 10, Old Style], 1893, Kabany, near Kiev, Ukraine, Russian Empire [now in Ukrainian S.S.R.]—d. before 1963?), Soviet Communist Party leader and supporter of Joseph Stalin during the 1930s.

As a young Jewish shoemaker, Kaganovich became involved in the Bolshevik wing of the Russian Social Democratic Workers' Party (in 1911) and in 1920 was made head of the Soviet government of Tashkent. His success in consolidating Soviet rule in Turkestan brought him to the attention of Stalin, who put him in charge of supervising the activities of local party organizations and, in 1924, of party patronage. Because his work in the latter capacity helped Stalin to defeat his political rivals and because he was a capable organizer and administrator, Kaganovich rose quickly in the party administration and by 1930 was a full member of the Politburo. He was one of the small group of Stalin's top advisers pushing for very high rates of collectivization after 1929. As head of the Moscow regional party organization (1930–35), he brought it firmly under Stalin's control. During this period he was also instrumental in the construction of the Moscow subway and the distribution of heavy farm equipment to shore up the failing collective system.

Within the Politburo, Kaganovich and V.M. Molotov led the opposition to Sergey M. Kirov's proposed concessions to the peasantry and to his attempts to relax the harshness of Stalin's control. They formed the core of Stalin's "post-Purge" Politburo. From this time through the end of Stalin's administration, Kaganovich was largely responsible for the heavy industry in the Soviet Union. He was appointed people's commissar (*i.e.,* minister) of transport (1935), heavy industry (1937), fuel industry (1939), and petroleum industry (1939). He became a deputy premier in 1938 and a member of Stalin's State Defense Committee in World War II. Kaganovich and the writer Ilya Ehrenburg were conspicuously spared in Stalin's postwar campaign of persecution against the Jews.

Under Nikita Khrushchev, Kaganovich was given largely administrative posts supervising industrial affairs. He opposed Khrushchev's de-Stalinization and joined the unsuccessful attempt to depose him (June 1957), as a result of which he lost all his government and party offices and was reportedly given a minor administrative post.

The date and circumstances of his death are unknown. In 1963 a Western journalist reported that he had seen Kaganovich's grave; in 1964 the Soviet government announced, without verifying the report, that Kaganovich had earlier been expelled from the party.

Kagawa, smallest *ken* (prefecture) of Shikoku, Japan, facing the Inland Sea opposite Okayama prefecture, Honshu. Its area of 727 square miles (1,883 square km) includes Shōdo and other offshore islands. The climate is warm with little rain; the prefecture is drained by numerous rivers (including the Kōtō and Doki) and is dotted with lakes. The Yashima promontory, overlooking the Inland Sea, was the scene of a major sea battle between the Taira (Heike) and Minamoto (Genji) clans in 1184.

Rice, barley, and wheat are the main crops; mandarin oranges are grown in the south, and olives are raised on Shōdo Island. Much of Japan's salt is mined in Kagawa prefecture; and lacquer, work gloves, and fans are major manufactures. The quarries of Shōdo Island are believed to have yielded the rock from which the first Ōsaka Castle was built.

Takamatsu is the prefectural capital. As the chief port for communication with Honshu, it is a major tourist centre for Shikoku and the Inland Sea National Park. Tamamo Park contains the ruins of the 16th-century Takamatsu Castle, and Ritsurin Park is considered to be one of the best examples of Japanese landscape gardening. The 19th-century Kotohira (Kompira) Shrine at Kotohira, 19 miles (31 km) to the southwest, attracts many pilgrims. Pop. (1988 est.) 1,026,000.

Consult the INDEX *first*

Kagawa Kageki, also called KEIEN (b. May 25, 1768, Tottori, Japan—d. April 26, 1843, Japan), Japanese poet and literary scholar of the late Tokugawa period (1603–1867) who founded the Keien school of poetry.

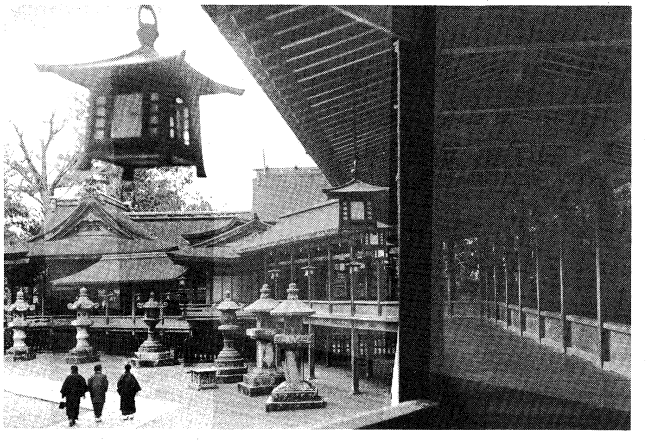
Kageki was born into a samurai family, but by the age of 25 he left his home and became the student of Kagawa Kagetomo in Kyōto. Kageki was adopted by the Kagawa family but later broke with Kagetomo.

In 1796 he met Ozawa Roan, whose rejection of the traditional and formal poetic style and advocacy of simple and honest expression of feelings greatly influenced him. He began advocating the concept of *shirabe* ("tuning"), stating that the tone of a poem was more important than its intellectual content. In the early 19th century Kageki became the leading poet of Kyōto and established the Keien school; he increased his reputation by publishing *Shingaku iken* (1811), in which he criticized the poetic style of Kamo Mabuchi. Many of his poems of this period were published in the anthology *Keien isshi* (1828).

His views and the establishment of his school won him the enmity of Mabuchi's disciples and of other established schools. Despite their attacks, his influence survived his death, and the Keien school remained a major force in Japanese poetry until the late 19th century.

Kagawa Toyohiko (b. July 10, 1888, Kōbe, Japan—d. April 23, 1960, Tokyo), Christian social reformer, author, and leader in Japanese labour and democratic movements who focused attention upon the poor of Japan.

As a youth he enrolled in a Bible class to learn English and was soon converted to Christianity. He continued his Christian studies in Japan and the U.S. When he returned to Japan



Kotohira-gu, Kagawa, Japan

By courtesy of the Consulate General of Japan, N.Y.

he became involved with the labour movement and with social welfare work, choosing to live in the slums of Kōbe. He took part in the campaign for universal adult male suffrage, which was achieved in 1925, and helped organize the Japanese Federation of Labour. In 1921 and again in 1922 he was briefly imprisoned for his labour activities. After his release he began to conduct great evangelistic campaigns in the chief cities of Japan and other countries.

A pacifist, Kagawa founded the National Anti-War League in 1928 and in 1940 was arrested for apologizing to China for Japan's attack on that country. A year later he was one of a group that went to the U.S. in an attempt to avert the coming war. He returned to Japan after World War II and led the effort to gain suffrage for women.

While in prison in 1921 and 1922 Kagawa wrote his first two novels, *Crossing the Deathline* and *Shooting at the Sun;* both became best-sellers. Altogether he wrote more than 150 books, including several novels, such as *Before the Dawn* (1924); sociological studies and religious studies; and translations of the works of Albert Schweitzer.

BIBLIOGRAPHY. William Axling, *Kagawa* (1932); J.M. Trout, *Kagawa, Japanese Prophet* (1959).

Kagera River, most remote headstream of the Nile and largest tributary of Lake Victoria, rising in Burundi near the northern tip of Lake Tanganyika. It is formed at the confluence of its two headstreams—the Nyawarongo (Niavarongo) and the Ruvubu (Ruvuvu)—which in turn are fed by streams rising in the highlands east of Lake Kivu and Lake Tanganyika, between Zaire and Rwanda. The Kagera flows about 250 mi (400 km) north and east. In its middle course northward it is the boundary between Tanzania and Rwanda; turning eastward, it forms the boundary between Tanzania and Uganda for some distance and then crosses Tanzania to enter Lake Victoria 25 mi north of Bukoba.

The Kagera Basin, mountainous and dotted with lakes and swamps, lies chiefly in Rwanda and includes Kagera National Park. The river's longest tributary is the Lukarara, the southernmost the Ruvironza (Luvironza). Much of the Kagera is unnavigable; its only port, Kyaka, Tanzania, is served by shallow-draft cargo steamers.

Kageran Pluvial Stage, division of Pleistocene time and deposits in Africa (the Pleistocene Epoch began about 2,500,000 years ago and ended about 10,000 years ago). The Kageran Pluvial, a period of wetter climatic conditions, was named for the Kagera River of Uganda, along which the deposits formed during this time were first studied. The Kageran may correspond to the advance of continental glaciers in the Northern Hemisphere and is thought to represent early Pleistocene time. The Kageran was followed by the Kageran-Kamasian Interpluvial, or dry period.

Kagoshima, city and prefecture (*ken*), southernmost Kyushu, Japan, including the island groups of Ōsumi-guntō, Tokara-guntō, and Amami-guntō. It occupies an area of 3,537 sq mi (9,163 sq km). Its southern coast is deeply indented by Kagoshima Bay. The active volcano, On-take, was an island in the bay until an eruption in 1914 connected it to the eastern shore. Rough topography, volcanic ash soil, and relative isolation limit agriculture to grains, tobacco, and sweet potatoes. Forests in the interior are exploited, and coastal fishing is important. Industry is based on processed foodstuffs, woodworking, and traditional handicrafts. The custom of not washing a man's clothes at the same time as a woman's has persisted since feudal times in some of the villages. Kagoshima, the prefectural capital, is the economic, cultural, and transport centre of southern Kyushu. Located on Kagoshima Bay opposite On-take, it is sometimes called the "Naples of the Orient." Ibusuki, at the head of the bay, is a tourist resort noted for its hot springs. The Amami-guntō are Japan's only subtropical region, producing tropical fruits, sugarcane, camphor, and betel nuts. Kagoshima city has a university founded in 1949. Pop. (1983 est.) city, 520,998; prefecture, 1,804,000.



Kagoshima with On-take (volcano) across the bay, Japan
Imperial Press—FPG/EB Inc.

kagu (*Rhynochetus jubatus*), nearly extinct and virtually flightless bird of New Caledonia, sole member of the family Rhynochetidae (order Gruiformes). About 55 centimetres (22 inches) long, it is a chunky bird with loose, gray plumage, including an erectile crest. The bill, legs, and eyes are reddish orange. In courtship the kagu dances with wings spread to show attractive spots of black, white, and rust. Its loud, piercing or rattling calls are heard mainly at night. It forages in forests for snails and insects. The introduction of dogs into New Caledonia was the main factor in its decline.



Kagu (*Rhynochetus jubatus*)
Cy La Tour

Kagu-tsuchi (Shintō fire god): *see* Homusubi.

Kagwa, Sir Apolo (b. *c.* 1869—d. February 1927, Nairobi, Kenya), *katikiro* (prime minister) of Buganda (1890–1926) and the leading figure in the semi-autonomous development of the Ganda (Baganda) people under British authority.

A devout Anglican, Kagwa was a leader of the Protestant faction in the civil wars of the Ganda people (1888–92). He became *katikiro* when King Mwanga returned to the throne in 1890 and grew increasingly powerful during the remainder of his reign. When Mwanga fled in 1897, the new *kabaka* (ruler) was only an infant, and Kagwa served as regent until the *kabaka* came of age in 1914. By his support of the British during a mutiny of their Sudanese troops at the end of the 19th century, Kagwa was able to win a privileged position of relative autonomy for Buganda.

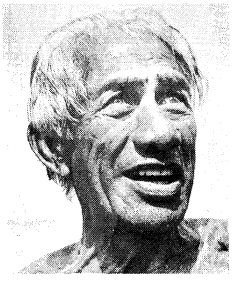
From the 1890s on, Kagwa ruled the kingdom as an extremely competent and progressive autocrat, loyal but never subservient to the British and easily dominating the chiefs in the Lukiko (advisory parliament). Conflict developed between him and the *kabaka,* however, especially in the early 1920s.

Kagwa's downfall was brought about by a clash with a British administrator in 1925 over the fundamental issue of colonial officials' right to deal directly with Ganda chiefs rather than through the *katikiro.* Although Kagwa appealed directly to the secretary of state for the colonies as a loyal British ally, the administrator was upheld. In 1926 Kagwa reluctantly resigned.

Kagyupa (Tibetan Buddhist sect): *see* Bka'-brgyud-pa.

Kagyur (Tibetan Buddhist literature): *see* Bka'-'gyur.

Kahanamoku, Duke Paoa (b. Aug. 26, 1890, near Waikiki, Oahu, Hawaii—d. Jan. 22, 1968, Honolulu), Hawaiian swimmer who won three Olympic gold medals and who for several years was considered the greatest freestyle performer in the world. He was perhaps most important for developing the flutter kick, which largely replaced the scissors kick.



Kahanamoku, 1967
AP/Wide World Photos

Kahanamoku set three universally recognized world records in the 100-yard freestyle between July 5, 1913, and Sept. 5, 1917 (53 seconds; broken by Johnny Weissmuller in 1922). In the 100-yard freestyle, Kahanamoku was U.S. indoor champion in 1913 and outdoor titleholder in 1916–17 and 1920. In the Olympic Games at Stockholm in 1912, he won the 100-metre freestyle event, and

he repeated that triumph in the Olympics at Antwerp in 1920, when he also was a member of the victorious U.S. team in the 800-metre relay race.

Intermittently from the mid-1920s Kahanamoku was a motion-picture actor. From 1932 to 1961 he was sheriff of the city and county of Honolulu. He served in the salaried office of official greeter of other famous personages for the state of Hawaii from 1961 until his death.

Kahiga, Samuel (b. Aug. 1946, Thika, Kenya), African novelist and short-story writer.

Kahiga attended Thika High School and later received a degree in fine art and design at the University of Nairobi. His most widely known early work is a collaboration with his brother, Leonard Kibera, on a volume of short stories, *Potent Ash* (1968). Kahiga's seven stories in that collection cover a range of themes, reflecting his own experience of growing up in the rural area north of Nairobi that is inhabited by the Kikuyu people, of life there during the independence struggle of the mid-1950s, and of later middle-class existence in the Westernized urban scene of modern Kenya. The latter is the concern of several popular, melodramatic novels—including *The Girl From Abroad* (1974), *Lover in the Sky* (1975), and *When the Stars Are Scattered* (1979)—which are concerned with doomed love among the growing literate, professional class in Kenya, a group that also constitutes Kahiga's primary audience. Later short stories were published as *Flight to Juba* (1979). His easy, colloquial style and conventional romantic plots mask a subtle, ironic criticism of contemporary Kenya's social and political problems.

Kahn, Albert (b. March 21, 1869, Rhauen, Westphalia—d. Dec. 8, 1942, Detroit), pioneering industrial architect and planner known for his designs of American automobile factories. In his own time he was considered the world's foremost industrial architect and the "father of modern factory design."

Kahn's father, a rabbi, brought his family to the United States in 1881. Kahn had no formal schooling but was taken on as a student by George D. Mason, a leading Michigan architect. Following this apprenticeship, Kahn travelled for a year in Europe on a scholarship won in a competition sponsored by *American Architect* magazine. After working with various Detroit architects, he established his own firm (1895), which developed into one of the largest in architectural history. In 1904 Kahn was given his first commission for an auto factory by the Packard Motor Company. The resulting design, using a reinforced concrete frame, represented an innovative departure from traditional masonry factory construction and helped establish Kahn's reputation. In subsequent structures, he originated the "all-under-one-roof" factory and then the "all-on-one-floor" scheme, which is now the most common plan. An example is the Chrysler Corporation Press Shop at Detroit (1936) which, with its unbroken glass walls and skylighting, gives an impression of lightness and elegance despite the building's immense size.

Kahn was the principal architect for most of the large American automobile companies for 30 years. He designed more than a thousand projects for Ford, among them the River Rouge fabrication and assembly plant, one of the largest industrial complexes in the world. Commissions for factories, foundries, and warehouses came from all continents. The Soviet government in 1929 asked Kahn to construct a tractor factory in Stalingrad (1930). Kahn's firm subsequently designed 521 factories in the U.S.S.R. and trained more than a thousand Soviet engineers during the following decade.

Kahn, Gustave (b. Dec. 21, 1859, Metz, Fr.—d. Sept. 5, 1936, Paris), French poet and literary theorist who claimed to be the inventor of *vers libre* ("free verse").

After studying in Paris, Kahn spent four years in North Africa, returning to Paris in 1885. He helped found or edit several literary reviews, including *La Vogue, Le Symboliste,* and *La Revue Indépendante,* which printed his poems and discussed the various theories surrounding the Symbolist movement. Kahn explained his theory of *vers libre* in the preface to his *Premiers poèmes* (1897), a collection that included the earlier volumes *Les Palais nomades* (1887; "The Wandering Palaces"), *Chansons d'amant* (1891; "A Lover's Songs"), and *Domaine de fée* (1895; "Fairy World"). It cannot be established with certainty who developed this verse form, but Kahn was undoubtedly its first and most persuasive advocate. He broke with the tradition of the alexandrine line and sought to make rhythm more dependent on the movement of the poem's thoughts rather than on traditional rules of prosody. His poems are successful in capturing subtle accords in minor key with a changing musical rhythm.



Gustave Kahn, oil painting by Roger Casse, 1931; in a private collection
Giraudon—Art Resource/EB Inc.

He also wrote a highly personal contribution to the history of French poetry, *Symbolistes et décadents* (1902).

Kahn, Herman (b. Feb. 15, 1922, Bayonne, N.J., U.S.—d. July 7, 1983, Chappaqua, N.Y.), American physicist, strategist, and futurist best known for his controversial studies of nuclear warfare.

Kahn grew up in New York City and in California and graduated from the University of California at Los Angeles in 1945. Over the next three years he worked for several aircraft manufacturing companies and completed his master's degree at the California Institute of Technology. In 1948 he joined the Rand Corp., a private research centre largely funded by the U.S. Air Force, where he studied the application to military strategy of such new analytic techniques as game theory, operations research, and systems analysis.

Kahn came to public notice with the publication of *On Thermonuclear War* (1960), in which he presented his proposition that thermonuclear war differs only in degree and not in kind from conventional war and ought to be analyzed and planned in the same way. In 1961 Kahn left Rand and established the Hudson Institute (for research into matters of national security and public policy) at Croton-on-Hudson, N.Y., where he served as chairman and director of research.

Among Kahn's other books were *Thinking About the Unthinkable* (1962), *The Emerging Japanese Superstate* (1970), *The Next 200 Years* (with W. Brown and L. Martel, 1976), and *The Coming Boom* (1982).

Kahn, Louis I(sadore) (b. Feb. 20, 1901, Osel, Russian Estonia—d. March 17, 1974, New York City), U.S. architect whose buildings, characterized by powerful, massive forms, broke decisively with the International style, making him one of the most discussed architects to emerge after World War II.



Louis I. Kahn
Hans Namuth

His parents immigrated to the United States when he was a child. He graduated from the University of Pennsylvania, Philadelphia, in 1924 and later toured Europe, studying and sketching architectural monuments. In 1941 he was in partnership with George Howe and from 1942 to 1944 with Howe and Oscar Stonorov.

While he was a professor of architecture at Yale University (1947–57), Kahn carried out his first important work: the Yale University Art Gallery at New Haven, Conn. (1952–54). Despite certain features suggestive of the work of the architect Mies van der Rohe, the building was considered a notable departure from the International style. His next important work, the Bath House, Trenton (N.J.) Jewish Community Center (1955–56), had four pyramid-shaped roofs supported by concrete block columns.

In 1957 Kahn was named professor of architecture at the University of Pennsylvania. His Richards Medical Research Building at the university (1960) is particularly outstanding for its expression of the distinction between "servant" and "served" spaces. The servant spaces (stairwells, elevators, exhaust and intake vents, and pipes) are isolated in four towers, distinct from the served spaces (living and working areas). Rough-textured concrete slabs were widely used in his Salk Institute for Biological Studies, La Jolla, Calif. (1959–65).

Light reaches the interior of the main meeting room of the First Unitarian Church, Rochester, N.Y. (1959–62), via windows of towers at the four corners. To this church, as to other Kahn buildings, critics have applied terms such as harsh, massive, vigorous, and monumental. Towers were also used to admit light in his dormitory for Bryn Mawr College (Bryn Mawr, Pa.; 1961–65). The special problem of light control in a hot, sunny climate was a major consideration in the design of the capitol centre at Dacca, Bangladesh, and in the Indian Institute of Management at Ahmadābād. In both projects, walls are pierced by large, geometric holes designed to admit light but to shield the interior from direct glare. His last work, the Yale Center for British Art, in New Haven, was completed in 1977.

Vincent Scully, Jr., *Louis I. Kahn* (1962), is the best analysis of his work.

Kahn, Otto Hermann (b. Feb. 21, 1867, Mannheim, Baden—d. March 29, 1934, New York City), banker and patron of the arts who played an important role in reorganizing the U.S. railroad systems.

In 1888 Kahn was sent to the London branch of Berlin's Deutsche Bank and became a British citizen. The banking house of Speyer

& Co. offered him a position in New York City in 1893. In 1897 he became a partner in Kuhn, Loeb & Co. and stayed with the company for 37 years. Edward Harriman relied on Kahn's financial acumen in reorganizing the properties of six railroad systems, including the Union Pacific and the Baltimore and Ohio. Kahn gave up his British citizenship in 1917 and generously supported the Allied war effort during World War I. For his contributions, he was decorated by France, Italy, Spain, Belgium, and Japan.

In 1903 he became a stockholder in the foundering Metropolitan Opera Company of New York City. For several years he made good its losses, and in 1908 he brought in director Giulio Gatti-Casazza and conductor Arturo Toscanini from La Scala in Milan. He was president from 1918 to 1931, owning 84 percent of the company's stock at his death.

Kahn was a collector of paintings, tapestries, and bronzes. His arts patronage included establishing prizes for New York's black artists, donating cash and paintings to various civic museums, financing an American tour of the Moscow Arts Theatre, helping build the New Theatre in New York, and supporting restoration of the Parthenon in Athens.

Kahn wrote many books on art, history, politics, and business, including *Art and the People* (1916), *The Myth of American Imperialism* (1925?), and *Of Many Things* (1926), a collection of his speeches and writings on finance and politics.

Kahn, Reuben Leon (b. July 26, 1887, Kovno, Lithuania [now Kaunas, Lithuanian S.S.R.]—d. July 22, 1979, Miami?), American immunologist whose investigations of blood reactions led him to develop an efficient test for syphilis.

While serving as an immunologist with the Michigan State Department of Health (1920–28), Kahn found that, under carefully controlled conditions, the mixing of an infected blood sample, beef heart muscle serum, and a quantity of cholesterol would result in a clouding of the solution. Although this reaction, which came to be called the Kahn test, has been known to yield false-positive results in persons recently vaccinated or suffering from diseases other than syphilis, it has proved more useful than the slower Wassermann test.

As an assistant professor of bacteriology at the University of Michigan, Ann Arbor (1928–48), where he became professor of serology (1951–57, emeritus after 1957), Kahn found that by adjusting the temperature, salt concentration, and serum dilution used in his test, the reaction could indicate the presence of the agents of tuberculosis, malaria, or leprosy in the blood sample. He explained the theory of his expanded test, which he called the universal serologic reaction, in *An Introduction to the Universal Serologic Reaction in Health and Disease* (1951). Supported by the Atomic Energy Commission in his investigations of radiation effects on animal immunity to disease (1957–67), he found that radiation destroys the localization of antibody reactions with foreign proteins—a development that may allow the efficiency of inoculations to be greatly increased. Kahn was professor of microbiology (1968–73) at Howard University medical school, Washington, D.C., after which he became a research consultant.



Reuben Kahn

By courtesy of the Michigan Historical Collections of the University of Michigan, Ann Arbor

Kahnweiler, Daniel-Henry (b. June 25, 1884, Mannheim, Ger.—d. Jan. 11, 1979, Paris), German-born French art dealer and publisher, best known for his early espousal of Cubism and long, close association with Pablo Picasso.

Trained for a career in finance, Kahnweiler instead chose art and settled in Paris, where he opened a small gallery in 1907. He became interested in the work of several young artists and soon exclusively represented Picasso, Georges Braque, André Derain, Maurice de Vlaminck, Fernand Léger, and Juan Gris. He also published books by a number of emerging literary artists, including Guillaume Apollinaire, André Malraux, and Antonin Artaud.

At the outbreak of World War I, Kahnweiler was not in Paris, and his German citizenship precluded his return. His gallery was closed and its stock confiscated. He returned to Paris in February 1920, and for two unhappy years he watched the government auction his confiscated stock. In September 1920 he opened Galerie Simon, and he became a French citizen in 1937. At the beginning of World War II, his wife's sister, Louise Leiris, purchased his stock and business, renaming it Galerie Louise Leiris. After France was liberated, Kahnweiler served as a director of Galerie Louise Leiris until shortly before his death.

In addition to writing several monographs on the artists with whom he was most familiar, Kahnweiler published his memoirs, *Mes galeries et mes peintres* (1961; *My Galleries and Painters*).

Kahonde (people): *see* Kaonde.

Kahr, Gustav, Ritter von (knight of) (b. Nov. 29, 1862, Weissenburg, Bavaria [Germany]—d. June 30, 1934, Munich), conservative monarchist politician who served briefly as prime minister and then was virtual dictator of Bavaria during the anti-leftist reaction of the early 1920s.

Kahr was appointed provincial governor of Upper Bavaria in 1917. Shortly after the abortive Kapp Putsch against the Weimar Republic in March 1920, Kahr became prime minister of Bavaria. Enjoying the support of the paramilitary Einwohnerwehren (Home Guards) and reactionary elements, he immediately dissolved the leftist "workers and soldiers' councils." In June 1921, however, the Home Guards were disbanded under pressure from the Allies, and Kahr resigned (September 1921) after the Bavarian legislative leaders refused to support his defiance of a Reich decree to restore order and public peace.

Two years later, during the widespread confusion that accompanied the Franco-Belgian occupation of the Ruhr, he was appointed *General-Staatskommissar* ("state commissioner general") by the Bavarian government with virtually dictatorial powers. In open defiance of the Reich government, he fostered plans for a Bavarian secession and monarchical restoration; but he had to drop such plans after Adolf Hitler's Beer Hall Putsch in Munich (November 1923)—a coup that would have both complemented and countered his own designs and one that he was forced to suppress. Resigning his post the following February, he subsequently served as president of the Bavarian court administration. He was killed in the Nazis' purge of June 30, 1934.

Kahramanmaraş, city, southern Turkey, at the edge of a fertile plain below Ahır Mountain, east-northeast of Adana. The city is near the southern outlet of three important passes through the Taurus Mountains (from Göksun, Elbistan, and Malatya).

Capital of the Hittite kingdom of Gurgum (*c.* 12th century BC), it was known to the 8th-century-BC conquering Assyrians as Markasi and later to the Romans as Germanicia Caesarea. The Arabs conquered it about AD 645 and used it as a base for their incursions into Asia Minor. The town, destroyed several times in the Arab-Byzantine-Armenian struggles, was rebuilt by the Umayyad caliph Mu'āwiyah I (7th century) and was fortified (*c.* 800) by the 'Abbāsid caliph Hārūn ar-Rashīd. It was briefly occupied by the crusaders (1097) and passed on to the Seljuq Turks in the 12th century. It was incorporated into the Ottoman Empire under Sultan Selim I in about 1515. With the surrounding province, it was occupied by France in 1919 but returned to Turkey two years later.

A medieval citadel that towers above the city contains an archaeological museum with a collection of Hittite monuments excavated nearby. The city has several mosques (notably the 15th-century Ulu Cami), *medreses* (religious schools), and old churches and is a centre of light industry and commerce, producing and exporting olive oil, spices, and handloomed goods. It is linked by a branch line with the Adana–Malatya railway.

The surrounding region is mountainous and contains rich mineral deposits, chiefly iron and silver. The agricultural regions, watered by the Ceyhan River, produce wheat, rice, and legumes. Pop. (1985) 210,371.

Kahului, city, Maui county, on the northern coast of Maui Island, Hawaii, U.S., on Kahului Bay. Until the 1950s Kahului had a small, transitory population. The Hawaiian and Commercial Sugar Company then sponsored a large planning project, and modern business and residential sectors were developed. Kahului has Maui's principal airport and its only deepwater port. With nearby Wailuku (to the west), it is the commercial–transportation centre and the outlet for the products of the island's fertile central plain. Protected by breakwaters, Kahului Harbor has bulk sugar-loading and container freight facilities and is connected by rail with nearby pineapple canneries and sugar plantations. Kahului is the seat of Maui Community College (1931). Pop. (1980) 12,978.

Kahun, ancient Egyptian town, its site lying in modern al-Fayyūm *muḥāfaẓah* (governorate). It was erected for the overseers and workmen employed in constructing the Pyramid of Illahūn, built by Sesostris II (reigned 1844–37 BC), and it was abandoned when the pyramid was completed. Excavated by the English archaeologist Sir Flinders Petrie (1888–90), it revealed a criss-cross of streets with houses built of unburnt brick having beamed, flat mud roofs, open courts and porticoes, and the earliest example of a supporting wooden column, fluted and on a raised base. Cretan polychrome Kamáres ware and Cypriot black ware were also found at the site.

K'ai-feng, Pinyin KAIFENG, city in northern Honan *sheng* (province), China. Until 1955 it was the provincial capital (now transferred to Cheng-chou). K'ai-feng is situated in the southern section of the North China Plain, to the south of the Huang Ho (Yellow River), in an area where a number of streams flow southeastward into the Huai River.

In the 4th century BC, as Ta-liang, it became the capital of the Wei dynasty; the Wei also built the first of many canals there, the Lang-t'ang Canal, joining the Huang Ho to the Chin River, flowing into northern Shantung province. At the end of the 3rd century BC, however, Ta-liang was laid waste by the forces

of the Ch'in dynasty (221–206 BC), and until the 5th century AD, K'ai-feng was only a medium-sized market town. Under the Northern Wei dynasty at the end of the 5th century, it became the seat of a commandery, and in the 6th century a prefecture, Pien Chou. Under this name it again became one of the most important commercial cities in China, its new importance being based on the Grand Canal, built in 607–608 under the Sui dynasty (581–618) and linking the Huang Ho with the Huai Ho, the Yangtze River, and the region of modern Hang-chou. All the revenues of southern China, and a vast volume of private shipping, passed through the city, which was the junction for another canal to western Shantung built in the early 7th century. Its importance grew steadily throughout the T'ang period (618–907), and after 756 it was made the seat of a military governor whose province was named Hsüan-wu. After 907 the various regional regimes that successively controlled the northern plain made it their eastern capital. When the Sung (960–1126) reestablished a unified empire, they too made it their capital. A cosmopolitan centre from early times, the city had, for many centuries, the only well-documented Jewish community in China (*see* K'ai-feng Jew).

K'ai-feng was the first Chinese capital to be primarily a commercial metropolis. Under the Sung it was probably the most important centre of trade in the Orient. The focus of four major canals, it drew in vast revenues in grain and commodities and also became the focus of an industrial complex, which included an iron industry. The city itself was surrounded by a triple ring of walls. It seems probable that in the 11th century K'ai-feng's population was between about 600,000 and 700,000.

The city suffered a severe blow when the Juchen (Chin) overran North China, captured K'ai-feng in 1127, and sacked it. Under Chin rule after 1127, K'ai-feng was first known as Pien-ching and later as the southern capital. It remained an important administrative centre, as it also was under the Mongol occupation, which lasted from 1234 until 1368, during which period it was the seat of the provincial administration of Honan. After 1127 the outer walls were abandoned, and the city was confined to the old inner city of early Sung times. In 1368 the first emperor of the Ming dynasty (1368–1644) made K'ai-feng the capital of Honan Province and built a new set of walls. K'ai-feng suffered another disaster in 1642 when rebel forces diverted the Huang Ho to flood the city, which was temporarily abandoned and restored only in 1662.

Although K'ai-feng remained an important regional administrative centre throughout Ming and Ch'ing (1644–1911) times, its commercial importance never regained its 11th-century peak. After the construction under the Mongols and the Ming of a new Grand Canal farther east, it was no longer a key point on the main north–south traffic artery. Neglect of the river works on the Huang Ho, moreover, made the river less useful as a waterway, while flood disasters became frequent.

K'ai-feng's position suffered still further in the 20th century when both of the main north–south rail lines bypassed it, though it is linked to them by the east–west Lungai Railway. It has, however, undergone considerable industrial expansion. In addition to the old, established handicraft industries, such as cotton textiles and iron implements, it has become the centre of an engineering industry producing agricultural machinery, a zinc industry, and a large chemical industry. Some traces of the Sung capital still remain. It is a cultural centre, with a medical college, libraries, and a provincial museum. Pop. (1980 UN est.) 700,000.

K'ai-feng Jew, Pinyin KAIFENG JEW, member of a former religious community in Honan Province, China, whose adoption of Judaism and careful observance of its precepts over many centuries has long intrigued scholars. Matteo Ricci, the famous Jesuit missionary, was apparently the first Westerner to learn of the existence of Chinese Jews. In 1605 he was visited by a young man, totally Chinese in appearance, who claimed to be one of many monotheists living in K'ai-feng. Three years later a Chinese Jesuit visited the community, confirmed the existence of a large synagogue (with a Holy of Holies accessible only to the chief rabbi), and testified to the authenticity of Jewish observances. The Jewish character of the community was unmistakable, for the Chinese observed the sabbath and major religious festivals, practiced circumcision, read the Torah, had Hebrew manuscripts, used name tablets rather than pictures in their synagogue, and abstained from eating pork. Their Chinese name, T'iao-chin chiao ("pick out the tendons"), refers to practices prescribed by Jewish dietary laws.

An extant stone tablet, dated 1663, refers to Adam as the first ancestor, to Abraham as the founder of their religion, and to Moses' role in producing the Scriptures and notes the similarity between Judaism and Confucianism. A tablet dated 1512 claims that Judaism entered China during the latter half of the Han dynasty (206 BC–AD 220), but it is more likely that Jews entered K'ai-feng *c.* 1127 from India or Persia. The oldest known synagogue in K'ai-feng was built in 1163.

The religious life of the Jewish community was permanently disrupted by a protracted revolution that, in 1644, established the Ch'ing (Manchu) dynasty. The flooding of the city to prevent capture in 1642 destroyed the synagogue and marked a rapid decline in religious fervour that was never rekindled. The strong ties with past traditions were irreparably severed with the passing of the older generation. Though the synagogue was rebuilt in 1653, Hebrew was a dead language there by 1700. When the last Chinese rabbi died in 1800, the spirit of Judaism in K'ai-feng was so enfeebled that Christian missionaries were able to purchase Torah scrolls, Hebrew manuscripts, and records that eventually were placed in libraries and museums in Europe and the United States.

Efforts by the Portuguese Jews of London in 1760 to contact the Chinese Jews were unsuccessful, as were similar efforts by the Jews of London in 1815. Two Chinese converts, however, dispatched to K'ai-feng in 1850 by the Anglican Mission in Hong Kong, visited the synagogue, obtained scrolls and Hebrew manuscripts of the Old Testament, and brought back copies of Hebrew inscriptions. Though few traces of vibrant Judaism remained, the information thus obtained (published Shanghai, 1851) made it possible to reconstruct past history. A Protestant missionary visiting K'ai-feng in 1866 was told that poverty had forced the Chinese Jews to dismantle their synagogue and sell the stones to Muslims who wished to build a mosque.

In 1870 a letter from K'ai-feng arrived in Hong Kong. It was in reply to a letter sent 26 years earlier by a British officer. The reply described the plight of the K'ai-feng Jews in pitiful terms. When several attempts by European Jews in China to raise money for the K'ai-feng community met with little response, the Chinese Jews were invited to move to Shanghai. An old gentleman and his son arrived in the early 1900s to announce that they were among the last members of the once-flourishing community. There is indisputable evidence that other Jewish communities existed in China for much more than 1,000 years, but only the history of the K'ai-feng Jews has been well documented.

Kai Islands, Bahasa Indonesia KEPULAUAN KAI, also called KEY ISLANDS, KEI ISLANDS, or EWAB ISLANDS, group of the southeastern Moluccas, west of the Kepulauan (islands) Aru and southeast of Seram, in the Banda Sea. The group, which forms part of Maluku *propinsi* (province), Indonesia, includes Kai Besar (Great Kai), Kai Kecil (Little Kai) and Kai Dulah, and the Kur and Tayandu groups; the total land area is 555 sq mi (1,438 sq km). Kai Besar is mountainous, rising to nearly 3,000 ft (900 m); it has steep cliffs along the coasts. Most of the islands are encircled by shoals, and all are covered with dense forest, a source of excellent timber.

Flora include the fig and the ironwood tree and various palms and mangrove; rice and tobacco are cultivated. Among the fauna are a wild pig and a small, pouched mammal called cuscus, a small green lizard, a rare species of pigeon, red lories, a number of rare species of butterfly, and several unusual beetles. Numerous tortoises are found on the reefs.

The inhabitants are typical black Papuans who have intermarried considerably with peoples of Malay stock. Because of missionary work, they are now predominantly Christian, but there are many Muslims. The society is communal in organization, untilled land being owned by the village and cultivated ground by the individual as long as he tills it. Kai Islanders are skillful at wood carving and basketry and are first-class boatbuilders. Plantain, yams, corn (maize), rice, and tobacco are grown. Two communities, Banda Elat on the western coast of Kai Besar and Banda Eli on the eastern coast, represent the original inhabitants of the Kepulauan Banda driven away from their home islands by the Dutch in the early 17th century. Principal trade is in copra, timber, trepang, and tortoiseshell. Tual, on the western coast of Kai Kecil, is the administrative centre and main port. Pop. (1971) 108,328.

k'ai-shu, Pinyin KAISHU (Chinese: "regular script"), in Chinese calligraphy, a stylization of chancery script developed during the Later Han dynasty (AD 23–220) further simplifying the earlier *li-shu* script into a more fluent and easily written form. Characterized by clear-cut corners and straight strokes of varying thickness, it underwent its most vital period of development and was the most important type of script during the T'ang dynasty (618–907), when a successful career in the civil service depended in part on one's skill as a calligrapher. It remains the standard script in use today and the model for printed type.

K'ai-yüan, Pinyin KAIYUAN, formerly (until 1931) AMICHOW, town in southern Yunnan Province (*sheng*), China. K'ai-yüan is a county (*hsien*) seat in Hung-ho-ha-ni-tsu-i-tsu (Hung-Ho Hani-Yi) Autonomous Prefecture (*tzu-chih-chou*). It is the natural transport centre for a mining district that has developed rapidly in the 20th century. K'ai-yüan was a small village until the completion in 1910 of the railway from the provincial capital of K'unming to what is now the Vietnamese port of Haiphong. At that time coal deposits were discovered along the rail line at Kao-pao-chun in I-liang County, in Mi-lo County, and at Hsiao-lung-t'an, north of K'ai-yüan. Until 1932 the nearby Ko-chiu tin mines shipped most of their production to Hong Kong for refining; but in that year a modern smelter was installed, and K'ai-yüan became an important supplier of coal to this expanding industry. Continual development of coal mining and thermal-power production has continued since the 1950s. The town, moreover, has become the centre of the local lumber industry and provides timber for construction. Pop. (mid-1970s) 10,000–50,000.

Kaibara Ekiken, Ekiken also spelled EKKEN, original name ATSUNOBU (b. Dec. 17, 1630,

Fukuoka, Japan—d. Oct. 5, 1714, Japan), philosopher, travel writer, and pioneer botanist of the early Tokugawa period (1603–1867) who set forth the Confucian doctrines in simple language that could be understood by Japanese of all classes. He was the first to apply Confucian ethics to women and children and the Japanese lower classes.

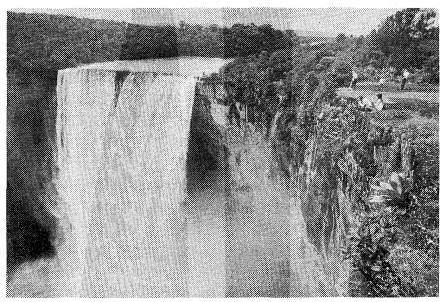
Originally trained as a physician, he left the medical profession in 1657 to study the thought of the great Chinese Neo-Confucian philosopher Chu Hsi, under the teachers Yamazaki Ansai and Kinoshita Jun-an. He became a highly popular teacher who traveled widely and kept such detailed accounts of his journeys that they were used by others following his routes. He is also considered the father of botany in Japan. His *Yamato honzō* ("Japanese Plants") attracted the attention of many Westerners.

Kaibara wrote about 100 philosophical works in which he stressed Chu Hsi's Neo-Confucian conception of the hierarchical structure of society. In his *Taigi roku* ("Grave Doubts"), however, he took issue with Chu Hsi's dualism in favour of a single creative force. In his *Dōji kun* ("Instructions for Children"), Kaibara tells parents to severely discipline their children, who must blindly and respectfully accept all that parents tell them, whether it is right or wrong. To Kaibara is usually attributed *Onna daigaku* ("The Great Learning for Women"), long considered the most important ethical text for women in Japan, which advocates women's obedience to their parents, parents-in-law, husband, and, if widowed, to their eldest son. Kaibara, however, treated his wife, Tōken, to whom he was happily married for 45 years, on terms of equality. She was also a scholar, calligrapher, and poet, and it has been suggested that Tōken was the real author of his books.

Kaidu (d. *c.* 1301), Mongol khan (reigned 1269–1301), the great-grandson of Genghis Khan, grandson of Ögödei, and a leader of the opposition to Kublai Khan's rule over the Mongol empire. Kaidu controlled Turkistan and, for a time, much of Mongolia proper, including Karakorum, the former capital of the Mongol empire. In spite of almost continuous warfare for more than 30 years, he was unable to break Kublai's power.

Kaidu first emerged about 1263 as a claimant to Turkistan. By means of a military alliance, he won that province. By 1269 he had himself been recognized by a gathering of Mongol chieftains as their rightful khan. He spent most of his reign making war on Kublai Khan, continuing these attacks after Kublai's death in 1294. In 1301 Kaidu was defeated near Karakorum and was killed while in flight.

Kaieteur Falls, cataract on the Potaro River, west-central Guyana. After a sheer drop of 741 feet (226 m) over the edge of a sandstone plateau, the falls have eroded a gorge, 5 miles (8 km) long, that descends another 81 feet (25 m). The falls are 300 to 350 feet (90 to 105 m) wide at the top and are the central feature of the Kaieteur National Park (established 1930). Tourists usually visit the site by chartered aircraft from Georgetown, but a road and river expedition is also possible. The falls were sighted by C. Barrington Brown, a British geologist, in 1870.



Kaieteur Falls, Guyana
Peter L. Gould

Consult the INDEX *first*

Kaifu Toshiki (b. Jan. 2, 1931, Ichinomiya, Japan), politician and government offical who became prime minister of Japan in 1989.

The son of a photography studio owner, Kaifu graduated from Waseda University, Tokyo, in 1954. Entering politics, he won election to the House of Representatives as a member of the Liberal-Democratic Party (LDP) in 1960 and was regularly reelected thereafter. He served as deputy chief secretary of Prime Minister Miki Takeo's Cabinet in 1974–76 and then became minister of education (1976–77) under Prime Minister Fukuda Takeo. He held this latter post again in 1985–86 under Prime Minister Nakasone Yasuhiro.

After prime ministers Takeshita Noboru and Uno Sosuke had successively resigned from office in 1989 owing to financial scandals and public dissatisfaction with the governing Liberal-Democratic Party, Kaifu on August 8 was chosen to fill out Uno's term as president of the party, and the next day he was elected by the House of Representatives to succeed the latter as prime minister. In October Kaifu was elected to a full two-year term as president of the LDP, and in February 1990 the LDP under his leadership won a sweeping victory in national elections to the House of Representatives, thereby retaining a majority in that legislative body.

Kaigetsudō Ando, also called OKAZAKI GENSHICHI (b. 1671, Japan—d. 1743), early Japanese painter of Ukiyo-e, or scenes of the transient world of daily life.

He founded the Kaigetsudō school, comprising several artists with more or less identical styles. He was known for his paintings of standing courtesans, executed in bold and steady brushstrokes with a skillful but restrained use of colour. Since other artists drew strikingly similar pictures of courtesans, some speculate that Ando operated a workshop in which his pupils produced paintings under his direction. No prints by him are known.

Little is known of Ando's life except that he was banished in 1714 to the island of Ōshima. It is also uncertain if his given name should be read Ando or Yasunobu. Among his best-known paintings are "Courtesan and a Young Girl in Attendance," "Standing Beauty," and "Beauty in the Breeze."

Kaihō Yūshō (b. 1533, Ōmi province, Japan—d. March 1, 1615, Kyōto), major Japanese screen painter of the Azuchi-Momoyama period.

Born into a military family, he entered the priesthood after he came to Kyōto. He initially studied under a Kanō artist (probably Eitoku) but later established his own independent school of painting. He was famous during his lifetime, and his patrons included the *taikō* Toyotomi Hideyoshi and the emperor Go-Yōzei. Yūshō was adept both in the rich, colourful painting style developed by Eitoku and in the more subdued monochromatic ink tradition of the Zen priest-painters. When doing figures in the latter style (*e.g.*, his pictures of Chinese sages), he used a *genpitsu* ("reduced brushstrokes") technique reminiscent of Liang K'ai, an early-13th-century Chinese painter whose work was popular in Japan. These portraits are called *fukuro-e* after the loosely defined garments that seem to hang like voluminous sacks upon the figures.

Some of Yūshō's work can be seen in the Myōshin Temple in Kyōto and in the Kyōto Onishi Museum of Art. His Kanō-style screen paintings are notable for their graceful lines (*e.g.*, "Plum Tree," in the Kennin Temple, Kyōto) and brilliant colour harmonies (*e.g.*, "Fishing Nets," in the Tokyo National Museum), qualities that influenced later artists.

Kaikei, also called ANAMI BUTSU (fl. 1183–1236), Japanese sculptor who helped establish the traditional pattern of Buddhist sculpture.

Together with his father, Kōkei, and his brother Unkei, he made statues for the temples of Kōfuku and Tōdai in Nara, the ancient capital of Japan. Kaikei's style, while sharing the direct and realistic manner typical of the time, was noted for its gentleness and grace in contrast to Unkei's, which was overwhelmingly dynamic. Among Kaikei's 20-odd extant works are the painted sculptures of Hachiman, the Japanese god of war, as a Buddhist priest, and of Jizōbosatsu, the guardian deity of children, both at Tōdai Temple. He later became a monk and assumed the name of Anami Butsu. For this reason his style is known as Anami style.

Kaikoura Range, twin mountain chains, South Island, New Zealand, paralleling the island's northeastern coast for 60 miles (100 km). The name, meaning "to eat crayfish," has its origin in Maori myth. The Inland Kaikouras rise to 9,465 feet (2,885 m) at Tapuaenuku, and the Seaward Kaikouras reach 8,562 feet (2,609 m) at Manakau. The ranges are steepest along their southeast flanks, where there are active faults. The Clarence River flows between the ranges, and the Awatere River runs west of the Inland range. Lumbering has reduced the slopes' forest cover to scrub.

At the eastern foot of the mountains is the small Kaikoura Peninsula, called "Lookers On" by Captain James Cook in 1770. In his journal Cook described how 57 men in four double canoes came out toward his ship, "looked on" for a time, and then returned to shore. On the peninsula is the community of Kaikoura, founded in 1850. It is a farming, dairying, and sheep-raising centre with a limeworks, a crayfish-processing plant, and a marine biological research station.

Kailas Range, Wade-Giles romanization KANG-TI-SSU SHAN, Pinyin GANGDISI SHAN, one of the highest and most rugged parts of the Himalayan Mountain system, located in the southwestern part of the Tibet autonomous *ch'ü* (region), China. The range has a roughly northwest-to-southeast axis and lies to the north of a trough drained in the western section by the Lang-ch'u River—the name by which the Sutlej River is known in China—and drained in the east by the Mach'üan River, an extreme headwater of the Brahmaputra (known in Chinese as the Ya-lu-tsang-pu River, or Tsangpo). In the middle of this depression lies Mapam Lake, reputed to be the highest freshwater lake in the world at 14,950 feet (4,557 m) above sea level. To the north of this lake lies Mount Kailas, which reaches an elevation of 22,028 feet (6,714 m); it is known as Gang Tise to the Tibetans and is the highest peak in the range.

Mt. Kailas is an important holy site, both to the Hindus, who identify it with the paradise of Śiva (one of the three supreme gods of Hinduism), and to the Tibetan Buddhists, who identify it with Mt. Sumeru, cosmic centre of the universe. Although access to both Mt. Kailas and Mapam Lake as places of religious pilgrimage was permitted after the Chinese occupation of Tibet in 1951 and guaranteed in the Sino-Indian Treaty of 1954, access was restricted after the suppression of the subsequent Tibetan rising, and the frontier was closed in

1962. Access to the area from the south is via a high pass, the Li-p'u-lieh-ko Shan-k'ou, south of P'u-lan. The Indus River rises on the north flank of the Kailas Range.

Kailua-Kona, resort area on the west central coast of Hawaii Island, Hawaii, U.S. Kailua (meaning "two ocean currents"), on Kailua Bay at the foot of Mt. Hualalai, is a centre for big-game fishing and the main village of the North Kona District. Capt. James Cook, the English navigator and explorer, landed there on Jan. 16, 1779, and was slain (Feb. 14) on Kealakekua Beach, to the south, during a fracas with Hawaiians; a monument (1874) was erected near the spot across the bay from Napoopoo village. Capt. George Vancouver introduced oranges to the islands at Kailua in 1792. Two years later, Vancouver brought the first cattle and sheep to Kealakekua. A modern hotel stands on the site of King Kamehameha I's home and council area. Mokuaikaua Church (1823) was built by Governor Kuakini. Hulihee Palace (1837), now a museum, was the summer residence of Hawaiian kings in the 19th century. The Kona ("leeward") District is the home of the state's coffee industry. Coffee is grown on small privately owned plots at 1,000- to 2,000-ft (300- to 600-m) elevations. The farmers' houses cling to the slopes of the volcanoes Hualalai and Mauna Loa. Pop. (1980) Kailua, 4,751.

Kailua-Lanikai, twin residential communities, Honolulu County, southeastern Oahu Island, Hawaii, U.S., extending along Kailua Bay. They occupy superb white beach land that was the residence of Oahu's medieval kings. The Kawainui swamplands, to the west, were then royal fishponds. Numerous temple ruins, such as Ulu Po Heiau, are in the vicinity. Many residents commute to Honolulu (10 mi [16 km] southwest) by the road tunnel through the Koolau Range. Pop. (1980) Kailua city, 35,812.

Kailyard school, late 19th-century movement in Scottish fiction characterized by a sentimental idealization of humble village life. Its name derives from the Scottish "kail-yard," a small cabbage patch usually adjacent to a cottage. The Kailyard novels of prominent writers such as Sir James Barrie, author of *Auld Licht Idylls* (1888) and *A Window in Thrums* (1889), Ian Maclaren (pseudonym of John Watson), and S.R. Crockett were widely read throughout Scotland, England, and the United States and inspired hundreds of imitators. The natural and unsophisticated style and parochial viewpoint quickly degenerated into mawkish sentimentality, which provoked a hostile reaction among contemporary Scottish Realists and later writers of the 20th century.

Kainan, city, Wakayama Prefecture (*ken*), Honshu, Japan, on Wakanoura-wan (Wakanoura Bay). It was formed in 1934 with the merger of the towns of Kuroe, Hiigata, and Uchiumi. The city has been known since the Tokugawa period for its Kuroe-nuri lacquer ware and the production of Japanese umbrellas. Modern industry includes the petrochemical plants developed on reclaimed parts of the coast. Pop. (1980) 52,530.

kainite, a naturally occurring double salt, hydrated potassium and magnesium sulfate-chloride, $KMgSO_4Cl \cdot 3H_2O$. It has been found only in potash deposits with other salts as a product of metamorphism. It is the principal constituent of the large salt deposits in middle and northern Germany. Water decomposes kainite to epsomite and sylvite. For chemical formula and detailed physical properties, *see* sulfate mineral (table).

Kainji Lake, reservoir on the Niger River, on the border between Niger and Kwara states, in western Nigeria. It was created in 1968 by the construction of the Kainji Dam 630 mi (1,014 km) from the sea and covers an area of 500 sq mi (1,300 sq km); it is used extensively for fishing and irrigation. The lake completely submerged Foge Island in the Niger River, the town of Bussa, and other riverine settlements; part of the old town of Yelwa (the seat of Yauri emirate) was also permanently flooded. About 50,000 people—mostly Reshe (Gungunci, Gungawa), Busa (Busawa, Bussangi), Kamberi, Nupe, Lopawa, and Laro peoples in Kwara and Niger states were displaced. Most of these remain near the lake in the government's "Resettlement Villages," which include the town of New Bussa (22 mi south of the old Bussa), completed in 1966.

Kainji Lake National Park (1,515 sq mi) contains the Borgu and Zugurma game reserves. Open for visitors during the dry season (November–March), it is rich in wildlife, including baboons, duikers, hippopotamuses, hyenas, kobs, roans, and warthogs.

Kainji Dam (opened in 1969), the largest of the dams on the Niger, is 215 ft (66 m) high and 1,800 ft across and provides electrical power, improved river navigation upstream to Yelwa in Sokoto State, water control of the Niger down to the Kaduna River confluence, and a road across the Niger, as well as waters for irrigation and fishing.

Kaipara Harbour, inlet of the Tasman Sea indenting northwestern North Island, New Zealand. It is the largest drowned river system of the North Auckland Peninsula, formed when the sea flooded the lower valleys of the Wairoa, Kaipara, Hoteo, and other rivers. Connected to the open sea by a passage 5 mi (8 km) wide, the interior of the broad, shallow harbour—200 sq mi (520 sq km) in area—has many narrow extensions and more than 2,000 mi of shoreline. The harbour served as an important port before roads and rail lines were built in the area. Major settlements on the inlet are Helensville, Ruawai, and Paparoa.

Kaira (India): *see* Kheda.

Kairouan (Tunisia): *see* Qayrawān, al-.

Kairov, Ivan Andreyevich (b. Dec. 26 [Dec. 14, old style], 1893, Ryazan, Russia—d. Oct. 29, 1978), Soviet educator and public education official responsible for numerous works dealing with pedagogical theory.

Educated in the natural sciences division of the department of physics and mathematics at Moscow University, Kairov later taught there, at the Moscow Timiryanzev Agricultural Academy, and at the Lenin Pedagogical Institute. He also served as Russian Soviet minister of education, as a member of the Supreme Soviet, as vice president and president of the U.S.S.R. Academy of Pedagogical Sciences, and as a delegate to conferences on education in Finland, Czechoslovakia, Poland, and England. In 1957 he headed the Soviet delegation to the Third International Conference on Banning Atomic and Hydrogen Weapons, in Tokyo. Kairov's best known work is *Pedagogika* (1956). His awards included three Orders of Lenin, Hero of Socialist Labour, and other decorations.

Kaiser, Georg (b. Nov. 25, 1878, Magdeburg, Ger.—d. June 4, 1945, Ascona, Switz.), leading German Expressionist dramatist.

Kaiser went to Argentina as a clerk, but ill health forced him to return to Germany. During a long convalescence he wrote his first plays, mainly satirical comedies that attracted little attention. His first success was *Die Bürger von Calais* (1914), in which he revealed his outstanding gift for constructing close-knit drama expressed in trenchant and impassioned language. He followed this with a series of plays in which he showed man



Georg Kaiser, *c.* 1928
Archiv fur Kunst und Geschichte, West Berlin

in deadly conflict with the modern world of money and machines: *Von Morgens bis Mitternachts* (1916; *From Morn to Midnight*, 1922), *Die Koralle* (1917; *The Coral*, 1929), *Gas I* and *Gas II* (1918 and 1920; Eng. trans., 1924), *Hölle, Weg, Erde* (1919), *Nebeneinander* (1923), *Zweimal Oliver* (1926), and *Der Silbersee* (1933), with music by Kurt Weill. These established him as a leader of the Expressionist movement.

But Expressionism was only a phase in Kaiser's career, and his later plays, considered the products of his artistic maturity, are more intimate and embody a deep experience of love: *Oktobertag* (1928; *The Phantom Lover*, 1928), *Der Gärtner von Toulouse* (1938), *Alain und Elise* (1940), and others. In 1938, after the Nazis had banned his plays, Kaiser went into exile in Switzerland, where he continued his prolific output until his death. His last work was a mythological trilogy, *Zweimal Amphitryon, Pygmalion*, and *Bellerophon* (published 1948).

Kaiser, Henry J(ohn) (b. May 9, 1882, Sprout Brook, N.Y., U.S.—d. Aug. 24, 1967, Honolulu), U.S. industrialist and founder of more than 100 companies including Kaiser Aluminum, Kaiser Steel, and Kaiser Cement and Gypsum.

In 1913 Kaiser was working for a gravel and cement dealer in Washington when one of his clients, a Canadian road-building company, went out of business. He got a loan to take over the company's project and finished it with a profit. From 1913 to 1930, he built California dams, Mississippi levees, and highways, including 200 miles of road and 500 bridges in Cuba, while establishing sand and gravel plants to supply his own materials. Between 1931 and 1945, he helped organize combinations of construction companies to build the Hoover, Bonneville, and Grand Coulee dams, as well as other large projects. To supply 6,700,000 barrels of cement for the Shasta Dam, he erected a cement plant in Permanente, Calif., and a nine-mile conveyor belt across a mountain to the dam site in 1939.

During World War II he ran seven shipyards that used assembly-line production to build ships in as little as 4½ days. By the end of the war, his yards had produced 1,490 ships for the U.S. maritime commission. In 1941–42, he built the only integrated steel mill on the U.S. west coast, to make steel for his shipyards. He established Kaiser Gypsum in 1944. He bought up aluminum plants from Alcoa to supply his Kaiser-Frazer automobile business; but, because of an industry slump, Kaiser stopped making cars in 1953. By then Kaiser Aluminum & Chemical Corporation had become profitable. From 1954 to 1960, he directed construction of the Hawaiian Village resort centre, which was sold in 1961 to the Hilton chain for more than $21,000,000.

In 1942 Kaiser established the first health maintenance organization for his shipyard employees. A model for later federal programs, the Kaiser Foundation Medical Care Plan built 19 hospitals providing preventive health care for more than 1,000,000 people.

Kaiserin Augusta River (New Guinea): *see* Sepik River.

Kaiserslautern, city, Rhineland-Palatinate *Land* (state), southwestern Germany, between the Haardt Mountains (Pfälzer Wald) and the Saar-Nahe-Bergland (Nordpfälzer Bergland), surrounded by the Pfälzer Wald nature preserve. A royal residence existed there in the Carolingian period (after 751). The placename is derived from Lauter (a local stream) and from the emperor (kaiser) Frederick Barbarossa, who built a palace on the site in the 12th century. It became an imperial city in 1276 but fell under the rule of the electoral counts Palatine by 1375. The city was the focal point of the Palatinate democratic revolution in 1848–49. Several old buildings survive in spite of severe damage in World War II. The cultural heart of the western Palatinate, Kaiserslautern has a variety of schools and museums, in addition to a theatre and a concert hall. The university that is located in the city was founded in 1970 as part of the Trier–Kaiserslautern University joint campus. It became autonomous in 1975.

Kaiserslautern is an important banking and rail transshipment centre, manufacturing machines, textiles, and automobiles. Pop. (1989 est.) 96,990.

Kaishintō, English PROGRESSIVE PARTY, leading pre-World War I Japanese political party, founded in 1882 by the great democratic leader Ōkuma Shigenobu. It generally represented the urban elite of intellectuals, industrialists, and merchants. Its platform, like that of its main opponents, the Jiyūtō and the Rikken Seiyūkai, called for the establishment and (after 1890) the strengthening of a parliament elected by the richer classes to serve as a check on the power of the bureaucrats, who had been most influential with the emperor since the Meiji Restoration (1868).

In 1898 the Kaishintō was briefly merged with the Jiyūtō to form the Kenseitō (Constitutional Party), but this effort to unite the Diet against the bureaucrats fell prey to long-standing enmities among the politicians. During the following decade the Rikken Seiyūka (Friends of Constitutional Government), even more willing to give up policy-making powers to the bureaucrats in return for patronage, traded power back and forth with the Kaishintō. In 1916 the Kaishintō was replaced by the Kenseikai (Constitutional Association), which grew into the Minseitō (Democratic Party) in 1927.

Kaitaia, borough, northern North Island, New Zealand, 4½ miles (7 km) above the mouth of the Awanui River, on the North Auckland Peninsula. In 1833 W.G. Puckey of the Church Missionary Society established a station there. The settlement that grew up was made a town in 1922 and a borough in 1945. Kaitaia derives its name from a Maori word meaning "food destroyed by floods." It is a business and administrative centre for the dairy, sheep, and mushroom farms of the northernmost part of the island. It has road connections to Auckland (145 miles [233 km] southeast). Manufactures include agricultural machinery and engineering and concrete products; there are dairy plants, limeworks, and sawmills. Ninety Mile Beach is nearby. Pop. (1984 est.) 4,940.

Kaitangata, borough, southeastern South Island, New Zealand, 4 miles (6 km) above the mouth of the Matau, a branch of the Clutha River. First settled in 1855, it was linked to the main railway line at Stirling (4 miles north) in 1876. It became a town district in 1882 and a borough in 1887. The name Kaitangata, from the Maori for "man eater," refers to the ritual in which victors in battle consumed the bodies of defeated warriors.

Kaitangata is one of New Zealand's principal coaling sites. Its production in the only state-owned mines in operation shifted to subbituminous coal of lower quality in 1970. The borough, 45 miles (72 km) southwest of Dunedin, is the centre of a sheep and dairy farming district. Pop. (1984 est.) 1,080.

Kaithal, city, north-central Haryāna state, northwestern India. Said to have been founded by Yudhiṣṭhira, a Pāṇḍava king in the ancient epic poem the *Mahābhārata,* Kaithal was later a Muslim cultural centre. Of historical interest are the large bathing tank and tombs of several saints dating from the 13th century AD. An agricultural market centre, it was constituted a municipality in 1867. Industries include cotton ginning, saltpetre refining, and metalwork, pottery, and lacquered woodwork manufacture. Kaithal houses three colleges affiliated with Kurukshetra University. Pop. (1981) 58,385.

Kajanus, Robert (b. Dec. 2, 1856, Helsingfors [now Helsinki]—d. July 6, 1933, Helsinki), Finnish conductor and composer who championed Finnish national music.

Kajanus studied music in Helsinki, Leipzig, and Paris. In 1882 he founded the *Helsingfors Orkesterförening,* the first complete symphony orchestra in Finland; in 1914 it united with the state's symphony orchestra. He remained its conductor until 1932 and became known as the authoritative interpreter of the works of his friend Jean Sibelius. Kajanus also founded choral and orchestral schools. His compositions, influenced by the German Romantic composers and by Finnish folk music, include two symphonic works—*Kullervo* (1881) and *Aino* (1885), based on the *Kalevala*— and two Finnish rhapsodies for orchestra, in addition to a number of cantatas, piano works, and songs.

Kajikawa FAMILY (fl. 17th–early 19th centuries), Japanese lacquer ware artists whose school in Edo (now Tokyo) flourished for more than 200 years.

Kyūjirō (also called Kijirō) is generally acknowledged as the founder of the family and the inaugurator of its traditions. He excelled in the particularly delicate lacquer *inrō,* portable medicine cases composed of a nest of tiny boxes tightly fitted into one another and secured with a silk cord. Because so much artistic skill went into decorating the outside of the *inrō,* they were worn on the obi (a broad sash) by men of the upper classes and prized as collector's items. Kajikawa artists also designed lacquer netsuke—toggles carved in the shapes of animals, human figures, and plants, used to attach medicine boxes and tobacco and money pouches to men's sashes. Objects exemplifying the exquisite craftsmanship of the Kajikawa artists are in the Victoria and Albert Museum, London, and in the Charles A. Greenfield Collection, New York City.

kaka, New Zealand parrot species of the subfamily Nestorinae. *See* parrot.

Kakamega, town, southwestern Kenya, East Africa, located at an elevation of about 5,100 feet (1,550 m). The British developed Kakamega for defensive purposes in 1903, and by 1920 it had become the district headquarters. The discovery of gold in 1931 brought an influx of settlers and greatly increased the town's population. Industrial products include processed food, clothing, and footwear. Kakamega is linked by roads with Mumias and Kisumu. Pop. (1979) 32,025.

kakapo, also called OWL PARROT, New Zealand parrot species of the subfamily Strigopinae. *See* parrot.

Kakata, city, western Liberia, West Africa, on the road from Monrovia to Gbarnga. It is the site of Booker Washington Institute (1929; Liberia's first vocational and agricultural school), the Kakata Rural Teacher Training Institute, and several church secondary schools. Rubber production, diamond prospecting, and subsistence rice farming are important to Kakata's economy. Barite deposits are found in the nearby Gibi Ridge. Pop. (1974) 9,992.

kakelaar (bird): *see* wood hoopoe.

kakemono, in Japanese art, scroll painting intended to be hung on a wall. *See* scroll painting.

Kakiemon ware, Japanese porcelain made primarily during the Edo period (1603–1867; *i.e.,* the period of the Tokugawa shogunate) by the Sakaida family, who established kilns at Arita, near the port of Imari in the province of Hizen (Saga Prefecture). Typical dishes,



Kakiemon porcelain bowl decorated with overglaze colours, late 17th century, Edo period; in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston, Hoyt Collection

bowls, and vases have octagonal, hexagonal, or square shapes, perhaps because these shapes give less evidence of warping in the kiln than do circular ones. Wares were painted in a pale underglaze blue until the family learned the Chinese secret of using overglaze colours. Sakaida Kakiemon I perfected this overglaze technique at Arita in the Kan'ei era (1624–43). It was continued by his family, and, since many of them were also called Kakiemon, the style has become known by that name. Characteristic colours are iron red, light blue, bluish green, and yellow, and sometimes a little gilding. Themes from between about 1680 and 1720 are markedly asymmetrical, with much of the white porcelain left untouched. The most famous Kakiemon decorative device shows sprigs of foliage and little quails—called the quail pattern. This was exported to Europe by Dutch merchants and significantly influenced the early decorative styles of several European factories, including Chelsea, Bow, and Worcester in England; Meissen in Germany; and Chantilly in France. Designs known as the "Tiger and Wheatsheaf" and the "Hob in the Well" are also characteristic. European copies of Kakiemon porcelain were so abundant that they are much more familiar to the West than are the original Kakiemon wares, which are very scarce.

Kākināda, also called COCANADA, town, northeastern Andhra Pradesh state, southern India. Although a seaport, it is now little used because the anchorage is 5 to 6 miles (8 to 10 km) offshore. Because it is situated in a shifting deltaic region, the port has to be constantly dredged to keep the seabed at a uniform depth of 4 to 6 feet (1.2 to 1.8 m). Kākināda is an exporter of cotton, peanuts (groundnuts), sugar, and tobacco and has a flour-milling plant and an iron factory. A salt-evaporating plant was constructed in the 1970s. The town has colleges affiliated with Andhra University. Pop. (1981) 226,409.

Kakinomoto Hitomaro, also called KAKINOMOTO NO HITOMARO (d. 708, Japan), poet venerated by the Japanese since earliest times. He was also Japan's first great literary figure.

Among his surviving works are poems in the

two major Japanese poetic forms of his day—*tanka* and *chōka*. Probably he also wrote *sedōka* ("head-repeated poem," consisting of two



Kakinomoto Hitomaro, ink on paper, by Tosa Mitsunobu (1434–1525)

By courtesy of the International Society for Educational Information, Tokyo

three-line verses of 5, 7, 7 syllables), a relatively minor song form that seems to have been first adapted to literary purposes by Hitomaro and to have barely survived him. All of the poems accepted as indisputably his (61 *tanka* and 16 *chōka*), as well as a large number of others attributed to him, are to be found in the *Man'yō-shū*, the first and largest of Japan's anthologies of native poetry. These poems, together with notes by the compilers, are the chief source for information on his life, about which very little is known.

Hitomaro is believed to have been born and reared near Nara. He entered the service of the court in a minor capacity, serving successively two imperial princes; imperial activities are celebrated in some of his most famous poems. Later he became a provincial official, and he is believed to have died in Iwami Province (now Shimane Prefecture). He seems to have had at least two wives.

Standing on the threshold of Japan's emergence from a preliterate to literate, civilized society, Hitomaro achieved in his poems a splendid balance between the homely qualities of primitive song and the more sophisticated interests and literary techniques of a new age. He inherited the stiff techniques, plain imagery, and restricted range and subject matter—the traditional "word hoard"—of preliterate song. To that inheritance he added new subjects, modes, and concerns, as well as new rhetorical and other structural techniques (some of which may have been adapted from Chinese poetry), along with a new seriousness and importance of treatment and tone. Many of his longer poems are introduced by a kind of solemn "overture," relating the present with the divine past of the Japanese land and people.

All of Hitomaro's poems are suffused with a deep personal lyricism and with a broad humanity and sense of identity with his fellowman. Outstanding among his works are his poem on the ruined capital at Ōmi; his celebration of Prince Karu's journey to the plains of Aki; two poems each on the death of his first wife and on parting from his second; his lament on the death of Prince Takechi; and his poem composed on finding the body of a man on the island of Samine.

Kakogawa, city in Hyōgo Prefecture (*ken*), Honshu, Japan, in the lower valley of the Kako-gawa (Kako River). A prosperous river port during the Tokugawa era (1603–1867), it industrialized after the opening of the Sanyō Line (railway; 1888) and the Banshu Line (1913). The production of fertilizer and woollen textiles was supplemented after World War II with the establishment of iron, steel, machinery, spinning, and chemical plants. In the hilly area to the north, a large residential district has been developed. Kakogawa is part of the Harima Industrial Zone and is served by the outport of Befu in its southern sector. Pop. (1983 est.) 222,657.

Kakongo, Kingdom of, former African state, founded about the 15th century on the Atlantic coast between the kingdoms of Loango (north) and Ngoy (south). It extended from what is now central Cabinda eastward into Zaire. The main town was Malemba, a port that grew in importance after the 16th century as a centre for the export of slaves. After 1700 port facilities were expanded to handle increasing numbers of French, English, and Portuguese trading ships. The offices of "governor of the harbour" and "minister of trade and Europeans" rivalled the crown in prestige and authority. Slavery transformed the social and political structure: status came to depend on the number of slaves owned, and free non-nobles either fell into slavery or rose to the nobility. The increasingly strong nobles asserted their autonomy, reducing the king to a figurehead. After the 1830s they dropped any pretense of adhering to a unified state, and the Kakongo monarchy ceased to exist.

Kakure Kirishitan (Japanese: Hidden Christians), descendants of the first Japanese converts to Christianity who, driven underground by 1650, managed to maintain their faith in secret for more than two centuries. *See* Kirishitan.

Kakuyū (Japanese priest): *see* Toba Sōjō.

Kala (people): *see* Wa.

kala-azar, also called VISCERAL LEISHMANIASIS, DUM-DUM FEVER, TROPICAL SPLENOMEGALY, or SIRKARI DISEASE, endemic infectious disease, often with animal reservoirs, occurring in the Mediterranean area, Asia, Africa, and Latin America; it is caused by the protozoan *Leishmania donovani* and transmitted by the bites of sand flies (*Phlebotomus*). Visceral leishmaniasis in man is an insidious, chronic disease characterized by fever, reduction in the number of white blood cells, mild anemia, wasting, gross enlargement of the spleen, and derangement of amounts and kinds of serum proteins. Symptoms appear two or more months after infection and gradually become more intense; death occurs in one to two years in 95 percent of the untreated cases, often as a result of a secondary infection. Treatment with compounds of antimony or aromatic diamidines is usually effective. Amphotericin B may be used for patients who do not respond to these drugs. Control of the insect carriers is of great importance. *See also* Oriental sore.

Kalacuri DYNASTY, any of several dynasties in Indian history, disparately placed in time and space. Apart from the dynastic name and perhaps a belief in common ancestry, there is little in known sources to connect them.

The earliest known Kalacuri family (*c.* AD 550–620) ruled in northern Mahārāshtra, Gujarāt, Mālwa (Mālava), and parts of the western Deccan and probably had their capital at Māhiṣmatī in the Narmada Valley. Three members of the family—Kṛṣṇarāja, Śaṅkaragaṇa, and Buddharāja—are known from epigraphs and coins distributed over a wide area. Although the rise of the Bādāmi Cālukyas (Chalukyas) ended Kalacuri power in the early 7th century, the dynasty seems to have lingered in the Mālwa region until a late date.

Another Kalacuri dynasty rose to power in the Deccan and spanned the period 1156–81. This family traced its origin to Kṛṣṇa, conqueror of Kālañjara and Ḍāhala in Madhya Pradesh, but its authority in Karnātaka was established by Bijjala, who originally served as a feudatory of the Kalyāṇī Cālukyas at Banavāsī, Nolambapāḍi, and Tārddevāḍi and wrested power from Cālukya Taila III. The Kalacuris held power in Karnātaka during the reigns of Bijjala's sons Someśvara and Saṅkama, but after 1181 Āhavamalla and Singhana, two other sons of Bijjala, gradually surrendered authority back to the Cālukyas. Despite its brevity, the Kalacuri period in Karnātaka is historically important because it coincides with the rise of the Liṅgāyat or Vīraśaiva Hindu sect.

Central India. The best known Kalacuri family in Indian history ruled in central India, with its base at the ancient city of Tripurī (modern Tewar). Its origin is placed around the beginning of the 8th century, but little is known of its early history. The line comes into clearer focus only with Kokalla I (reigned *c.* 850–885). The period between Kokalla I and Kokalla II (reigned *c.* 990–1015) is marked by a consolidation of Kalacuri power and by their relations with contemporary dynasties. The success attributed to Kokalla I against the Pratihāras, the Kalacuris of Uttar Pradesh, the Guhilas of Mārwār, the Cāhamānas of Śākambharī, and the kings of Vaṅga and Konkan appears somewhat exaggerated. Matrimonial relations with the powerful Rāṣṭrakūṭa family of the Deccan remained uninterrupted for some time, and the Kalacuris were at times involved in Rāṣṭrakūṭa politics, as in the period of Yuvarāja I (reigned *c.* 915–945). Between the mid-9th and the early 11th centuries the Kalacuris pursued a policy of traditional hostility toward the kingdoms of south Kosala, Kaliṅga, Gauḍa, and Vaṅga; occasional clashes with the Gurjaras, the Chandelās, (Cāndellās) the eastern Cālukyas, the Gujarāt Caulukyas, and others are mentioned in their records.

These military exploits, however, did not produce any substantial results until the period of Gāṅgeyadeva (reigned *c.* 1015–41), who, besides achieving success against the traditional rivals, Dakṣiṇakośala and Orissa, pushed northward to acquire the Vārānasi area at the expense of the Pālas; he also had substantial success against the Kalyāṇī Cālukyas. The reign of Gāṅgeyadeva's son Karṇa (reigned 1041–73) represents a high point in contemporary military adventurism. He consolidated his power in the Vārānasi-Allāhābād area and undertook large-scale military campaigns in eastern, southern, central, and western India. His successes were short-lived, however, and Kalacuri power declined steadily in the period between Yaśaḥkarṇa (reigned 1073–1123) and Vijayasiṃha (reigned *c.* 1188–1209). The neighbouring Gāhaḍavālas, Paramāras, and Chandelās started encroaching on the Kalacuri kingdom, and soon after 1211 Baghelkhand and almost all Ḍāhalamaṇḍala were incorporated into the Chandelā kingdom.

Two other Kalacuri families are known to history: the Kalacuris of Sarayūpāra and the Kalacuris of Ratanpur. The Sarayūpāra family ruled on the banks of the Sarayū (modern Ghāghara) River, in the Bahraich and Gonda districts, Uttar Pradesh. The family originated in the late 8th century and lasted until the last quarter of the 11th century, when its kingdom extended from the Ghāghara River to the Gandak River and included the Bahraich, Gonda, Bastī, and Gorakhpur districts.

The Ratanpur Kalacuris, who first ruled from Tummāna (Bilāspur district) and later from Ratanapura (16 miles [26 kilometres] north of Bilāspur), were distantly related to, and feudatories of, the Tripurī Kalacuris. Beginning to rule in the early 11th century, they gained prominence under Jājalladeva I in the early 12th century. Early historical documents of their rule continue to Pratāpamalla (reigned *c.* 1188–1217) and are then interrupted until the 15th century, by which time the family had split into two branches—Ratanpur and Raipur. No authentic historical document relating to their history after the 15th century is known.

Kalāhāndi, district, southwestern Orissa state, eastern India, 4,570 sq mi (11,835 sq km) in area. Part of the district is a fertile plain, and the rest is generally hilly land crossed by the Eastern Ghāts ranges. The Indrāvati and Tel rivers provide irrigation for the cultivation of rice, wheat, and other crops. Timber, bamboo, and sal come from the forests; there are great unexploited mineral resources. Belkhāndi and Gudahāndi have archaeological sites, while Bhawānipatna, the district headquarters, contains an old palace and a science college. Pop. (1981) 1,339,192.

Kalahari, a basin-shaped, largely sand-covered desert region in southern Africa, bounded by the headwaters of the Zambezi River to the north, the plateaus of the Transvaal and Zimbabwe to the east, the Orange River to the south, and the highlands of South West Africa/Namibia to the west. The following article summarizes information about the Kalahari; for full details, *see* MACROPAEDIA: Africa.

"Desert" overstates the aridity of the Kalahari, which is more aptly described as a thirstland; there is no permanent surface water in this sandy but well-vegetated region, with the exception of the Boteti River and related drainages. The Boteti system is fed by a seasonal overflow from the inland deltaic Okavango Swamps. Sands of both eolian (wind) and fluviatile (river) origin mantle more than 90 percent of the region. The only landforms rising above the relatively uniform surface of the Kalahari, lying 3,000 to 3,600 ft (900 to 1,100 m) above sea level, are occasional residuals of older rocks that form hills in the southeast, southwest, and northwest. A major feature in the northeastern Kalahari is the Makgadikgadi (formerly Makarikari) depression, consisting of two extensive bare pan areas floored by alkaline sandy clays. Barchan dunes (crescent-shaped dunes, with the convex side facing the wind) on the Ntwetwe Pan in the western Makgadikgadi region are the only naturally formed sand dunes in the area. South of the Boteti River, fossil river valleys form striking topographical features. These ancient drainage lines have pronounced valleys in their middle portions, but normally degenerate into strings of shallow, grass-covered pans and flats farther into the Kalahari. The climate is of the low latitude, hot steppe type, characterized by marked differences in seasonal temperatures and by large diurnal temperature ranges. Precipitation is local and erratic and in winter, freezing nights are common.

The Kalahari possesses a well-developed cover of trees, low scrub, and tussocky grasses. Close to the ground, seasonal annuals, tuberous and bulbous plants, creepers, and vines are found. Animal life is varied and many species such as springbok, wildebeest (gnu), hartebeest, gemsbok (oryx), eland, giraffe, zebra, and elephant exist despite the absence of surface water. The main inhabitants of the sparsely populated Kalahari are Bantu-speaking Africans, a large minority of Bushmen, and a few Europeans. The Kalahari is served by infrequent roads and tracks, most passable only by trucks and four wheel-drive vehicles; maintained roads connect administrative centres and major habitations. Area more than 100,000 sq mi (260,000 sq km).

Kalahari Gemsbok National Park, national park in the Kalahari desert, extreme northern Cape Province, South Africa, between South West Africa/Namibia and Botswana, adjoining the Gemsbok National Park of Botswana. It was established in 1931 and has an area of 3,730 sq mi (9,660 sq km), with an additional 3,700 sq mi (administered by the same South African staff) in Botswana. The South African section lies mainly between the usually dry beds of the Auob and Nossob rivers. The park consists largely of reddish dunes, with species of acacia growing in the river beds. Quick grass, gemsbok cucumber, and such shrubs as driedoring and raisinbush provide forage for large herds of gemsbok (or oryx), wildebeest, springbok, and some red hartebeest. Among other wildlife are lions, the smaller cats such as caracals and servals, wild dogs, black-backed jackals, ostriches, and numerous other birds. The portion of the area in Botswana was established in 1932 to facilitate protection of migratory animal populations which cross the border between the two countries.

Kālakācāryakathā ("The Story of the Teacher Kālaka"), a noncanonical work of the Śvetāmbara sect of Jainism, a religion of India. The Kālaka (or Kālakācārya) cycle of legends began to appear from about the 12th century AD or earlier, and versions have been recorded in Sanskrit, Prākrit, Apabhraṃśa, Gujarati, and other languages. Many of the manuscripts have been illustrated, so that they have become a repository of the western Indian style of miniature paintings from the 12th to the 16th century.

Four separate episodes of Kālaka's career are generally treated in the many versions: his overthrow with the help of the Śakas of the wicked king Gandabhilla of Ujjayinī (modern Ujjain), who had abducted Kālaka's sister, the nun Sarasvatī; the advancing by one night of the date of the Paryuṣaṇa festival; Kālaka's reproof to the conceited monk Sāgaracandra, his disciple's disciple; Kālaka's exposition of the *nigoda* doctrine before Śakra (Indra), the king of the gods. It was long suspected that there may have been three separate teachers known as Kālaka behind these legends, but recent research shows that there was indeed a single Kālaka, a historical figure who composed several texts and who lived in at least a few decades before 57 BC. He is now identified with Ārya Śyāma.

Kalakaua, in full DAVID KALAKAUA (b. Nov. 16, 1836, Honolulu—d. Jan 30, 1891, San Francisco), king of Hawaii from 1874 to 1891.

The son of a high chief, he was a candidate to the throne in 1873 but lost the election to Lunalilo. When Lunalilo died the following year, the legislature then elected Kalakaua, who inaugurated a decidedly reactionary and pro-American reign. In 1874 he visited the United States, and in 1881 he took a trip around the world. Although he secured a somewhat favourable reciprocity treaty with the United States in 1876, he yielded in 1887 to demands to give the U.S. the exclusive right to enter Pearl Harbor and maintain a naval coaling and repair station there.

There was an ever-increasing endeavour by King Kalakaua to restore the ancient order with its customs and ideas of absolutism and divine right, but it was accompanied by extravagance, corruption, personal interference in politics, and fomentation of race feeling, until he was compelled to promulgate (1887) a new constitution providing for responsible ministerial government and other guarantees. The struggle continued, however, not only until the end of his reign (1891), during which there was an armed insurrection (1889) by the opposition, but even more hotly during the subsequent reign of his sister, Liliuokalani. Indeed, Kalakaua died on a visit to the United States, amid rumours that he was about to sell his kingdom.

Kalakh (ancient Assyrian city): *see* Calah.

kalām, in Islām, speculative theology. The term is derived from the phrase *kalām Allāh* (Arabic: "word of God"), which refers to the Qur'ān, the sacred scripture of Islām; those who practice *kalām* are known as *mutakallimūn*.

In its early stage, *kalām* was merely a defense of Islām against Christians, Manichaeans, and believers in other religions. As interest in philosophy grew among Muslim thinkers, *kalām* adopted the dialectic (methodology) of the Greek skeptics and the Stoics, and directed these against the Islāmic philosophers who attempted to fit Aristotle and Plato into a Muslim context.

Several schools of *kalām* developed. The most significant was the Mu'tazilah, often described as the rationalists of Islām, who appeared in the 8th century. They believed in the autonomy of reason with regard to revelation and in the supremacy of reasoned (*'aqlī*) faith against traditional (*naqlī*) faith. The Mu'tazilah championed the freedom of the human will, holding that it was against divine justice either to punish a good man or pardon an unrighteous one. The Ash'arīyah, a 10th-century school of *kalām*, was a mediation between the rationalization of the Mu'tazilah and the anthropomorphism of the traditionalists and represented the successful adaptation of Hellenistic philosophical reasoning to Muslim orthodox theology. They too affirmed the freedom of the human will, but denied its efficacy. Closely resembling, but more liberal than the Ash'arīyah, was the al-Māturīdīyah (also 10th-century).

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Kalámai, also spelled KALAMÁTA, industrial city and port of the southern Peloponnese and capital of the *nomós* (department) of Messenia, Greece, on the Nédhon Potamós (river) at the head of the Messiniakós Kólpos (gulf). After Pátrai, it is the principal outlet for exports from the Peloponnese, a port of call for small passenger ships, and the seat of the metropolitan bishop of Messenia. The city long has produced silk cloth, flour, liquor, and tobacco. The principal market for high-quality olives, currants, and other fruit crops of the Messenian plain, it is served by an airport and has rail links to Pátrai and Athens.

A Byzantine centre in the 10th century, it became in 1208, after the Fourth Crusade, a fief of the Villehardouin family, whose castle stands on a hill behind the town. The Venetians first occupied it during the first Turko-Venetian war (1463–79) and again in 1685; in 1770 and in 1821 it was the headquarters for revolutionaries in the Peloponnese. In 1825 it was sacked by Muslims. Kalámai was a major evacuation point for British forces in Greece in 1941. Pop. (1981) 42,075.

Kalamáta, Gulf of (Greece): *see* Messenia, Gulf of.

kalamatianos, a Greek chain dance, a form of the *syrtos* (*q.v.*).

Kalamazoo, city, seat (1830) of Kalamazoo County, southwestern Michigan, U.S., on the Kalamazoo River, 50 mi (80 km) south of Grand Rapids. A fur-trading post, known as Kee-Kalamazoo (Indian: "boiling water,") probably in reference to the rapids on the river), was already established at the site where Titus Bronson built a cabin in 1829. The settlement, first known as Bronson, was renamed in 1836. The presence of a government land office and the arrival of the Michigan Central Railroad (1846) encouraged growth. In the 1850s Dutch farmers made it famous for celery. The paper industry, dominant since 1874, has been augmented by diversified manufactures, including pharmaceuticals, transportation equipment, and metal products. Kalamazoo College (1833), Western Michigan University (1903), Nazareth College (1924), and Kalamazoo Valley Community College (1966) are located there. Kalamazoo Nature Center includes nature trails, a barnyard, and a restored pioneer homestead. Inc. village, 1843; city, 1883. Pop. (1980) 79,722.

Kalambo Falls, waterfall, the second highest uninterrupted fall in Africa (after Tugela Falls, South Africa), located on the Kalambo River near the southeastern shore of Lake Tanganyika on the Tanzania–Zambia border, East Africa. The 704-ft (215-m) drop in the falls is only part of a 3,000-ft descent along a 6-mi (10-km) section of the Kalambo River. In the abyss is the breeding ground of the rare, giant marabou stork. Primitive tools have been excavated from Kalambo Gorge and dated by radiocarbon from 300,000 BC.

Kālāmukha (Hindu ascetic): *see* Kāpālika and Kālāmukha.

Kalan (Turkey): *see* Tunceli.

Kalanchoe, genus of succulent plants, of the stonecrop family (Crassulaceae), popular for their easy culture indoors. The genera *Bryophyllum* and *Kitchingia* are usually subsumed under *Kalanchoe.*

Many are called simply kalanchoe, but the most common species, valued for their unusual foliage, include the panda plant (*K. tomentosa*); penwiper plant (*K. marmorata*); air plant or maternity plant (*K. pinnata*); velvet leaf, or felt bush (*K. beharensis*); devil's backbone (*K. daigremontiana*); and South American air plant (*K. fedtschenkoi*). A range of attractive pot plants, distinguished by their colourful flowers, have been derived from *K. blossfeldiana*; they are marketed widely in the winter for their flowers, which may remain fresh for as long as eight weeks.

As succulents, kalanchoes are relatively care-free houseplants, requiring considerable direct sunlight—though they will survive bright indirect light—and watering only when thoroughly dry. All species can be propagated readily from leaf or stem cuttings.

Kalantiyaw, Code of, one of the few written documents to survive from the pre-Spanish Philippine culture. The penal code was apparently written in 1433 and discovered on the island of Panay in 1614.

Eighteen orders decreed the proper punishment to be administered for certain moral and social transgressions. Depending on the gravity of the offense, punishment ranged from a light fine to being cut to pieces and thrown to crocodiles. Many of the offenses specified—such as cutting sacred trees, singing during night walks, and killing white monkeys—shed light on the ancient Filipino religious beliefs.

Kalashnikov Model 1947 (Soviet rifle): *see* AK-47.

Kalasin, town and *changwat* (province) in the Northeastern region of Thailand on the Khorat Plateau. Kalasin town, the provincial capital, is on the east bank of the Khlong Lam Bao (Bao River) on a major road from Khon Kaen to Sakon Nakhon. The province occupies an area of 2,682 sq mi (6,947 sq km) and is drained by the Khlong Lam Bao and the Huai Yang (Yang River). Livestock and watermelons are significant products. Rice is grown in the river valleys. Pop. (1980) town, 19,710; province, 722,581.

Kalāt, town, district, and division of Baluchistan Province, Pakistan. The town, known locally as Kalāt-e Baluch to distinguish it from Kalāt-e Ghilzai (Qalāt-e Ghelzā'ī) in Afghanistan, and Kalāt-e Sewa after its legendary founder, occupies a spur of the Shas-i Mardan Hill at the western end of Kalāt Valley. A small retail-market centre, it is connected by roads with Quetta, Pasni, and Karāchi. The old town, within the Mīrī (citadel), containing the palace of the *khāns* of Kalāt, was partially destroyed by a 1935 earthquake. It was then moved to its present site.

Captured by the Mirwārīs in the 15th century, it remained the capital of the Mirwārī Aḥmadzai *khāns* (originally from Oman in southeast Arabia) until British occupation in 1839. With the arrival of a British political agent, possession was returned in 1842 to the *khān.*

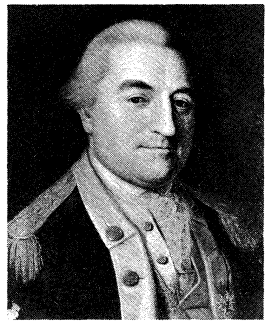
Kalāt District (area about 7,000 sq mi [18,000 sq km]), constituted in 1955, is mostly mountainous, with ranges intersected by long narrow valleys. Some, such as Mastung Valley are fertile, irrigated through river flooding, *kārez* (underground water channels), and springs. Kalāt has moderate summers and cold snowy winters; precipitation is adequate. Wheat, barley, melons, *jowār* (sorghum), and various fruits are grown. Minerals worked include coal (near Spezand), iron ore, and sulfur. Pile carpets, embroidery, leather goods, and palm bags and mats are local products. Population is sparse, the Brahui and Baluchi peoples being the predominant ethnic groups. A former princely state, Kalāt reached its zenith in the 18th century under the Aḥmadzai *khāns*, although subject to the suzerainty of Delhi or Qandahār. During the 19th and 20th centuries, the area governed by the *khāns* was progressively reduced. The state acceded to Pakistan in 1948.

Kalāt Division (area 72,944 sq mi) comprises Kalāt, Khuzdār, Las Bela, and Khārān districts. The Nindowari excavations in Jhalawān (Khuzdār District), just west of the Kūd River, have revealed settlements of the Kulli culture, contemporaneous with the Indus Valley civilization (*c.* 2500–1500 BC). Pop. (1981 prelim.) town, 11,000; district, 333,000; division, 1,020,000.

Kalaupapa, also called MAKANALUA, peninsula on the northern shore of Molokai Island, Hawaii, U.S. Occupying a 10-sq-mi (26-sq-km) plateau, unsuited to agriculture, it is isolated from the rest of the island by 2,000-ft (600-m) cliffs. Kalawao village, on the peninsula's east side, is now abandoned but was the site of the original Hansen's disease (leprosy) settlement established by King Kamehameha V in 1866. There from 1873 to 1889 Father Damien, the Belgian missionary, administered to the physical and spiritual needs of the lepers; his example drew many helpers to the colony. The entire peninsula is now occupied by the state leprosarium. Kalaupapa (meaning "flat plain") is administered by the State Department of Health. The district is called Kalawao County but has no formal government and is represented in the state legislature as part of Maui County.

Kalb, Johann, byname BARON DE KALB (b. June 29, 1721, Hüttendorf, Ger.—d. Aug. 19, 1780, Camden, S.C., U.S.), prominent German officer who fought for the Continental Army in the U.S. War of Independence (1775–83).

Kalb received his first military training in 1743 as a lieutenant in a German regiment of the French infantry. After a number of years of outstanding service, he was asked, in 1768, by the Duc de Choiseul, head of the French Foreign Ministry, to undertake a secret visit to the 13 British colonies in North America to ascertain their attitude toward the mother country. His four-month investigation resulted in a number of detailed and astute reports. Eager to return to the New World after going back to Europe, Kalb in 1776 secured a promise of a commission in the Continental Army from Silas Deane, American commissioner to France. He reached Philadelphia in July 1777 and was eventually appointed a major general by the Continental Congress. He became a strong admirer of Gen. George Washington and served with him through the trying winter at Valley Forge, Pa. As second in command to the Marquis de Lafayette, he participated in an abortive expedition against Canada (1778).



Kalb, portrait replica by Charles Willson Peale, 1781–82; in Independence National Historical Park, Philadelphia

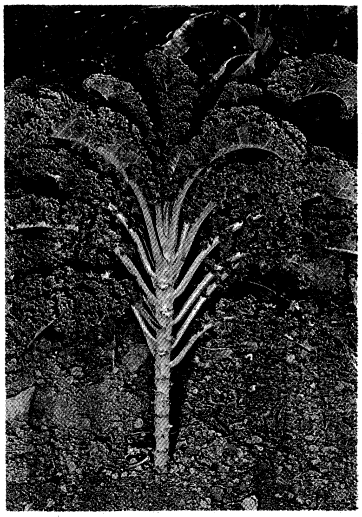
By courtesy of the Independence National Historical Park Collection, Philadelphia

In April 1780 Kalb was ordered from Morristown, N.J., to the relief of Charleston, S.C., but the city fell to the British while he was marching south. At Deep River, N.C., he was joined in July by Gen. Horatio Gates, commander of the southern department. Kalb urged an immediate attack, but Gates waited until the British forces knew of his presence and then on August 14 marched against them at Camden. The British drove Gates from the field, but Kalb remained in the battle and died five days later from wounds received there.

Kalb, Nahr al-, Latin LYCUS, river, west central Lebanon, flowing westward and emptying into the Mediterranean Sea north of Beirut. Apart from a small section near the coast the river is seasonal; in summer its only source is a spring at the Maghārat (cave) J'ītā. The Nahr al-Kalb (River of the Dog) is about 19 mi (30 km) in length and is located in Jabal Lubnān *muḥāfaẓah* (governorate). The ravine through which it flows was inhabited as early as Paleolithic times. Inscriptions commissioned by Nebuchadrezzar II (*c.* 630–562 BC), king of the Chaldean (Neo-Babylonian) Empire, are found on the right bank of the river. Other historical inscriptions, also commemorating the victories of their authors, were carved on stelae on the left bank of the river. These include inscriptions made for Ramses II the Great (1290–1224 BC), in hieroglyphics; King Esarhaddon (680–669 BC), in Assyrian; Emperor Marcus Aurelius (AD 211–217), in Latin; and az-Zahir Sayf ad-Din Barquq (1382–1399), in Arabic. There are also commentaries in French and English on affairs of the region as recent as 1946. Agriculture along the river consists of citrus fruit and bananas grown on the coastal plain; grapes, olives, and grains raised on the highland slopes; and figs, vegetables, and grains cultivated in the higher part of the river valley. The major town along the river is Biskintā.

Kaldu (ancient Mesopotamian city): *see* Chaldea.

kale, loose-leafed, edible plant (*Brassica oleracea* variety *acephala*), derived from the cabbage (*q.v.*) of the mustard family (Brassicaceae) and including several forms. Common, or Scotch, and Buda kale are among the hardiest of vegetable crops. The plant produces a strong-growing rosette of long-petioled, elongated leaves with wavy to frilled margins. In a long growing season the main stem reaches a height of 60 centimetres (24 inches) or more. In the United States the plant is usually harvested by cutting off the entire rosette before the stem has elongated, but in Great Britain and in Europe the individual lower leaves are usually removed progressively as the main stem elongates. Kale is grown mainly for autumn and winter harvest, because cold improves its eating quality and its hardiness permits harvest of fresh greens after most fresh vegetables have become unavailable. It



Kale (*Brassica oleracea* variety *acephala*)
G.R. Roberts

is usually served as a cooked vegetable and is a good source of vitamin A. The leaves of fresh kale should be unwilted and dark bluish green in colour.

Kaledin, Aleksey Maksimovich (b. Oct. 24 [Oct. 12, Old Style], 1861, Ust-Khopyorskaya, Russia—d. Feb. 11 [Jan. 29], 1918, Novocherkassk, Russian S.F.S.R., U.S.S.R.), Russian Imperial Army officer and Cossack leader who was one of the first to organize military resistance against the Bolsheviks after their accession to power in Russia (October 1917, Old Style).

The son of a Don Cossack officer, Kaledin became a professional soldier and served in World War I as commander of a cavalry division operating in Galicia, then as commander of the 8th Army, which waged an offensive at Lutsk (in the Ukraine) in 1916. He opposed the military reforms instituted by the Russian provisional government that replaced the tsarist regime (February 1917, Old Style), however, and he was forced to resign from the army (May 1917). He then returned to the Don region, where, after displaying sympathy for the Cossack movement for local autonomy, he was elected the Don Cossacks' hetman (governor) on June 8 (May 26, Old Style), 1917.

After the Bolsheviks seized control of the Russian government, the Don territory became virtually independent and was used as a refuge by conservative and liberal politicians and military officers who were fleeing from the revolutionary centres of Petrograd (now Leningrad) and Moscow. Kaledin not only welcomed the refugees but also allowed them to organize the anti-Bolshevik Volunteer Army in his territory. He himself had organized new Cossack military detachments and included representatives of the underprivileged, non-Cossack population in his government to broaden his base of political support; he also had the military support of the Volunteer Army. But when, in December 1917, the Bolsheviks dispatched an army to destroy Kaledin's centre of opposition, he lacked the critical support of many regular Cossack regiments and the industrial workers.

Forced to abandon Taganrog (late January 1918) and threatened with the loss of the Don part of Rostov after several military defeats, he resigned and shot himself.

kaleidoscope, optical device consisting of mirrors that reflect images of bits of coloured glass in a symmetrical geometric design through a viewer. The design may be changed endlessly by rotating the section containing the loose fragments. The name is derived from the Greek words *kalos* ("beautiful"), *eidos* ("form"), and *skopeïn* ("to view").

The kaleidoscope was invented by Sir David Brewster about 1816 and patented in 1817. Sold usually as a toy, the kaleidoscope also has value for the pattern designer.

The kaleidoscope illustrates the image-forming properties of combined, inclined mirrors. If an object is placed between two mirrors inclined at right angles, an image is formed in each mirror. Each of these mirror images is in turn reflected in the other mirror, forming the appearance of four symmetrically placed objects. If the mirrors are inclined at 60°, a hexagonally symmetrical pattern results from one object producing six regularly placed images.

A simple kaleidoscope consists of two thin, wedge-shaped mirror strips touching along a common edge or of a single sheet of bright aluminum bent to an angle of 60° or 45°. The mirrors are enclosed in a tube with a viewing eyehole at one end. At the other end is a thin, flat box that can be rotated; it is made from two glass disks, the outer one ground to act as a diffusing screen. In this box are pieces of coloured glass, tinsel, or beads. When the box is turned or tapped, the objects inside tumble into an arbitrary grouping, and when the diffusing screen is illuminated, the sixfold or eightfold multiplication creates a striking symmetrical pattern. The number of combinations and patterns is effectively without limit.

Some kaleidoscopes dispense with the object box and use a lens to throw images of distant objects on the mirrors, an eyepiece at the viewing eyehole then being an advantage.

Kalējs (Baltic deity): *see* Kalvis.

Kalemie, also spelled KALEMI, also called LUKUGA, formerly (1915–66) ALBERTVILLE, town, southeastern Zaire, central Africa. It is a port on the west bank of Lake Tanganyika where the Lukuga River exits, and it has an airport and rail links to Lubumbashi and Kananga. In 1915 Kalemie, then the site of a British–Belgian military base, was chosen as the terminus of the Chemin de Fer des Grands Lacs (Great Lakes Railway), and the name Albertville was transferred to the town from a nearby abandoned settlement. Kalemie's harbour handles most of Zaire's imports coming from Dar es-Salaam (Tanzania), on the Indian Ocean, to Lubumbashi. There is some commercial fishing in addition to the manufacture of textiles and cement. The Bendera hydroelectric centre is nearby. Pop. (1984 prelim.) 70,694.

Kalenjin, member of the Nandi (*q.v.*), Kipsikis, Suk (Pokot), Tatoga, and other related peoples of west central Kenya, northern Tanzania, and Uganda who speak Eastern Sudanic languages (also called Kalenjin) of the Chari-Nile branch of the Nilo-Saharan family. The name Kalenjin, which means "I tell you," was adopted in the 1940s. They depend for their subsistence primarily on agriculture. The Kalenjin peoples expanded into the Rift Valley about AD 1500. During the 18th century, a Masai expansion pushed them into the area between the Rift Valley and Lake Victoria, where they live today.

Kalevala, Finnish national epic compiled from old Finnish ballads, lyrical songs, and incantations that were a part of Finnish oral tradition.

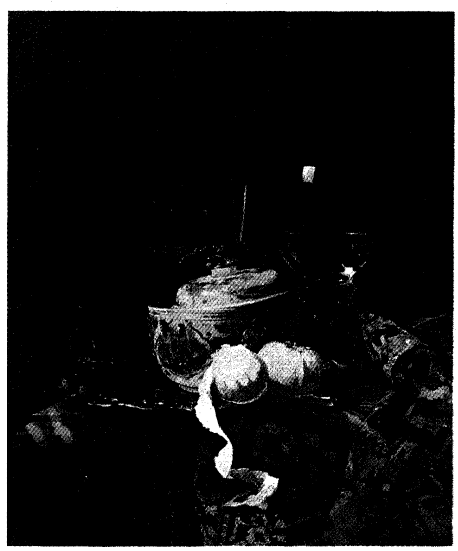
The *Kalevala* was compiled by Elias Lönnrot, who published the folk material in two editions (32 cantos, 1835; enlarged into 50 cantos, 1849). Kalevala, the dwelling place of the poem's chief characters, is a poetic name for Finland, meaning "land of heroes." The leader of the "sons of Kaleva" is the old and wise Väinämöinen, a powerful seer with supernatural origins, who is a master of the kantele, the Finnish harplike stringed instrument. Other characters include the skilled smith Ilmarinen, one of those who forged the "lids of heaven" when the world was created; Lemminkäinen, the carefree adventurer-warrior and charmer of women; Louhi, the female ruler of Pohjola, a powerful land in the north; and the tragic hero Kullervo, who is forced by fate to be a slave from childhood.

Among the main dramas of the poem are the creation of the world and the adventurous journeys of Väinämöinen, Ilmarinen, and Lemminkäinen to Pohjola to woo the beautiful daughter of Louhi, during which the miraculous *sampo,* a mill that produces salt, meal, and gold and is a talisman of happiness and prosperity, is forged and recovered for the people of Kalevala. Although the *Kalevala* depicts the conditions and ideas of the pre-Christian period, the last canto seems to predict the decline of paganism: the maid Marjatta gives birth to a son who is baptized king of Karelia, and the pagan Väinämöinen makes way for him, departing from Finland without his kantele and songs.

The *Kalevala* is written in unrhymed octosyllabic trochees and dactyls (the *Kalevala* metre) and its style is characterized by alliteration, parallelism, and repetition. Besides fostering the Finnish national spirit, the poem has been translated into at least 20 languages; it has inspired many outstanding works of art, *e.g.,* the paintings of Akseli Gallén-Kallela and the musical compositions of Jean Sibelius. The epic style and metre of the poem *The Song of Hiawatha* by Henry Wadsworth Longfellow also reflect the influence of the *Kalevala.*

Kalf, Willem, Kalf also spelled KALFF (b. Nov. 3, 1619, Rotterdam—d. July 31, 1693, Amsterdam), one of the best known Dutch painters of still-life compositions.

Kalf was a student of Hendrik Pot, a painter of historical subjects, and probably also of the painter Cornelis Saftleven. His choice of still lifes as subject matter dates to a stay



"Still Life with a Chinese Tureen," painting by Willem Kalf; in the Staatliche Museen Preussischer Kulturbesitz, Berlin
By courtesy of the Staatliche Museen der Siftung Preussischer Kulturbesitz, Berlin

in Paris (1642–46). His early works depict kitchen interiors with such elements as gourds and pots and pans strewn on the floor. These early paintings are much different in character from his later, luxurious compositions featuring such expensive and extraordinary objects as goblets, pewter, Venetian glass, and Chinese porcelain atop a marble or tapestry-covered table. Though his still lifes followed an established formula, Kalf greatly enriched the genre with his use of simple composi-

tion, dark background, and acutely perceived highlights. In restraint and richness of texture, Kalf's still lifes were seldom, if ever, matched.

The wealthy inhabitants of Amsterdam found Kalf's work irresistable. His banquet pieces and lavish representations of fine objects were in great demand. Paintings such as "Still Life with a Nautilus Cup" (*c.* 1660; Thyssen Collection, Lugano, Switz.) and "Still Life with a Silver Decanter and Fruit" (Rijksmuseum, Amsterdam) reveal the tastes of the wealthy Dutch in the mid-17th century.

Kalgan, Wade–Giles romanization CHANG-CHIA-K'OU, Pinyin ZHANGJIAKOU, formerly (1911–29) WAN-CH'ÜAN, city in northwestern Hopeh Province, China. Kalgan, the name by which the city is most commonly known, is a Mongolian word meaning "gate in a barrier," or "frontier." The city was colloquially known in Chinese as the Tung-k'ou (Eastern Entry) into China from Inner Mongolia. It is about 100 miles (160 km) northwest of Peking.

Kalgan was the point at which the main caravan route from Peking to Inner Mongolia and beyond passed through the Great Wall of China at the foot of the escarpments reaching up to the lower Mongolian Plateau. The Han dynasty (206 BC–AD 220) had a county there, Kuang-ning County, the seat of which was slightly east of Kalgan, but the area remained only on the margins of effective Chinese control. Later it became an important centre of the Hsien-pei, Mongol invaders of the 4th century. In 1429 the Ming dynasty (1368–1644) constructed a fort—the present Hsia Pao (Lower Fort)—as part of the defenses against the Mongols. In 1613 the present Lai-yüan Pao (Upper Fort) was built north of it as a trading centre. The town of Kalgan then grew up on the west bank of the Ch'ing-shui River, a tributary of the Yung-ting River, between the forts. The main trading centre was K'ou-wai, outside the north gate of the Upper Fort.

Administratively, in Ch'ing times (1644–1911/12), Kalgan was subordinated to Hsüan-hua, about 17 miles south. It was the seat of a civil prefect and also of the military governor of the Mongols of Chahar, a former province of what is now Inner Mongolia.

Kalgan's importance, however, was always primarily commercial—as the terminus of the principal caravan route to Mongolia and Russia, bearing most of the vast Siberian tea trade. In 1860, under the Sino-Russian Treaty, it was opened to Russian trade and in 1902 to international trade. In 1911 the railway from Peking reached Kalgan and was then steadily extended to the northwest. This was, however, the zenith of Kalgan's international trade, when the city contained some 7,000 commercial firms and when the caravan traffic employed hundreds of thousands of camels, great numbers of ox wagons, and many thousands of men. After 1920 trade slumped because the Russian Revolution of 1917, and political changes in Outer Mongolia had drastically reduced the importance of the caravan traffic. Civil disorder and banditry were rampant in the area north and west of Kalgan, while the extension of the railway to Hohhot in Inner Mongolia meant that Kalgan itself was no longer a railhead.

Although the traditional commercial dominance of Kalgan was diminished, it remained a political and strategic centre. After the foundation of the republic in 1911, it was given the name of Wan-ch'üan County. In 1929 Kalgan was made the administrative capital of a new Chahar Province, which accelerated the colonization of the area by Chinese settlers. By the early 1930s Chinese settlers had pushed 75 miles beyond Kalgan, causing great damage to the environment by destroying the natural pasture and bringing about extensive soil erosion.

In 1937 the Japanese occupied the area and established an autonomous government, Chanan (South Chahar), at Kalgan. In 1937 the Federated Mengchiang Commission was set up at Kalgan to supervise the economic affairs, banking, communications, and industry of Japanese-occupied Inner Mongolia. Colonization by Chinese settlers was checked as part of the pro-Mongol policies pursued by the Japanese. After World War II the area fell to the Chinese Communists, and although the Nationalist armies drove them out briefly, Kalgan was retaken in 1948. From 1948 to 1949 Kalgan was the capital of the Inner Mongolian Autonomous Region, although located outside its borders. In 1952, when Chahar Province was abolished, Kalgan again became a part of Hopeh Province.

Some light industry—primarily preparation of furs, leatherwork, tanning, and shoemaking—had already existed in the 1920s and 1930s. Light industry and food processing were also encouraged under the Japanese occupation. After the establishment of the Communist government in 1949, Kalgan developed rapidly, its population trebling between 1948 and 1958. Some heavier industry was developed in the city, including new machine-building works. Pop. (1985 est.) city centre, 483,200; city, 607,900; city and administratively attached counties, 905,700.

Kalgoorlie, town, south central Western Australia. Together with neighbouring Boulder to the south, it forms the principal settlement of the East Coolgardie goldfield, on the western fringe of the Nullarbor Plain and the Great Victoria Desert. Mining began with a rush following Paddy Hannan's discovery of gold in 1893, and the main deposit of deep, rich ores came to be known as the Golden Mile reef. Kalgoorlie developed as Hannan's Find; its present name is a corruption of the Aboriginal word *galgurli,* an indigenous scrub.

Gold production peaked in 1903 and then, with the depletion of surface deposits, declined until 1929. Controlled production and subsequent improvements in mining and processing methods and gold prices brought a degree of stabilization until the early 1970s. By the end of 1978, only one major gold mine was still in operation. Rising prices in the 1980s, however, brought about a revival of gold mining and exploration.

Nickel has now taken the place of gold as the region's chief mineral product. After the discovery (1966) of nickel ore at Kambalda (37 miles [60 km] south), Kalgoorlie became a service centre for this developing field. It has a large nickel smelter, built since 1971. Other industries in the town include ore-treatment plants, foundries, engineering works, and breweries. Kalgoorlie lies on the Great Eastern Highway to Perth (374 miles west). It is served by the state rail system connecting to Esperance (260 miles south), and the Trans-Australian Railway to Port Augusta and Port Pirie in South Australia.

Kalgoorlie is in an arid region and has, since 1903, been part of the Goldfield Water Supply System, bringing water from the Mundaring Weir on the Helena River, 15 miles east of Perth. The Western Australia School of Mines moved to Kalgoorlie in 1903. Pop. (1985 est.) town, 10,390; Kalgoorlie–Boulder urban area, 25,630.

Kalhu (ancient Assyrian city): *see* Calah.

Kālī (Sanskrit: "Black"), in Hinduism, a devouring, destructive goddess. In accordance with the Indian predilection for bringing together seemingly contradictory aspects of life, Kālī is a fierce, terrifying aspect of Devī (the supreme goddess), who in other forms is represented as tranquil and pacific. Kālī is depicted as a hideous, black-faced hag smeared



Kālī, sandstone relief from Bherāghāṭ, near Jabalpur, Madhya Pradesh state, India, 10th century AD
Pramod Chandra

with blood, with bared teeth and protruding tongue. Her four hands hold, variously, a sword, a shield, the severed hand of a giant, or a strangling noose, or they are stretched in a gesture of assurance. Kālī is naked, except for her ornaments, consisting of a garland of skulls and a girdle of severed hands. In painting and in sculpture, she is often shown dancing on the inert body of her consort, Śiva.

Kālī is said to have developed a taste for blood when she was called upon to kill the demon Raktavīja, who produced 1,000 more like himself each time a drop of his blood fell on the Earth. In order to vanquish him, she pierced him with a spear and, holding him high, drank his blood before it reached the ground. Goats are sacrificed to her daily at her temples, such as the well-known Kālīghāṭ, in Calcutta. The thugs, assassins who operated in India until the 19th century, were worshipers of Kālī and made ritual offerings of their victims to her.

Kālī is associated with the goddess Durgā (also a fierce aspect of the Devī), with whom she is often identified.

Kāli (India): *see* Sārda River.

Kali Glagah Fauna, early Pleistocene vertebrate faunal assemblage known from Southeast Asia (the Pleistocene Epoch began about 2,500,000 years ago and ended about 10,000 years ago). The Kali Glagah deposits follow those of the Tji Djulang Beds and are more than 2,000,000 years old. The Kali Glagah Fauna has been correlated with the Pinjor Zone of the Siwalik Series of India, also of early Pleistocene age, as well as the Upper Irrawaddy Beds of upper Burma. The fauna is characterized by distinctive species of horses, camels, antelope, and rhinoceroses.

Kalibangan, ancient site of the Indus Valley Civilization, in northwestern India (now Rājasthān). This site, discovered by A. Ghosh (director general of the Archaeological Survey of India), is of archaeological significance because it contains both pre-Harappan and Harappan remains; and therein can be seen the transition between the two cultures. Although the pre-Harappan culture worked copper and produced pottery, it had no writing system, and its ruins lack the orderly layout and use of baked brick that is found in the later Harappan sites. The Harappan remains include a cemetery and a fortified citadel.

Kālidāsa (fl. *c.* 5th century AD, India), Sanskrit poet and dramatist, probably the greatest Indian writer of any epoch. The six works identified as genuine are the dramas *Abhijñāna-*

śakuntala ("The Recognition of Śakuntalā"), *Vikramorvaśī* ("Urvaśī Won by Valour"), and *Mālavikāgnimitra* ("Mālavikā and Agnimitra"); the epic poems *Raghuvaṃśa* ("Dynasty of Raghu") and *Kumārasambhava* ("Birth of the War God"); and the lyric "Meghadūta" ("Cloud Messenger").

As with most classical Indian authors, little is known about Kālidāsa's person or his historical relationships. His poems suggest but nowhere declare that he was a Brahman (priest), liberal yet committed to the orthodox Hindu worldview. His name, literally "servant of Kālī," presumes that he was a Śaivite (follower of the god Śiva, whose consort was Kālī), though occasionally he eulogizes other gods, notably Vishnu.

A Sinhalese tradition says that he died in Ceylon (Sri Lanka) during the reign of Kumāradāsa, who ascended the throne in 517. A more persistent legend makes Kālidāsa one of the "nine gems" at the court of the fabulous king Vikramāditya of Ujjain. Unfortunately, there are several known Vikramādityas (Sun of Valour—a common royal appellation); likewise, the nine distinguished courtiers could not have been contemporaries. It is certain only that the poet lived sometime between the reign of Agnimitra, the second Śuṅga king (*c.* 170 BC), the hero of one of his dramas, and the Aihole inscription of AD 634, which lauds Kālidāsa. He is apparently imitated, though not named, in the Mandasor inscription of 473. No single hypothesis accounts for all the discordant information and conjecture surrounding this date.

An opinion accepted by many—but not all—scholars is that Kālidāsa should be associated with Candra Gupta II (reigned *c.* 380–*c.* 415). The most convincing but most conjectural rationale for relating Kālidāsa to the brilliant Gupta dynasty is simply the character of his work, which appears as both the perfect reflection and the most thorough statement of the cultural values of that serene and sophisticated aristocracy.

Tradition has associated many works with the poet; criticism identifies six as genuine and one more as likely ("Ṛtusaṃhāra," the "Garland of the Seasons," perhaps a youthful work). Attempts to trace Kālidāsa's poetic and intellectual development through these works are frustrated by the impersonality that is characteristic of classical Sanskrit literature. His works are judged by the Indian tradition as realizations of literary qualities inherent in the Sanskrit language and its supporting culture. Kālidāsa has become the archetype for Sanskrit literary composition.

In drama, his *Abhijñānaśakuntala* is the most famous and is usually judged the best Indian literary effort of any period. Taken from an epic legend, the work tells of the seduction of the nymph Śakuntalā by King Duṣyanta, his rejection of the girl and his child, and their subsequent reunion in heaven. The epic myth is important because of the child, for he is Bharata, eponymous ancestor of the Indian nation (Bhāratavarṣa, "Subcontinent of Bharata"). Kālidāsa remakes the story into a love idyll whose characters represent a pristine aristocratic ideal: the girl, sentimental, selfless, alive to little but the delicacies of nature, and the king, first servant of the dharma (religious and social law and duties), protector of the social order, resolute hero, yet tender and suffering agonies over his lost love. The plot and characters are made believable by a change Kālidāsa has wrought in the story: Duṣyanta is not responsible for the lovers' separation; he acts only under a delusion caused by a sage's curse. As in all of Kālidāsa's works, the beauty of nature is depicted with a precise elegance of metaphor that would be difficult to match in any of the world's literatures.

The second drama, *Vikramorvaśī* (possibly a pun on *vikramāditya*), tells a legend as old as the Veda (earliest Hindu scripture), though very differently. Its theme is the love of a mortal for a divine maiden; it is well known for the "mad scene" (Act IV) in which the king, grief-stricken, wanders through a lovely forest apostrophizing various flowers and trees as though they were his love. The scene was intended in part to be sung or danced.

The third of Kālidāsa's dramas, *Mālavikāgnimitra,* is of a different stamp—a harem intrigue, comical and playful, but not less accomplished for lacking any high purpose. The play (unique in this respect) contains datable references, the historicity of which have been much discussed.

Kālidāsa's efforts in *kāvya* (strophic poetry) are of uniform quality and show two different subtypes, epic and lyric. Examples of the epic are the two long poems *Raghuvaṃśa* and *Kumārasambhava.* The first recounts the legends of the hero Rāma's forebears and descendants; the second tells the picaresque story of Śiva's seduction by his consort Pārvatī, the conflagration of Kāma (the god of desire), and the birth of Kumāra (Skanda), Śiva's son. These stories are mere pretext for the poet to enchain stanzas, each metrically and grammatically complete, redounding with complex and reposeful imagery. Kālidāsa's mastery of Sanskrit as a poetic medium is nowhere more marked.

A lyric poem, the "Meghadūta," contains, interspersed in a message from a lover to his absent beloved, an extraordinary series of unexcelled and knowledgeable vignettes, describing the mountains, rivers, and forests of northern India.

The society reflected in Kālidāsa's work is that of a courtly aristocracy sure of its dignity and power. Kālidāsa has perhaps done more than any other writer to wed the older, Brahmanic religious tradition, particularly its ritual concern with Sanskrit, to the needs of a new and brilliant secular Hinduism. The fusion, which epitomizes the renaissance of the Gupta period, did not, however, survive its fragile social base; with the disorders following the collapse of the Gupta Empire, Kālidāsa became a memory of perfection that neither Sanskrit nor the Indian aristocracy would know again.

(Ed.G./Ed.)

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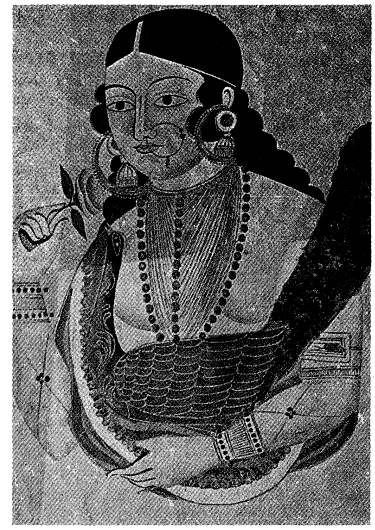
All the works of Kālidāsa (including the "Ṛtusaṃhāra") have been edited by A. Scharpé and were published in four volumes of *Rijksuniversiteit te Gent: Werken uitgegeven door de Faculteit van de Wijsbegeerten Letteren* (vol. 117, 120, 122, and 134). For the "Ṛtusaṃhāra," this constitutes the only modern critical edition. All the works are available in excellent but not critical (by Western standards) editions, published by the Nirnayasagara Press, Bombay.

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See also the introductions to the various critical editions of Kālidāsa's works published under the auspices of the Sāhitya Akademi, Delhi; and Rabindranath Tagore, *Shipwreck* (1906).

Kālīghāṭ painting, short-lived style of watercolour painting produced in the 19th century in India by artists in the Calcutta marketplace for sale to pilgrims visiting the Kālīghāṭ temple. The style is characterized by broad sweeping brush lines, bold colours, and simplification of forms suitable for their mass production.



Lady holding a bird, Kālīghāṭ watercolour painting, late 19th century; in a private collection
P. Chandra

The paintings, usually 17 by 11 inches (43 by 28 centimetres), were done on blank sheets, with no attempt made to fill in the backgrounds. Most usually depicted were the popular Hindu deities, but scenes of contemporary life are also found. The school, which rose in response to the competition of cheap coloured lithographs, soon lost the contest and disappeared rapidly. The charm and vigour of Kālīghāṭ painting had an influence on a number of modern Indian painters, as can be seen in the work of Jamini Roy.

Kalimantan, southern three-quarters of the island of Borneo (*q.v.*) that is politically part of Indonesia. Indonesians, however, use the word as a geographic term for the entire island.



Floating houses along the Barito River, Bandjarmasin, Kalimantan, Indonesia
Ava Hamilton

The origin of the name Kalimantan is obscure. In Sarawak the term Kelamantan refers to the sago-eating peoples of northern Borneo. Indonesian Kalimantan is divided into four *propinsi-propinsi* (provinces): Kaliman-

tan Barat, Kalimantan Tengah, Kalimantan Selatan, and Kalimantan Timur.

The history of Indonesian Borneo is closely linked to that of India, and there is considerable evidence of Indian cultural influences. Inscriptions in Sanskrit that date from the late 5th century have been found there, as well as an early Buddha figure. Numbers of other Buddhist and Hindu images that date from the 7th to the 11th century and that show Javanese influence have also been found in eastern Borneo. The Śrivijaya Empire of Sumatra was, in fact, the predominant power in southern and western Borneo from the 7th century until the Majapahit Empire of eastern Java conquered the area in the 14th century. With the arrival of Islām in the 16th century, a number of separate Muslim states were formed. In the first half of the 17th century, the Dutch extended their influence in Borneo by a series of trade and fortification agreements with individual states and also by intervening in internal disputes. British involvement in the affairs of the sultanate of Brunei and the British acquisition of territory eventually led the Dutch to adopt a more active policy of expansion. By 1863 they had established colonial rule, though sporadic resistance continued until 1905. The island was occupied by the Japanese during World War II. With news of Japanese surrender came a strong Indonesian independence movement, and though the Dutch at first attempted to retain control, Kalimantan became a part of the Republic of Indonesia in 1949–50.

Kalimantan Barat, English WEST BORNEO, *propinsi* (province), western Borneo, Indonesia, bounded on the north by the East Malaysian state of Sarawak, by the Indonesian province of Kalimantan Timur (East Borneo) on the northeast and Kalimantan Tengah (Central Borneo) on the southeast, and by the Java Sea on the south and the Karimata Strait on the west. It covers an area of 56,664 square miles (146,760 square km) and includes the individual islands of Pelapis, Maya, Laut, Temaju, Bawal, Pengiki, and Padangtikar, as well as the Lemukutan islands and the Karimata island group in the Karimata Strait.

Most of the province, including the western coastal margin, consists of swampy lowlands crisscrossed by the Kapuas, Pawan, and Kendaua rivers and their tributaries. The Muller Mountains and the Schwaner Mountains run sequentially from northeast to southwest and form about two-thirds of the southeastern boundary of the province. Most of the northern boundary is demarcated by the Kapuas Hulu Mountains that meet the Muller Mountains in the northeast. Offshoots of the Muller and Schwaner mountains extend into the interior and form broad valleys drained by the Melawi and northeastern Kapuas rivers. The mountains have peaks that rise to an elevation of about 5,600 feet (1,700 m). Dense forests of ironwood, teak, oak, and conifer cover the mountains, and epiphytes abound. Shifting cultivation forms the basis of the economy; rice, corn (maize), and cassava are raised. There are also some rubber and copra plantations. Industries are household and produce milled rice, palm oil, carved wood, handwoven cloth, and mats and baskets. Roads are few and connect Pontianak, the provincial capital, with other inland cities and the coast. Rivers provide the principal means of internal transport. Most of the population is Dayak. Pop. (1986 est.) 2,827,000.

Kalimantan Selatan, English SOUTH BORNEO, *propinsi* (province), southeastern Borneo, Indonesia, bounded by the Makassar Strait on the east, the Java Sea on the south, and the provinces of Kalimantan Tengah (Central Borneo) on the west and Kalimantan Timur (East Borneo) on the north. It covers an area of 14,541 square miles (37,660 square km) and includes the islands of Laut, Sebuku, and Balabalangan in the Makassar Strait.

The low-lying Meratus Mountains run in a north–south arc that almost bisects the province; on its southern fringe is the Kusan mountain range. The Meratus range slopes to the east to merge into the flat coastal lowlands and to the west into the swampy basin formed by the Negara River. The eastern coast is marked by several small bays. The offshore island of Laut is nearly flat, with its northeastern coast marked by slightly rising uplands. The province's low mountains are covered with equatorial forests of teak and ebony and with ferns and other epiphytes; the swamps have mangrove trees and nipa palms. Most of the population is engaged in subsistence agriculture based on the shifting cultivation of rice, corn (maize), and cassava. Rubber and copra are also produced. Industries process foods and beverages and manufacture furniture, chemicals, and rubber goods. Gold, iron ore, diamonds, and coal are mined; and oil, timber, rattan, rubber, and gutta-percha (latex from trees of the sapodilla family) are exports. Banjarmasin, the provincial capital, is linked by road with Martapura, Kandangam, and Amuntai. Tanjung and Banjarmasin have airports. The Dayak people are the largest ethnic group, and there are a few Banjar. Pop. (1986 est.) 2,328,000.

Kalimantan Tengah, English CENTRAL BORNEO, *propinsi* (province), south central Borneo, Indonesia, bounded by Kalimantan Barat (West Borneo) province on the northwest, Kalimantan Timur (East Borneo) province on the north and northeast, Kalimantan Selatan (South Borneo) province on the southeast, and the Java Sea on the south. It has an area of 58,919 square miles (152,600 square km).

The Schwaner Mountains and the Muller Mountains run parallel to the northwestern boundary of the province, and an offshoot of the Muller range skirts the northern boundary. Mount Raya, the highest peak in the Schwaner range, reaches 7,474 feet (2,278 m). South of these mountains is an expanse of alluvial plain that constitutes the central and southern parts of the province. The southern coastal lowlands are covered with wide swamp belts intersected by estuaries formed by the southward-flowing Kapuas, Sampit, Pembuang, Aiut, and Lamandau rivers and their tributaries. Most of the province is covered by dense tropical rain forest. Agriculture is the principal means of livelihood in this sparsely populated province; products include rice, resin, rattan, wild rubber, beeswax, corn (maize), cassava, sweet potatoes, peanuts (groundnuts), and soybeans. Industries are mainly small scale and include sawmilling, rice and flour milling, wood and timber processing, small-boat construction, weaving, plaiting, and beadworking. The province is economically one of the least developed in Indonesia, largely because of the extent of the southern swamps and difficulty of communication. Rivers provide limited inland transport routes as they have a great unevenness of flow and are subject to seasonal flooding. Palangkaraya, the provincial capital, and Sampit are linked by air. West of Palangkaraya are the remains of a highway to Tangkiling, built by the U.S.S.R. in 1960. The population consists mostly of Dayak (subdivided into Land Dayak, Ot Danum Dayak, Ngadyu Dayak, and Maanyan Dayak); there are also coastal Malay, Chinese, and immigrants from elsewhere in Indonesia. The Dayak are mostly animists, although some in less isolated coastal regions have become either Muslims or Christians. Pop. (1986 est.) 1,159,000.

Kalimantan Timur, English EAST BORNEO, *propinsi* (province), east central Borneo, Indonesia, fronting the Celebes Sea to the northeast and the Makassar Strait to the southeast. It is bounded on the north and northwest by the East Malaysian states of Sabah and Sarawak and by the Indonesian *propinsi-propinsi* (provinces) of Kalimantan Barat (West Borneo) on the west and Kalimantan Tengah (Central Borneo) and Kalimantan Selatan (South Borneo) on the southwest. Kalimantan Timur covers an area of 78,162 square miles (202,440 square km) and embraces the islands of Sebalik (southern half), Bunyu, Tarakan, Panjang, Derawan, and Bilangbilangan in the Celebes Sea.

An uninterrupted mountain range, the Iran Mountains, runs north–south, parallel to the western boundary of Kalimantan Timur. The range has spurs that run northeastward in the central and northern parts of the province and nearly reach the coast. The mountains are surmounted by nonvolcanic peaks including Mount Murud (7,999 feet [2,438 m]), Mount Kongkemul (6,735 feet), and Mount Batubrok (7,349 feet). Northern rivers include the Sebulku, Sembakong, Sesayap, Kayau, and Besau. They flow eastward to the Celebes Sea and have created a number of estuaries at their mouths along the coast. The Mahakam River, together with its tributaries, the Tolen and Belayan, has formed an inland basin covered by swamps that includes the Semayang, Melintang, and Jempang lakes in the southeastern part of the province. The mountains are covered by dense tropical rain forests of teak, oak, pine, alder, maple, and ash. Heavy rainfall has resulted in advanced laterization and consequent impoverishment of the soils. Agriculture, based on shifting cultivation, is the principal means of livelihood; rice, corn (maize), cassava, potatoes, red pepper, fruits, and vegetables are the major crops. Livestock and poultry are raised, and riverine and deep-sea fishing are economically important. Industries and crafts include food processing, rice milling, pharmaceutical production, sawmilling, wood carving, weaving, plaiting, beadworking, basket and mat making, and iron smelting. There is an oil refinery near Balikpapan, and oil and natural gas are extracted from offshore fields in the southeast. Roads are confined to the southeastern coastal plains and connect Samarinda, the provincial capital, with Tenggarong and Balikpapan. Internal communication is mainly by riverboat and coastal vessels; Balikpapan has an airport. The population consists mostly of the Iban, Kayan, Kelabitic Marut, and Tidong ethnic groups. Islām is the dominant religion, although many Iban have become Christians. The Kutai Game Reserve is located near Bontang on the eastern coast of the province. Pop. (1986 est.) 1,690,500.

Kálimnos, mountainous Greek island in the Aegean Sea, part of the Dodecanese group, 42 square miles (111 square km) in area. The capital, Kálimnos (Pothia), located at the head of an inlet in the southeast, is the chief port and a prominent Aegean commercial centre with the bulk of the island's population. As in classical times sponge fishing remains the chief industry, with the sponge fleet away to the North African coast for up to six months each year after Easter. Toward the centre of the island, the volcanic valley of Vathys, irrigated from springs, supports citrus, olives, figs, and vines. The island is the seat of a metropolitan bishop of the Greek Orthodox Church.

Believed to have been settled by a Dorian colony from Epidaurus in the Peloponnese, the island coined its own money and took part in the first and second Athenian leagues (5th and 4th centuries BC). As a Persian satrapy, it was conquered in 332 by the forces of Alexander the Great and was later annexed by Rome to the province of Asia. Until AD 1310 it was occupied by Venetians, who then gave way to the Knights of Rhodes. In 1522

it was captured with the other islands of the Dodecanese by the Turks, and in 1912 it was occupied by Italy. The people of Kálimnos resisted Italianization, and during World War II many fled to Turkey. The necropolis of Damos and more than 100 ancient Greek inscriptions are among the antiquities found or excavated on the island. Pop. (1981) island, 14,295; capital, 10,118.

Kālimpong, town, extreme northern West Bengal state, northeastern India, just east of the Tīsta River. The town, a Himalayan hill station, is linked by road with Darjeeling, Silīguri, and Bāghdogra and is the terminus of the mule-trade route from Tibet. It has a large bazaar and conducts a brisk trade in raw wool. Kālimpong holds an annual agricultural produce and stock fair and is well known for its handicrafts (especially weaving). The town has a hospital, an arts-and-crafts training centre, and a college affiliated with the University of North Bengal. Pop. (1981) 28,885.

Kaline, Al, byname of ALBERT WILLIAM KALINE (b. Dec. 19, 1934, Baltimore, Md., U.S.), U.S. professional American League baseball outfielder who was a preeminent fielder and hitter, batting and throwing right-handed.

Kaline started playing sandlot baseball before he went to school. Many in his family had been in semiprofessional baseball. At first he wanted to be a pitcher, but at Southern High School (Baltimore) he was considered too small to pitch and too frail for the infield and so became an outfielder. He was signed to a contract by the Detroit Tigers in midseason of 1953 and played with them until he retired in 1974. In 1955 he hit 27 home runs, the youngest player to do so, and his .340 batting percentage led the league. From 1968 he played at first base. In the 1968 World Series, which Detroit won, he batted .379 and batted in eight runs. He made his 3,000th hit on Sept. 24, 1974. After retirement he became a television baseball broadcaster, and in 1980 he was elected to the Baseball Hall of Fame.

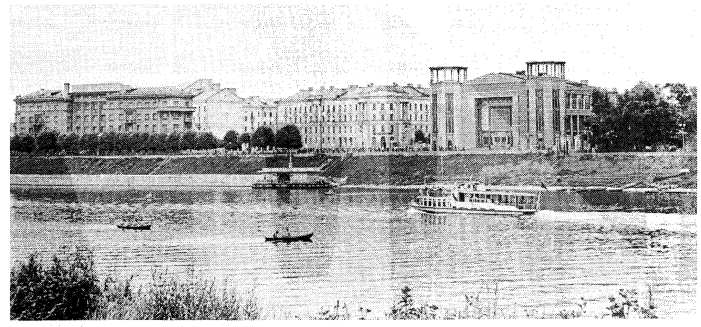
Kaliṅga, ancient territorial subdivision of east-central India, corresponding to northern Andhra Pradesh, most of Orissa, and a portion of Madhya Pradesh. Strictly, it stretched no farther south than the Godāvari River, thus excluding Veṅgi (the Andhra territory between that river and the Krishna). The hinterland of Kaliṅga led through mountainous and thickly forested country, inhabited by semi-Hinduized tribes, to central India and the Gangetic Plain. With the ports of Coringa (Kakināda), Vishākhapatnam, Chicacole, and Gañjām and the important towns of Rājahmundry and Vizianagaram, Kaliṅga did a rich seaborne trade with Myanmar (Burma) and areas still farther south and east. It was mentioned by Pliny.

Kaliṅga was conquered by Mahāpadma, the founder of the Nanda dynasty (*c.* 343–*c.* 321 BC) of Magadha. It seceded from the Magadhan empire some time after the fall of the Nanda dynasty, but it was reconquered by the Maurya king Aśoka in the 3rd century BC in a terrible war that was said to have helped to convert him to Buddhism. Subsequently, the Somavaṃśis of southern Kosala, who controlled the strategic town of Chakrakotta (in the former Bastar state), ruled parts of the coastal strip for a period of time, as did the Yayātis, Viṣṇukuṇḍins, Bhanjas, and Bhauma Karas.

The Eastern Gaṅgas were the most famous rulers of all Kaliṅga. Their dynasty, which began its rule in the mid-11th century AD, sometimes competed with and sometimes allied itself with the Eastern Cālukyas of Veṅgi. In the next century Anantavarman Cōḍagaṅgadeva was particularly renowned; he built the Temple of Juggernaut (Jagannātha) at Purī. This temple came under the protection of the Eastern Gaṅgas, and the god was treated as their landlord. The famous temple of the sun god at Konārak (Koṇārka) was built in the 13th century by Narasiṃha I. Between 1238 and 1305 the Eastern Gaṅgas successfully withstood Muslim infiltration from the north, but the dynasty collapsed when the sultan of Delhi penetrated Kaliṅga from the south in 1324.

Kalinin, *oblast* (province), western Russian Soviet Federated Socialist Republic. It occupies an area of 32,471 square miles (84,100 square km) and extends from the morainic Valdai Hills in the southwest, across the broad, swampy plain of the upper Volga River, to the shore of the huge Rybinsk Reservoir in the northeast. The Valdai Hills have scores of lakes and many areas of swamp. The chief cities in the oblast are Kalinin, the administrative centre, Vyshny Volochok, and Rzhev. The oblast is largely forested with spruce, pine, and birch; peat bogs, grass marsh, and floodplain meadows are also extensive, and most of the soils are of low fertility. Oak and other deciduous species occur in the south. The climate is continental, with about 24 inches (600 mm) of precipitation a year. Although only about one-quarter of the land area is plowed, agriculture dominates the economy, consisting chiefly of dairying, livestock, and the growing of flax. Rye, oats, and wheat are the chief grains grown. The oblast's industry is concerned with processing local agricultural and forest products, the manufacture of both linen and cotton textiles, and timber working, with some light engineering. Kalinin, the capital, has some heavy machinery, including railroad rolling stock. Peat and lignite (brown coal) are exploited locally. Pop. (1989 prelim.) 1,670,000.

Kalinin, formerly TVER, city and administrative centre of Kalinin *oblast* (province), western Russian Soviet Federated Socialist Republic. The city lies at the confluence of the upper Volga and Tvertsa rivers. The first mention of Tver dates from 1134–35, when it was subject to Novgorod. It became part of the Principality of Vladimir-Suzdal in 1209, and in 1246 it became the capital of the Principality of Tver. In 1327, with its kremlin large and well fortified, Tver organized an uprising against the Tatars but was defeated. The Principality of Tver was annexed by Moscow in 1485. In the 14th and 15th centuries Tver was well known as an important crafts centre. With the construction of the Vyshny Volochok canal system between the Tvertsa and the Msta rivers in 1703–08, river trade through Tver became important. Although this route is no longer used, Kalinin remains the major river port of the upper Volga and is linked by the Moscow Canal (Kanal Imeny Moskvy) to the national capital. The city was laid out in a gridiron pattern in the 18th century, and a number of historic buildings survive. The city is now the centre of a major flax-growing region and is also an industrial centre, with emphasis on textile manufacturing and other light industries and on the manufacture of railroad rolling stock. It was renamed Kalinin in 1931 after Mikhail Kalinin (1875–1946), a revolutionary and ceremonial head of state of the Soviet Union. Kalinin was severely damaged during World War II when it was captured and occupied by the Germans in 1941. Its buildings were subsequently restored. Pop. (1989 prelim.) 451,000.



Kalinin, Russian S.F.S.R., across the Volga River
Novosti Press Agency

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Kalinin, Mikhail Ivanovich (b. Nov. 19 [Nov. 7, Old Style], 1875, Verkhnyaya Troitsa, in Tver province, Russia [now in Russian S.F.S.R.]—d. June 3, 1946, Moscow), communist leader and statesman who was the formal head of the Soviet state from 1919 until 1946.

A peasant by birth, Kalinin became an industrial worker in St. Petersburg (now Leningrad) in 1893, joined the Russian Social-Democratic Workers' Party in 1898, and became one of the first supporters in Russia of Vladimir Lenin's Bolshevik faction. He played an active role in the party's revolutionary functions (he was arrested in 1899 and again in 1903) and participated in the Russian Revolution of 1905 in St. Petersburg. In 1912 he became a candidate member of the Bolsheviks' Central Committee, a member of their Russian bureau, and cofounder of their newspaper *Pravda* ("Truth").

After the Bolshevik coup d'état (November 1917), he served as mayor of Petrograd (now Leningrad). In March 1919 he became head of the Soviet state—*i.e.,* chairman of the central executive committee of the All-Russian Congress of Soviets. (In 1924 his title was changed to chairman of the All-Union Central Executive Committee, and from 1938 until March 1946 his official post was chairman of the Presidium of the Supreme Soviet.) In December 1925 he also became a full member of the Politburo of the party's Central Committee.

Although Kalinin tended to favour the party's right wing in intraparty disputes over industrial and agricultural policies in the 1920s, in crucial votes he supported Joseph Stalin. As a result, he not only survived the purges of the 1930s during which Stalin eliminated his political rivals but he also retained his high party and government offices until shortly before his death.

Kaliningrad, *oblast* (province), western Russian Soviet Federated Socialist Republic, occupying an area of 5,830 square miles (15,100 square km), most of it in the basin of the Pregolya River and its tributaries. Centred on Kaliningrad city, it was formed in 1945 from the northern half of German East Prussia, which was ceded to the U.S.S.R. by the Potsdam agreement of that year. Along the coasts

are the large freshwater lagoons of Frisches Haff (Russian Vislinsky Zaliv) and Kurisches Haff (Russian Kursky Zalif), separated from the Baltic by long sandspits. Most of the *oblast* comprises low, gently rolling hills and swampy lowlands; about 20 percent is in mixed forest of oak, pine, spruce, beech, and hornbeam. The former German inhabitants either fled or were deported, to be replaced by Russian settlers. The main branches of industry are engineering, metalworking, and paper-pulp making. Amber, once the monopoly of the Teutonic Knights, is now produced by a large combine at Yantarny. Fishing is important along the coast. Grains, potatoes, vegetables, and dairy cattle dominate agricultural activity. About 77 percent of the population is urban. Pop. (1983 est.) 824,000.

Kaliningrad, formerly (until 1946) KÖNIGSBERG, city, seaport, and administrative centre of Kaliningrad *oblast* (region), Russian Soviet Federated Socialist Republic, on the Pregolya River just upstream from Frisches Haff. Formerly a major German naval base in East Prussia, the city was ceded to the U.S.S.R. in 1945 under the Potsdam agreement; it is now a major naval base on the Baltic Sea. Originally a fortress, founded in 1255 by the Teutonic Knights, it became a town in 1286. From 1340 Königsberg was an important member of the Hanseatic League, and in the 15th century it became the residence of the grand master of the Teutonic Knights and later the seat of the dukes of Prussia. Immanuel Kant was a professor at the university, the Collegium Albertinium, founded in 1544. The city was the site of the coronation of Frederick I (1701) and of William I (1861) as kings of Prussia. Few of the city's historic buildings survived the destruction of World War II. Kaliningrad is also an important commercial and fishing port, connected by a dredged channel to its outport, Baltiysk. It has engineering, timber-working, machine-building, and papermaking industries. Pop. (1983 est.) 371,000.

Kaliningrad, city, Moscow *oblast* (administrative region), western Russian Soviet Federated Socialist Republic, on the northeastern outskirts of Moscow. It developed after 1928 as an industrial satellite and dormitory town of the capital, achieving city status in 1938. Its principal industries are the production of textiles, notably silk, and equipment for foodprocessing industries. Pop. (1983 est.) 139,000.

kaliophilite, variety of the mineral nepheline (*q.v.*).

Kalispell, city, seat (1894) of Flathead County, northwestern Montana, U.S., in the Flathead Valley near the head of Flathead Lake. It is the western gateway to Glacier National Park, headquarters of the Flathead National Forest, and site of Flathead Valley Community College (1967). Named for the Kalispel Indians, it was founded in 1891 with the coming of the Great Northern Railway. Its economy depends chiefly on agriculture (notably processing seed potatoes and cherries), lumbering, tourism, and an aluminum plant near Columbia Falls, 17 mi (27 km) northeast. Inc. 1892. Pop. (1980) 10,648.

Kalisz, *województwo* (province), west central Poland, established 1975, comprising an area of 2,514 sq mi (6,512 sq km). It is bordered by the provinces of Poznań and Konin on the north, Sieradz on the east, Częstochowa and Opole on the south, and Wrocław and Leszno on the west. The economy of Kalisz province is built upon the production of textiles, clothing, chemicals, paper, electrical machinery, and building materials and on agriculture; its fertile soils produce wheat, rye, sugar beets, and potatoes. Railroads and highways connect towns and cities of the province with the major markets of the country. The Prosna River flows northward the length of the province; Kalisz (*q.v.*) city, the provincial capital, is famous for its textiles and garment industry. The town appeared on Roman maps as early as the 2nd century. It is on the banks of the Prosna. Numerous health and recreational spas are found in the province's extensive forests. There are ruins of Roman settlements dating from the 2nd century AD. Pop. (1982 est.) 672,800.

Kalisz, city, capital of Kalisz *województwo* (province), west central Poland, situated on the Prosna River. The excavations of a prehistoric village and mention of the settlement as Calisia by the astronomer-geographer Ptolemy in the 2nd century AD are evidences of the town's antiquity. A powerful castle stood there from the 12th to the 14th century. Kalisz obtained town rights in 1282.

Now industrialized, Kalisz specializes in textile production, a trade begun during the 15th century. It contains many scenic parks and historic churches and the regional museum. Annually, in May, it is host to a national drama festival. Pop. (1982 est.) 100,300.

Kalkbrenner, Frédéric (b. November 1785, near Kassel, Hesse-Kassel—d. June 10, 1849, Enghien-les-Bains, Fr.), French pianist, composer, and teacher of German birth whose compositions, mainly for piano, exhibit an emphasis on virtuosity.

Educated at the Paris Conservatoire, where he studied with Nicodami, Louis Adam, and Charles-Simon Catel, Kalkbrenner began his career as a pianist with his move to London in 1814. He returned to Paris in 1824, joining the piano-building firm of Pleyel. The decade 1825–35 saw the height of his reputation as a performer, but, after 1835 his fame was eclipsed by a new generation of pianists that included Liszt, Chopin, and Thalberg.

Kalkbrenner's playing was marked by clarity and a beauty of tone, although it was said to be lacking in emotional power. He was noted especially for the use of octaves. As a teacher, he invented a hand guide for the development of technique and wrote a piano method.

Kalkin, also called KALKI, final avatar (incarnation) of the Hindu god Vishnu, who is yet to appear. At the end of the present Kali age, when virtue and religion have disappeared and the world is ruled by unjust men, Kalkin will appear to destroy the wicked and to usher in a new age. He will, according to tradition, be seated on a white horse with a naked sword in his hand, blazing like a comet. He is less commonly represented in painting and sculpture than the other avatars of Vishnu and is shown either on horseback or accompanied by his horse. According to some legends of the end of the world, Kalkin's horse will stamp the earth with its right foot, causing the tortoise which supports the world to drop into the deep. Then the gods will restore the earth once again to its former purity.



Kalkin, Nepalese miniature, 17th century; in a private collection
Pramod Chandra

Kállay (von Nagy-Kálló), Benjamin (b. Dec. 22, 1839, Pest, Hung.—d. July 13, 1903, Vienna), Austro-Hungarian statesman, concurrently imperial minister of finance and chief secretary for Bosnia for more than two decades (1882–1903).

A lifelong student of the Balkans, he first held office as consul general at Belgrade (1867). Several years later, he published a brief history of Serbia. A conservative in politics and a disciple of the foreign minister Count Gyula Andrássy, he was named section chief in the ministry in 1879 and two years later temporarily headed the Foreign Office during a brief ministerial interregnum. Inheriting the proconsulship of Bosnia (in modern Yugoslavia) with his accession to the Ministry of Finance (1882), he soon instituted an efficient and enlightened, though autocratic, administration there. A vigorous program of public works—especially railway construction—and improved medical and civil services marked his regime and a sympathy for South Slav peoples infused both his administrative conduct and the attitudes of his several historical works.

Kállay, Miklós (b. Jan. 23, 1887, Nyíregyháza, Hung., Austria-Hungary—d. Jan. 14, 1967, New York City), politician who, as prime minister of Hungary in World War II, unsuccessfully attempted to extricate his country from the German alliance.

Born of an old and influential family of local gentry, Kállay served first as lord lieutenant of his county (1921–29), moving later to the national government as deputy under secretary of state in the Ministry of Trade (1929–31) and minister of agriculture (1932–35). Resigning in 1935 in disagreement with the extreme right-wing policies of Prime Minister Gyula Gömbös, Kállay withdrew from active politics until 1942, when asked by Miklós Horthy, the regent of Hungary, to form a government that would reverse the policies of László Bárdossy, whose government had involved the country in a dangerous dependence on Germany. Under the Kállay government (March 9, 1942–March 19, 1944), Jews enjoyed a degree of protection almost unparalleled on the Continent, and the press and the parties of the left continued to function. Internationally, Kállay pursued a policy of armed opposition to Russia concurrently with peaceful overtures to the Western powers. Dissatisfied with the manner in which Hungary was pursuing the war, Germany occupied Hungary in March 1944.

Kállay was forced into hiding and subsequently taken prisoner, being held at the concentration camp of Dachau and, later, Mauthausen. Released when Germany collapsed, Kállay went into voluntary exile in 1946, eventually settling in the United States in 1951. His memoirs, *Hungarian Premier; A Personal Account of a Nation's Struggle in the Second World War,* appeared in 1954.

Kallérgis, Dimítrios (b. 1803, Crete—d. Jan. 24, 1867, Athens), statesman prominent in the early years of Greek independence.

In September 1843, antagonistic to the rule of King Otto I, Kallérgis, then a colonel, led a revolt that caused Otto to dismiss his Bavarian administration and to adopt a new, more liberal constitution (1844). Exiled in 1845, he returned in 1848 and tried unsuccessfully to instigate a revolution. In 1854 he was appointed minister in the cabinet of Alexándros Mavrokordátos but was forced by the King to

resign in October 1855. After the fall of Otto he took part in the negotiations leading to the accession of Prince William of Denmark to the Greek throne in 1863.

Kallikrates: *see* Callicrates.

Kallinikos OF HELIOPOLIS: *see* Callinicus of Heliopolis.

Kalliope (Muse): *see* Calliope.

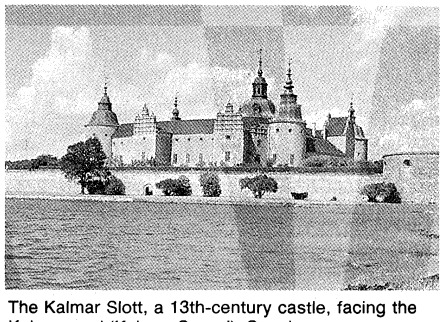
Kálmán (king of Hungary): *see* Coloman.

Kalmar, *län* (county) of southeastern Sweden, in Götaland region, on the Baltic Sea. Its land area of 4,311 sq mi (11,166 sq km) has two distinct parts: the mainland, forming the eastern part of the traditional *landskap* (province) of Småland, and the island *landskap* of Öland (*q.v.*). Between Öland and the mainland is the long, narrow Kalmarsund (Kalmar Sound).

The undulating surface of the *län* is mainly wooded, with marshes in the western areas. The coastal region, with its fertile soils and large meadow areas, lends itself to sheep raising and dairying. Chief industries include woodworking and the manufacture of matches, furniture, glass, and metal products. Besides Kalmar, the capital, principal towns are Västervik, Oskarshamn, Nybro, Hultsfred, and Vimmerby on the mainland, and Borgholm on the island. Pop. (1984 est.) 240,134.

Kalmar, city, port, and capital of the *län* (county) of Kalmar, southeastern Sweden, on Kalmarsund (Kalmar Sound). Founded in the 12th century in a strategic coastal position, it gave its name in 1397 to the Kalmar Union, by which Scandinavia was united under one ruler until 1523. During the 15th century it served as the union's political centre. In 1613 it was captured by the Danes, and its military importance waned.

After being burned down in 1647, most of



The Kalmar Slott, a 13th-century castle, facing the Kalmarsund (Kalmar Sound), Sweden
Refot

the city was rebuilt on the nearby island of Kvarnholmen. Remains of 17th-century fortifications still surround the centre of the city, and several historic buildings date from that period: the Italian Renaissance cathedral (1666–1700); the residence of the governor (1674), where the French king Louis XVIII lived briefly after going into exile in 1800; and the town hall (1680). The 13th-century castle, Kalmar Slott, has served as fortress, distillery, granary, and prison and now houses the county museum.

Shipbuilding has been carried on since the Middle Ages, and there is a good harbour; but Kalmar is mainly a manufacturing city, with products ranging from machinery to confectionery. Nearby are some of the finest glassworks in the world—Orrefors, Kosta, Boda, Pukaberg, and Strömbergshyttan. There are rail and air communications, as well as ferry connections with Öland. Pop. (1984 est.) mun., 53,516.

Kalmar Union, Scandinavian union formed at Kalmar, Swed., in June 1397 that brought the kingdoms of Norway, Sweden, and Denmark under a single monarch until 1523.

When Margaret I became ruler of Denmark, Norway, and Sweden (1387–88), it was understood that she should, at the first convenient opportunity, provide the three kingdoms with a king who was to be her nearest kinsman; and in 1389 she proclaimed her infant cousin, Erik of Pomerania, king of Norway. In 1396 homage was also rendered to him in Denmark and Sweden, Margaret reserving to herself the office of regent during his minority. To weld the three kingdoms still more closely together, Margaret summoned a congress of the three councils of state (the Rigsraads) and other magnates to Kalmar in June 1397; and on Trinity Sunday, June 17, the joint coronation of Eric united the kingdoms.

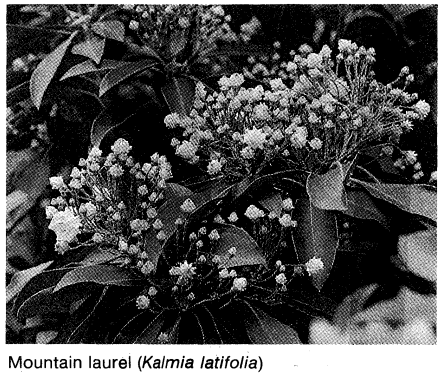
The proposed act of union divided the three Rigsraads, but the actual charter, or constitution, embodying the terms of the union never got beyond the stage of an unratified draft. Margaret objected to the clauses that insisted that each country should retain exclusive possession of its own laws and customs and be administered by its own dignitaries, for she believed that such policies would tend to prevent the complete amalgamation of Scandinavia. She avoided every appearance of an open rupture, however, and succeeding monarchs also avoided stirring up the issue.

The Kalmar Union lasted until Sweden rebelled and became independent in 1523, under King Gustav I Vasa. At the same time, Norway sank to the status of a Danish province (1536).

Kalmar War (1611–13), the war between Denmark and Sweden for control of the northern Norwegian coast and hinterland, which resulted in Sweden's acceptance of Denmark-Norway's sovereignty over the area.

Denmark's king Christian IV declared war on Sweden in April 1611 after the Swedish king Charles IX claimed sovereignty over the old Finnmark region, a strategic point along the Atlantic–White Sea trade route that had long provided the Danish-Norwegian kings with fish and furs. Growing Swedish power in the eastern Baltic and the development of the Swedish port of Göteborg beyond the Danish Sound (Øresund) were additional reasons for Christian's action. The war was named for the Swedish port of Kalmar, which fell to the Danes in the summer of 1611. Swedish fortunes continued to ebb as their troops were forced out of Finnmark by the Norwegians, and the port of Älvsborg fell to the Danes in May 1612. The war ended with the signing of the Peace of Knäred in January 1613. By this treaty, Danish-Norwegian sovereignty over Finnmark was recognized, and Älvsborg was to be held by the Danes pending payment of a Swedish tribute, which was paid four years later.

Kalmia, genus of about six species of evergreen shrubs, of the heath family (Ericaceae), all occurring in North America and the West Indies. The leaves, which are borne on short stalks, are smooth-edged and opposite, alternate, or whorled (*i.e.,* three or more growing from one point in a circle). The bowl-shaped,



Mountain laurel (*Kalmia latifolia*)
Grant Heilman—EB Inc.

five-lobed showy flowers are pink, purple, lavender, or white and are borne in terminal or lateral (arising from the leaf axil) clusters. The anthers (pollen-bearing tips of the stamens) are tucked into pockets on the inner surface of the petals. When touched by an insect, the anthers spring free, scattering pollen onto the insect's body. Three species are particularly well known: *K. angustifolia,* sometimes called sheep laurel, dwarf laurel, pig laurel, and lambkill; *K. latifolia,* sometimes called mountain laurel, American laurel, calico bush, and spoonwood; and *K. polifolia,* sometimes called pale laurel, bog laurel, or bog kalmia.

Kalmia angustifolia, like *K. polifolia,* has foliage that is poisonous to grazing animals. It occurs throughout eastern North America and is most often found on damp soil in open areas. It grows about 90–170 centimetres (about 3–6 feet) tall and has erect, unbranching stems, with lance-shaped leaves that are opposite and narrow. The lavender or rose flowers grow in lateral clusters.

Kalmia latifolia occurs in most mountainous regions of eastern North America. It grows to about 100 centimetres in height, and its oval leaves are alternate or whorled. The rosy, pink, or white flowers appear in large terminal clusters.

K. polifolia, found in peaty or boggy soils of northern North America, grows to about 60 cm, has oval leaves (opposite or whorled), and rosy or bluish-pink flowers that grow in a terminal cluster.

Kalmuck (people): *see* Kalmyk.

Kalmyk, also spelled KALMUCK, Mongol people residing chiefly in the Kalmyk Autonomous Soviet Socialist Republic, whose language belongs to the Oyrat (Oirat), or western, branch of the Mongolian language group. The Oyrat dialects are also spoken in western Mongolia, Sinkiang, and neighbouring provinces of China. The home of the Kalmyk lies west of the Volga River in its lower courses, in an arc along the northwestern shore of the Caspian Sea. A small number of Kalmyk of the Buzawa tribe live along the Don River. Another small group, called the Sart Kalmyk, live in the Kirgiz Soviet Socialist Republic near the Chinese border. A few emigrated after World War II to the United States.

The western Mongols were enemies of the eastern Mongols at the time of their imperial apogee in the 13th century AD. During the following centuries they maintained a separate existence under a confederation known as the *Dörben Oyrat* (Four Allies, from which the name Oyrat is derived); at times they were allies, at times enemies of the eastern Mongols. Part of the western Mongols remained in their homeland, northern Sinkiang, or Dzungaria, and western Mongolia. Part of the Oyrat confederation, including all or part of the Torgut, Khoshut, Dorbet (or Derbet), and other groups, moved across southern Siberia to the southern Urals at the beginning of the 17th century. From there they moved to the lower Volga, and for a century and a half, until 1771, they roamed both to the east and west of this region. During the course of the 18th century, they were absorbed by the Russian Empire, which was then expanding to the south and east. In 1771, those of the left bank, to the east of the Volga, returned to China. The right-bank Kalmyk, comprising the contemporary Torgut, Dorbet, and Buzawa, remained in Russia.

The Kalmyk are by long tradition nomadic pastoralists. They raise horses, cattle, sheep, goats, and a few camels. Their nomadism is of a classical pattern: an annual round of movement from winter camp to spring, summer, and fall pasture, and return. The Kalmyk

home is a tent (called a *ger,* or yurt) made of felt on a lattice frame, readily assembled and disassembled. Where they have taken to agriculture, they have introduced fixed dwellings.

Family life, descent lines, marriage relations, and inheritance of property are all principally regulated by the paternal connection. The family is traditionally an extended one composed of parents, married sons and their families, and unmarried sons and daughters. Several families are grouped into nomadic kin villages. The kin villages are grouped into lineages and clans, and these in turn were formerly grouped into clan confederations. Traditionally the Kalmyk were divided into a princely estate, which ruled the various confederations; a noble estate, which ruled the lower social hierarchies, clans, and lineages; and a common estate. There was also a clerical order forming an estate of its own. All of the estates except the common have disappeared.

Like other Mongols, the Kalmyk are Tibetan Buddhists, but their Buddhism has a strong admixture of indigenous beliefs and shamanistic practices. The Sart Kalmyk are Muslims.

At the end of World War II the Kalmyk were accused of anti-Soviet activity and exiled to Soviet Central Asia. In 1957 they were restored to their home territories. According to the censuses of 1939 and 1959, they decreased in number from 134,000 to 106,000 in 20 years. In 1970, they numbered about 137,000 and in 1979, 147,000.

Kalmyk Autonomous Soviet Socialist Republic, also called KALMYKIYA, administrative division of southwestern Russian S.F.S.R., northwest of the Caspian Sea and west of the lower Volga River. It covers an area of 29,300 sq mi (75,900 sq km). On the east it reaches the Caspian shore and in the northeast the Volga at two points. Most of the republic lies in the vast lowland of the northern Caspian Depression, the greater part lying below sea level. The Yergeni hills and the Salsk-Manych ridge rise to a maximum of 725 ft (221 m) along the western boundary. On the east the Yergeni is sliced by innumerable valleys and ravines, mostly dry, except during rainy periods. A long panhandle of the republic extends westward through the Manych Depression, containing large salt lakes by way of which the Caspian was formerly linked to the Black Sea. East of the Yergeni, the republic is a level plain, containing ancient burial mounds. The Yergeni has steppe-grass vegetation and groves of deciduous trees (willow, elm, and poplar) in the valleys; elsewhere it is semidesert. The climate is characterized by hot summers and low rainfall, which often comes in torrential downpours causing flash floods in the valleys.

The Kalmyks, of Mongol origin, migrated to the Caspian region in the 17th century from Central Asia. They were mainly nomadic cattle breeders. Kalmykiya was established in 1920 as an autonomous *oblast* (administrative region); in 1936 it became a republic, which was abolished in 1944 when the Kalmyks were exiled for alleged collaboration with the Germans. In 1957 they were allowed to return and the area was reestablished as an autonomous *oblast.* It regained republic status in 1958. In 1979 nearly 41 percent of the population lived in three cities, including Elista (*q.v.*), the capital, and in five urban settlements.

Kalmykiya's economy, based on livestock raising, specializes in fine-fleece and Karakul sheep breeding. The people have become more stabilized, and only the herders move with the animals. There is some arable farming on the Yergeni; grains, corn (maize), fodder grasses, mustard seed, sunflowers, and melons are the main crops. Peasants are united on 54 state and 27 collective farms. Fishing is important along the Caspian, and Kaspiysky has a large fish-processing plant. Industry, centred around processed-livestock products (leather, wool, butter, and cheese), is concentrated in Elista and in Kaspiysky. Pop. (1983 est.) 310,000.

Kálnoky von Köröspatak, Gusztav Siegmund, Graf (Count) (b. Dec. 29, 1832, Lettowitz, Moravia—d. Feb. 13, 1898, Prödlitz), Austro-Hungarian statesman, minister of foreign affairs from 1881 to 1895.

At first a professional soldier, Kálnoky entered the Austrian diplomatic service in 1854



Kálnoky, engraving by Carl Mayer

By courtesy of the Bild-Archiv, Österreichische Nationalbibliothek, Vienna

without giving up his connection with the army, in which he attained the rank of general in 1879. After holding diplomatic posts in London, Rome, and Copenhagen, he became ambassador to Russia in 1880 and the next year returned to Vienna as foreign minister.

Kálnoky's policy was generally conservative and fairly successful. He renewed Austria's alliance with Germany and cooperated with Bismarck in securing Italy's adherence to the Triple Alliance (1882). His secret treaties with Serbia (1881) and Romania (1883) were designed to diminish Russian power in the Balkans, as were his dealings with Bulgaria. Not wishing to worsen the problem of minorities within the empire, he rejected an offer by King Milan of Serbia to sell that country to Austria-Hungary. Always wary of Russia, Kálnoky nonetheless tried to improve Austro-Russian relations.

Kálnoky caused friction with Italy by stating in a speech (1891) that the question of the temporal power of the papacy was still unsettled. He wanted to use the Vatican to disrupt the Franco-Russian alliance (1893). Hungarian dislike of Kálnoky's views favouring papal authority was chiefly responsible for his resignation as foreign minister.

Kalocsa, town, Bács-Kiskun *megye* (county), central Hungary, located just east of the Danube. It was one of the bishoprics founded by the first king of Hungary, Stephen I, and was a thriving medieval town until it was sacked by the Turks, rising again in the 19th century as an agricultural centre. Kalocsa has perhaps the richest folk art in all Hungary; the motifs painted by the town's "writing women" are distinguished by inventiveness of design and a wealth of colour. The House of Folk Art museum and the Károly Visky Museum display local work. The Kalocsa motifs are also reproduced in much-sought-after embroidery work, which is exported all over the world. Abundant sunlight permits paprika to thrive, and the town is well known for that crop. Pop. (1983 est.) 19,000.

Kalogeropoulos, Maria Anna Sofia Cecilia (singer): *see* Callas, Maria.

Kalpa-sūtra, manual of Hindu religious practice, a number of which emerged within the different schools of the Veda, the earliest sacred literature of India. Each explains the procedures (*kalpa*) of its school as it applies to three different categories: the sacrificial ritual (the *Śrauta-sūtras, see* Śrauta-sūtra), the domestic ritual (the *Gṛhya-sūtras, see* Gṛhya-sūtra), and the conduct of life (the *Dharma-sūtras, see* Dharma-śāstra). They are written in the short aphoristic style of the *sūtra* (literally "thread") so that they could be committed easily to memory. *Kalpa* is one of six fields of scholarly discipline known as *vedāṅga*s ("accessories to the Vedas"). As they are regarded to be of human origin they are considered *Smṛti* ("tradition") as distinct from the earlier Vedic literature, which is *Śruti* ("revelation").

Kalpa-sūtra, a text held in great honour by the Śvetāmbara sect of Jainism, a religion of India. It deals with the lives of the 24 Jaina saviours, the Tīrthaṅkaras; the succession of pontiffs; and the rules for monks during the Paryuṣaṇa festival.

The five auspicious events (the descent from heaven, birth, initiation, obtaining of omniscience, and death) and many legends of the last three saints, Ariṣṭanemi, Pārśvanātha, and Mahāvīra, and of Ṛṣabanātha, the first of the 24 saints, are recorded. The names and details of the other saints are briefly listed. The manuscripts, housed in monastery libraries, are often profusely illustrated in the characteristic western Indian style of miniature painting. Once a year during the Paryuṣaṇa festival the *Kalpa-sūtra* manuscript is taken out in a procession and read by the monks before the laity. Great merit is attributed to hearing the *Kalpa-sūtra.*

kalsilite, variety of the mineral nepheline (*q.v.*).

Kaltenbrunner, Ernst (b. Oct. 4, 1903, Ried im Innkreis, Austria-Hungary—d. Oct. 16, 1946, Nürnberg), Austrian Nazi, leader of the Austrian SS (Schutzstaffel).

Kaltenbrunner attended public schools at Linz and studied at the University of Prague. He joined the Austrian Nazi Party in 1932 and became leader of the SS (elite guards) in Austria in 1935. After the *Anschluss* he became the official head of the Austrian storm troopers. He was also appointed secretary of state for security in Austria, holding this post until 1941. He was made chief of the security police, Jan. 30, 1943; and following the assassination of Reinhard Heydrich by Czechoslovak patriots in June 1942, he became head of the Reich Security Head office. A rabid anti-Semite, he was said to have agreed with Heinrich Himmler at a conference in 1942 that the gas chamber should be the form of execution used in the slaughter of Jews. He was taken prisoner by U.S. troops on May 15, 1945, and was indicted on charges of war crimes by the International Military Tribunal at Nürnberg, Aug. 29, 1945. He was convicted Oct. 1, 1946, of committing war crimes and crimes against humanity and was sentenced to hang.

Kaluga, *oblast* (administrative region), western Russian Soviet Federated Socialist Republic, occupying an area of 11,500 sq mi (29,900 sq km) in the upper Oka River Basin southwest of Moscow *oblast.* Broad, often swampy valleys alternate with rolling hills of the Central Russian Upland. The natural vegetation—mixed forest of oak, spruce, pine, and birch—survives over only one-third of the surface; elsewhere the soils have been cleared for agriculture. The climate is continental, with about 24 in. (600 mm) of precipitation a year. Cultivation of grain, flax, hemp, and fodder crops and livestock raising are well developed. The small towns of the *oblast* are engaged in processing agricultural produce, light engineering, timber working and, in the northeast, textiles; some lignite (brown coal) is mined. The first Soviet atomic power plant was built in 1955 in Obninsk. Kaluga city is the administrative centre. Pop. (1983 est.) 1,020,000.

Kaluga, city and administrative centre of Kaluga *oblast* (region), western Russian Soviet Federated Socialist Republic, west of Moscow on the Oka River. Founded in the 14th century as a stronghold against the Tatars on the southern borders of Muscovy, it later became a seat of provincial administration. In the early 17th century it was devastated by Cossacks, plague, and fire, and in the winter of 1941 it was held by the Germans. It has a wide range of industries, producing turbines, railway equipment, and consumer goods. The city is on the Vyazma–Tula railway near its junction with the Moscow–Kiev line. Pop. (1985 est.) 297,000.

Kalulushi, town, north-central Zambia, southern Africa. Kalulushi is located near the Zaire border and is about 175 miles (280 km) north of Lusaka, with which it is connected by road. Main roads connect it with other mining centres such as Kitwe, Luanshya, and Chingola. Copper was discovered in the early 1920s, and the resulting development of mining-related industries brought an influx of rural migrants. Other minerals mined include cobalt and selenium. Industries producing food and beverages, wood and wood products, plastics, fabricated metal products, and chemicals are also located in Kalulushi. Pop. (1980 prelim.) 59,213.

Kalundborg, city, Vestsjællands *amtskommune* (county), northwestern Sjælland (Zealand), Denmark, on Kalundborg Fjord. A favourite royal seat in the Middle Ages (chartered 1485), its castle was a frequent meeting place for the Danehof (national assembly). The castle later became a state prison, where Christian II was confined (1549–59) by Christian III; it was razed by the Swedes in 1658. Vor Frue Kirke (church; *c.* 1170) is a unique landmark, the ground plan being in the form of a Greek cross, with five towers. There is also a historical museum. The city has a sheltered harbour and berths for various ferry services; industries include meat-packing, shipbuilding, oil refining, and the manufacture of machinery and chemicals. Pop. (1983 est.) city, 15,306; (1985 est.) mun., 19,248.

Kalush, city, Ivano-Frankovsk *oblast* (administrative region), southwestern Ukrainian Soviet Socialist Republic. Kalush was incorporated as a city in 1939 and became the centre of Kalush *rayon* (district). It is approximately 56 miles (90 km) southeast of Lvov and is on the Ivano-Frankovsk–Stry rail line. Industries include food processing, clothing manufacture, chemicals, and concrete. There is also a chemical and technological *tekhnikum* (semiprofessional training school). Pop. (1985 est.) 65,000.

Kalutara, town, southwestern Sri Lanka. The town, situated on the coast, is a fishing and trade centre. The local craft is making rope, baskets, and other articles from the fibre of the coconut palm. A Portuguese fort in Kalutara surrendered to the Dutch in 1655 without a shot being fired; it was later enlarged by the conquering Dutch. In addition to its fibre crafts, the area produces arrack (an alcoholic beverage distilled from malted rice mash and molasses) and mangosteen, a reddish-brown fruit that is valued for its juicy, delicate texture and its slightly astringent flavour. Pop. (1982 est.) 35,000.

Kalvis, also called KALVAITIS, or KALVELIS (Lithuanian), Latvian KALĒJS, in Baltic religion, the heavenly smith, usually associated with a huge iron hammer. A smith in the tradition of the Greek Hephaistos and the Vedic Tvaṣṭṛ, Kalvis also seems to have been a dragon killer, a function in which he was superseded by the Christian St. George. Every morning Kalvis hammers a new sun for Aušrinė (Latvian Auseklis), the dawn, and a silver belt and golden stirrups for Dievo sūneliai (Latvian Dieva dēli), the morning and evening stars.

Kalvis' extraordinarily large iron hammer, by whose aid the sun was said to have been freed from imprisonment, was honoured by the Lithuanians as late as the turn of the 15th century.

Kálvos, Andréas Ioannídis (b. April 1792, Zacynthus, Venetian Republic [now Zákinthos, Greece]—d. Nov. 3, 1869, London), Greek poet who brought an Italian Neoclassical influence to the Ionian school of poets (the school of Romantics from the seven Ionian islands).

Kálvos was brought up at Leghorn, Tuscany (1802–12), and lived most of his life in Italy and England. While in Italy he became secretary (1812–17) to the Italian poet and patriot Ugo Foscolo, a fellow native of Zacynthus, who exercised great influence on his writings. In fact, Kálvos' first works, including two tragedies, were written in Italian. In 1826 he went to Corfu, where he founded his own private school. He spent his last years in England.

Kálvos published 20 patriotic odes in two fascicles: *Líra* ("The Lyre") at Geneva in 1824 and *Néas Odás* ("New Odes") at Paris in 1826. He wrote of an idealized Greece, a Greece of the old virtues but a Greece viewed from outside. Although he sometimes used Demotic Greek (the vernacular tongue), he was generally a purist given to an austere and moralizing poetry and to various archaisms. The Italian Neoclassical influence was evident mainly in poetic paraphrases, extending metaphors, and artificial language and metres. Although admired by some, Kálvos was not a strong force in subsequent Greek literature.

Kalyān, town, western Mahārāshtra state, western India, on the Ulhās River, northeast of Bombay, a part of the Ulhāsnagar urban agglomeration. A relatively unimportant trading centre in Roman times, Kalyān was fortified by Shāh Jahān during the Mughal period. It became part of the Bijāpur kingdom and subsequently fell to the Marāṭhās (1662) and the British (1780). Now part of the Greater Bombay industrial complex, it specializes in the manufacture of chemicals, synthetics, and electrical equipment. Its small-scale cottage industries, particularly handloom cotton and silk weaving, are still important. The town has good road and rail connections throughout the region and maintains weekly markets and the wholesale marketing of agricultural produce. Kalyān is also a port for the local coastal trade. It has several monuments of the Muslim period including the Mātabarkhan Palace and the Kālī Masjid (Black Mosque). Pop. (1981) 136,052.

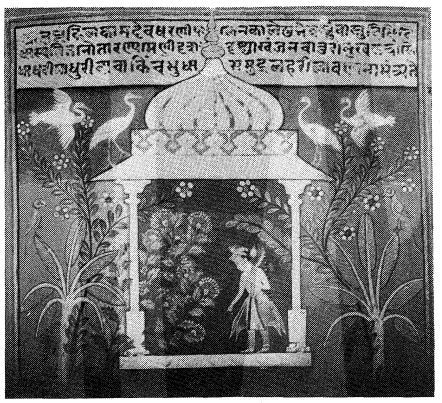
Kalyub (Egypt): *see* Qalyūb.

Kalyubia (Egypt): *see* Qalyūbīyah, al-.

Kam (people): *see* Tung.

Kāma, in the mythology of India, the god of love. During the Vedic age, he personified cosmic desire, or the creative impulse, and is called the first-born of the primeval chaos that makes all later creation possible. In later periods he is depicted as a handsome youth, attended by heavenly nymphs, who shoots love-producing flower-arrows. His bow is of sugarcane, his bowstring a row of bees. Once directed by the other gods to arouse Śiva's (Shiva's) passion for Pārvatī, he disturbed the great god's meditation on a mountaintop. Enraged, Śiva burned him to ashes with the fire of his third eye. Thus he became Ananga (Sanskrit: "the Bodiless"). But some accounts say Śiva soon relented and restored him to life after the entreaties of his wife, Rati.

The term kama (Sanskrit *kāma*) also refers to one of the proper pursuits of man in his role as a householder, that of pleasure and love. A classic textbook on erotics and other



Kāma, detail from a Mewār painting, *c.* mid-17th century; in the Kanoria Collection, Patna, India
Pramod Chandra

forms of human pleasure, the *Kāma-sūtra,* is attributed to the sage Vātsyāyana.

kāma-dhātu, in Buddhism, the realm of feeling. *See* arūpa-loka.

kāma-loka, in Buddhism, the world of feeling. *See* arūpa-loka.

Kama River, Russian REKA KAMA, river in the Russian Soviet Federated Socialist Republic. Rising in the Verkhne (Upper) Kama Upland of the Udmurt A.S.S.R., it flows north, then east, south, and southwest for 1,122 miles (1,805 km) until it enters the Volga below Kazan, in the Kuybyshev Reservoir. It drains a basin of 202,000 square miles (522,000 square km). The spring maximum flow following the snowmelt accounts for nearly 60 percent of the annual flow; freeze-up lasts from mid-November or early December until April. Navigation is possible to Rudnichny, some 954 miles (1,535 km). The Kama is one of the most important rivers of Russia—historically as the routeway to the Urals and Siberia and economically as part of the vast Volga system of waterways. There are large barrages and hydroelectric stations at Perm, at Chaykovsky near Votkinsk, and at Nizhnekamsk, downstream.

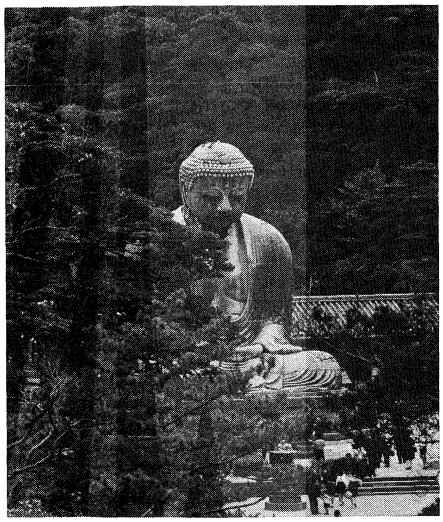
kamacite, meteoritic mineral consisting of iron alloyed with 5 to 7 percent nickel. It is found in iron meteorites and comprises all the metal in hexahedrites; it also is a principal constituent of the octahedrites, where it is intergrown with taenite (meteoritic nickel–iron). Its name is derived from the Greek word for shaft or lath and alludes to the shape of its crystals, which belong to the isometric system.

Kamaishi, city, Iwate Prefecture (*ken*), Honshu, Japan, facing Kamaishi Bay on the Pacific Ocean. Kamaishi was a small fishing village until magnetite was discovered in the area in 1727, and Japan's first European-style blast furnace was constructed in the city in 1857. In 1885 a government-controlled iron foundry was built using coal from Hokkaido and later using ore from China after the Sino-Japanese War (1894–95). Heavy damage was suffered during World War II, but mining revived after 1945, yielding magnetite ore. Iron and steel, mainly from Britain, are imported through Kamaishi's harbour, which is also an important fishing port and part of Rikuchu-kaigan National Park. In the 1970s the port facilities were reconstructed, and a large oil storage and industrial site were built on reclaimed land. The city is on the Tohoku railway line. Pop. (1980) 65,250.

Kamakaeha, Liliu: *see* Liliuokalani.

Kamakura, city, Kanagawa Prefecture (*ken*), Honshu, Japan, on the Pacific Ocean, south of Yokohama. Situated at the western base

of the Miura-hantō (Miura Peninsula), it is enclosed on three sides by hills and has fine



The Daibutsu (Great Buddha), cast in bronze by Ono Goroemon in 1252 and a Japanese national treasure, Kamakura, Japan
George Holton—Photo Researchers

sandy beaches to the south. Kamakura was a small fishing village until it was established as a capital of the Minamoto clan in 1180. It then retained its political status as the second capital of Japan for about 300 years. Civil wars, tidal waves, and fires led to a decline that was arrested during the Tokugawa period (1603–1867), when the town became a tourist centre. During that time, palaces, temples, and residences of nobles were built. Neighbouring villages were incorporated in 1939 and 1948.

Kamakura functions as a historic site, a resort, and a residential district along the Yokosuka Line (railway). The Ōfuna area developed industrially after 1945. Historic landmarks include the bronze Great Buddha, or Daibutsu, a national treasure; the Kenchō-ji and Engaku-ji (temples); and the statue of Kannon, the goddess of compassion. The city houses the Kamakura Museum and the Kamakura Prefectural Museum of Modern Art. The beaches of Yui-ga-hama and Shichiri-ga-hama attract thousands of tourists. Kamakura *bori* (lacquer ware), developed and maintained by Buddhist sculptors since the 13th century, is still produced as a folk art. Pop. (1982 est.) 173,850.

Kamakura-bori (Japanese: "Kamakura carving"), in Japanese lacquerwork, technique in which designs are carved in wood and then coated with red or black lacquer. Originally, it was an imitation of a Chinese carved lacquer (*tiao-ch'i,* called *tsuishu* in Japanese) in which many layers of lacquer are built up to a considerable thickness (often in several colours) and then cut back to achieve the desired relief design. There also existed in China a technique of carving wood and coating it with vermilion lacquer, but this does not seem to have been the inspiration for Kamakura-*bori.*

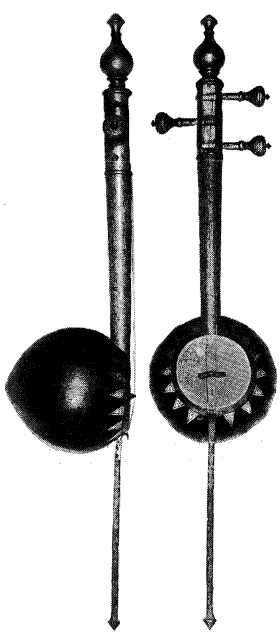
Chinese lacquerwork was fashionable in Japan during the Kamakura period (1192–1333), and Kamakura-*bori* dates from the latter part of that period. One of the earliest extant examples is an incense container with a peony pattern in the Nanzen-ji, Kyōto, believed to date from the 14th or early 15th century. The influence of the *tiao-ch'i* technique also can be seen in Kamakura-*bori* chests and cabinets dating from the latter part of the Muromachi period (1338–1573). Chinese artists in the Chia-ching period (1522–66) of the Ming dynasty used layers of red and green lacquer cut back to produce red flowers and green leaves. The Kamakura-*bori* versions consist of a carved wood design, with the flowers coated in red lacquer and the leaves in green.

Kamakura period, in Japanese history, the period from 1192 to 1333 during which the basis of feudalism was firmly established. It was named for the city where Minamoto Yoritomo set up the headquarters of his military government, commonly known as the Kamakura shogunate. After his decisive victory over the rival Taira family at the battle of Dannoura (1185), Yoritomo created his own military administration (*bakufu*) to serve beside the Imperial court. In 1192 his authority was given Imperial sanction when he was granted the official rank of shogun (hereditary military dictator). After Yoritomo's death in 1199, however, real power in the *bakufu* was wielded by members of the Hōjō family who acted as shogunal regents for the remainder of the period. Two invasion attempts by the Mongols in 1274 and 1281 were thwarted by Japanese warriors with the aid of the "divine wind" (*kamikaze*) of typhoons that decimated the enemy fleet. The financial strain imposed by the defense efforts against the Mongol attacks, however, exacerbated internal weaknesses in the regime. The revolt of the emperor Go-Daigo against the Kamakura shogunate in 1331 and ensuing factional struggles led to the collapse of the *bakufu* in 1333.

Kamakura culture was largely defined by the rise of the warrior class, which held martial skills and the ideals of duty, loyalty, and bravery in the highest regard. The practice of ritual suicide by disembowelment (*seppuku*) and the cult of the sword both emerged during this period. Zen Buddhism, which emphasized discipline, concentration, and direct action, became influential as it appealed to warrior sensibilities, while the new faith sects of True Pure Land and Nichiren Buddhism found followers among the populace. In literature military chronicles that romantically depicted the heroic but often unsuccessful exploits of famous warriors developed into an important genre.

Kamanga (people): *see* Tumbuka.

kamanjā, also spelled KAMĀNJA, fiddle prominent in Arab and Persian art music. It is



Kamanjā, side and front views; in the Musée Instrumental du Conservatoire Royal, Brussels
By courtesy of the Musee Instrumental, Brussels; photograph, © A.C.L., Brussels

a spike fiddle; *i.e.,* its small, round or cylindrical body appears skewered by the neck, which forms a "foot" that the instrument rests on when played. It has a membrane belly and, commonly, two to four strings.

It apparently originated in northern Persia and was mentioned by the 10th-century philosopher and music theorist al-Fārābī. Though still common in the Near East, it has given way in North Africa to the vertically played European viola and violin, which there are called *kamanjās.*

Both the instrument and the name are widely diffused. In Central Asia, northern India, and Southeast Asia, spike fiddles closely resembling the *kamanjā* are common under the name rebab. The *kamanjā* is called *rabāb* in Turkey, the derivative name *kemençe* being applied to a pear-shaped fiddle similar to the Greek lira.

Kamaraj, Kumaraswami (b. July 15, 1903, Virudunagar, India—d. Oct. 2, 1975, Madras), Indian statesman who rose from the Nadar (next to lowest) caste to become chief minister of Madras (later Tamil Nadu) and president of the Congress Party.

At age 15 Kamaraj entered politics by organizing fund-raising rallies for the Congress Party in his home district. Elected to the Madras Legislative Assembly in 1937, he went on to win a seat in the lower house of the Indian Parliament in the general elections of 1952. From 1954 to 1963 he served as chief minister of Madras, giving up that post under what came to be known as the Kamaraj Plan, which called for the voluntary resignations of high national and state officials to devote their efforts to Congress Party reorganization at the grass-roots level. Soon thereafter he was appointed president of the party. He was largely responsible for placing Lal Bahadur Shastri in the prime ministership in 1964 and Indira Gandhi in 1966—both times defeating the rightist Morarji Desai. He suffered defeat in his home town in 1967 and soon after was manoeuvred out of the party leadership by Mrs. Gandhi. In 1969 he was part of an old-guard leaders' group that tried to remove Mrs. Gandhi from power, but the party split, leaving Kamaraj and his associates with a small splinter group.

Kamaraj's low social origins contributed to his success in bringing low caste and untouchable voters into the Congress fold. He underscored his strong belief in personal contact by visiting nearly all the villages in his state more than once.

Kamarān, island in the Red Sea off the coast of Yemen (Ṣan'ā') but belonging to Yemen (Aden). The largest member of an archipelago, it is 22 sq mi (57 sq km) in area. Its name, meaning "two moons" in Arabic, refers to a double reflection of the moon that can be seen there. Kamarān, consisting of coral reefs with little relief, has a regular west coast and a broken east coast with a harbour. The island's mean annual temperature of 85° F (29° C) is among the world's highest, and the climate is made more uncomfortable by dust storms and high humidity; rainfall is light.

The Portuguese held Kamarān, for the purpose of controlling Red Sea navigation, from 1513 until they were displaced by the Ottomans in 1620. The British occupied the island in 1915, governing it from Aden. Three villages on the western shore carry on pearl fishing, and the island exports dried fish and charcoal. An insular airfield has connections to Aden.

Kamáres ware, style of painted pottery that flourished on Crete during the Middle Minoan period (*c.* 2100–*c.* 1550 BC). Surviving examples include ridged cups, small, round spouted jars, and large storage jars (pithoi), on which combinations of abstract curvilinear

designs and stylized plant and marine motifs are painted in white and tones of red, orange, and yellow on black grounds.

Kāmārhāti, town, Twenty-four Parganas district, West Bengal state, northeastern India, just east of the Hooghly River, part of the Calcutta urban agglomeration. The town has major industries that include jute and cotton milling, leather tanning, and the manufacture of rubber goods, cement, pottery, and paint. It contains a group of temples, called Rani Rāsmanī's Nabaratna, that are dedicated to the deities Kālī, Krishna, and Śiva. Formerly included in Baranagar (*q.v.*) city, Kāmārhāti was constituted as a separate municipality in 1899. Pop. (1981) 234,951.

Kāmarūpa, also called KĀMĀTĀ, ancient Indian state corresponding roughly to what is now the state of Assam in northeastern India. This region had many rulers, but, being protected by natural fortifications, it maintained fairly consistent territorial boundaries.

Kāmarūpa was ruled by a single dynasty from AD 350 to 650. Although it began as a feudatory state of the Gupta empire, under a second dynasty that ruled in the 9th and 10th centuries Kāmarūpa existed as an independent kingdom. Although several Muslim invasions were repelled in the 13th century, in the same period the area was infiltrated by the Ahom tribe of northern Burma, who slowly progressed westward in their control of the region. The Ahoms called the region Assam, and this term eventually supplanted "Kāmarūpa" as the accepted name for the area. Being a unique mix of South Asian and East Asian cultures, Kāmarūpa was the seat of evolution for the Tantric form of Hinduism.

Kamasian Pluvial Stage, major division of Pleistocene time and deposits in Africa (the Pleistocene Epoch began about 2,500,000 years ago and ended about 10,000 years ago). The Kamasian Pluvial Stage, a period of wetter climatic conditions, followed the Kageran Pluvial Stage and is separated from it by a period of drier climate, the Kageran-Kamasian Interpluvial. The Kamasian Stage has been equated with the Mindel Glacial Stage of the Northern Hemisphere as well as with Bed II at Olduvai Gorge. Substantiation of a wetter climatic period is afforded by the presence of crocodile fossils in Kamasian sedimentary deposits.

Kamba, Bantu-speaking people occupying the Machakos and Kitui districts of Kenya. They are closely related to the neighbouring Kikuyu.

Though primarily agriculturalists, the Kamba keep considerable numbers of cattle, sheep, and goats. Their main staple crops are millet, sorghum, and corn (maize). Overcrowding and soil erosion in the Machakos district have driven many to work in Nairobi. The Kamba have long been known as traders.

The basic group among the Kamba is a unit of flexible social and territorial boundaries called an *utui,* based on a core patrilineage. The Kamba are grouped into some 25 dispersed patrilineal clans varying greatly in size. Individuals are organized in age grades, but these are not based on initiation as among the Kikuyu and others. Men in the eldest grade traditionally formed local district councils that governed several *utui.* Now government-appointed chiefs and headmen work with them.

Traditional Kamba religion resembled the Kikuyu's, with belief in a high god, Ngai, and in ancestral spirits; the ancestral cult was particularly well developed. Communication with spirits was carried on through mediums. Most Kamba have become Christian.

Kambalda, mining town in Boulder shire, southern Western Australia, 40 mi (64 km) south of Kalgoorlie. Gold was mined there from 1896 to 1906, but the site's modern importance dates from 1966, when deposits of high-grade nickel were discovered in the vicinity. Ores are smelted at Kalgoorlie, refined at Kwinana (south of Perth), or carried southward to the port of Esperance for shipment. A plant built on the shore of dry Lake Lefroy, 2 mi northeast of Kambalda, produces nickel concentrates, which also contain copper, cobalt, paladium, and platinum. A model community has been constructed at Kambalda to house mine workers. There is widespread prospecting in the area, and mines have been opened at Spargoville and Nepean. Pop. (1981) 4,463.

Kamban, Gudmundur (Jonsson Hallgrimsson) (b. June 8, 1888, Álfranes, Ice.—d. May 5, 1945, Copenhagen), one of Iceland's most important 20th-century dramatists and novelists. His work, anchored in a deep historical awareness, often criticized modern Western values and spoke in favour of attitudes of compassion and understanding. He wrote his works in both Icelandic and Danish.

His greatest work is the four-volume historical novel *Skálholt* (1930–32; Eng. trans. of vols. 1 and 2, *The Virgin of Skalholt,* 1935), a carefully researched fictional investigation of the life of the daughter of the 17th-century Icelandic bishop Brynjólfur Sveinsson. Another important work is *Jeg ser et stort skönt land* (1936; *I See A Wondrous Land,* 1938), a historical novel set in the 11th century which recounts the Viking expeditions to Greenland and America. Among Kamban's most important plays are *Hadda Padda* (1914; Eng. trans. 1917), on the theme of erotic love and *Vi mordere* (1920; *We Murderers,* 1970), which focusses attention on the penal system and raises questions concerning the legitimacy of punishment.

Kamban was inadvertently shot and killed by the Danish resistance as they attempted to arrest him in order to question him concerning his alleged Nazi sympathies.

Kambujia: *see* Cambyses.

Kamchadal, also called ITELMEN, people of southern Kamchatka Peninsula, U.S.S.R., numbering about 1,400 in the 1979 Soviet census. Much reduced by conquest and epidemics, they have been largely Russianized since the 18th century. In Soviet usage the surviving remnant is designated by their own term Itelmen; the name Kamchadal refers to mixed bloods in the U.S.S.R.

Their Luoraweltan language of the Paleosiberian language group and their mythology are closely related to those of the neighbouring Chukchi and Koryak. Along with many other tribes around the North Pacific the Kamchadal based their economy and pattern of life on the annual salmon run; extensive use of wild plants was also characteristic. The year's food supply was largely obtained with weirs, traps, and nets in summer, permitting relative leisure during other seasons.

The Kamchadal were primarily a riverine and coastal people. Living in relative isolation, they were still technologically in the Stone Age when first reported (1697). Uniquely, they lived in underground houses in winter and in elevated pile structures during the summer. Dog sleds or small dugout canoes provided transportation, depending on the season. Warfare among local groups was frequent. Little is known about traditional Kamchadal social organization, but women had considerable influence. Religion included propitiation of countless spirits, and game-animal rituals designed to assure hunting success. Shamans were less important than elsewhere in Siberia.

Kamchatka, also spelled KAMČATKA, *oblast* (administrative region), far eastern Russian Soviet Federated Socialist Republic, occupying an area of 182,355 sq mi (472,300 sq km) that comprises the entire Kamchatka Peninsula and the southern end of the Koryak Mountains. It includes the Koryak autonomous *okrug* (area). The administrative centre is Petropavlovsk-Kamchatsky (*q.v.*). The population, averaging only 2.2 persons per sq mi (0.9 per sq km) in 1982, consists chiefly of Russian settlers. The Koryaks of the north comprise the main indigenous group; smaller groups include the Evens, Chukchis, and Kamchadal. Fishing dominates the economy and includes large-scale crab fishing and canning. Some timber is cut in the Kamchatka Valley, in which the only small patches of agriculture occur. The first geothermal electric power station in the U.S.S.R. was built in Kamchatka *oblast.* Pop. (1983 est.) 415,000.

Kamchatka Peninsula, also spelled KAMČATKA, Russian POLUOSTROV KAMCHATKA, peninsula in the far eastern Russian Soviet Federated Socialist Republic, lying between



Geysers on the Kamchatka Peninsula, Russian S.F.S.R.
Novosti Press Agency

the Sea of Okhotsk on the west and the Pacific Ocean and Bering Sea on the east. It is about 750 mi (1,200 km) long north–south and about 300 mi across at its widest; the area is about 140,000 sq mi (370,000 sq km). Two mountain ranges, the Sredinny (Central) and Vostochny (Eastern), extend along the peninsula and rise to 15,584 ft (4,750 m) in Klyuchevskaya Sopka (*q.v.*), which is a volcano. Of the 127 volcanoes, 22 are still active, together with many geysers and hot springs. A small geothermal power station, the only one in the U.S.S.R., uses underground steam and is in operation near the southern end of the peninsula. Further development of geothermal potential is planned. The climate is severe, with prolonged, cold, and snowy winters and wet, cool summers. Most of Kamchatka is tundra supporting mosses and lichens, with thickets of Kamchatka alder. Sheltered lowlands, notably the valley of the Kamchatka River, which separates the mountain chains, are in birch or larch forest, with poplar and willow in wetter areas. The only important economy is fishing, especially crabbing, around the coasts. Agriculture is limited; some cattle and reindeer are kept. The main centre is the city and port of Petropavlovsk-Kamchatsky. Kronotsky State Reserve, established in 1934 and having 2,400,000 ac (964,000 ha), is located on the eastern coast of the peninsula. Most of the inhabitants are Russians, with indigenous Koryaks, Chukchis, and Itelmens.

Kamchatka River, also spelled KAMČATKA, river, northeastern Russian Soviet Federated Socialist Republic. It rises in the Sredinny (Central) Range of the Kamchatka Peninsula and flows north and east about 478 mi (758 km) past Milkovo, head of shallow draught navigation, to the Bering Sea. The river freezes from November until May, except in places where hot springs come to the surface. The Kamchatka is used for timber transport. The port of Ust-Kamchatsk is located at the mouth of the river.

kame, moundlike hill of poorly sorted drift, mostly sand and gravel, deposited at or near the terminus of a glacier. A kame may be produced either as a delta of a meltwater stream or as an accumulation of debris let down onto the ground surface by the melting glacier. A group of closely associated kames is called a kame field or complex and may be interspersed with kettles or kettle lakes. A kame terrace is produced when a meltwater stream deposits its sediments between the ice mass and the valley wall. In small areas, kames may form the terminal moraine.

Kamehameha, name of kings of Hawaii, grouped below chronologically and indicated by the symbol •.

• **Kamehameha I,** original name PAIEA, byname KAMEHAMEHA THE GREAT (b. November 1758?, Kohala district, island of Hawaii—d. May 8, 1819, Kailua), Hawaiian conqueror and king who, by 1810, had united all the Hawaiian islands and founded the Kamehameha dynasty, the most enduring and best documented line of Hawaiian rulers.

First named Paiea, meaning Soft-Shelled Crab, the future sovereign was the son of Keoua, a high chief, and of Kekuiapoiwa, a daughter of the former king Alapai. A Hawaiian tradition tells that a bright star, Kokoiki, appeared just before the great conqueror was born. The date of the legend coincides with the appearance of Halley's comet in 1758. When Kokoiki was viewed by the *kahunas*, Hawaii's mystic seers, it was prophesied that a great leader was about to be born who would defeat all his rivals and reign supreme over all the islands. The infant prince was ordered to be put to death by Alapai, but was reared secretly and grew to manhood, taking the name Kamehameha, meaning The Very Lonely One, or The One Set Apart.

At the death of King Kalaniopuu in 1782, the island of Hawaii was divided between his son, Kiwalao, and his nephew, Kamehameha. Despite jealousy between the two cousins, relations were peaceful until July 1782, when a dispute between their chiefs at Keomo led to the outbreak of war. In the ensuing battle at Mokuohai, Kiwalao was slain. Kamehameha then embarked upon a series of conquests that by 1795 had brought all the islands but Kauai and Niihau under his control. When these were ceded to him through peaceful negotiations in 1810, Kamehameha was undisputed ruler of the entire island group.

Although autocratic in principle, Kamehameha set up governors to administer each island. He retained the traditional harsh *kapu* system of laws and punishments, but he also promulgated the *mamalahoe kanawai,* "The Law of the Splintered Paddle," which protected the common people from unduly brutal aggressions of powerful chiefs. He also outlawed human sacrifice, rites that had been performed in former times to increase the *mana,* or sacred power, of the king.

A shrewd businessman, Kamehameha amassed a fortune for his kingdom through a government monopoly on the sandalwood trade and through the imposition of port duties on visiting ships. He was an open-minded sovereign who rightfully deserves his title, Kamehameha the Great. Acclaimed as the strongest Hawaiian ruler, he maintained his kingdom's independence throughout the difficult period of European discovery and exploration of the islands—a task that proved too great for his successors. James T. Pole's *Hawaii's First King* appeared in 1959.

• **Kamehameha II,** also called LIHOLIHO (b. 1797, Hawaii—d. July 14, 1824, London), king of Hawaii from 1819 to 1824, son of Kamehameha I.

In 1820 he admitted the first company of missionaries (from New England), who, within two years, had learned the language, reduced it to writing, and printed the first textbook. Kamehameha resisted conversion to Christianity, allegedly because he refused to give up four of his five wives as well as rum drinking. In 1823 he sailed on a visit to England, in a delegation that included two of his wives. Stricken with measles in London in June 1824, Kamehameha and his favourite wife, Kamamalu, died there.

• **Kamehameha III,** also called KAUIKEAOULI (b. March 7, 1814, Hawaii—d. Dec. 15, 1854, Honolulu), king of Hawaii from 1825 to 1854, brother of Kamehameha II.

Only 10 years of age when he succeeded to the throne, he was initially under the regency of Kamehameha I's favourite wife, Kaahumanu, who had been regent ever since Kamehameha II had visited England in 1824 and died there. Converted to Christianity in 1824, she became known for her wise and beneficent rule. On her death in 1832 the regency fell to Kamehameha I's daughter Kinau, but in the following year Kamehameha III assumed power in his own right.

After hearing a series of lectures on government delivered by an American clergyman, William Richards, Kamehameha III promulgated the Declaration of Rights, called Hawaii's Magna Carta, on June 7, 1839, the Edict of Toleration on June 17, 1839, and the first constitution on Oct. 8, 1840. This first written constitution for Hawaii contained several innovations, including a representative body of legislators elected by the people. It also set up a supreme court. The first compilation of laws was published in 1842. With Richards' aid, Kamehameha also obtained diplomatic recognition of Hawaiian independence by the United States (1842) and by Great Britain and France (1843).

• **Kamehameha IV,** original name ALEXANDER LIHOLIHO (b. Feb. 9, 1834, Ewa, Oahu, Hawaii—d. Nov. 30, 1863, Honolulu), Hawaiian sovereign known for his firm opposition to the annexation of his kingdom by the United States. As Kamehameha IV, he strove to curb the political power of the U.S. Protestant missionaries in the Hawaiian Islands. Dedicated to protecting his people, who were rapidly dying out because of disease, he sponsored many social and economic reforms. He established Hawaii's commercial and political relations with other nations on a solid base and tried to balance each country's influence on island life.

The son of Kekuanaoa, governor of Oahu, and Kinau, a woman chief who had been *kuhina nui* (prime minister), Prince Alexander Liholiho was adopted as a child by his uncle, Kamehameha III. He was rigorously educated by Protestant missionaries and attended the Chiefs' Childrens' School. To prepare him further for his future role, Prince Alexander and his brother, Lot, accompanied by the missionary-doctor Gerritt P. Judd, toured the United States, England, and France in 1849. Crowned in 1855 at the death of Kamehameha III, he became a popular monarch and was virtually an idol to the Hawaiian people.

The annexation movement of 1853–54, championed by many U.S. missionaries, caused Kamehameha to take steps to ensure the independence of his kingdom. To balance foreign relations, formerly dominated by the U.S., he invited the Church of England to establish itself in the islands. Impatient with the puritanical U.S. missionaries, and suspicious of Yankee businessmen, he gradually removed all U.S. members from cabinet posts and encouraged Hawaii's commercial interests with other nations.

Among the many features of his benevolent rule were his construction of a sailors' home and the Queen's Hospital in Honolulu in 1860 to provide free medical care for Hawaiians and part-Hawaiians. He established Hawaii's first chamber of commerce, took an active interest in economic expansion, and sponsored an agricultural program designed to spur native interest in farming. Island harbours were improved to accommodate Hawaii's rapidly growing whaling industry.

Kamehameha withdrew from public life in 1862 upon the death of his only son, Prince Albert Edward Kauikeaouli (born 1858).

• **Kamehameha V,** also called LOT KAMEHAMEHA (b. Dec. 11, 1830, Honolulu—d. Dec. 11, 1872, Honolulu), king of Hawaii from 1863 to 1872.

Succeeding to the throne on the death of his younger brother, Kamehameha IV, he immediately revealed his intention to rule with a strong hand, refusing at his inauguration to take the oath to maintain the existing, comparatively liberal constitution. After calling and dismissing a constitutional convention, he himself wrote and promulgated a new constitution (1864), which remained in effect for 23 years. He also imported the first wave of Japanese labourers, by a contract made in 1868. In the later years of his reign he grew so obese (weighing about 375 pounds) that he remained almost constantly confined to his palace, becoming at last unable to stand or support himself. He never married, and the Kamehameha dynasty ended with his death. The legislature elected a cousin, William Charles Lunalilo, to succeed him.

kamelaukion, closed bonnet-like headdress, apparently of Byzantine origin, rising from a circlet and usually equipped with hanging ornaments, or *pendilia,* on each side. Its form is retained in the mitres of prelates of the Greek Orthodox Church.

Sometimes the kamelaukion was made of precious metal, sometimes of fabric; in either event, it might be richly decorated with jewels. The crown of Abyssinia (Ethiopia), brought to England after the fall of Magdala in 1868 but since returned to Addis Ababa, appears to be a development of this headdress.

Kamen-na-Obi, city and administrative centre of Kamensky *rayon* (district) of Altay *kray* (territory), west central Russian Soviet Federated Socialist Republic. A port on the Ob River, it was founded in 1670 and designated an urban settlement in 1915 and became a city in 1925. Its economic base is the food-processing industry; other factories produce bricks and furniture. Plans were prepared in the 1970s for a dam at Kamen-na-Obi, which would back up a reservoir past Barnaul, generate 630 megawatts, and irrigate 5,000,000 ac (2,000,000 ha) in the Kulunda Steppe. Teacher-training and veterinary colleges are located in the city. Pop. (1970) 35,604.

Kamenets-Podolsky (*oblast,* Ukrainian S.S.R.): *see* Khmelnitsky.

Kamenets-Podolsky, also spelled KAMENEC-PODOL'SKIJ, city, Khmelnitsky *oblast* (region), Ukrainian Soviet Socialist Republic, on the Smotrich River, at an extremely defensible site where the river forms a loop. The city is one of the largest and oldest in the Dnestr River Basin, dating back to at least the 11th century. It was long a frontier fortress and centre of the

Lithuanian province of Podolye. The coming of the railway in the 19th century revived the town, which had been absorbed by Russia in 1793. It is now a varied industrial centre with food, building-material, and scientific industries, as well as technical colleges and teacher-training and agricultural institutes. A cement plant built in the 1970s is one of the largest in the Ukraine and was the impetus for substantial population growth. Pop. (1987 est.) 101,000.

Kamenev, Lev Borisovich, original name LEV BORISOVICH ROSENFELD (b. July 22, 1883, Moscow—d. Aug. 24, 1936, Moscow), Old Bolshevik and prominent member of the Communist Party and Soviet government during the decade after the October Revolution in Russia (1917), who became an opponent of Joseph Stalin and was executed during the Great Purge.

Born to middle-class parents who themselves had been involved in the Russian revolutionary movement of the 1870s, Kamenev became a professional revolutionary, joining the Russian Social-Democratic Workers' Party (1901) and its Bolshevik faction (1903).

In 1908 he emigrated to western Europe, where he worked closely with the Bolshevik leader Lenin. In 1914 Lenin sent him back to Russia, but when Kamenev directed the Bolshevik delegates to the Duma (Russian parliament) to oppose Russia's participation in World War I, he was arrested and exiled to Siberia (November 1914).

After the February Revolution (1917), he returned to Petrograd (now Leningrad), assumed leadership of the Bolshevik organization there (with Stalin), and advocated conditional support of the provisional government. Although his policy was overruled by Lenin upon his return to Russia (April 1917), Kamenev retained his cautious approach to the revolution, opposing, with his close friend and colleague Grigory Zinovyev, the Bolshevik decision to seize power. Despite his dissident views, he was elected to the Bolsheviks' first Politburo (October 1917), and, after the insurrection, he served as the first chairman of the Central Executive Committee of the All Russian Congress of Soviets. In 1919 he became a member of the reestablished Politburo and chairman of the Moscow Soviet.

When Lenin became seriously ill (1922), Kamenev joined Stalin and Zinovyev to form the ruling triumvirate, which politically attacked the commissar for war, Leon Trotsky, thus eliminating him from contention for power. Stalin then shifted his attack to Kamenev and Zinovyev (1925). Stalin succeeded in demoting Kamenev's status in the Politburo and removing him from other government offices. Kamenev later held other posts, but after he, Zinovyev, and Trotsky formed a united opposition against Stalin (1926), he was removed entirely from the Politburo (October 1926) and from the party's Central Committee (November 1927) and was expelled from the party three times.

After the party leader Sergey Kirov was assassinated on Dec. 1, 1934, Kamenev was secretly tried and sentenced, with Zinovyev, for having indirectly contributed to the crime. In August 1936, however, he and Zinovyev were tried again in the first public-show trial of the Great Purge. Accused of conspiring to assassinate Stalin and other Soviet leaders, Kamenev confessed to the fabricated charges and was shot. Both Kamenev and Zinovyev were cleared of charges by the Soviet Supreme Court in 1988.

Kamensk-Shakhtinsky, also spelled KAMENSK-ŠACHTINSKIJ, city, Rostov *oblast* (province), southwestern Russian Soviet Federated Socialist Republic, on the Seversky ("Northern") Donets River. Founded in 1686 as a Cossack settlement, it became a city in 1927. Once a major coal-mining centre of the eastern Donets Basin, it primarily manufactures agricultural and mining machinery, artificial fibres, and glass. Pop. (1987 est.) 75,000.

Kamensk-Uralsky, also spelled KAMENSK-URAL'SKIJ, city, Sverdlovsk *oblast* (province), western Russian Soviet Federated Socialist Republic, at the confluence of the Kamenka and Iset rivers. The first state iron foundry in the Urals, Kamensky Zavod, was established there in 1700–01. The modern city specializes in the production of aluminum and aluminum castings and sheets, using bauxite from Severouralsk. Steel tubes and a range of electrical machinery also are made. Pop. (1987 est.) 204,000.

Kamenskoye (Ukrainian S.S.R.): *see* Dneprodzerzhinsk.

Kamerlingh Onnes, Heike (b. Sept. 21, 1853, Groningen, Neth.—d. Feb. 21, 1926, Leiden), Dutch winner of the Nobel Prize for Physics in 1913 for his work on low-temperature physics and his production of liquid helium. He discovered superconductivity, the almost total lack of electrical resistance in certain materials when cooled to a temperature near absolute zero.

From 1871 until 1873 he studied and worked at Heidelberg University, notably with the German physicists Robert Bunsen and Gustav Kirchhoff. Awarded a doctorate by the University of Groningen (1879), he taught at the Polytechnic School in Delft (1878–1882). From 1882 to 1923 Kamerlingh Onnes served as professor of experimental physics at the University of Leiden.

Influenced by the work of Johannes van der Waals, Kamerlingh Onnes investigated the equations describing the states of matter and studied the general thermodynamic properties of liquids and gases over a wide range of pressures and temperatures. He founded (1894) and built up the Cryogenic Laboratory (now known by his name) that established Leiden as the low-temperature research centre of the world. From 1895 to 1906 he concentrated on



Kamerlingh Onnes

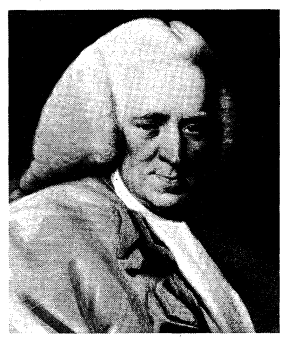
By courtesy of the Rijksmuseum Voor de Geschiedenis der Natuurwetenschappen, Leiden, Neth.

perfecting cryogenic experimental techniques, and studied metals and fluids at low temperatures. Having built an improved hydrogen-liquefaction machine two years previously, in 1908 he succeeded in liquefying helium. Attempts to solidify helium were fruitless until Willem Hendrik Keesom, his student and successor as director of the Kamerlingh Onnes Laboratory, achieved the feat in 1926.

Kamerny Theatre, Russian KAMERNY TEATR, small, intimate theatre founded in Moscow in 1914 by the Russian director Aleksandr Tairov (*q.v.*) to support his experimental synthetic theatre that incorporated all theatrical arts—ballet, opera, music, mime, and drama—as an alternative to the naturalistic presentations of Stanislavsky's realism at the Moscow Art Theatre. Instead of staging plays of everyday life, Tairov offered a theatre of heroics, in which the hero was to elevate the audience above the quotidian levels of existence. The Kamerny developed as an experimental theatre specializing in foreign plays. Among the many reforms associated with the Kamerny are the use of music, dance, gesture, and mime and the inclusion of chanted or intoned speech. In many of its choreographed movements, which made use of offbeat rhythms and atonal sound patterns, the Kamerny anticipated certain dance configurations now associated with modern dance. Enlarged to 1,210 seats in 1930 by Tairov, the Kamerny achieved its greatest recognition in 1934 in Moscow with its production of *Optimisticheskaya tragediya* ("The Optimistic Tragedy"), an acceptance of Soviet socialist realism, which he interspersed with his experimentation. Thereafter, the experimental nature of the theatre declined. The theatre closed in 1950 with Tairov's death.

Kames, Henry Home, Lord (b. 1696, Kames, Berwickshire, Scot.—d. Dec. 27, 1782, Edinburgh), lawyer, agriculturalist, and philosopher.

Kames was called to the bar in 1724 and was appointed a judge in the Court of Session in



Kames, detail of a portrait by David Martin; in the Scottish National Portrait Gallery, Edinburgh

By courtesy of the Scottish National Portrait Gallery, Edinburgh

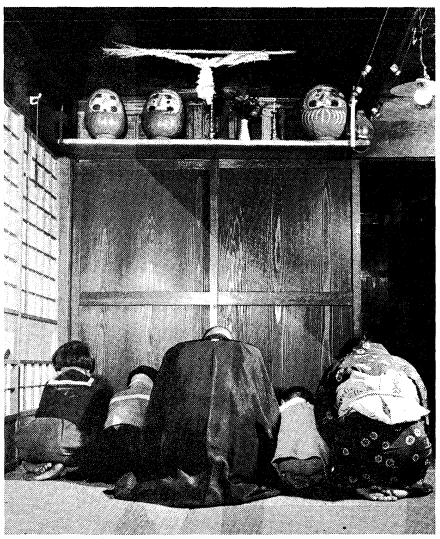
1752. He became a lord of justiciary in 1763. He is best known for his *Elements of Criticism*, 3 vol. (1762), a work remarkable in the history of aesthetics for its attempt to equate beauty with what is pleasant to the natural senses of sight and hearing.

His other works include *Essays on the Principles of Morality and Natural Religion* (1751), *An Introduction to the Art of Thinking* (1761), *Sketches of the History of Man*, 2 vol. (1774), and *The Gentleman Farmer* (1776).

kami, object of worship in Shintō and other indigenous religions of Japan. The term *kami* is often translated as "god," "lord," or "deity"; but it also includes other forces of nature, both good and evil, which, because of their superiority or divinity, become objects of reverence and respect. The sun goddess Amaterasu Ōmikami and other creator spirits, illustrious ancestors, and both animate and inanimate things, such as plants, rocks, birds, beasts, and fish, may all be treated as *kami.* In early Shintō, the heavenly *kami* (*amatsukami*) were considered more noble than the earthly *kami* (*kunitsukami*), but in modern Shintō this distinction is no longer made. *Kami* are manifested in, or take residence in, a symbolic object such as a mirror (*see* shintai), in which form they are usually worshiped in Shintō shrines. Shintō myths speak of the "800 myriads of *kami*" to express the infinite number of potential *kami,* and new ones continue to be recognized.

kamidana (Japanese: "god-shelf"), in the Shintō religion of Japan, a miniature shrine, the centre of daily worship in a household or a shop. The *kamidana* usually consists of a

small cupboard or shelf on which are displayed articles of veneration and daily offerings. At the centre of the shrine stands the *taima,* an inscribed board from the main Shintō shrine at Ise, which represents a universal kami (de-



Japanese family bowing at the *kamidana*
George Silk—© Time Inc.

ity, or sacred power). On either side are various paper amulets (*o-fuda*) associated with local tutelary gods (*uji-gami, q.v.*) and ancestral spirits. The *kamidana* may also include a *shimenawa,* a sacred rope of twisted rice straw traditionally used to demarcate a sacred area. Offerings of water, sake (rice beer), food, and green twigs are placed daily at the front of the shrine, and prayers are offered for blessings on the household. Often Japanese households that maintain a *kamidana* also have a Buddhist family altar, or *butsudan* (*q.v.*), as well.

kamikaze, any of the Japanese pilots who in World War II made deliberate suicidal crashes into enemy targets, usually ships. The term also denotes the aircraft used in such attacks. The practice was most prevalent from the Battle of Leyte Gulf, October 1944, to the end of the war. The word kamikaze means "divine wind," a reference to a typhoon that fortuitously dispersed a Mongol invasion fleet threatening Japan from the west in 1281. Most kamikaze planes were ordinary fighters or light bombers, usually loaded with bombs and extra gasoline tanks before being flown deliberately to crash into their targets.

A piloted missile was developed for kamikaze use that was given the nickname "Baka" by the Allies from the Japanese word for fool. The pilot had no means of getting out once the missile was fastened to the aircraft that would launch it. Dropped usually from an altitude of over 25,000 feet (7,500 m) and more than 50 miles (80 km) from its target, the missile would glide to about 3 miles (5 km) from its target before the pilot turned on its three rocket engines, accelerating the craft to more than 600 miles per hour (960 km per hour) in its final dive. The explosive charge built into the nose weighed more than a ton.

Kamikaze attacks sank 34 ships and damaged hundreds of others during the war. At Okinawa they inflicted the greatest losses ever suffered by the U.S. Navy in a single battle, killing almost 5,000 men. Usually the most successful defense against kamikaze attack was to direct concentrated antiaircraft fire from a ship's batteries against the approaching aircraft.

Kāmil, al-Malik al- (b. 1180—d. 1238), sultan (from 1218) of the Ayyūbid line, who ruled Egypt, Palestine, and Syria during the Fifth and Sixth crusades.

On his accession to the sultanate, al-Kāmil engaged the armies of the Fifth Crusade and eventually negotiated their withdrawal from Egypt in 1221. During this conflict he had an interview with St. Francis of Assisi, who wished to convert him to Christianity. In 1229 al-Kāmil ceded Jerusalem and other Palestinian towns to Emperor Frederick II, leader of the Sixth Crusade.

Kāmil, Muṣṭafā, also called MUṢṬAFĀ KĀMIL PASHA (b. Aug. 14, 1874, Cairo, Egypt—d. Feb. 10, 1908, Cairo), lawyer, journalist, and Egyptian nationalist who was a founder of the National Party.

Kāmil believed that Egypt was already a nation and fully qualified to rule itself. To put forward his views, he founded the newspaper *al-Liwāʾ* ("The Standard") in 1900. He realized that independence would be difficult to obtain, and he looked to France, which he saw as the symbol of European liberalism, to help Egypt counter British power. When France and Great Britain signed the Entente Cordiale in 1904, Kāmil turned to the Ottoman sultan to aid Egypt in its struggle.

Although, nominally, Egypt was a province of the Ottoman Empire, Kāmil did not want a resumption of direct Ottoman rule. Nevertheless, he saw Ottoman solidarity as an aid in the conflict with the British. He believed that the strength of the Egyptians themselves could be channeled into a patriotic spirit—a feeling of love for the land and traditions of Egypt, in which he included the Sudan. As a political vehicle for these policies he joined in founding the National Party (al-Ḥizb al-Waṭanī) in October 1907 but died a few months later.

Kâmil Paşa, Mehmed (b. 1832, Cyprus—d. Nov. 14, 1913, Nicosia), Turkish army officer who served four times as Ottoman grand vizier (chief minister).

Trained as a military officer in Cairo, Kâmil held a succession of government posts until he became grand vizier in 1885–91 and again in 1895. Sultan Abdülhamid II dismissed him because he proposed a cabinet responsible to Parliament, and he then served as governor of Smyrna for 12 years.

After the revolution of 1908, Kâmil joined the Cabinet of Said Paşa and later that same year replaced him as grand vizier. At first his administration succeeded, but in 1909 he was forced to resign by the Committee of Union and Progress. He became grand vizier in 1912 for the fourth time but was forced to resign in 1913 as a result of Enver Paşa's coup d'état.

Kamina, town, Shaba region, southeastern Zaire. The town is an important centre on the Lubumbashi–Ilebo rail line at the junction of branch lines northward to Kindu and to Kalemie, a port with connections to eastern Africa. The town has air services to Lubumbashi, Kolwezi, and Kananga. Kamina is also the site of a military air base. A nearby dam on the Lovoi River supplies electricity to the town. Cotton, tobacco, and vegetables are the main local crops. Pop. (1976) 160,020.

Kaminaljuyú, historic centre of the highland Maya, located near modern Guatemala City, Guat. The site was inhabited from the Formative period (1500 BC–AD 100) until its decline after the Late Classic period (*c.* AD 600–900). About 200 burial sites dating from the Late Formative period (300 BC–AD 100) have been uncovered. From the Early Classic period (*c.* AD 100–600), a number of more elaborate tombs containing Teotihuacán-style pottery have been unearthed. The design of the tombs and some of the pyramids also reflects the influence of Teotihuacán, the most important centre in central Mexico during the Classic period. There are also courts for playing the ball game *tlachtli.* Because of the lack of stone suitable for construction, pyramids and other structures at Kaminaljuyú were built of adobe and later of other perishable materials. In the Late Classic period the centre declined in importance.

Kaminska, Ida (b. Sept. 4, 1899, Odessa, Ukraine, Russian Empire—d. May 21, 1980, New York, N.Y., U.S.), Polish-born Yiddish performer of stage and screen and theatre manager who achieved international stature.

The daughter of the well-known Yiddish actors Abraham Isaac and Ester Rachel Kaminski, she appeared for the first time onstage at age five. Her true debut was in Warsaw (1916) with the theatre company named for her father. She played many leads in Warsaw (1916–19), toured Russia for three years (1919–21), and returned to Warsaw to found her own Ida Kaminska Theatre, where she starred in productions that she adapted and directed. She spent the years during World War II acting in Russia, and then returned to her homeland to found the Jewish State Theatre of Poland (1945), which received official recognition and financial aid from the state until she abandoned Poland for the United States in 1968. Doubtless her best-known stage performance was the title role in *Mirele Efros* by Jacob Gordin in a version adapted and directed by Kaminska. She portrayed this role at home and on tour in western Europe and the United States with her Jewish State Theatre (1967) and revived the character once again when she was in the United States as a private citizen (1969). Other particularly notable roles included Nora in *A Doll's House,* Laurenzia in *Fuenteovejuna,* and the title role in *Mother Courage and Her Children.* She also enjoyed great success in her own adaptation for the stage of *The Brothers Karamazov.*

Kaminska's film credits, while not extensive, are noteworthy. She made Polish films infrequently, starting in 1913, and her *A Vilna Legend* (silent, 1924) and *Without a Home* (1939) were especially well received. The high point of her film career was her appearance in the Czech film *The Shop on Main Street* (1965), for which she received an Academy Award nomination in the United States. In 1973 Kaminska published her autobiography in English, *My Life, My Theatre.* Disappointed in her attempts to establish a Yiddish repertory theatre in the United States, she went to Israel.

Kamloops, city, southern British Columbia, Canada. It lies astride the confluence of the North and South Thompson rivers near their expansion into Kamloops Lake and adjacent to the Kamloops Indian Reserve, 262 miles (422 km) northeast of Vancouver. It originated as a trading settlement, founded by Alexander Ross of the Pacific (Astoria) Fur Company, who called it Cumcloups (Indian: Meeting of the Waters); in 1813 the North West Company bought out the Pacific. The trading concession was sold in 1821 to the Hudson's Bay Company, which moved its post (Fort Kamloops) in 1862 across the river to what is now North Kamloops. Growth that began with the gold rush of the late 1850s was sustained with the arrival of the "overlanders" in 1862 and the railroad in 1885. Kamloops was incorporated as a city in 1893, and North Kamloops became a village in 1946 and a town in 1961. The two communities were amalgamated in 1967 to form the city.

Kamloops is the service centre for a ranching and lumbering area, and its economic activities include livestock marketing, wood and pulp processing, and food canning and packing. The Highland Valley copper mines are nearby. Kamloops is also a railroad divisional point and the junction of three major highways, including the Trans-Canada. Government employment (Kamloops is administration headquarters for the southern interior of British Columbia) and tourism are additional sources of income. Pop. (1986) 61,773.

kammaṭṭhāna (Pāli: "the basis of meditation"), Sanskrit KARMASTHĀNA, in Theravāda Buddhist tradition, one of the objects of mental concentration or a stage of meditation employing it. According to *Visuddhi-magga* (a 5th-century-AD Pāli text by Buddhaghosa), there are 40 *kammaṭṭhānas*; an individual should choose the object of mental concentration that is in accordance with his own character or inclination. Theravāda Buddhism classifies man's dispositions into six: covetousness, anger, stupidity, trustfulness, wisdom, and reason. Each type of disposition has its appropriate objects for mental concentration among the *kammaṭṭhānas*. The meditation of *kammaṭṭhāna* is highly valued among Buddhist monks and is still practiced in Myanmar (Burma), Thailand, and other Southeast Asian countries.

Kammerer, Paul (b. Aug. 17, 1880, Vienna, Austria—d. Sept. 23, 1926, Puchberg, Ger.), Austrian biologist who claimed to have produced experimental evidence that acquired traits could be inherited.

The results of Kammerer's experiments with salamanders and other amphibians were widely published in technical papers and books, the first appearing in 1904 and the last published posthumously in 1928. He claimed to have caused the offspring of the viviparous Alpine salamander to acquire certain characteristics of the spotted oviparous lowland salamander, and vice versa. After a second series of experiments, Kammerer announced that he could make the male midwife toad, which lacks the thick pigmented thumb pads found in other toads, inherit such pads.

The theory of acquired traits is not supported by science, and Kammerer's claim to have proved it met with a great deal of criticism. Kammerer was called upon to make his evidence available to other scientists for examination. In 1923 he lectured and presented his evidence at the University of Cambridge and before the Linnean Society of London. His major critic, William Bateson, attempted to discredit Kammerer's experiments, and, in 1926, when G.K. Noble and Hans Przibram observed the preserved amphibians, they found that the pads were artificially coloured with India ink. Kammerer claimed to have no knowledge of the use of India ink on his specimens, and evidence of the perpetrator was inconclusive. He committed suicide shortly after details of the controversy were published. A study of these events, *The Case of the Midwife Toad* by Arthur Koestler, appeared in 1971.

At the time of his death Kammerer had accepted the position of professor of biology at Moscow University. His best-known publication, which was also little accepted in the scientific community, was *Das Gesetz der Serie* (1919; "The Law of Seriality"), an attempt to explain coincidence as the manifestation of a natural principle operating independently of known physical causation laws.

Kammu, in full KAMMU TENNŌ, personal name YAMANOBE (b. 737, Nara, Japan—d. April 9, 806, Heian-kyō), 50th emperor of Japan, who established the Japanese capital at Heian-kyō (later called Kyōto), where it remained until 1868. His accomplishments laid the basis for the Heian period, which lasted from 794 to 1185.

Enthroned in 781 as the emperor Kammu, he was one of the strongest rulers Japan had known for several centuries. When he assumed office, the Buddhist religious leaders, because of their immunity to taxation and their political ambitions, had grown so strong that they threatened the stability of the government. Kammu issued an edict that limited the construction of new Buddhist buildings, the entrance of people into monasteries, and the sale or donation of land to Buddhist institutions. Kammu, who himself was a devout Buddhist, supported the growth of two new Buddhist sects that opposed the older groups.

The major problem facing the court, however, was the control of local officials. To prevent them from promoting their rank by falsifying their hereditary status, Kammu relied on genealogical charts. He also forbade the purchase of rank. On the northern frontier he reversed former military setbacks and succeeded in subduing the Ainu, a non-Mongoloid people of northern Honshu and Hokkaido.

In an apparent attempt to escape the great monasteries around the old capital of Nara, or Heijō-kyō, Kammu in 784 moved the government about 30 miles (48 km) north to Nagaoka-kyō. Ten years later the costly work at the new capital was suddenly halted—possibly because it was believed to be haunted by the malevolent spirit of Kammu's brother, the crown prince, who had starved to death after his banishment—and another new capital was built nearby.

Situated on the Yodo River, where it was accessible to communications with coastal ports, the new city was named Heian-kyō ("Capital of Peace and Tranquillity"). In later years it became known as Kyōto ("Capital"). Modeled after Ch'ang-an, the capital of the Chinese Sui and T'ang dynasties, Heian-kyō was planned on a grand scale, with great thoroughfares and numerous intersecting streets and lanes. In the centre of the city, surrounded by a rectangular walled enclosure, were the palace buildings and government offices.

Kamo Chōmei, also called KAMO NO CHŌMEI (b. 1155, Japan—d. July 24, 1216, Kyōto), poet and critic of Japanese vernacular poetry, one of the major figures in the history of Japanese poetics. He is best known as a classic example of the man of sensibility turned recluse and as the author of *Hōjō-ki* (1212; *The Ten Foot Square Hut*), a description of his life in seclusion.

The son of a Shintō priest of Kyōto, Chōmei was given a thorough artistic training. Despite his comparatively humble origin, his poetic gifts brought him grudging recognition from the court and, eventually, a court-appointed office. Shortly after his position was established, Chōmei took Buddhist orders (1204) and turned his back on the world. He lived first for four or five years in the hills of Ōhara and then built his tiny hermit's hut in the Hino foothills southeast of the capital and completed his *Hōjō-ki*. The work is a series of brief accounts of the disasters that had befallen Kyōto during Chōmei's lifetime, followed by a contrasting description of the natural beauty and peace of his hermit's life. The whole is dominated by a characteristic Buddhist view of the vanity of human endeavour and the impermanence of material things. The *Hōjō-ki* bears a more than coincidental resemblance to the *Chitei-ki* ("Account of My Cottage by the Pond") of Yoshishige Yasutane (934?–997), a work in Chinese prose dating from 981.



Kamo Chōmei, colour on silk, attributed to Soseki; in the Historiographical Institute, University of Tokyo

By courtesy of the International Society for Educational Information, Tokyo

Chōmei, in fact, kept in touch with the court and the poetic world after his retirement. In 1205, to his great delight, 10 of his poems were included in the first draft of the *Shin kokin-shū,* the eighth imperial anthology of court poetry. Around 1208/9 he began work on his *Mumyō shō* ("Nameless Notes"), an extremely valuable collection of critical comments, anecdotes, and poetic lore. In 1214 or 1215 he is believed to have completed his *Hosshin shū* ("Examples of Religious Vocation"). His other works include a selection of his own poems (probably compiled in 1181) and the *Ise-ki* ("Record of a Journey to Ise"), no longer extant. Chōmei's poetry is representative of the best of an age that produced many poets of the first rank. His poetry was unusual in its extreme difficulty but possessed great tonal depth and resonance.

Kamo Mabuchi (b. 1697, Iba, Japan—d. Oct. 31, 1769, Edō [now Tokyo]), one of the earliest representatives of the Kokugaku ("National Learning") school, a movement to restore the true Japanese spirit by a return to ancient traditions and culture. The school was revived in World War II in connection with resurgent nationalism.



Kamo Mabuchi, ink painting by an unknown artist

By courtesy of the International Society for Educational Information, Tokyo

Mabuchi was born into a branch of the old Shintō Kamo family, who served as priests of the famous Kamo shrine near Kyōto. Under the tutelage of Shintō priests, he began a study of Japanese literature. Through his studies he became convinced of the importance of the earliest collection of Japanese poems, the *Manyō-shū,* and of the collection of Shintō rituals called *Norito.* Insisting that these ancient works were free of foreign influence and that they were therefore representative of the pure Japanese spirit, he helped foster a revival of the early poetic style. His chief original work, the *Kokuikō,* contains a biting rejection of Chinese thought and literature and a hymnal glorification of Japanese antiquity. His writings, collected in 12 volumes, are made up primarily of commentaries on Old Japanese literature.

Kamose, last king of the 17th dynasty (*c.* 1630–1540 BC) of Egypt, who opened hostil-

ities with the Hyksos, the west Semitic invaders who had seized part of Egypt in the 17th century BC. Following the death of his father, Seqenenre, Kamose became ruler of the southernmost third of Egypt. In his third year the Hyksos-Egyptian border lay at Cusae, near modern Asyūṭ, in Middle Egypt, while a separate kingdom held Nubia south of the First Nile Cataract.

Although his kingdom had peaceful relations with the Hyksos, Kamose, dissatisfied with ruling only part of Egypt, decided on a war of liberation. With a fleet and desert tribal troops from Nubia, he made a surprise attack against the Hyksos' southernmost stronghold. Continuing his northward march, Kamose showed no mercy to Egyptians who had made accommodations with the enemy. He also claimed that his fleet captured Hyksos ships laden with weapons and that he sailed past the Hyksos capital itself, in the eastern Nile Delta, where he taunted and insulted the enemy king. About 100 miles (160 km) downstream from Cusae, he captured a Hyksos messenger en route to Cush (in the modern Sudan) who was carrying a missive urging the Kushite prince to attack Egypt from the rear. Completely undaunted, Kamose sent a detachment to seize the important Baḥriyah Oasis and so thwarted his foes. As the campaign season ended, he returned jubilantly to Thebes, defeating rebels who had risen behind him.

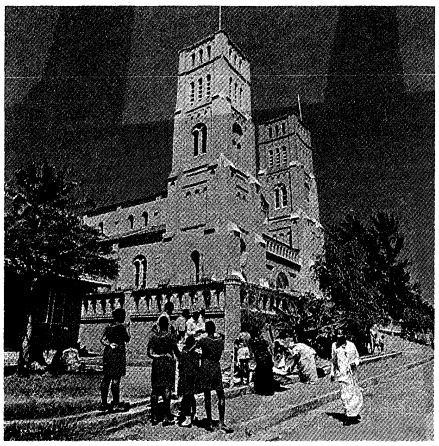
Kamose's name appears in Nubia, at the Second Nile Cataract, beside that of his brother, Ahmose, who succeeded him. It is therefore possible that Kamose penetrated into Kushite territory. Little else is known about Kamose's reign. Most scholars agree that he did not rule for more than five years.

kampaku (Japanese: "white barrier"), in Japanese history, office of chief councillor or regent to an adult emperor; the post was created in the Heian period (794–1185) and was thereafter customarily held by members of the Fujiwara clan. Officially serving on behalf of the emperor, regents often acted as the real centre of authority in the government. Fujiwara Mototsune was the first to hold the title of *kampaku,* in 887, initiating a long period of Fujiwara control over the court which reached its peak in the 11th century under Fujiwara Michinaga. The Fujiwara were able to maintain their hold on the post of *kampaku* by their extensive and continuing intermarriage with the imperial line. The political power of the *kampaku* declined after about 1068 with the initiation of the system of rule by retired emperors.

The only non-Fujiwara to act as *kampaku* were Toyotomi Hideyoshi and his adopted son Hidetsugu. Hideyoshi was able to reunite feudal Japan under his control in 1590. Although he ruled as military dictator, Hideyoshi did not take the title of shogun, which was reserved for descendants of the Minamoto clan. By claiming descent from the Fujiwara, however, he was named *kampaku.* The office continued until the end of the Tokugawa period (1603–1867), but after Hideyoshi it had no actual authority.

Kampala, capital and largest city of Uganda, eastern Africa. It occupies a series of hills at an elevation of about 3,900 feet (1,190 m) and is situated in the southern part of the country, just north of Lake Victoria. Lying just north of Mengo, the capital of the Kingdom of Buganda in the 19th century, it was selected in 1890 by Captain Frederick (later Lord) Lugard as the headquarters of the Imperial British East Africa Company. Lugard's fort on Old Kampala Hill remained the Ugandan colonial administrative headquarters until 1905, when it was moved to Entebbe. In 1962 Kampala (a municipality since 1949) became the capital of independent Uganda. New parliamentary and commercial buildings, industry, and residential areas are separated into sectors.

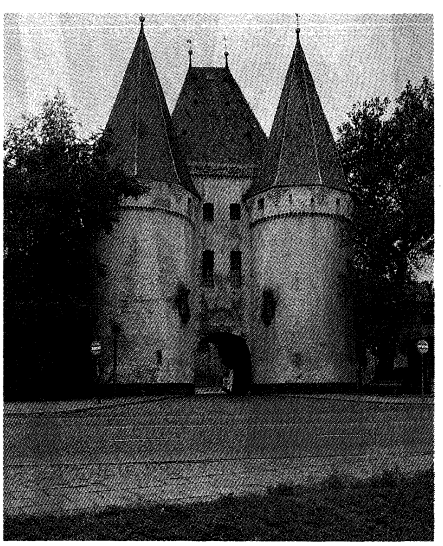
Situated in the country's most prosperous agricultural section, Kampala exports coffee,



Rubaga Cathedral in Kampala, Uganda
Picturepoint, London

cotton, tea, tobacco, and sugar. Although second industrially to Jinja (40 miles [64 km] east-northeast), it has numerous food, metal-products, and furniture enterprises and a tractor-assembly plant. It is the headquarters for most of Uganda's large firms and the chief market for the Lake Victoria region. Kampala has a technical institute and is the seat of Makerere University (founded in 1922, became a university college in 1949, and a university in 1970) and the Uganda Museum. Also a religious centre, Kampala has mosques (including the white Kibuli Mosque), Hindu temples, and Christian churches (notably Namirembe Anglican Cathedral and Rubaga and St. Peter's Roman Catholic cathedrals). The city is the hub of the nation's road network and lies on the railway from Kasese (208 miles [335 km] west) to Mombasa, Kenya; it is also served by Port Bell (6 miles [10 km] east) on Lake Victoria, and by Uganda's international airport at Entebbe (21 miles [34 km] south-southwest). Pop. (1980 prelim.) 458,423.

Kampen, *gemeente* (commune) and port, Overijssel *provincie,* north-central Netherlands. It lies on the southwest side of the IJssel River near its influx into Lake Ketel. First mentioned in 1227, it was a member of the Hanseatic League and a leading commercial centre until it was supplanted by Amsterdam in the 16th century. Its economy revived with the development of industry in the 19th century and the opening of the nearby agricultural polders (land reclaimed from the IJsselmeer) in 1942 and 1957. It manufactures cigars and enamelware and is a garrison town and rail junction. Historic buildings include the old town hall, restored after a fire in 1543, with the Schepen Hall; the Boven Church and the Buiten Church, both from the 14th and 16th centuries; and three medieval turreted gateways—the Koornmarkts Gate, the Cellebroeders Gate, and the Broeders Gate (now a museum). Two Dutch Reformed theological seminaries are located in Kampen. Pop. (1986 est.) 32,230.



Koornmarkts Gate, one of three medieval turreted gateways at Kampen, The Netherlands
Beeldbank & Uitgeefprojekten B.V., Amsterdam

Kämpfer, Engelbert (b. Sept. 16, 1651, Lemgo, Westphalia [Germany]—d. Nov. 2, 1716, Lieme), German traveler whose writings are a valuable source of information on 17th-century Persia and Japan.

At Uppsala, Swed., Kämpfer joined a trade mission to Russia and Persia and then went on to visit Batavia, Java (now Jakarta), where in 1690 he joined a Dutch trade mission to Japan. Remaining for two years, he saw more of the country and collected more information than any other European before him. Kämpfer returned to Europe in 1694. His account of Japan, *Geschichte und Beschreibung von Japan* (1777–79), was first published in English (*The History of Japan,* 1727) after his death and appeared in the original German only after additional translations into Latin, Dutch, and French had already appeared. Kämpfer's manuscripts are in the British Museum.

Kamphaeng Phet, town, western Thailand. It lies along the Ping River and is an old walled settlement with notable ruins and temples and a museum. Rice cultivation is the main economic activity in the surrounding area, and teak is cut in the forested highlands to the west. Pop. (1985 est.) 23,147.

Kâmpóng Cham, also spelled KOMPONG CHAM, town, south-central Kampuchea (Cambodia). The town lies on the right bank of the Mekong River and is an important river port about 45 miles (75 km) northeast of Phnom Penh, the national capital. It has a major airfield, a cotton-textile mill, a rice mill, and agricultural-machinery and vehicle-repair facilities. Before the revolution in 1975, the town contained a branch of the Royal University of Kâmpóng Cham.

In 1921 the well-drained red volcanic soils of the Chŭb Hill area on the left bank of the Mekong River were discovered to be favourable to the cultivation of the rubber tree. The 64,000-acre (26,000-hectare) Chup Plantation was subsequently started a few miles southeast of Kâmpóng Cham; it was privately owned until 1975 and had a crepe-rubber factory. Rice, cotton, fruit trees, potatoes, sugarcane, tobacco, jute, cassava, beans, sesame, kapok, cinchona, and corn (maize) are also grown in the surrounding area. The upland regions near Kâmpóng Cham are rich in timbers, including Ceylon ironwood, rosewood, bean trees, teak, and rubber trees. Fishing has been important along the banks of the Mekong, and the area's agricultural potential has been improved by several large-scale irrigation projects undertaken after 1975, notably reservoirs at Krâchăb Lake and Khŭm Bathéay. Pop. (1971 est.) town, 34,706.

Kâmpóng Chhnăng, also spelled KOMPONG CHHNANG, town, central Kampuchea (Cambodia). Kâmpóng Chhnăng is located just west of the Sab River and has port facilities. It is connected to Phnom Penh, the national capital, by a national highway route and railway. There are clay deposits nearby.

The surrounding area is occupied by Khmer peoples, some of whom tend rice paddies and live on floating fishing villages during the

monsoonal high-water season. Before 1975 the major products of the area were agricultural, including rice and bananas, supplemented by fishing. Pop. (1971 est.) 15,813.

Kâmpóng Saôm, also spelled KOMPONG SOM, formerly SIHANOUKVILLE, a new town and principal deepwater port of southern Kampuchea (Cambodia), situated on a peninsula of the Gulf of Thailand. The port is connected with Phnom Penh, the national capital, by two major highways. It was first opened to ocean traffic in 1956; initial facilities were capable of handling simultaneously four 10,000-ton vessels, and additional facilities were added later. By 1966 the town had schools, parks, hospitals, nearly 50 miles (80 km) of streets, and a population of 14,000. By 1967 a major stage of the 163-mile (263-kilometre) rail link to Phnom Penh had been completed. Before 1975 the port had an industrial park, with a petroleum refinery (1968) and storage tanks, a tractor factory, a fish-processing plant (the town is headquarters of Kampuchea's maritime fishing industry), a truck-assembly plant, and a brewery. Principal exports included rice, corn (maize), and rubber; imports included petroleum products, iron and steel, chemicals, machines, and metal products. There is a major airfield nearby. Pop. (1971 est.) 8,633.

Kâmpóng Spœ, also spelled KOMPONG SPEU, town, south-central Kampuchea (Cambodia). The town lies along the Tnaôt River at the foot of the Dâmrei (Elephant) Mountains and astride the national highway linking Phnom Penh, the national capital, with Kâmpóng Saôm, the country's principal seaport.

The surrounding area supports rice, sugarcane, palm trees, cotton, cassava, and corn (maize); there are also silk spinning, timber trade, and a major sugar refinery in the area. Various irrigation projects have improved the region's agricultural potential, notably a series of dams on the Tnaôt River, constructed in the early 1960s just west of Kâmpóng Spœ. Pop. (1971 est.) 8,921.

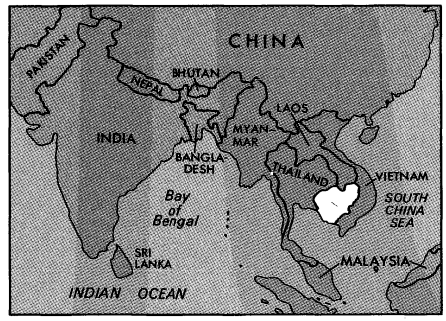
Kâmpóng Thum, also spelled KAMPONG THOM, town, north-central Kampuchea (Cambodia). Kâmpóng Thum lies along the Sên River and is linked to Phnom Penh, the national capital, by national highway routes. There are abundant low-grade iron-ore (hematite) deposits near the town.

Major agricultural products of the surrounding area include rice, corn (maize), rubber, and cotton. Bananas, potatoes, beans, sugarcane, tobacco, jute, coconuts, kapok, cinchona, lemons, cassava, sesame, China grass, mulberry, and mangoes are also grown. The upland areas to the northeast of Kâmpóng Thum are rich in timber, including good-quality hardwoods such as wild date, mahogany, berry trees, rosewood, and teak. In lowland areas there are vast bamboo groves. The area's agricultural potential was greatly increased after 1975 by several large-scale irrigation projects, including several dams, reservoirs, and canals. Pop. (1971 est.) 11,527.

Kâmpôt, town, southern Kampuchea (Cambodia). Kâmpôt is located near the mouth of the Koh Sla River. In the 19th century it was the country's chief port, but this function was taken over in the 1950s by Kâmpóng Saôm. It is connected to Phnom Penh, the national capital, and to Kâmpóng Saôm by a national highway route and a rail line. The town contains a textile mill.

The major agricultural products of the surrounding area include rice, pepper, bananas, coconuts, and durians. Littoral areas are rich in fish and shellfish. Mountainous areas in the region have a dense forest cover, including such first-quality woods as rosewood and teak, and berry, bean, and rubber trees. The area also supplies most of Kampuchea's salt needs from state-owned salt marshes along the Gulf of Thailand coast. The area's agricultural potential was increased after 1975 by a number of irrigation projects, notably several large dam-dike-reservoir complexes. Pop. (1971 est.) 15,448.

Kampuchea, officially STATE OF KAMPUCHEA, Khmer ROAT KAMPUCHEA, French ÉTAT DU KAMPUCHEA, formerly (to 1970) KINGDOM OF CAMBODIA, (1970–76) KHMER REPUBLIC, (1976–79) DEMOCRATIC KAMPUCHEA, or (1979–89) PEOPLE'S REPUBLIC OF KAMPUCHEA, country situated in the southwestern part of the Indochinese Peninsula in Southeast Asia, covering an area of 69,898 square miles (181,035 square km). The capital is Phnom Penh. Kampuchea's maximum length from north to south is 280 miles (450 km), and its maximum width from east to west is 360 miles (580 km). The country is bordered on the west and northwest by Thailand, on the northeast by Laos, on the east and southeast by Vietnam, and on the southwest by the Gulf of Thailand. The population in 1990 was estimated at 8,246,000.



Kampuchea

A brief treatment of Kampuchea follows. For full treatment, *see* MACROPAEDIA: Southeast Asia, Mainland.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. Much of Kampuchea's geography is dominated by large central plains (covering about three-fourths of the total land area) and by the Mekong River, which flows southward through the eastern part of the country. The low-lying, fertile, alluvial central plains surround Tonle Sap, which is drained eastward by the Sab River to the Mekong River. Rimming the central plains on the northeast and east are the eastern highlands (average elevation 1,200 feet [360 m] above sea level); on the north are the Dângrêk Mountains (average elevation 1,600 feet [490 m]); and on the southwest are the remote and largely uninhabited Krâvanh (Cardamom) Mountains and the Dâmrei (Elephant) Mountains, in which Kampuchea's highest point, Mount Aôral (5,949 feet [1,813 m]) is located. The Mekong drains most of Kampuchea and flows for about 315 miles (505 km) within the country. The annual floods of the Mekong deposit rich alluvial sediments on its extensive banks and provide natural irrigation to numerous rice paddies.

Kampuchea has a tropical monsoonal climate with annual average temperatures ranging from 70° to 95° F (21° to 35° C). Annual rainfall (chiefly from the southwest monsoon) varies from as much as 200 inches (5,000 mm) on the southwestern mountain slopes to 55 inches (1,400 mm) in the central plains. The climate is favourable for natural vegetation, and about three-fourths of Kampuchea's land area is forested: deciduous forests and grasslands cover much of the eastern highlands; broadleaf evergreen forests cover the northern mountains; rain forests grow on the southwestern mountains; and mangrove forests are found on the coast. Animal life includes elephants, wild ox, panthers, and bears.

The people. Kampuchea's population status and trends are difficult to estimate; there are no accurate statistics between 1970 and 1981, when a census was conducted, because of a decade of the Second Indochinese War, civil war, and the genocide carried out by the Khmer Rouge government under Pol Pot. In 1973 many villages were destroyed by U.S. bombing. Subsequently the Pol Pot regime, which may have killed as many as 2,000,000 persons in the mid- and late 1970s, turned the Khmer people into a nation of refugees and slave labourers. From 1975 to 1978 the Khmer Rouge forced much of the population to abandon the cities and move into primitive agricultural communes. From 1979 the sporadic fighting between guerrilla units of the deposed Khmer Rouge and the Vietnamese units acting on behalf of Kampuchea's Vietnamese-controlled government of the Democratic Republic of Kampuchea further reduced the population. As a result, Kampuchea's total population in 1985 was about the same as it had been in 1975, despite a United Nations estimated natural growth rate (1980–85) of 2.9 percent. About one-third of the population is believed to be younger than 15 years of age. By the mid-1980s only one-tenth of the population lived in cities.

The majority of the population of Kampuchea belongs to the Mon-Khmer ethnic group. The Khmer themselves are a mixture of various ethnic groups that have intermarried throughout the centuries, including Indian, Indo-Malayan, Tai, Vietnamese, and Chinese. In 1975 the Khmer Rouge expelled most of the minorities (Vietnamese, Cham-Malays, and Europeans) from the country except for ethnic Chinese and tribal people. Since 1979 the number of Vietnamese in Kampuchea has increased to between 4 and 8 percent of the total population. The number of Khmer refugees in Thailand in the early 1980s was estimated at 330,000.

Theravāda (Hināyana) Buddhism was the state religion before 1975. Under the Khmer Rouge regime between 1975 and 1978, Buddhist monks were forced to work in the fields, images of Buddha were destroyed, and temples were used as granaries and barracks. Since 1979 many Buddhist temples have been reopened, however. An estimated nine-tenths of the population are Buddhists.

The economy. Kampuchea has a developing, centrally planned economy that is based largely on agriculture and foreign aid. Per capita income was calculated at $90 in the early 1980s, and Kampuchea remains one of the world's poorest countries. The Vietnamese have encouraged the revival of the private sector; the production of rice, severely disrupted during the Khmer Rouge regime, increased during the 1980s but fell far short of domestic demand.

Agriculture employs three-fourths of the work force and is dominated by subsistence farming. Rice is the chief staple. Authorities have successfully encouraged farmers to plant paddies with local strains of rice, which germinate at higher rates than imported strains. Limited quantities of cassava, sugarcane, and corn (maize) are also produced. Livestock (mainly cattle, pigs, and buffalo) raising and maritime fishing were reported to have made gains in production in the early 1980s. Kampuchea lost most of its agricultural technicians between 1975 and 1980; an institute of agriculture near Phnom Penh, however, provided some training beginning in the early 1980s.

Mineral industries are of negligible importance. Domestic consumption of petroleum is minimal and is met entirely from imports. Limited quantities of phosphate rock, gems, salt, and nonmetallic construction materials are produced locally.

Manufacturing industries are inconsequential and centre on the processing of locally

grown rubber and other agricultural commodities. Small quantities of agricultural products, rubber, and wood (such as teak) are exported. Most capital and consumer goods must be imported. Trade partners include the U.S.S.R., Vietnam, Czechoslovakia, Bulgaria, Germany, and Hungary. A significant amount of undeclared trade takes place with Thailand and Singapore.

Only about one-fifth of Kampuchea's roads are paved, and rural roads are wholly inadequate for the purposes of goods transport. Inland waterways include the Mekong and Sab rivers and Tonle Sap. The country's principal deepwater port is Kâmpóng Saôm on the Gulf of Thailand. There is an international airport near Phnom Penh.

Commercial activity in towns, which was severely disrupted between 1975 and 1978, has resumed. The use of money, replaced by barter based on units of rice in 1978, was restored in 1979, and new bank notes were issued in 1980. The lack, since the mid-1970s, of a taxable domestic economic base or of any significant income-earning export markets has left Kampuchea without a central-governmental budget other than the dispersal of foreign aid and the management of development investments.

Government and social conditions. The People's Republic of Kampuchea is a republic governed by a Vietnamese-supported communist party, the Kampuchea People's Revolutionary Party (KPRP). The 1981 constitution vested legislative power in a National Assembly. Its members are selected by the KPRP and ratified in elections, usually unopposed. The National Assembly elects from among its membership a Council of State to serve as its permanent organ; its chairman is head of state and commander in chief of the armed forces. Executive power is vested in the Council of Ministers, elected by and responsible to the National Assembly. The KPRP is headed by the Central Committee's Politburo and Secretariat. The Vietnamese-backed government of Kampuchea had, by the early 1990s, obtained only limited international recognition, and the country's former Khmer Rouge government, ousted in 1979, continued to represent Kampuchea at the United Nations. In the early 1990s Kampuchean armed forces continued to confront Khmer Rouge and other national-resistance guerrilla forces in many areas throughout the countryside.

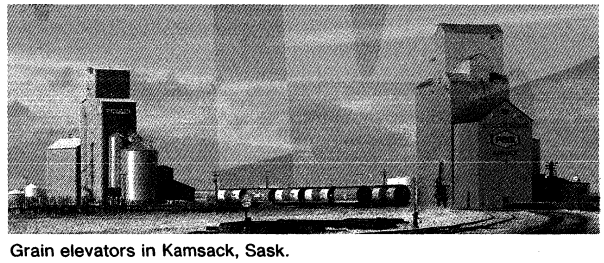
The government has tried to restore adequate living conditions after the deprivations experienced under the Khmer Rouge. The public health-care system, largely destroyed under that regime, is being rebuilt, with the reopening of hospitals and clinics, although a shortage of manpower still exists. Infectious diseases such as malaria and schistosomiasis are prevalent, and malnutrition is widespread. Reconstruction of the educational system has included the reopening of primary and secondary schools and institutions of higher education and the introduction of compulsory education between the ages of 6 and 12. The government controls all communications media.

Cultural life. Kampuchea's modern culture was virtually destroyed by the Khmer Rouge; the aspirations of the country's survivors are overshadowed by the achievements of the past, notably the architecture and sculpture of the Angkorean period (802–1432), seen in the restored temples at Angkor. These, together with other cultural relics, have been greatly damaged by vandalism, looting, and neglect in recent years.

History. Neolithic peoples inhabited present-day Kampuchea during the 2nd and lst millennia BC. Khmer civilization developed over several distinct periods. The first was dominated by the Hindu-Buddhist kingdoms of Funan and Chenla, beginning during the early Christian era and extending into the 8th century AD. The Chenla kingdom established sovereignty over the Funan during the late 6th and early 7th centuries and came to a close in the early 9th century, when the Angkorean period began under Jayavarman II. This dynastic era has been called the classical period of Khmer civilization (802–1432).

Jayavarman established his capital in the region of Angkor, where he and his successors constructed great architectural monuments. The power of the Khmer empire reached its height in the 12th century under Suryavarman II, who built the temple complex of Angkor Wat. His armies ranged as far west as northern Siam (now northern Thailand) and into the Red River delta (now in Vietnam) to the east. The Khmer empire's strength was based on a well-developed system of irrigated rice cultivation and the control exerted over Khmer manpower by an elaborate bureaucracy. In the early 13th century, Jayavarman VII was able to extend the empire farther afield than any of his predecessors, but the empire quickly crumbled in the 13th and 14th centuries. Domestic instability caused by the accession of weak rulers left the Khmers exposed to the attacks of their neighbours, and their difficulties were compounded when Buddhism began to undermine the hierarchy of the state, which was based on Hinduism. By the 15th century the Khmers could no longer defend their capital at Angkor.

The next 400 years were a period of political and social decline in which Khmer rulers were often involved in wars with Vietnam and Siam. Many times the Khmer rulers became vassals of one or the other.



Grain elevators in Kamsack, Sask.
©Todd Korol—First Light Associated Photographers

In 1864 political stability was restored with the establishment of a French Protectorate that lasted until after World War II, when Cambodia became an autonomous state within the French Union. During the war the Japanese occupied the country but left the Vichy French administration in place. In 1941 the French installed Prince Norodom Sihanouk on the Cambodian throne. In 1953 Cambodia received its independence from France, and the next year Sihanouk's government was recognized as the legitimate authority within the country.

Sihanouk's capable rule, a cornerstone of which was noninvolvement with either side in the Vietnam War, ended in 1970, when he was deposed by General Lon Nol and others opposed to the tacit presence of Vietnamese communists in the country.

Lon Nol's attempts to suppress the Vietnamese presence and the small Cambodian communist group known as the Khmer Rouge disrupted the country. A massive and largely indiscriminate U.S. bombing campaign over much of the country during the early 1970s alienated large segments of the population, enabling the Khmer Rouge to grow rapidly by recruitment. Despite U.S. aid, Lon Nol's government was overthrown by the Khmer Rouge in 1975. In 1976 the republic of Democratic Kampuchea was proclaimed, and the Khmer Rouge leader Pol Pot—supported by the People's Republic of China—became its premier. The next year the Kampuchea Communist Party was officially recognized as the country's governing body.

Phnom Penh was immediately evacuated by the Khmer Rouge after they overran the city, and Kampuchea's other urban populations were forcibly relocated to rural areas and set to digging immense irrigation and other public works in an effort to foster agricultural production. Miserable living and working conditions throughout the country bred starvation and disease, and these factors, along with the Khmer Rouge's systematic extermination of the educated and middle classes and any other perceived enemies of the regime, had resulted in the deaths of as many as 2,000,000 Kampucheans by 1979. The Khmer Rouge's combative stance toward their powerful neighbour, Vietnam, prompted the latter to launch a military invasion of Kampuchea in 1979. The Vietnamese drove the Khmer Rouge into the western hinterlands and established a puppet Kampuchean government composed largely of defectors from the Khmer Rouge. This socialist government was relatively benign compared to the preceding regime, but the reconstruction efforts it undertook were severely hampered by meagre foreign aid and a dearth of skilled Kampuchean technicians and professionals. Meanwhile, fighting continued into the early 1990s between Khmer Rouge guerrillas and Kampuchea's Vietnam-backed government.

Kāmrūp Sanctuary (India): *see* Manās Wild Life Sanctuary.

Kamsack, town, eastern Saskatchewan, Canada. It lies at the confluence of the Assiniboine and Whitesand rivers, just west of the Manitoba border, 167 miles (268 km) north-east of Regina. Trading posts had existed in the locality since the establishment of Grant's House (Fort-Rivière Tremblante) in 1793. Homesteaders (including the Dukhobors, who fled religious persecution in Russia) arrived after 1899. The town, named in about 1888 for a local Indian mail carrier, was reached by the main line of the Canadian National Railway in 1903. Severe damage by a tornado in 1944 was followed by major rebuilding. Kamsack is a service centre for a mixed-farming, lumbering, and stock-raising area. Its industries include oil refining and dairying. The meeting house (1917) of Peter Verigin, celebrated leader of the Dukhobors, survives in the village of Verigin, immediately to the west. Several Indian reservations and Duck Mountain Provincial Park (57,882 acres [23,424 hectares]) are nearby. Inc. village, 1905; town, 1911. Pop. (1986) 2,565.

Kamyshin, also spelled KAMYŠIN, city, Volgograd *oblast* (province), western Russian Soviet Federated Socialist Republic. It lies on the Volga River and the Volgograd reservoir. In 1697 Peter I the Great built a fort, Petrovsk, to protect workmen attempting to construct a canal between the Volga and Don rivers. Renamed Dmitriyevsk in 1710 and Kamyshin in 1780, it became the centre of an agricultural region and a transshipment point; it was linked by rail to Tambov in 1895. Modern Kamyshin also has engineering and other industries. Pop. (1989) 119,000.

Kan Chiang (China): *see* Kan River.

Kan-chou (town, Kansu Province, China): *see* Chang-yeh.

Kan-chou, formerly (1911–49) KAN-HSIEN, Pinyin GANZHOU, or GANXIAN, conventional KANCHOW, city in southern Kiangsi Province (*sheng*), China. It is a county-level municipality (*shih*) and the administrative centre of Kan-chou Prefecture (*ti-ch'ü*), which includes several counties in the upper valleys of the Kan Chiang (river) and its tributaries. Kan-chou is a natural route centre at the confluence of the various river systems that branch off from the north–south route to Nan-ch'ang. Although Kan-chou has no rail connections, highways lead from it to the southeast, northeast, and south.

The city was first settled in Han times (206 BC–AD 220) and became a county seat in the 3rd century AD. In 589, under the Sui dynasty (581–618), it became the seat of a prefecture, Chien-chou, the name being changed to Kan-chou (named after the river on which it stands) in the late 12th century. Under the Ming and Ch'ing dynasties (1368–1911) it became the Kan-chou Superior Prefecture (*fu*). In the 18th and 19th centuries, when all foreign trade was restricted to Canton, it became an important centre on the route from Canton to Nan-ching (Nanking) in Kiangsu Province and to the Yangtze River (Ch'ang Chiang) Valley, particularly for the tea trade. In the 20th century the construction of the Han-k'ou–Canton railway transferred the mainstream of the north–south trade to Hunan, so that Kan-chou has to some degree suffered a decline. Before World War II it was a large regional centre of commerce, but little more.

After 1949 the population increased, and some industrial development took place, exploiting the agricultural and mineral products of the area, which is rich in tungsten and tin. A large hydroelectric station has been established some 25 mi (40 km) to the west at Shang-yu. The main industries are engineering, papermaking, wood manufactures, and sugar and camphor refining. Pop. (mid-1970s est.) 10,000–300,000.

Kan-Hakka languages, Chinese spoken primarily in Kiangsi Province and Kwangtung Province but also spoken in Fukien Province and in other widely scattered areas, including settlements in Thailand, Malaysia, and Indonesia. The best known of these languages is the Hakka of Mei County (*hsien*) in Kwangtung, which has the same initial and final consonants and the same syllabic nasal sounds (nasals that function as vowels) as standard Cantonese but has a vowel system resembling that of Modern Standard Chinese. Hakka, like Cantonese, has six tones to distinguish meaning between words or word elements with the same series of consonants and vowels. Kan-Hakka languages have borrowed many words from Cantonese.

Kan-hsien (China): *see* Kan-chou.

Kan Oum (Vietnamese leader): *see* Deo van Tri.

Kan River, Wade–Giles romanization KAN CHIANG, Pinyin GAN JIANG, river, chiefly in Kiangsi Province, China. The Kan River is one of the principal southern tributaries of the Yangtze River. Its headwaters rise in Kwangtung Province, where the Ta-yü Ling (mountains) divide southwestern Kiangsi from Kwangtung. This upper stream is called the Chang Shui. Another stream, the Kung Shui, rises in the Chiu-lien Shan in the far south of Kiangsi. These two streams flow together near the city of Kan-chou and flow north through the province into the P'o-yang Hu (lake), and thence into the Yangtze. The valley provided an important route in historical times from Canton in Kwangtung to the Yangtze Valley and the north.

The Kan River below Chi-an, in Kiangsi, is navigable by small steamers in summer high water, although in winter these craft can only reach Ch'ing-chiang. Above Chi-an the river is much obstructed by rapids, and the 95 mi (150 km) from Chi-an to Kan-chou takes some nine days by junk. The upper stream of the Chang Shui is navigable by small craft to Ta-yü, as is the Kung Shui to Hui-ch'ang, from where easy passes lead into Kwangtung. This route was used for communication between Canton and the Yangtze Valley before 1840, when all foreign trade was concentrated in Canton; imports to central China were brought in and tea exports shipped south via this route. With the construction in 1937 of the main rail link between Canton and Han-k'ou in Hupeh Province via the alternative western route through Hunan Province, the importance of the Kan River, except for local transport, has declined. In addition to the various streams that form its headwaters, the Kan River has two major tributaries, the Hsin Chiang, which joins it below its junction with the P'o-yang Hu, and flows westward from the Chekiang Province border, and the Chin Chiang, which flows eastward from the border of Hunan, joining the main stream some distance above Nan-ch'ang. These two valleys provide the major east–west route across the north of Kiangsi. The total length of the Kan River is 506 mi (815 km).

kana, two parallel modern Japanese syllabaries (*katakana* and *hiragana*), each of which independently represents all the sounds of the Japanese language. Although each derives its simple elements from Chinese characters, the two serve different purposes and differ stylistically. *Katakana* symbols, which tend to be angular in shape, are used for foreign words, telegrams, for some children's books, and often for advertising headlines in print media and television and billboards. *Hiragana,* a cursive, graceful writing system which flourished as the script of ladies of the court *c.* 1000, when it came to be called *onna-de* (woman's hand), is used in modern Japanese primarily to perform grammatical functions. This need arises because the Chinese characters (*kanji*) used extensively in written Japanese to convey meaning cannot of themselves express the inflected forms of the Japanese language; *hiragana* symbols indicate inflection and possession, identify direct objects of sentences and phrases, and perform other grammatical functions. Prepositions and many adjectives and common phrases are nearly always written in *hiragana,* as are numerous frequently used single words. A typical passage of Japanese writing, therefore, contains *kanji, hiragana,* and perhaps also *katakana.*

Each *kana* syllabary consists of 46 basic symbols, the first five of which represent the vowels *a, i, u, e, o.* The next 40 symbols represent syllables composed of an initial consonant (or consonants) followed by a vowel, *e.g., ka, shi, fu, te, yo.* The final symbol represents a final *n* (sometimes *m*). Additional sounds are represented by slightly modifying 20 of the basic *katakana* or *hiragana* symbols; this is done by placing *nigori,* a tiny circle or two small strokes resembling quotation marks, at the upper right hand corner of the symbol. In this way 25 new sound symbols are produced; *e.g., ka* becomes *ga, shi* becomes *ji, fu* becomes *bu* or *pu, te* becomes *de,* and *so* becomes *zo.* Further sounds are represented by combining syllables; for example *ki* and *ya* are pronounced *kya*; *shi* and *yu* are pronounced *shu.*

Kanab, city, seat (1864) of Kane County, southwestern Utah, U.S., on Kanab Creek, at the foot of Vermillion Cliffs, just north of the Arizona line. Settlement was first made in 1864 around Ft. Kanab (from a Paiute Indian word meaning "willow"), but was abandoned because of Indian attacks. In 1870 Mormon missionaries reoccupied the place, which developed as a trading centre for livestock, grain and alfalfa farming, and lumbering. The city has also become a tourist base for several nearby points of interest, including the Grand Canyon (to the south in Arizona) and the Bryce Canyon and Zion national parks (*qq.v.*). Coral Pink Sand Dunes State Reserve is to the west. The author Zane Grey lived briefly in Kanab, and the surrounding sand dunes, canyons, and flatlands provided the setting for *Riders of the Purple Sage* (1912). Since the early 1930s many outdoor movies have been shot in the area; some movie-set towns remain, and Kanab has been called "Hollywood's backyard." Pop. (1980) 2,148.

Kanagaki Robun, original name BUNZŌ NOZAKI (b. Jan. 6, 1829, Edo [now Tokyo]—d. Oct. 8, 1894, Tokyo), Japanese writer of humorous light fiction who brought a traditional satirical art to bear on the peculiarities of Japanese society in the process of Westernization.

He began as an apprentice shop boy but became a disciple of Hanagasa Bunkyō, a writer in the *gesaku* tradition (light, witty writing intended for the entertainment of the merchant and working classes of Edo). Eventually Kanagaki was recognized as a leading *gesaku* writer, noted for such works as *Kokkei Fuji mōde* (1860–61; "A Comic Mt. Fuji Pilgrimage"), a satire of popular works on pilgrimages to famous places, and *Aguranabe* (1871; *The Beefeater,* 1956).

Kanagawa, prefecture (*ken*), Honshu, Japan, located south of Tokyo and bordered by Tōkyō-wan (Tokyo Bay; east) and the Pacific Ocean (south). It occupies an area of 926 sq mi (2,397 sq km). The eastern coast is an important part of the Keihin Industrial Zone; Yokohama, Tokyo's port, is the prefectural capital. The Pacific coast is a popular resort area, including such cities as Kamakura, Hiratsuka, and Odawara.

Inland Kanagawa is an agricultural area producing flowers and dairy products for the Tokyo market. The port of Misaki, at the head of the Miura Peninsula, is a major centre of bonito and tuna fishing. During the late 1970s the population increased dramatically due to industrial growth and urbanization of housing developments for workers. Pop. (1983 est.) 7,210,000.

Kanagawa, Treaty of, also called PERRY CONVENTION (March 31, 1854), Japan's first treaty with a Western nation. Concluded by representatives of the United States and Japan at Kanagawa (now part of Yokohama), it marked the end of Japan's period of seclusion (1639–1854). The treaty was signed as a result of pressure from U.S. Commo. Matthew C. Perry, who sailed into Tokyo Bay with a fleet of warships in July 1853 and demanded that the Japanese open their ports to U.S. ships for supplies. Perry then left Japan in order to give the government a few months to consider its decision. When he returned in February 1854, the Japanese, aware that none of their armaments was a match for Perry's warships, agreed to admit U.S. ships to the ports of Shimoda and Hakodate and to accept a U.S. consul at Shimoda. The Treaty of Kanagawa was the first of the treaties signed between Japan and other Western countries in the 19th century.

Kanaka (Hawaiian: Person, or Man), in the late 19th and early 20th centuries, any of the South Pacific islanders employed in Queensland, Australia, on sugar plantations or cattle stations or as servants in towns. The islanders were first introduced into Queensland in 1847 for employment on cotton plantations; in succeeding years they formed the cheap-labour

base on which the sugar industry was built. By 1900 approximately 57,000 islanders had been recruited in a manner that often amounted to kidnapping.

In the Queensland interior the labourers were generally abused and reduced to near-slave status (*see* blackbirding). Although this treatment called forth a strong humanitarian protest, it was rather the charge that the use of Kanakas lowered the standard of living, along with demands for the promotion of European labourers and for small European landholdings, that prompted the Queensland government to prohibit further recruitment in 1890. Already, plantation owners had shown their feelings on the matter by calling for the formation of a new colony, which they presumably would dominate, in northern Queensland; now their hostility was effectual in having the prohibition suspended (1892). The replacement of the hoe by the plow and the greater productivity of Australian farmers lessened the importance of Kanaka labour in the following years, however. The new Commonwealth of Australia in 1901 (in the Pacific Island Labourers' Act) finally called for the abolition of recruitment after 1904 and for the deportation of most South Pacific labourers after 1906.

Kan'ami, in full, KAN'AMI KIYOTSUGU, original name YŪSAKI KIYOTSUGU, also called MIYOMARU, or KANZE KIYOTSUGU (b. 1333, Iga province, Japan—d. June 8, 1384, Suruga province), Japanese actor, playwright, and musician who was one of the founders of nō drama.

Kan'ami organized a theatre group in Obata to perform *sarugaku* (a form of popular drama that had at one time included tricks, acrobatics, and slapstick skits), which by his time were plays with dialogue, acrobatics, and dances. He moved his troupe to Yamato and formed the Yūzaki-za (Yūzaki Theatrical Company), which eventually became the highly influential Kanze school of nō. His popularity spread, and he began traveling to Kyōto to perform there as well. At one such performance in 1374 the shogun Ashikaga Yoshimitsu was in the audience and was so favourably impressed that he became Kan'ami's patron and thus enabled Kan'ami to continue refining the form and to write new plays.

Kan'ami was the first to incorporate *kusemai* (a popular song and dance form with a strong irregular beat) in the drama. He also used music and dances of the *dengaku* (rustic harvest celebrations). Thus he brought together the two principal tributaries to nō in his plays, which also set new standards of literary quality for drama. Some of the outstanding works attributed to him are *Komachi, Ji'nen koji, Shii no shōshō, Matzukaze,* and *Eguchi.* His son Zeami Motokiyo, trained by Kan'ami in the theatrical arts, acted, wrote plays, and became the foremost theorist of the nō theatre. He succeeded his father as director of the Kanze school.

Kananga, formerly (until 1972) LULUABOURG, city, south-central Zaire, situated just east of the Lulua River, a tributary of the Kasai. It is on road and rail routes to Lubumbashi (southeast) and the Kasai River port of Ilebo (northwest) and has air links to those and other Zairian cities. It was named Luluabourg in 1884 by a German explorer and became a military post that was the scene in 1895 of a widespread revolt of African troops against the Belgians. Luluabourg succeeded Lusambo as the capital of the Kasai region in 1950. A main commercial centre, the city now serves an area producing diamonds (around Tshikapa to the southwest), livestock, and large quantities of coffee and cotton. Palm oil, rice, cassava, peanuts (groundnuts), bananas, and pineapples are processed. Other industries include brewing and printing. Kananga is the site of a national museum and a teacher-training college. In the 15 years after Zaire's independence (1960) the city's population grew rapidly, and the original name was restored in 1972. Pop. (1984 prelim.) 290,898.

Kanapoi fossil, well-preserved distal humerus of a hominid species estimated to have lived more than 2,500,000 years ago, found near Lake Rudolph, in northwestern Kenya, in 1965 by Bryan Patterson. The discovery of antelope remains at the same site convinced scientists that the bone was a hominid fossil rather than a chimpanzee fossil, for chimpanzee fossils would have been found only in a forest environment.

The fossil is generally assumed to be associated with *Australopithecus boisei,* one of the earliest of the genus *Homo.* It was a significant find because it pushed the record of known remains of *Australopithecus* back further than had been earlier estimated.

Kanara, region along the Malabar Coast of the Arabian Sea, western Karnātaka (formerly Mysore) state, India. It is bounded on the east by the Western Ghāts. Formerly divided between Bombay to the north and Madras (now Tamil Nādu) to the southeast, the region became part of Mysore state in the linguistic reorganization of India in 1956. Kanara produces rice (the main food crop) and sugarcane (the main cash crop), as well as pepper, betel nuts, and coconuts. Teak and blackwood are obtained from local forests. The people of Kanara, called Kanarese, speak Kannada. The main population centre is Mangalore.

Kanārak (India): *see* Konārak.

Kanarese language: *see* Kannada language.

Kanarese literature: *see* Kannada literature.

Kanáris, Konstantínos (b. 1790, Psará, Greece—d. Sept. 14, 1877, Athens), Greek naval officer and statesman who achieved fame for his exploits against the Turks during the War of Greek Independence (1821–32).

During the war Kanáris contributed his own ship to the fleet of the Greek navy. He soon achieved fame through his effective use of fire ships. On June 18, 1822, off the island of Chios, he blew up the Turkish admiral's flagship and so harassed the Turkish fleet that it retreated to the Dardanelles. In November 1822 he destroyed another large Turkish ship at Tenedos. Though unable to save his home island of Psara, which fell to the Turks in June 1824, he burned or sank several Turkish ships off Samos and Lesbos and harassed and delayed the Egyptian squadrons, whose objective was Crete. His audacious attempt to burn Muḥammad 'Alī's Egyptian fleet at Alexandria in August 1825 failed at the last moment because of a contrary wind.

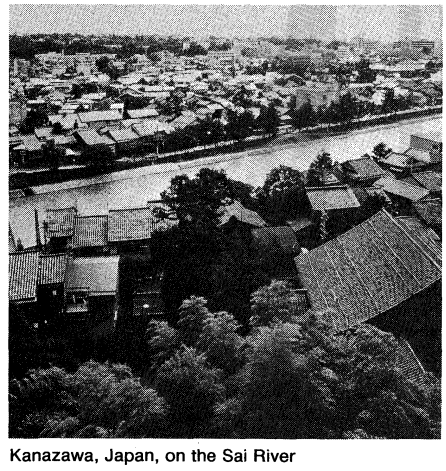
A retiring man, Kanáris played little part in the stormy politics of the War of Independence; but after the war he was associated with the opposition to King Otto, though he served as prime minister in 1848–49. He was a member of the provisional government that deposed Otto in 1861, after which he was one of the three regents until 1863. He was prime minister from April to May 1864 and from August 1864 to February 1865. He came back from retirement to preside over the ministry formed during the Russo-Turkish War of 1877 but died in office.

kanat (water-supply system): *see* qanāt.

Kanauj (India): *see* Kannauj.

Kanawha River, river formed at Gauley Bridge, West Virginia, U.S., by the confluence of the New and Gauley rivers. It flows 97 miles (156 km) in a northwesterly direction to enter the Ohio River at Point Pleasant. It has dams and locks and is navigable to Kanawha Falls, 30 miles (48 km) above Charleston, located at the point where it is joined by the Elk River. The Kanawha River valley has extensive deposits of salt brines (chlorine, bromine, iodine, calcium, magnesium, and potash) and natural gas and oil wells. The towns of Charleston, South Charleston, Belle, Nitro, and Dunbar form the nucleus of this activity.

Kanazawa, capital, Ishikawa *ken* (prefecture), Japan, on the Sai River. In the 16th century



Kanazawa, Japan, on the Sai River
Akisuke Shibata—Bon

the city and the province of Kaga were given to the Maeda family, the richest daimyo family in Tokugawa times; Kanazawa remained under their jurisdiction for about 300 years. The walls, gates, and a few buildings of the Maeda family's castle remain, giving the city the atmosphere of traditional Japan. Kenroku-en, formerly their garden, is a fine example of Japanese landscape gardening. Manufacturing developed from Kanazawa's luxury industries of fine lacquer and Kutani ware porcelain. An ancient silk industry has been expanded to include cotton, woolen, rayon, and nylon textiles. Kanazawa University was founded in the city in 1949. Pop. (1988 est.) 437,202.

Kanchanaburi, town, western Thailand, 70 miles (110 km) northwest of Bangkok. The Khwae Noi River joins the Klong River near Kanchanaburi. Built in the 18th century as a defense against Burmese invaders, the walled town is the site of two paper factories. A cemetery there commemorates the Allied soldiers who died while constructing and operating the notorious "death railway" during World War II. The "Bridge on the River Kwai," carrying that railway, was built to connect Japanese-occupied Bangkok with Burma (Myanmar). Running along the ancient trade route through the Khwae Noi valley and the Three Pagoda Pass (Phra Chedi Sam Ong) to Moulmein, in Myanmar, the railway is now in disrepair. Sai Yok Waterfall is near the town.

Large stands of bamboo in the surrounding area provide pulp for Kanchanaburi's paper factories, and rice and tobacco are grown. Khao Salop Wildlife and Forest Reserve is in the locality. Pop. (1986 est.) 33,616.

Kānchenjunga, also spelled KĀNGCHENJUNGA, or KINCHINJUNGA, Nepali KUMBHKARAN LUNGUR, world's third highest mountain (28,169 ft [8,586 m]), in the Himalayas on the Nepalese border with Sikkim, India, 46 mi (74 km) north-northwest of Darjeeling. The Kānchenjunga massif is in the form of a gigantic cross, the arms of which lie north, south, east, and west. The individual summits connect to neighbouring peaks by four main ridges, from which four glaciers flow: the Zemu (northeast), Talung (southeast), Yalung (southwest), and Kānchenjunga (northwest). The mountain holds an important place in the mythology and religious ritual of the local inhabitants, and its slopes were no doubt fa-

miliar to herdsmen and traders for centuries before a rough survey of it was made.

The first map known of Kānchenjunga was made by Rinzin Namgyal, one of the pandit ("learned") explorers of the mid-19th century, who made a circuital sketch. In 1848 and 1849 Sir Joseph Hooker, a botanist, was the first European to visit and describe the region, and, in 1899, the explorer-mountaineer Douglas Freshfield travelled around the mountain. In 1905 the suggested Yalung Valley route was attempted by an Anglo-Swiss party, a venture during which four members perished in an avalanche.

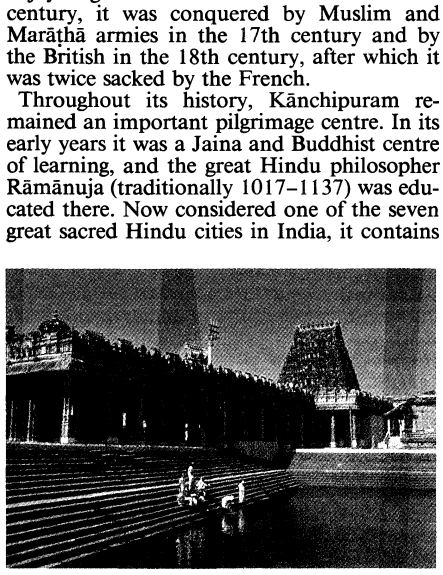
Mountaineers later explored other faces of the massif. A Bavarian expedition led by Paul Bauer in 1929 and 1931 vainly attempted it from the Zemu side, and Gunter O. Dyhrenfurth, in 1930, attempted it from the Kānchenjunga Glacier. The greatest height reached during these explorations was 25,263 ft (7,700 m) in 1931. Fatal accidents on two of these expeditions gave the mountain a reputation for unusual danger and difficulty. No more efforts were made to climb it until 1954, when, partly because the Sikkimese objected, attention was again turned to the Yalung face, which is in Nepal. Gilmour Lewis' visits to the Yalung in 1951, 1953, and 1954 led to a 1955 British expedition led by Charles Evans, under the auspices of the Royal Geographical Society and the Alpine Club (London), which stopped within a few yards of the actual summit in deference to the religious beliefs and wishes of the Sikkimese.

The name Kānchenjunga is derived from four words of Tibetan origin, usually rendered Kang-chen-dzo-nga or Yang-chhen-dzönga and interpreted in Sikkim as the Five Treasuries of the Great Snow.

kanchil, any of several small chevrotains, or mouse deer, native to Southeast Asia. Formerly believed to be separate species, they are now generally thought to be varieties of the species *Tragulus kanchil.* *See* chevrotain.

Kānchipuram, also called CONJEEVERAM, town, administrative headquarters of Chingleput district, Tamil Nādu state, southeastern India, on the Pālār River and the Madras–Bangalore road and rail systems. One of the most ancient towns of southern India, it traces its history to the 2nd century BC as an early Cōla capital. From the 3rd to the 9th century AD it was the Pallava capital, and from the 10th to the 13th century it served as the late Cōla government headquarters. An important Vijayanagar town from the 15th to the 17th century, it was conquered by Muslim and Marāṭhā armies in the 17th century and by the British in the 18th century, after which it was twice sacked by the French.

Throughout its history, Kānchipuram remained an important pilgrimage centre. In its early years it was a Jaina and Buddhist centre of learning, and the great Hindu philosopher Rāmānuja (traditionally 1017–1137) was educated there. Now considered one of the seven great sacred Hindu cities in India, it contains 108 Śaiva and 18 Vaishnava temples. Also a modern centre of learning, it has two colleges affiliated with the University of Madras. Pop. (1981) 130,926; metropolitan area, 145,254.



Ekāmbaranātha Hindu temple (dating from the Vijayanagar period, *c.* 1500) at Kānchipuram, Tamil Nādu, India

Kaypix—Shostal/EB Inc.

Kānchrāpāra, town, Twenty-four Parganas district, West Bengal state, northeastern India, just east of the Hooghly River, part of the Calcutta urban agglomeration. The town, within Hālisahar (*q.v.*) municipality, has one of the largest railway workshops in India; jute milling is the major industry. A temple is dedicated to Krishna, and a religious festival is held annually. Just north of the temple lies a governmental land-development area, which includes Kalyani, a planned modern town with a university (founded 1960), a state tuberculosis hospital, and a Bangladesh refugee colony. Pop. (1981) 88,798.

Kandahār (Afghanistan): *see* Qandahār.

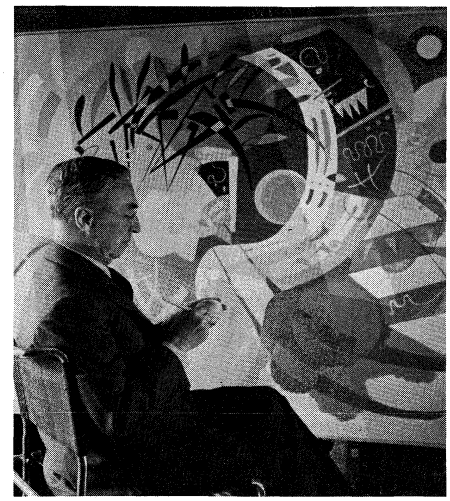
Kândal, *khêt* (province), south central Kampuchea (Cambodia), situated on the east bank of the Mekong River and traversed by the Tônlé (river) Sab and the Tônlé Basăk; it surrounds Phnom Penh, the national capital, and borders Vietnam to the south. The 1,472-sq-mi (3,812-sq-km) province benefits from the annual monsoonal floods of the Mekong, which overflow the Tônlé Sab and Tônlé Basăk levees through several hundred openings, or *prêk* (streams). Water conservation projects completed after 1975, notably the Kâmpóng Kântuŏt dam on the Prêk Tnaôt, a dam on the Prêk Rœssei Srok, and new levees along the major rivers, have increased Kândal's agricultural potential. A wide assortment of field crops, fruit, and vegetables are grown with year-round irrigation in normal years, principally rice, corn (maize), potatoes, beans, sugarcane, bananas, palm sugar, cotton, soybeans, and castor-oil beans. Among fibres harvested are kapok and jute. Freshwater fishing is also important. Provincial industry includes a plywood factory at Dei Eth, an earthenware factory at Bêk Chan, a textile mill in S'ang, and a ship building yard on the Tônlé Sab at Prêk Pnŏu. Kaolin and various types of stone are quarried at Phnum (mountain) Basĕt. There are several important national highway routes and rail junctions in the province that link Phnom Penh with all provinces in Kampuchea. The provincial capital is Ta Khmau town located just south of Phnom Penh. Pop. (1971 est.) 858,900.

Kandavu (Fiji): *see* Kadavu.

Kandh (people): *see* Khond.

Kandinsky, Wassily, Russian in full VASILY VASILYEVICH KANDINSKY (b. Dec. 16 [Dec. 4, old style], 1866, Moscow—d. Dec. 13, 1944, Neuilly-sur-Seine, Fr.), Russian-born artist, arguably the creator of the first pure abstraction in modern painting. After successful avant-garde exhibitions, he founded the influential Munich group Der Blaue Reiter (The Blue Rider; 1911–14) and began completely abstract painting. His forms evolved from fluid and organic to geometric and, finally, to pictographic (*e.g.*, "Tempered Élan," 1944).

Early years. Kandinsky's mother was a Muscovite, one of his great-grandmothers was a Mongolian princess, and his father a native of Kyakhta, a Siberian town near the Chinese border; the boy thus grew up with a cultural heritage that was partly European and partly, although not specifically, Asian. His family was genteel, well-to-do, and fond of travel; while still a child he became familiar with Venice, Rome, Florence, the Caucasus, and the Crimean Peninsula. At Odessa, where his parents settled in 1871, he completed his secondary schooling and became an amateur performer on the piano and the cello. He also became an amateur painter, and he later recalled, as a sort of first impulse toward abstraction, an adolescent conviction that each colour had a mysterious life of its own. In 1886 he began to study law and economics at the University of Moscow, but he continued to have unusual feelings about colour as he contemplated the city's vivid architecture and its collections of icons; in the latter, he once said, could be found the roots of his own art.



Kandinsky

By courtesy of Mme Nina Kandinsky; © A.D.A.G.P. 1972 by French Reproduction Rights, Inc.

In 1889 the university sent him on an ethnographic mission to the province of Vologda, in the forested north, and he returned with a lasting interest in the often garish, nonrealistic styles of Russian folk painting. During that same year he discovered the Rembrandts in the Hermitage at St. Petersburg (Leningrad), and he furthered his visual education with a trip to Paris. He pursued his academic career and in 1893 was granted the degree equivalent of a doctorate.

By this time, according to his reminiscences, he had lost much of his early enthusiasm for the social sciences. He felt, however, that art was "a luxury forbidden to a Russian." Eventually, after a period of teaching at the university, he accepted a post as the director of the photographic section of a Moscow printing establishment. In 1896, when he was approaching his 30th birthday, he was forced to choose among his possible futures, for he was offered a professorship in jurisprudence at the University of Dorpat (later called Tartu), in Estonia, which was then undergoing Russification. In what he called a "now or never" mood, he turned down the offer and took the train for Germany with the intention of becoming a painter.

Munich period. He already had the air of authority that would contribute to his success as a teacher in later years. He was tall, large-framed, impeccably dressed, and equipped with pince-nez glasses; he had a habit of holding his head high and seeming to look down at the universe. He resembled, according to acquaintances, a mixture of diplomat, scientist, and Mongol prince. But for the moment he was simply an average art student, and he enrolled as such in a private school at Munich run by Anton Azbé. Two years of study under Azbé were followed by a year of work alone and then by enrollment at the Munich Academy in the class of Franz von Stuck. Kandinsky emerged from the academy with a diploma in 1900 and, during the next few years, achieved moderate success as a competent professional artist in touch with modern trends. Starting from a base in 19th-century Realism, he was influenced by Impressionism, by the whiplash lines and decorative effects of Art Nouveau (called Jugendstil in Germany),

by the dot technique of Neo-Impressionism or Pointillism, and by the strong, unrealistic colour of central European Expressionism and French Fauvism. Often he revealed that he had not forgotten the icons of Moscow and the folk art of Vologda; sometimes he indulged in patterns of violent hues that would have delighted his Asian ancestors. He exhibited with the vanguard groups and in the big nonacademic shows that had sprung up all over Europe—with the Munich Phalanx group (of which he became president in 1902), with the Berlin Sezession group, in the Paris Salon d'Automne and Salon des Indépendants, and with the Dresden group that called itself Die Brücke (the Bridge). In 1903 in Moscow he had his first one-man show, followed the next year by two others in Poland. Between 1903 and 1908 he travelled extensively, from Holland to as far south as Tunisia and from Paris back to Russia, stopping off for stays of several months each in Kairouan (Tunisia), Rapallo (Italy), Dresden, the Parisian suburb of Sèvres, and Berlin.

In 1909 Kandinsky and the German painter Gabriele Münter, who had been his mistress since 1902, acquired a house in the small town of Murnau, in southern Bavaria. Working part of the time in Murnau and part of the time in Munich, he began the process that led to the emergence of his first strikingly personal style and finally to the historic breakthrough into purely abstract painting. Gradually, the many influences he had undergone coalesced. His impulse to eliminate subject matter altogether was not, it should be noted, due merely or even primarily to strictly aesthetic considerations. No one could have been less of an aesthete, less of an "art for art's sake" addict, than Kandinsky. In addition, he was not the sort of born painter who could enjoy the physical properties of oil and pigment without caring what they meant. He wanted a kind of painting in which colours, lines, and shapes, freed from the distracting business of depicting recognizable objects, might evolve into a visual "language" capable—as was, for him, the abstract "language" of music—of expressing general ideas and evoking deep emotions.

The project was not, of course, entirely new. Analogies between painting and music had long been common; many thinkers had attempted to codify the supposed expressiveness of colours, lines, and shapes; and more than one fairly ancient sketch might compete for the honour of being called the first abstract picture. Moreover, in these years just before World War I, Kandinsky was by no means alone in his attack on figurative art. By 1909 the Cubists were turning out intellectualized and fragmented visions of reality that baffled the ordinary viewer. Between 1910 and 1914 the list of pioneer abstract artists included many fine painters. A strict examination of works and dates can show, therefore, that Kandinsky does not quite deserve to be called, as he often is, the "founder" of nonfigurative painting; at least he cannot be called the only founder. But, when this historical point is conceded, he remains a pioneer of the first importance.

Kandinsky's widely accepted claim to historical priority rests mainly on an untitled work dated 1910 and commonly referred to as "First Abstract Watercolour." On the basis of research done in the 1950s, however, this work can be dated somewhat later and can be regarded as a study for the 1913 "Composition VII"; and in any event it must be considered merely an incident—among many for which the evidence has not been preserved—on Kandinsky's route. In "Blue Mountain" (1908) the evolution toward nonrepresentation is already clearly under way; the forms are schematic, the colours non-naturalistic, and the general effect that of a dream landscape. In "Landscape with Steeple" (1909; Musée National d'Art Moderne, Paris) similar tendencies are evident, together with the beginning of what might be called an explosion in the composition. By 1910, "Improvisation XIV" is already, as its somewhat musical title suggests, practically abstract; with the 1911 "Encircled," there has definitely developed a kind of painting that, though not just decoration, has no discernible point of departure in the depiction of recognizable objects. After that come such major works as "With the Black Arch," "Black Lines," and "Autumn"; in such pictures, done between 1912 and 1914 in a slashing, splashing, dramatic style that anticipates the New York Abstract Expressionism of the 1950s, most art historians see the peak of the artist's achievement.

Kandinsky was an active animator of the avant-garde movement in Munich, helping to found in 1909 the Neue Künstlervereinigung (New Artists' Association). Following a disagreement within this group, he and the German painter Franz Marc founded in 1911 an informally organized rival group, which took the name Der Blaue Reiter (The Blue Rider), from the title of one of Kandinsky's 1903 pictures.

Russian interlude. When World War I was declared in 1914, Kandinsky broke off his relationship with Gabriele Münter and returned to Russia by way of Switzerland, Italy, and the Balkans. An early marriage to a cousin had been dissolved in 1910 after a long period of separation, and in 1917 he married a Moscow woman, Nina Andreevskaya, whom he had met the previous year. Although he was past 50 and his bride was many years younger, the marriage turned out to be extremely successful, and he settled down in Moscow with the intention of reintegrating himself into Russian life. His intention was encouraged by the new Soviet government, which at first showed itself anxious to win the favour and services of avant-garde artists. In 1918 he became a professor at the Moscow Academy of Fine Arts and a member of the arts section of the People's Commissariat for Public Instruction. His autobiographical *Rückblicke* was translated into Russian and published by the Moscow municipal authorities. In 1919 he created the Institute of Artistic Culture, became director of the Moscow Museum for Pictorial Culture, and helped to organize 22 museums across the Soviet Union. In 1920 he was made a professor at the University of Moscow and was honoured with a one-man show organized by the state. In 1921 he founded the Russian Academy of Artistic Sciences. But by then the Soviet government was veering from avant-garde art to Social Realism, and so, at the end of the year, he and his wife left Moscow for Berlin.

In spite of the war, the Revolution, and official duties, he had found time to paint during this Russian interlude and even to begin a quite drastic transformation of his art. Whereas, in his Munich work as late as 1914 one can still find occasional allusions to landscape, the canvases and watercolours of his Moscow years show a determination to be completely abstract. They also show a growing tendency to abandon the earlier spontaneous, lyrical, organic style in favour of a more deliberate, rational, and constructional approach. The change is evident in such pictures as "White Line" and "Blue Segment."

Bauhaus period. By this time Kandinsky had an international reputation as a painter. He had always, however, been interested in teaching, first as a lecturer in law and economics just after getting his university degree, then as the master of a painting school he had organized in Munich, and more recently as a professor at the University of Moscow. He seems not to have hesitated, therefore, when early in 1922 he was offered a teaching post at Weimar in the already famous Bauhaus school of architecture and applied art. At first his duties were a little remote from his personal activity, for the Bauhaus was not concerned with the formation of "painters" in the traditional sense of the word. He lectured on the elements of form, gave a course in colour, and directed the mural workshop. Not until 1925, when the school moved from Weimar to Dessau, did he have a class in "free," nonapplied painting. In spite of the somewhat routine nature of his work, however, he appears to have found life at the Bauhaus rewarding and pleasant. The climate was one of research and craftsmanship combined with a certain amount of aesthetic puritanism; it was classical, to use the term rather loosely, by comparison with the warm romanticism of his pre-1914 days in Munich.

Kandinsky responded to this climate by continuing to evolve in the general direction of geometrical abstraction, but with a dynamism and a taste for detail-crowded pictorial space that recall his earlier sweeping-gesture technique. That Kandinsky was keenly interested in theory during these years is evident from his publication in 1926 of his second important treatise, *Punkt und Linie zu Fläche* ("Point and Line to Plane"). In his first treatise, *Concerning the Spiritual in Art,* he had emphasized in particular the supposed expressiveness of colours, comparing yellow, for example, to the aggressive, allegedly earthly sound of a trumpet and comparing blue to the allegedly heavenly sound of the pipe organ. Now, in the same spirit, he analyzed the supposed effects of the abstract elements of drawing, interpreting a horizontal line, for example, as cold and a vertical line as hot.

Paris period. Although he had been a German citizen since 1928, he emigrated to Paris when, in 1933, the Gestapo forced the Bauhaus to close. The last, and one of the finest, of his German pictures is the sober "Development in Brown"; its title probably alludes to the Nazi brown-shirted storm troopers, who regarded his abstract art as "degenerate." He lived for the remaining 11 years of his life in an apartment in the Parisian suburb of Neuilly-sur-Seine, becoming a naturalized French citizen in 1939.

During this final period his painting, which he began to prefer to call "concrete" rather than "abstract," became to some extent a synthesis of the organic manner of the Munich period and the geometrical manner of the Bauhaus period. The visual language he had been aiming at since at least 1910 turned into collections of signs that look like almost-decipherable messages written in pictographs and hieroglyphs; many of the signs resemble aquatic larvae, and now and then there is a figurative hand or a lunar human face. Typical works are "Violet Dominant," "Dominant Curve," "Fifteen," "Moderation," and "Tempered Élan." The production of such works was accompanied by the writing of essays in which the artist stressed the alleged failure of modern scientific positivism and the need to perceive what he termed "the symbolic character of physical substances."

Kandinsky died in 1944. His influence on 20th-century art, often filtered through the work of more accessible painters, was profound. (R.McMu./Ed.)

MAJOR WORKS. "The Sluice" (1901; Neue Pinakothek, Munich); "The Blue Rider" (1903; Ernst Bührle Collection, Zürich); "Beach Baskets in Holland" (1904; Neue Pinakothek); "The Night" (1907; Neue Pinakothek); "Street in Murnau with Women" (1908; Musée National d'Art Moderne, Paris); "Blue Mountain" (1908; Solomon R. Guggenheim Museum, New York City); "First Abstract Watercolour" (1910; Nina Kandinsky Collection, Neuilly-sur-Seine, Fr.); "Encircled" (1911; Nina Kandinsky Collection); "All Saints Picture II" (1911; Neue Pinakothek); "With the Black Arch" (1912; Nina Kandinsky Collection); "Black

Lines" (1913; Solomon R. Guggenheim Museum); "Improvisation No. 30" (1913; Art Institute of Chicago); "Composition VII" (1913; State Tretyakov Gallery, Moscow); "Picture with Three Spots" (1914; Solomon R. Guggenheim Museum); "Autumn" (1914; Solomon R. Guggenheim Museum); "White Line" (1920; Nina Kandinsky Collection); "Blue Segment" (1921; Solomon R. Guggenheim Museum); "In the Black Circle" (1923; Fondation Maeght, Saint-Paul, Fr.); "One Center" (1924; Solomon R. Guggenheim Museum); "Yellow-Red-Blue" (1925; Nina Kandinsky Collection); "Several Circles" (1926; Solomon R. Guggenheim Museum); "Three Sounds" (1926; Solomon R. Guggenheim Museum); "On the Points" (1928; Nina Kandinsky Collection); "Scarcely (Kaum)" (1930; Boymans-van Beuningen Museum, Rotterdam); "Affirmed Pink" (1932; Solomon R. Guggenheim Museum); "Development in Brown" (1933; Musée National d'Art Moderne); "Violet Dominant" (1934; Fondation Maeght); "Succession" (1935; Phillips Collection, Washington, D.C.); "Dominant Curve" (1936; Solomon R. Guggenheim Museum); "Tensions Relaxed" (1937; W. Gidwitz Collection, Chicago); "Sweet Trifles" (1937; Nina Kandinsky Collection); "Fifteen" (1938; Nina Kandinsky Collection); "Composition X" (1939; Nina Kandinsky Collection); "Moderation" (1940; Solomon R. Guggenheim Museum); "Various Actions" (1941; Solomon R. Guggenheim Museum); "Division-Unity" (1943; Nina Kandinsky Collection); "Circle and Square" (1943; Nina Kandinsky Collection); "Seven" (1943; Max Bill Collection, Zürich); "White Balancing Act" (1944; Professor W. Löffler Collection, Zürich); "Tempered Élan" (1944; Nina Kandinsky Collection).

BIBLIOGRAPHY. Will Grohmann, *Wassily Kandinsky: Life and Work* (1959), is a sympathetic biography by a friend of the artist. Paul Overy, *Kandinsky: The Language of the Eye* (1969), offers a good analysis of the painter's not always clear intentions; Hans K. Roethel and Jean K. Benjamin, *Kandinsky* (1979), is an illustrated treatment of his work; Peg Weiss, *Kandinsky in Munich: The Formative Jugenstil Years* (1979), studies the influences in pre-World War I Munich. See also *Kandinsky: Complete Writings on Art*, 2 vol., ed. by Kenneth C. Lindsay and Peter Vergo (1982).

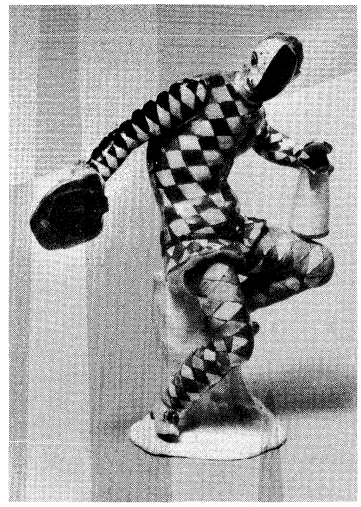
Kan-dla, town, northwestern Gujarāt state, west-central India, a port on the Gulf of Kutch of the Arabian Sea. The port was opened on Kandla's natural deepwater harbour in the 1930s. Designed to serve a hinterland much larger than Gujarāt state, it has continued to be improved. Petroleum, iron and steel machinery, and chemicals are major imports; the port also handles grains, textiles, and salt. Kandla is served by a major highway, a railway, and an airport. Pop. (1981) 23,978.

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Kändler, Johann Joachim (b. 1706, Fischbach, Saxony [Germany]—d. May 18, 1775, Meissen), late Baroque sculptor who was a major innovator in European porcelain sculpture.

In 1731 Kändler, a sculptor at the court of Augustus the Strong, elector of Saxony, was engaged to reorganize the modeling department of the porcelain factory at Meissen. He lent his great talents to the factory for a period of 44 years. His versatility and imagination were extraordinary, and it was largely through his genius that the Meissen factory gained world renown.

Kändler was ably assisted in design and execution by three of the most distinguished pottery sculptors of the Rococo period, J.F. Eberlein, F.E. Meyer, and P. Reinicke. Scarcely a palace in Europe did not contain Meissen figurines, dinner sets, vases, or other works of the Kändler period. Among his best known works are his commedia dell'arte figurines, largely done between 1738 and 1740; his birds for the Japanese Palace in Dresden, executed between 1731 and 1735; and the 2,200-piece

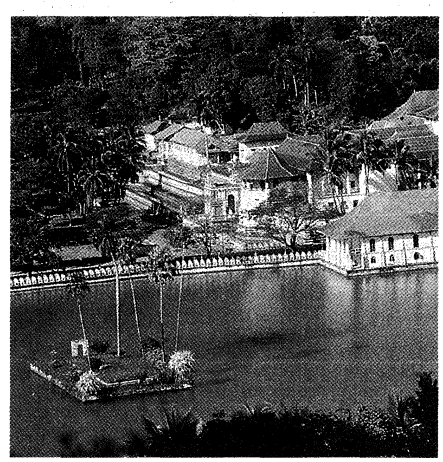


Harlequin, Meissen hard-paste porcelain figure from the commedia dell'arte modeled by Johann Joachim Kändler, *c.* 1738; in the Victoria and Albert Museum, London

By courtesy of the Victoria and Albert Museum, London; photograph, EB Inc.

Swan Service made for Heinrich, Graf von Brühl, from 1737 to 1741. *See also* Meissen porcelain.

Kandy, town, central Sri Lanka (Ceylon), on the Kandy Plateau at an elevation of 1,600 feet (488 m). It lies on the Mahaweli River near an artificial lake that was constructed (1806) by the last Kandyan king. Kandy first became the capital of a kingdom around 1480. In 1592 it became the capital of the Sinhalese kings, who preserved their independence during the period of European colonial rule—



Temple of the Tooth, Kandy, Sri Lanka

Ewing Galloway

except for temporary occupations by the Portuguese and the Dutch—until 1815, when the British ousted the last Kandyan king.

Kandy is the commercial centre for the surrounding densely populated agricultural area; it produces most of Sri Lanka's tea, as well as rice and other crops. Limestone is quarried, and bricks and tiles are made nearby. The town's historic buildings include the palace of the Kandyan kings and Dalada Maligava (Temple of the Tooth), which houses a sacred relic reputed to be a tooth of the Buddha. The University of Ceylon and the Royal Botanic Gardens are nearby. Pop. (1983 est.) 114,000.

Kandy, kingdom of, important independent monarchy in Ceylon (Sri Lanka) at the end of the 15th century and the last Sinhalese kingdom to be subjugated by a colonial power. Kandy survived the attacks of Ceylon's first two colonial rulers—the Portuguese and the Dutch—and finally succumbed to the third and last colonial ruler, the British, in 1818. While all the other Sinhalese kingdoms had been extinguished by the Portuguese in the early 1600s, Kandy survived with stubborn persistence for another two centuries as a result of three main factors: its clever diplomacy; its natural setting of mountains and dense forest, which was difficult to penetrate; and its skillful use of guerrilla warfare. Kandy was often captured but was never held for long.

Under Portuguese rule, Kandy allied itself with the Dutch; under Dutch rule, it sought assistance from the British. From the time of the British takeover of Ceylon in 1796, Kandy was thrown on its own resources. The British considered the continued independence of Kandy a hindrance to the expansion of both their trade and their communications network in Ceylon. The first British attack against Kandy in 1803 was a failure. By 1815, however, the Kandyan chiefs became dissatisfied with their tyrannical king (of South Indian descent) and welcomed British intervention. In the ensuing agreement of 1815, the Kandyan Convention, the Kandyan king was deposed and sovereignty was vested in the British crown, but the rights of the Kandyan chiefs were largely maintained. Soon, the chiefs became dissatisfied with this arrangement and openly rebelled in 1817 but were decisively subjugated by the British in 1818. Ceylon was thus brought, for the first time in many centuries, under unified rule.

Kandyan Convention, agreement in 1815 between the British and the chiefs of the kingdom of Kandy in Ceylon (Sri Lanka), whereby Kandy was annexed to the other British holdings in Ceylon, giving Britain complete control over the island. By the terms of the convention, the South Indian king of Kandy was deposed and his sovereignty vested in the British crown.

It was the Kandyan chiefs themselves who, in opposition to their then oppressive South Indian king, had invited British intervention. The convention therefore upheld many of their traditional rights and powers. In addition, the convention specified that the traditional laws, customs, and institutions of the Kandyans were to be maintained and administered by the usual native authorities. The Kandyans came to regret this 1815 agreement and, in 1817, rebelled. By 1818 the rebellion was put down, and an ensuing British proclamation took away from the Kandyans most of the rights that had been guaranteed them by the convention.

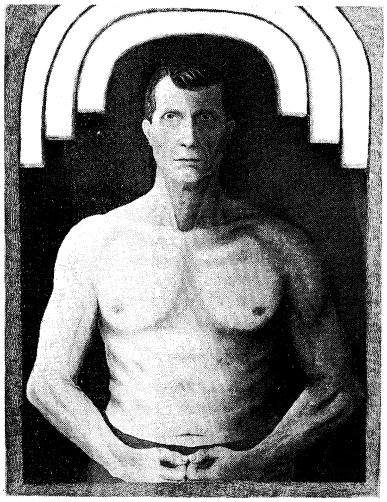
Kane, Elisha Kent (b. Feb. 3, 1820, Philadelphia—d. Feb. 16, 1857, Havana), American physician and Arctic explorer who in 1850 led an unsuccessful expedition to northwestern Greenland to search for the British explorer Sir John Franklin, missing since 1845.

Educated as a physician, Kane became a naval surgeon in 1843. After the Arctic search for Franklin, he made plans for his own attempt to find Franklin and also to establish whether or not there was an open sea around the North Pole. Leaving New York City on May 31, 1853, he sailed aboard the *Advance* to northwestern Greenland and entered the sea now called Kane Basin. The ship became icebound, but the party accomplished much geographical, meteorological, geological, and other scientific research, though none of Franklin's crew was found nor was an open polar sea discovered. Kane and his men suffered from scurvy and other ills and hardships during two winters. In May 1855 they abandoned the *Advance* and began an 83-day journey overland to Upernavik, Greenland. Found by a relief expedition, they returned

to New York City in October 1855. In 1856 Kane published *Arctic Explorations; The Second Grinnell Expedition in Search of Sir John Franklin, in the Years 1853, '54, '55.*

Kane, John, original name JOHN CAIN (b. Aug. 19, 1860, West Calder, Scot.—d. Aug. 10, 1934, Pittsburgh), Scottish-born U.S. artist who painted primitivist scenes of Pittsburgh and memories of Scotland.

John Cain emigrated to the United States (where a banker's misspelling changed his name to Kane) in 1879 after working in a coal mine since childhood. He was a steelworker, gandy dancer (railroad man who stamps gravel between the ties), street paver, house painter, carpenter, and amateur boxer. After losing a leg in a railroad accident, he became a watchman and a boxcar painter. For his own pleasure he would paint landscapes on boxcars at lunchtime, covering them over with regulation flat paint in the afternoon. He wandered away from home after the death of an infant son and began to paint on beaver board landscapes of the Pennsylvania countryside and cityscapes of Pittsburgh.



"Self-Portrait," oil painting by John Kane, 1929; in the Museum of Modern Art, New York City

By courtesy of the Museum of Modern Art, New York City, the Abby Aldrich Rockefeller Fund

His works were discovered in 1927, when one of his pictures was accepted for the Carnegie International Exhibition in Pittsburgh. He won a prize two years later, and museums began seeking his works. His autobiography, *Sky Hooks*, was published posthumously (1938). An intense self-portrait (1929; Museum of Modern Art, New York City) is his best known work.

Kane, Sheikh Hamidou, Sheikh also spelled CHEIKH (b. April 3, 1928, Matam, River Region, Senegal), African writer best known for his autobiographical novel *L'Aventure ambiguë* (1961; *Ambiguous Adventure,* 1963), which won the Grand Prix Littéraire de l'Afrique Noire in 1962.

Kane received a traditional Muslim education as a youth before leaving Senegal for Paris to study law at the Sorbonne. He received degrees in law and philosophy from the École Nationale de la France d' Outre-Mer. Upon his return to his homeland in 1959, he served as commissioner of planning in the government, governor of the region of Thiès, (1960–63) and director of the Cabinet within the Senegalese Ministry of Development and Planning. Subsequently he became director of Dakar Marine Industrial Projects and minister of industrial development. In 1963 he became an official of UNICEF in Lagos, Nigeria, and in 1966 became director of UNICEF in Abidgan, Ivory Coast.

The theme of *L'Aventure ambiguë* involves a young man caught between the traditional Islāmic faith and life pattern of his ancestors and the more soulless and materialistic Western culture, exported to Africa by the French, to which he has become acculturated. What gives the work strength and individuality is the clarity with which Kane poses the conflicting values.

A biographical and critical examination of Kane and his writings appears in *Writing in French from Senegal to Cameroon* (1967) by A.C. Brench.

Kanem-Bornu, African trading empire ruled by the Sef (Sayf) dynasty that controlled the area around Lake Chad from the 9th to the 19th century. Its territory at various times included what is now southern Chad, northern Cameroon, northeastern Nigeria, eastern Niger, and southern Libya.

Kanem-Bornu was probably founded around the mid-9th century, and its first capital was at Njimi, northeast of Lake Chad. Toward the end of the 11th century, the Sef *mai* (king) Umme (later known as Ibn ʿAbd al-Jalīl) became a Muslim, and from that time Kanem-Bornu was an Islāmic state. Because of its location, it served as a point of contact in trade between North Africa, the Nile Valley, and the sub-Sahara region.

In the late 14th century the Bulala people forced the Sef to abandon Kanem, and the capital was moved to Birni Ngazargamu in Bornu, west of Lake Chad. It remained there even after Kanem was retaken in the early 16th century.

Under its able rulers of the 16th century (Muḥammad Dunama, ʿAbd Allāh, and especially Idrīs Alawma, who reigned *c.* 1571–1603), Kanem-Bornu (thereafter sometimes called simply Bornu) was extended and consolidated.

At the beginning of the 19th century, the Fulani of Nigeria disputed Bornu's suzerainty over the Hausa states to the west of Lake Chad and drove *mai* Aḥmad from his capital in *c.* 1808. They were expelled by the intervention of Muḥammad al-Kanamī, a scholar, warrior, and diplomat of Kanem, to whom Aḥmad had been forced to appeal for aid. Obliged also to assist Aḥmad's successor, Dunama, against the raiding Fulani, al-Kanamī assumed implicit control of Bornu but was never able to reestablish its power. The Sef dynasty died out in 1846.

Kaneohe, town, Honolulu County, northeastern Oahu Island, Hawaii, U.S. Spreading from the foothills of the Koolau Range to Kaneohe Bay, it is primarily residential and is the seat of Hawaii Loa College (1963) and Windward Community College (1972). Like neighbouring Kailua to the east, the Kaneohe (meaning "bamboo husband") area was once the residence of the island's early kings. Local attractions include Waikalua, legendary home of a Tahitian prince who introduced the hula to the Hawaiians. Pop. (1980) 29,919.

Kaneohe Bay, on the northeastern shore of Oahu Island, Hawaii, U.S., a major tourist destination with clear, shallow waters and vivid underwater coral formations that can be seen from glass-bottom boats. Extending between Kaneohe Beach Park (south) and Kualoa Point (north), its 20-mi (32-km) shoreline is rimmed with ancient royal fishponds. The Hawaii Institute of Marine Biology of the University of Hawaii is on Moku O Loe (also called Coconut Island) in the bay. Moku Manu ("bird island"), 1 mi north of Mokapu Point, is a twin-isle refuge for terns and man-o'-war birds that lead fishermen to schools of ocean fish. Mokapu Peninsula, jutting into the bay to form an eastern shore, is the site of a U.S. Marine Corps air station.

K'ang (Chinese general): *see* An Lu-shan.

K'ang-hsi, Pinyin KANGXI (reign name), personal name (Wade–Giles romanization) HSÜAN-YEH, temple name (CH'ING) SHENG TSU, posthumous name, or *shih,* JEN TI (b. May 4, 1654, Peking—d. Dec. 20, 1722, Peking), second emperor of the Ch'ing dynasty (reigning 1661–1722). To the Chinese empire he added parts of Russia and Outer Mongolia and extended control over Tibet. He opened four ports to foreign trade and encouraged the introduction of Western education and arts and of Roman Catholicism.

Early life. The third son of the Shun-chih emperor, Hsüan-yeh was born to Empress Hsiao-k'ang, daughter of Tulai, a famous Manchu general from the prestigious T'ung clan. (The Manchus were a people of Tungusic stock living in Manchuria who conquered China and established the Ch'ing dynasty in 1644.) Upon Shunchih's sudden death from smallpox at age 23, in February 1661, Hsüan-yeh was immediately raised to the Imperial throne over his five brothers, who had been born to mothers lower in birth than his; his chosen reign name, K'ang-hsi (Manchu: Elhe Taifin), meant Peaceful Harmony.

Because the new emperor was not yet quite seven years old, his government was first administered by Sonin, Suksaha, Ebilun, and Oboi—four conservative Manchu courtiers from the preceding reign. One of the first political acts of the four Imperial advisers was to replace the so-called Thirteen Offices (Shih san ya men) with a Neiwu-fu (Dorgi Yamun), or Office of Household. The Thirteen Offices, all organized solely by Chinese eunuchs, had been the abomination of the Manchus ever since they were introduced by the late emperor, to handle affairs of the Imperial household, patterned after an elaborate model that had existed under the preceding dynasty—the Chinese Ming. Now the private sector of the Emperor's life would be run by his personal Manchu bond servants who staffed the newly created Office of Household. Thus, the Manchu Ch'ing successfully prevented court eunuchs from meddling with politics, in sharp contrast to many other dynasties, the Ming in particular, that had recurrently let eunuchs



K'ang-hsi, detail of a painting on silk, 19th century; in the Metropolitan Museum of Art, New York City

By courtesy of the Metropolitan Museum of Art, New York City, Rogers Fund, 1942

gain access to actual power, often with disastrous results.

In 1667, advised by Sonin and other ministers, K'ang-hsi began attending to affairs of state at the age of 13, as his father had before him. He ruled only in name, however; the real power was still firmly in the hands of the four advisers. Sonin soon died, and Oboi became a virtual dictator, putting Suksaha to death for an alleged crime and cowing Ebilun into submission. Finally, in 1669, Oboi and Ebilun were eliminated by K'ang-hsi, who must have enlisted the help of his grandmother, the Grand Empress Dowager, and of Hsiung Tz'u-li, his Chinese tutor. The actual arrest of Oboi was made in the audience room by young wrestlers, who jumped upon the powerful minister from their hiding place behind the throne. With this coup the 15-year-old emperor proved to the public that he was their real master.

Acquisition of actual power. Once in power, K'ang-hsi was confronted by the grave problem of what to do with three vassal kings in South China. The three kings—Wu San-kuei of Yunnan, Shang K'o-hsi of Kwangtung, and Keng Chi-mao (after his death succeeded by his son Keng Ching-chung) of Fukien—were among the Chinese warlords who, with their powerful firearms, had been welcomed into the Manchu camp even before the Manchu conquest of China in 1644. When Shun-chih had entered Peking in that year, the rest of China was still in the hands of the remaining Ming forces or of roving bands of robbers. Having made a major contribution toward subduing them, the three warlords had been created kings and had stayed in South China with their private armies. It was inevitable that the three vassal kings, with their virtual immunity, should become a menace to the Peking government.

A chance to improve the situation came in 1673, when Shang K'o-hsi offered to give up the command of his army and retire to Manchuria, his birthplace. The offer was so promptly accepted by K'ang-hsi that the other two kings were forced to make the same offer, if only for courtesy's sake. Now the chief issue at the Imperial council in Peking became whether or not to challenge the formidable military strength of Wu San-kuei, the very person responsible for the 1644 Manchu takeover of the capital. The young emperor again showed his resoluteness by deciding in favour of trying to deprive Wu of his army, arguing that the three kings were sure to eventually rebel against Peking and that it would be better to forestall them by taking advantage of this opportunity. A shocked Wu immediately went to war against the Manchus, starting the so-called Revolt of the Three Feudatories. Initial reverses suffered by the Imperial forces prompted Burni of the Chahar Mongols—the supreme royal tribe until the Manchu conquest of Inner Mongolia in 1635—to revolt also against the Ch'ing and sent ripples of political unease among other East Asian countries. K'ang-hsi's youthful energy and genius in military strategy finally triumphed over the senility of Wu San-kuei, who never even attempted to march on Peking but died soon after styling himself emperor. The Ch'ing army entered the city of Kunming, in Yunnan, in 1681; the war was over, and the dynasty was saved.

After eliminating the three kings, K'ang-hsi turned his attention to the Cheng regime on Taiwan. Originally from Fukien, the Cheng family had been for generations a sea power that monopolized trade across the vast expanse of the China seas. Gen. Cheng Ch'eng-kung (known to Westerners as the Koxinga), who refused to submit to the Manchus, had moved his headquarters to Taiwan, which he took from the Dutch in 1662, and his descendants had continued resistance to the Ch'ing from there. Lack of naval power prevented the Ch'ing from mounting an effective attack on Taiwan. Their only strategy, adopted in 1661, though to little avail, was the forced relocation of the inhabitants of coastal areas deeper into the continent, so that the Cheng might be isolated. In 1683 an internal strife in the Cheng family gave K'ang-hsi a chance to order his troops across the Taiwan Straits. The Cheng surrendered, and Taiwan was incorporated into the province of Fukien.

With China securely under his power, K'ang-hsi next turned to face his enemies in the north. The Russians in Siberia, who had reached the Amur Valley in the mid-17th century, had been expelled from their fortresses of Albazin and Nerchinsk by the Ch'ing army before K'ang-hsi's reign. But the Russians restored the two fortresses and were building many more in that region, and K'ang-hsi prepared to deal them a blow. In 1685 Ch'ing forces attacked Albazin and captured it in a few days. As soon as they withdrew, however, the Russians manned the fortress again. K'ang-hsi ordered another expedition to Albazin the following year and began a protracted siege. Concurrent diplomatic negotiations between K'ang-hsi and Tsar Peter the Great of Russia led to the signing of the Treaty of Nerchinsk (1689). Drafted under the pressure of a superior number of Ch'ing troops sent into Nerchinsk by K'ang-hsi, the treaty drew the Sino-Russian borderline along the Gorbitsa, an outer tributary of the Amur, and the Stanovoy Range, thereby leaving the Amur Valley and Manchuria, homeland of the dynasty, in the hands of the Ch'ing. Next K'ang-hsi brought Outer Mongolia under his power. Dga'-ldan Boshogtu Khan of the Dzungar Oyrats, a nomadic people who lived to the west of Outer Mongolia and to the north of the T'ien Shan, was an ambitious ruler who had conquered east Turkistan and then invaded the territories of the Outer Mongolian Khalkhas. The Khalkha Mongols fled in great numbers to Inner Mongolia, seeking protection under the Ch'ing. In 1691 K'ang-hsi met with representatives of the Khalkha tribes at Doloon Nuur (later called To-lun Hsein) in Inner Mongolia, where he received their formal pledge of allegiance. In 1696 he embarked on a daring and extremely dangerous venture—a military expedition to Outer Mongolia across the scorched Gobi. In personal command of the middle corps, K'ang-hsi managed to overcome hunger and thirst in the hostile terrain and annihilated the Dzungars at Dzuunmod, east of the present-day Ulaanbaatar. Dga'-ldan committed suicide the following year at his hideout in the Altai Mountains. With the return of the Khalkhas to their homeland, Outer Mongolia became an intergral part of the Ch'ing empire.

Two decades of peace between the Ch'ing and the Dzungars ensued, until the latter invaded Tibet and took Lhasa in 1717. Mindful of the spiritual sway of Tibet's Dalai Lama over the Mongols, K'ang-hsi sent his army into Tibet and expelled the Dzungars from Lhasa in 1720 and thus incorporated the country into his empire. Hoping to check the Dzungar power, K'ang-hsi sent, in 1712, an embassy to the Torguts, or Volga Kalmyks, who had migrated to southern Russia in the earlier half of the 17th century. When the Manchu envoys, who travelled the length of Siberia back and forth by its myriad waterways, returned to Peking three years later, one of them, Tulishen, wrote a detailed account of the journey under the title of *I yü lu* (*Record of Strange Regions*).

Administration of the empire. K'ang-hsi was an accomplished military leader who was endowed with exceptional physical strength and with skill in archery; he poured his inexhaustible energy into his daily administrative duties. Under the traditional Imperial system of China, nothing in the empire was too small to come under the personal scrutiny of the Emperor. K'ang-hsi read all the reports and memorandums presented to him, meticulously correcting even the smallest scribal errors, and he often boasted that he routinely took care of all the documents, even in wartime, when 300–400 arrived daily.

The Huang Ho was one of the subjects that commanded K'ang-hsi's attention. Long neglected, the river repeatedly flooded the land near where it joined the Huai Ho, causing great damage to northern Kiangsu. In 1677 K'ang-hsi appointed Chin Fu superintendent of riparian works; in 1683 Chin finished embanking and dredging to stabilize the flow of the river. At the same time, the Grand Canal, the important arterial waterway that connected the Huang Ho with the lower Yangtze River, was repaired to allow the smooth flow of large quantities of rice needed in the north from the rich granaries of the south. To inspect the results of the works and to acquaint himself with cultural and economic leaders of the wealthy south, K'ang-hsi travelled to the lower reaches of the Yangtze six times between 1684 and 1707, financing each journey with his own private funds. In his private life, K'ang-hsi was frugal in court expenditures, waited upon only by a small number of court ladies and eunuchs. He never raised taxes, even in wartime; in fact, taxes were reduced or exempted many times during his reign; in three years starting in 1711, all provinces received a tax relief that totalled more than 30,000,000 taels. In 1711 K'ang-hsi declared that from then on the number of taxpaying adults should be perpetually fixed at the present level for head-tax purposes, permanently exempting the balance of future population growth from taxation.

After the conquest of Taiwan, K'ang-hsi lifted restrictions on coastal trade and opened four ports, including Canton, to foreign ships. Foreigners brought silver to China to purchase such Chinese products as tea, silk, and chinawares. Such activities and internal peace stimulated a tremendous industrial growth, particularly in the lower reaches of the Yangtze.

K'ang-hsi was very fond of learning. His avidity for study steadily increased with his age, to a degree that even when ill from overwork he did not stop reading books. In 1677 he opened a small study hall called the Nan shufang in the Forbidden City, where he engaged himself in lively discussions on philosophical and historical topics with the leading scholars of his time. His inclination toward the scholar Chu Hsi's philosophy and arduous emulation of its Confucianist ideals were a most effective means for the Manchu Ch'ing to gain the confidence of the Chinese majority.

Besides the traditional civil service examinations for recruiting Chinese officials educated in Confucian disciplines, K'ang-hsi opened in 1678 a special channel through which persons with exceptional talents in learning and writing were admitted into his service on recommendation. The 50 men who thus won appointments at the Hanlin Academy, the famous scholar Chu I-tsun among them, worked on compilation of the *Ming-shih,* an official history of the Ming dynasty. Other great books commissioned by K'ang-hsi included the dictionary of Chinese characters, *K'ang-hsi tzu-tien,* listing about 42,000 characters (1716); the rhyming dictionary of Chinese compounds, *P'ei wen yün-fu* (1711); and the encyclopaedia of subject matter, *Yüan-chien lei-han* (1710). Another great encyclopaedia, the *Ku-chin t'u-shu chi-ch'eng,* which was to consist of 10,000 chapters, was also started in K'ang-hsi's reign.

In the field of popular education, K'ang-hsi issued, in 1669, an Imperial precept consisting of 16 articles, a revision and expansion from the six articles issued by Shun-chih, in which

he detailed practicalities of village life. The precept, expanded further by his son and successor, Yung-cheng, offered moral guidelines to the Chinese peasantry for almost two and a half centuries.

Always eager to absorb new knowledge and technologies from Europe, K'ang-hsi employed many Jesuit missionaries. He learned geometry from Ferdinand Verbiest, who became deputy director of the Imperial Observatory and compiled the official calendar of the empire. Verbiest was also responsible for the production of cannons that proved effective against the three rebellious kings and the Dzungars. Jean-François Gerbillon and Joachim Bouvet taught K'ang-hsi mathematics. K'ang-hsi ordered Pierre Jartoux, Jean-Baptiste Régis, and others to compile an accurate atlas of the empire; after long and laborious trigonometric surveys that covered every corner of the empire, starting in 1708, the atlas *Huang yü ch'üan lan t'u* was completed in 1717. The famous *Nouvel Atlas de la Chine, de la Tartarie chinoise et du Thibet* of Jean-Baptiste Bourguignon d'Anville is a French version of this original. European painting also fascinated K'ang-hsi. Gio Ghirardini, an Italian layman brought by Bouvet, and Giuseppe Castiglione were the Emperor's favourite court artists, who influenced Chinese painting with their European-style perspective drawing and other activities.

These cultural contributions by the Jesuits endeared Catholicism to K'ang-hsi, who gave official permission for its propagation in 1692 and later gave French missionaries a residence within the Imperial City and built a church for them in Peking in gratitude for curing him of malaria. His sympathy attracted to China more missionaries from such orders as the Dominicans, the Franciscans, and the Augustinians. In contrast to the Jesuits, who were lenient with such traditional Chinese rites as ancestor worship and the state cult of Confucius and Heaven, these newcomers condemned the traditions as superstitions incompatible with Christian faith. The Rites Controversy raged on until 1704, when Pope Clement XI issued a decree forbidding Chinese Catholics to take part in such rites. Angered by this interference in what he considered his exclusive domain, K'ang-hsi ordered the Portuguese to arrest Carlo Tommaso Maillard de Tournon, an apostolic legate to China carrying the papal decree, and in 1706 he expelled missionaries who would not adhere to the Jesuit line. In 1720 Carlo Ambrogio Mezzabarba, another legate, was ordered back home by the Emperor.

K'ang-hsi had three empresses—one a granddaughter of Sonin of the Hesheri clan, another a daughter of Ebilun of the Niohuru clan, and the third a granddaughter of Tulai of the T'ung clan—in addition to many concubines; they bore him 35 sons in all. He nominated the second son, Yin-jeng, crown prince in 1675, at the age of little more than a year and a half; this was against the Manchu tradition of giving all sons equal rights of succession, and it resulted in vicious fights among K'ang-hsi's sons. The hapless Yin-jeng was deposed in 1708, restored in 1709, and again deposed in 1712, this time permanently. Terribly hurt by the experience, K'ang-hsi and his successors never again tried to nominate a crown prince.

At the Chinese New Year of 1722, K'ang-hsi celebrated his long and prosperous reign by inviting many elders to a great banquet at the court. That winter he fell ill while staying at the Imperial villa of Ch'ang ch'un yüan, in the northwestern outskirts of Peking, and he died in December. The next year he was buried at Ma lan yü, to the northeast of Peking, in a mausoleum called the Ching ling. His throne was taken over by his fourth son, Yinchen (Yung-cheng). (N.Ka.)

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Kang Sheng, Wade–Giles romanization K'ANG SHENG, original name CHAO JUNG (b. 1899, Chu-ch'eng, Shantung Province, China—d. Dec. 16, 1975, Peking), Chinese Communist official, considered to be one of the three or four most powerful men in the government during the Cultural Revolution (1966–76).

Most Chinese Communist leaders belonged to the peasantry, but Kang was born into a large landholding family. After completing a Western education in Shanghai, he joined the Chinese Communist Party in the early 1920s. As a labour organizer there, he led workers in several uprisings. Later he became director of the party's intelligence bureau. In 1930 he went to the Soviet Union, where, except for a brief interval, he remained for seven years as an active participant in the Comintern, the Russian Communist Party's international organization. In 1937 he went to Yen-an, Shensi Province, where he took charge of the Chinese Communist Party's internal security operations; in 1945 he became a member of the party's governing body, the Central Committee, and the committee's governing body, the Politburo.

After the establishment of the People's Republic of China in 1949, Kang occupied various party and governmental positions, several times accompanying Premier Zhou Enlai on diplomatic missions abroad. With the reorganization of the central administration in 1954, his importance declined, and in 1956 he was made an alternate rather than a full member of the Politburo, although he continued to be linked with the government's intelligence and security operations. With the beginning of the Cultural Revolution in 1965, however, he was reelected to the Politburo, becoming a member of its powerful five-man Standing Committee. In 1970 his name was listed just below that of Zhou Enlai in official party pronouncements, and in 1973 he was made third vice chairman of the party.

Kang-ti-ssu Shan (mountain range, China): *see* Kailas Range.

K'ang-ting, formerly (until 1913) TA-CHIEN-LU, Pinyin KANGDING, or DAJIANLU, Tibetan DARRTSE-MDO, town in western Szechwan Province (*sheng*), China. It is both a county (*hsien*) seat and the administrative centre of Kan-tzu-tsang-tsu (Kan-tzu Tibetan) Autonomous Prefecture (*tzu-chih-chou*). K'ang-ting is on the T'o Chiang (river), a tributary of the Ta-tu Ho (river), 62 mi (100 km) west of Ya-an on the main route from Szechwan into the Tibetan Autonomous Region. At an altitude of 8,400 ft (2,560 m), it is situated in a wild mountainous region with a mixed Chinese and Tibetan population.

Until the Sung period (960–1279) the area was beyond Chinese control. In the 10th century a Chinese commissioner was stationed there, although the autonomy of the local Tibetan population was recognized. At that time the town was primarily a market in which Chinese merchants traded with Tibetan merchants in tea and cloth. In 1908 the site was accorded regular administrative status under the name of K'ang-ting Fu; it became a county in 1912. When Hsi-k'ang Province was established after 1928, K'ang-ting became the provincial capital and remained so until 1950, when the provincial seat was moved to Ya-an. Hsi-k'ang Province was abolished in 1955.

Since 1949 K'ang-ting has established a hydroelectric plant and has developed some handicraft industries. It also has a wool-dressing plant, hand loomed textile production, and tea processing. The town also remains a centre for Chinese relations with the Tibetans of the western Szechwan highlands. Pop. (mid-1970s est.) 10,000–50,000.

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K'ang Yu-wei, Pinyin KANG YOUWEI (b. March 19, 1858, Kwangtung Province, China—d. March 31, 1927, Tsingtao, Shantung Province), Chinese scholar, a leader of the Reform Movement of 1898 and a key figure in the intellectual development of modern China. During the last years of the empire and the early years of the republic he sought to promote Confucianism as an antidote against "moral degeneration" and indiscriminate westernization.



K'ang Yu-wei, 1905

By courtesy of the Library of Congress, Washington, D.C.

K'ang Yu-wei came from a scholarly gentry family in the district of Nan-hai in Kwangtung Province. His teacher imbued him with the Confucian ideal of service to society, and his study of Buddhism impressed him with its spirit of compassion. He rebelled against convention, Neo-Confucian authoritarianism, and the demands of the civil service examination system. After reading about the outside world, he came to admire Western civilization. In the 1880s he began to conceive some of his basic ideas: ideas of historical progress, social equality, a world government, and the nature of the universe.

K'ang's first venture in social reform was in 1883, when he tried to abolish in his village the custom of foot-binding imposed on women. The decay of the Ch'ing Empire (1644–1911/12) prompted K'ang and other concerned Chinese to urge fundamental institutional reforms. After his plans for the salvation of China—submitted in 1888 to the Ch'ing court—were ignored, K'ang set out to convert the educated class to his views and to arouse the people from their lethargy. In 1890 he opened a school in Canton to teach new learning. Assisted by his students, among whom was Liang Ch'i-ch'ao, who collaborated in his reform movement, he wrote *The Forged Classics* (1891), which reveals that the Confucian classics held sacrosanct as bases of the state cult had been tampered with in the Han period (206 BC–AD 220). This book was followed by *Confucius as*

a Reformer (1897), which expounded K'ang's belief that Confucius was concerned with contemporary problems and stood for change and that the progress of mankind was inevitable. His interpretation of Confucian teachings and researches on ancient texts later inspired modern scholarship in the reappraisal of China's past, although critics have charged that he invoked Confucius to further his aims and was undermining the established way of life.

When China was defeated by Japan in 1895, K'ang mobilized hundreds of provincial graduates then in Peking to protest against the humiliating peace terms and to petition for far-reaching reforms to strengthen the empire. To arouse the people to the dangers confronting China, he and his associates published newspapers and founded the Society for the Study of National Strengthening, the archetype of political parties in modern China. The society was suppressed in 1896.

In 1898, when foreign powers threatened to partition China, K'ang and his followers suggested an alliance with Britain and Japan to check Russia's advance and insisted that only institutional reforms could save China. He urged the clearing of channels for the expression of public opinion, the convocation of assemblies, and even the acceptance of popular sovereignty and the separation of state powers, and he organized the Society to Preserve the Nation to marshal support. Finally, he prevailed upon the emperor Kuang-hsü to launch the reform program. Among the many measures that were promulgated were the streamlining of the government, strengthening of the armed forces, new standards in the civil service examination system, the development of commerce and industry, the promotion of local self-government, and the opening of Peking University and modern schools.

The reform measures were annulled, however, when the dowager empress Tz'u-hsi (1835–1908) reasserted control. The Emperor was placed in confinement, six of the reform leaders, including K'ang's brother, were executed, and scores were arrested. K'ang and Liang Ch'i-ch'ao escaped to Japan. Unable to persuade the Japanese and British governments to intervene for the Emperor, K'ang went to Canada and founded the China Reform Association (popularly known as the Save the Emperor Association and in 1907 renamed the Constitutional Party) to carry on his plans.

After the failure of the revolts instigated by the reformers in 1900 in Anhwei and Hupeh provinces to restore the Emperor, K'ang resumed his writing in exile. His most significant work completed at this time was *The Great Commonwealth,* in which he envisaged a utopian world attainable through successive stages of human development, a world where the barriers of race, religion, state, class, sex, and family would be removed and where there would be an egalitarian, communal society under a universal government.

K'ang emerged from his retreat in 1903. To help the overseas Chinese and to unite them in a common effort, he and his colleagues founded an international business firm and established schools and newspapers. These activities, conducted in the United States, Mexico, Japan, and Southeast Asia, brought them into sharp competition with the Chinese revolutionists.

During his exile, K'ang travelled extensively. His stay in Europe and his study of Western history moved him to shun the violence and destructiveness of revolution as means of political change, and he proposed as an alternative course the promotion of science, technology, and industry to rebuild China.

After his return in 1914 to a weak and troubled China, he was soon involved in the campaign to thwart the monarchical scheme of the Chinese statesman Yüan Shih k'ai (1859–1916). In 1917, in line with his idea of a constitutional monarchy to bridge the transition to a truly democratic republic, he participated in the abortive restoration of the Ch'ing ruler. In the years that followed, animated by the fear of a divided country, he opposed the South China government of the revolutionary leader Sun Yat-sen (1866–1925). He called for the preservation of the best of China's heritage and the establishment of a reformed Confucian Church to provide the people with spiritual guidance. Partisan writers have criticized him for holding to these views. In his later years, he renewed his philosophic reflections, completing his last book, *The Heavens,* in which he blends astronomy with his own metaphysical musing, a year before his death at Tsingtao in 1927.

Besides prolific writings on the Chinese classics, politics, and economics, K'ang also left travel accounts and an anthology of his poems; he was also a famous calligrapher.

(J.-p.L.)

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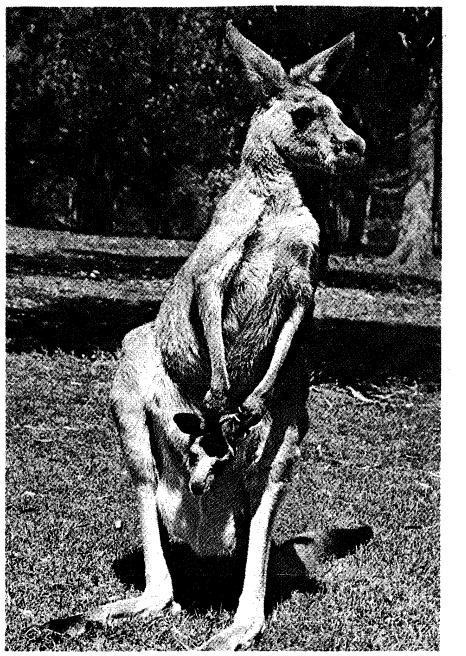
Kangar, town and capital of Perlis state, extreme northwest West Malaysia (Malaya), 5 mi (8 km) east of the Thailand border, on the Sungai (River) Perlis. The largest town in Perlis state, Kangar is the head of navigation for small craft on the Sungai Perlis; industries include cement, saw milling, rubber, paper, and processing of sugar and prawns. The town is a gathering centre for the paddy rice production of the surrounding district. Its municipal government is unified with that of the neighbouring communities of Arau and Kaki Bukit. Pop. (1980) 12,949.

Kangarid DYNASTY: *see* Mosāferīd dynasty.

kangaroo, any of about 47 species of Australasian marsupial mammals comprising the family Macropodidae; kangaroo also is the particular name of all the larger species and some of the smallest, which are described in this article. (For other small forms, *see* rat kangaroo; for those of medium size, *see* wallaby; for wallaroo, *see below.*)

The total length of the various species ranges from 23 centimetres (9 inches) to more than 2.5 metres (8 feet). They typically have long, thin, powerful hind legs for jumping and long tails, thickened at the base, for balancing. The fourth toe of the hind foot is somewhat longer than the fifth and bears the longest claw; the second and third toes are united and merely vestigial; and in all but one species the innermost hind toe is lacking. The short forelimbs are used almost like human arms, but all digits of the "hand" are sharp clawed, and the thumb is not opposable. The head is relatively small; the ears are large and rounded; and the mouth is small, with prominent lips. The pelage is soft and woolly; in many species it is grizzled, and stripes may be present on the head, back, or upper limbs.

Kangaroos usually have one young annually. Most species breed immediately after parturition; in these the implantation of the embryo may be delayed for months. The young kangaroo (joey) is only partially developed at birth but climbs unassisted into the mother's pouch, which is directed forward, and attaches itself to one of the four teats (two usually functional). It remains in the pouch for months and thereafter stays with the mother for a time, taking milk.



Gray kangaroo (*Macropus canguru*)
Warren Garst—Tom Stack and Associates

Kangaroos are found in Australia, Tasmania, New Guinea, and islands east to the Bismarcks; one species has been introduced into New Zealand. Most are terrestrial and all are herbivorous: natively, they occupy the place held elsewhere by grazing and browsing animals. Their enemies are large birds of prey, goannas (large lizards), pythons, dingoes, and humans, who kill kangaroos for meat, for their hides (used in shoes), and because they compete for forage with livestock.

The largest macropodids are the gray kangaroo, or forester, *Macropus canguru* (sometimes called *M. giganteus* or *M. major*); the wallaroo, or euro, *M.* (sometimes *Osphranter*) *robustus;* and the red kangaroo, or red flyer, *Megaleia rufa* (sometimes *Macropus rufus*). The gray, of eastern and southwestern Australia and Tasmania, is found mostly in open forests; it is long-haired and silvery gray in eastern coastal regions but short-haired and dark gray inland. A male may stand more than 2 m tall—record total length is nearly 3 m—and weigh more than 65 kilograms (about 145 pounds). A kangaroo continues to grow throughout life. A gray can clear more than 9 m at a bound—13.5 m has been recorded—and attain a speed of nearly 50 kilometres per hour (more than 30 mph). About the same measurements apply to the red kangaroo, which is found throughout Australia's interior grasslands; in eastern regions the female is blue-gray (blue flyer). The wallaroo, a smaller and stockier animal, may be dark gray to pinkish brown; it lives in rocky country throughout Australia except Victoria.

These large kangaroos travel in groups (mobs) under the leadership of the largest male ("old man," or "boomer"), which dominates younger rivals by biting, kicking, and boxing. In the female gray kangaroo the gestation period is variable—29 to 38 days—and the young remains in the pouch for about 10 months, then suckles for an additional 6 months. The red kangaroo gestates for about 33 days; its newborn is about 2 cm long and weighs about 1/30,000th of the mother's weight.

Tree kangaroos are the three species of the genus *Dendrolagus* of New Guinea; two of

them occur also in Queensland rain forests. About 95 to 175 cm (37 to 69 inches) long, they are short-eared, short-legged, and long-tailed, with complex markings. They spend the day in trees; at night they descend to feed on herbs and grubs.

Kangaroo Island, third largest Australian offshore island, located at the entrance to the Gulf St. Vincent, South Australia, 80 miles (130 km) southwest of Adelaide. It measures 1,680 square miles (4,351 square km). Its formation is that of a low, cliffed plateau (structurally a continuation of the Mount Lofty–Flinders ranges on the mainland) measuring 90 by 34 miles (145 by 55 km) and rising to 1,000 feet (300 m). Visited in 1802 by the English explorer Matthew Flinders, the island (named for its abundance of kangaroos) was often visited by whalers and sealers. Nepean Bay, its best harbour, was the site of the state's first (temporary) settlement in 1836.

Research (in connection with a post-World War II settlement program) on the scrubland in the western sector proved that, with proper care, the poor soils could yield crops of oats and barley and supply pasturage for cattle and sheep. There are air and sea links to the mainland from Kingscote, the island's principal settlement. Tourism, based on ocean fishing and Flinders Chase National Park at the island's western end, furnishes an ancillary source of income. A sanctuary and breeding ground for the Australian fur seal is located on the southern coast of Seal Bay. There are significant deposits of gypsum. Pop. (1986) 3,923.

kangaroo rat (genus *Dipodomys*), any of about 25 species of hopping rodents, belonging to the family Heteromyidae (order Rodentia), found in dry and desert regions of North America. Kangaroo rats have large heads and eyes, short forelimbs, and long hind limbs.



Kangaroo rat (*Dipodomys*)
Anthony Mercieca from Root Resources—EB Inc.

Like the related pocket mice, they have fur-lined, external cheek pouches that open alongside the mouth. Kangaroo rats are 10 to 16 cm (4 to 6.5 inches) long without the long tail. They are pale buff to brown above and white below, and they usually have a white stripe on each hip. The tail, ending in most species in a furry tuft, acts as a balancing organ as these animals leap about on their hind legs.

Kangaroo rats live in burrows, foraging by night for seeds, leaves, and other vegetation. They collect food, carrying it in their cheek pouches and storing it in their burrows. They obtain moisture from their food and thus seldom drink water. Females bear one or more yearly litters of two to five young; gestation is about a month. The Moro Bay kangaroo rat, found only in California, is endangered, and the Texas kangaroo rat, of Texas and Oklahoma, has become rare.

The small, desert-dwelling kangaroo mice (genus *Microdipodops*) are silky-haired, buff to blackish rodents up to 7.5 cm (3 inches) long, excluding the long tail. They are found in the western United States and are similar in habit to the larger kangaroo rats.

Kāngchenjunga (mountain, Nepal–India): *see* Kānchenjunga.

Kangding (China): *see* K'ang-ting.

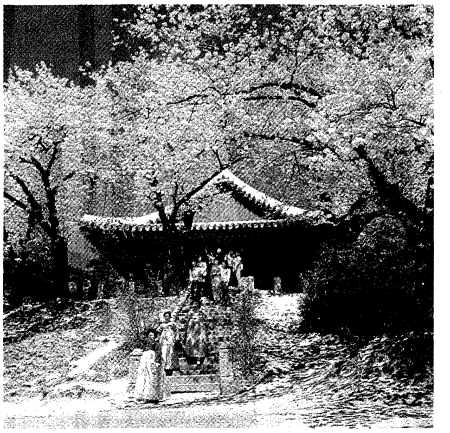
Kangean Islands, Indonesian KEPULAUAN KANGEAN, island group in the Java Sea, Jawa Timur *provinsi* ("province"), Indonesia. The Kangeans lie northwest of the Lesser Sunda Islands (Nusa Tenggara), some 75 miles (121 km) north of Bali, and consist of three main islands surrounded by about 60 islets covering a land area of 258 square miles (668 square km). The largest of the three main islands is Kangean, with an area of 188 square miles (487 square km), an east–west length of 25 miles (40 km), and a north–south width of 12 miles (19 km). Paliat Island is 9 miles (14 km) long and 3 miles (5 km) wide, and Sepanjang Island is 10 miles (16 km) long and 5 miles (8 km) wide; both lie to the southeast of Kangean. Among other islands in the group are Seridi Besar, Seridi Kecil, Sesiil, Setabo, Sapankur, and Memburit.

Kangean is generally low in elevation; hills on the northeast rise to about 1,192 feet (364 m). The hills are covered with teak, and there are coconut plantations along the coast. The climate is hot and humid, with generally cloudy skies and heavy rainfall. There is little agriculture, but cattle are raised, and copra, fish, salt, and timber are exported. Trade is mainly with Bali, across the Bali Sea. The chief towns are Arjasa and Pabean, both situated on Kangean Island.

Kanggye, city, northern North Korea. As a transportation junction of the inland plateau near the frontier, it has been a fortress and military base since the Yi dynasty (1392–1910). It is connected with P'yŏngyang by rail line and road. Industries include timber processing and ceramics. Manufacturing has been carried on since 1945, when a hydroelectric-power plant at the Tongno River, a tributary of the Yalu (Amnok) River, was built near the city. Mining industries in the vicinity include copper, zinc, coal, and graphite. The city has a college of education. Pop. (latest est.) 30,013.

Kanghwa Island, Korean KANGHWA-DO, island, Kyŏnggi *do* (province), northwestern South Korea. It lies in the Yellow Sea just off the northwestern coast, northwest of Inch'ŏn. Roughly rectangular in shape, it lies at the mouth of the Han River and has an area of 163 square miles (422 square km). The land is hilly but fertile and produces rice and other crops; the island is one of the country's leading areas for ginseng cultivation. The principal towns are Kanghwa, in the northeast, and Tongmak, in the south. The island was seized by the French in 1866 and by the Americans in 1871. Pop. (1985) 83,037.

Kangnŭng, city, Kangwŏn *do* (province), northeastern South Korea. A coastal city on the Sea of Japan (East Sea), it has been the administrative and economic centre for the eastern areas of the T'aebaek Mountains from ancient times. The city's many historical remains include Ojukhyŏn, an old shrine. It has a good bathing beach, and Kyŏngpodae, a scenic site 4 miles (6 km) north of the city, attracts tourists. Industry in the city has not developed except for some silk weaving. Pop. (1985) 132,897.



Temple in Kyŏngpodae near Kangnŭng, South Korea
Kim—Bavaria-Verlag

Kango, town, northwestern Gabon. The town is situated about 110 miles (180 km) east of Libreville and lies on the Como River at the head of the Gabon Estuary. Kango is the site of one of Africa's largest cellulose and paper-pulp factories, which was constructed in the 1970s by the Société Gabonaise de Cellulose (Sogacel) to process products of the surrounding forest. The factory draws its electric power from the Kinguélé dam on the Mbei River, which is a tributary of the Como River. The main Libreville-Lambaréné highway passes through Kango, where it crosses the Como by a large, modern bridge. Pop. (1985 est.) 26,600.

Kāngra, formerly NAGARKOT, city, western Himāchal Pradesh state, northwestern India. The city lies on a rail line just south-southwest of Dharmsāla, at an elevation of 2,409 feet (734 m). Kāngra is an agricultural-trade centre with a thriving handicrafts industry. Kāngra was known as Nagarkot in ancient and medieval times, when it was a fortress stronghold of the Rājput rajas. Maḥmūd of Ghazna, the Turkish conqueror, sacked the town in 1009, as did Emperor Fīrūz Shāh Tughluq in 1360. It was later held by the Mughals. In the 18th and 19th centuries Kāngra became the centre of a notable school of Rājput miniature painting. An earthquake leveled the town in 1905; the temple of Devī, one of the oldest in northern India, was destroyed but has been rebuilt.

Kāngra is situated in an area at the southern edge of the Himalayan foothills. The region is drained largely by the Beās River. Wheat, corn (maize), rice, tea, and other crops are grown, and the adjacent forests provide wood. The handloom weaving of blankets and shawls is the principal industry. Pop. (1981) city, 7,093.

Kangri (Turkey): *see* Çankırı.

KaNgwane, formerly SWAZI, nonindependent black state (created 1977), eastern Transvaal, South Africa. The state was created for those Swazi people not residing in Swaziland. KaNgwane is one of the smallest black states and occupies 1,476 square miles (3,823 square km) of mostly highveld land. It comprises two separate land units. KaNgwane's main body forms a narrow strip along the western and northern border of Swaziland; and a smaller exclave is situated immediately to the north. The capital is Louieville. KaNgwane (and the independent nation of Swaziland) are the traditional homeland of the Swazi, who were organized into a kingdom in the early 1800s. In 1895, what is now KaNgwane was taken over by the Boer South African Republic (later the Crown Colony of the Transvaal).

The most important economic activities in KaNgwane include cattle herding; the cultivation of corn (maize), vegetables, subtropical fruits, sugar, and sisal; and forestry. There is potential for the mining of gold, barite, iron ore, antimony, nickel, and coal. Little industry (except for some production of roof trusses and bricks) is present, and KaNgwane has lagged behind the other South African black states in planning for economic development. All of South Africa's Swazi people are legally citizens of KaNgwane, although in 1970 only about one-sixth of them were residents of the state. The South African government's attempts to cede KaNgwane to Swaziland were blocked by KaNgwane courts in 1982. Pop. (1985) 392,782.

Kangwŏn-do, English KANGWŎN PROVINCE, province, southeastern North Korea, facing the Sea of Japan (East Sea). The province consists of the small northern part of the former Kangwŏn Province, which was divided by the 38th parallel in 1945 and, after the armistice following the Korean War (1953), by the truce line. In 1945 Wŏnsan city and two counties from Hamgyŏng-namdo (South Hamgyŏng Province) were included as part of Kangwŏn-do. Most of the province's area of 4,100 sq mi (10,600 sq km) is in the northern end of the T'aebaek-sanmaek (mountains), where Kŭmgang-san (mountain; 5,374 ft [1,638 m]) has been known since antiquity as one of the most picturesque places in the Far East. It has fantastic rocks and peaks (12,000 have been counted), precipices and stone pillars formed by erosion, deep ponds and waterfalls, a variety of thick broadleaf and needle-leaf trees, and more than 100 old temples, including the Changan-sa, Maha-yon, and Sin'gye-sa temples. Agriculture has developed since the war, and products include grains and fruits, especially persimmons. Fishing has also become important. There are abundant reserves of such underground resources as lead, zinc, gold, silver, nickel, manganese, anthracite coal, and brown coal. Industries, including shipbuilding, automobile manufacturing, refining, and cement manufacturing, are concentrated around Wŏnsan, the provincial capital. Pop. (1972 est.) 1,203,000.

Kangwŏn-do, English KANGWŎN PROVINCE, province, northeastern South Korea, bounded (east) by the Sea of Japan (East Sea) and by the provinces of North Kyŏngsang and North Ch'ung-ch'ŏng (south) and Kyŏnggi (west). In the north it was divided between North and South Korea by the 38th parallel in 1945 and, following the Korean War armistice (1953), by the truce line, with most of the original province in South Korea. The T'aebaek-sanmaek (mountains) nearly reach the sea, and the contour of the coastline is steep and smooth. Of its 6,523-sq-mi (16,894-sq-km) area, four-fifths is woodland that contains forest products such as edible alpine plants and mushrooms. Mineral resources include iron, coal, tungsten, fluorite, and limestone. Other industries have been created by the development of hydroelectric and thermoelectric power plants. The nearby waters abound in fish, especially cuttlefish and pollack. Cities in the province are Ch'unch'ŏn, the provincial capital, Kangnŭng, Wŏnju, and Sokch'o. Both Sŏrak-san (mountain; 5,604 ft [1,708 m]), with a ski run, and Mt. Odae (5,128 ft [1,563 m]) are in national parks in the T'aebaek-sanmaek. Pop. (1982 est.) 1,809,871.

Kangxi (Chinese emperor): *see* K'ang-hsi.

Kānha National Park, national park in Mandla district, Madhya Pradesh state, central India, extending over 122 sq mi (316 sq km) of the central highlands, at an elevation of from 2,000 ft (600 m) to 3,000 ft. Originally established as the Banjār Valley Sanctuary in 1935, it became a national park in 1955 and was enlarged in 1964. Rolling, sometimes rugged hills that tend to be flat-topped enclose on three sides a large meadow-like grassland. Although there are occasional patches of bamboo, dense bush, or tall grass high on the slopes and on the hilltops, much of the park consists of dry deciduous woodlands. Fauna includes langur, wild dog, tiger, leopard, wild pig, barking deer, chital, sambar, swamp deer, gaur, quail, red and gray jungle fowl, and peafowl. The park can be reached by road from Nāgpur, Jabalpur, and Mandla, the district headquarters. There are observation towers, or *machān*, and elephants are used for transport in the park, especially when motorable tracks become impassable during the summer monsoon.

Kanibadam, city, Leninabad *oblast* (administrative region), Tadzhik Soviet Socialist Republic, in the western Fergana Valley. The Kanibadam oasis was best known for almonds, from which its name, Place of Almonds, is derived. The city dates back at least to the 15th century. Its economy is based on the processing of local agricultural products—cotton, silk, and fruit, particularly apricots. The Bolshoy (Great) Fergana Canal flows along the city's southern outskirts. There is a teacher-training institute and a music and drama theatre. Pop. (1971 est.) 27,600.

Kanık, Orhan Veli (b. 1914, Bekoz, Constantinople—d. Nov. 14, 1950, Istanbul), poet who was one of the most innovative poets in 20th-century Turkish literature.

Educated at the Faculty of Literature of Istanbul University, he worked briefly as a teaching assistant before joining the Turkish postal administration in Ankara (1936–42). From 1942 to 1945 he served as a reserve officer in the Turkish Army. Because he had a good command of French, he worked for the Ministry of Education in the translation office for two years and later translated the works of several major French poets and playwrights. In 1950 he was editor of the literary review *Yaprak* ("Folio").

Kanık first wrote under the pen name Mehmed Ali Sel and published his early poems in the avant-garde literary review *Varlık* ("Existence"). He gradually turned away from traditional poetic forms. In 1941 he published a volume of poetry, *Garip* ("Strange"), in collaboration with two other well-known poets, Oktay Rifat and Melih Cevdet Anday. The work revolutionized Turkish literature, creating a break with everything associated with Turkish poetry to that time; conventional metre, rhyme, language style, and themes were discarded. The art of poetry was to be directed at the people. Introducing everyday spoken Turkish and making use of folk poems and popular song motifs, he encountered violent opposition, but by the time of his death his work and reputation were firmly established. Other works included *Vazgecemediğim* (1945; "I Cannot Give Up"); *Destan Gibi* (1946; "Like an Epic"); *Yenisi* (1947; "The New One"); and *Karşı* (1949; "Across"). English translations of poems selected from all his works appear in *I Am Listening to Istanbul,* translated by Talât Sait Halman (1971).

Kanimblan orogeny, a mountain-building event in eastern Australia toward the end of Early Carboniferous time (about 325,000,000 years ago). Uplift and deformation occurred in a wide belt extending from Tasmania to Cape York. The Kanimblan was the most severe orogenic episode to affect the Tasman Geosyncline.

Kanin Peninsula, Russian POLUOSTROV KANIN, peninsula in Arkhangelsk *oblast* (administrative region), northwestern Russian Soviet Federated Socialist Republic. It separates the White Sea to the west from the Cheshskaya Guba (Bay), a gulf of the Barents Sea, to the east. It has an area of about 4,000 sq mi (10,500 sq km). Except in the north, where the Kanin Kamen runs northwest–southeast, the peninsula is a flat, marshy, tundra plain of glacial and marine deposits. Numerous morainic hills rise to 230–260 ft (70–80 m).

Kanis, Petrus: *see* Canisius, Saint Peter.

Kaniṣka, also spelled KANISHKA, Chinese CHIA-NI-SE-CHIA (fl. 1st century AD), greatest king of the Kushān dynasty that ruled over the northern part of the Indian subcontinent, Afghanistan, and possibly regions north of Kashmir in Central Asia. He is, however, chiefly remembered as a great patron of Buddhism.

Most of what is known about Kaniṣka derives from Chinese sources, particularly Buddhist writings. When Kaniṣka came to the throne is uncertain. His accession has been estimated as occurring between AD 78 and 144; his reign is believed to have lasted 23 years. The year 78 marks the beginning of the Śaka era, a system of dating that Kaniṣka might have initiated.

Through inheritance and conquest, Kaniṣka's kingdom covered an area extending from Bukhara (now in the Uzbek S.S.R.) in the west to Patna in the Ganges Valley in the east, and from the Pamirs (now in Tadzhik S.S.R.) in the north to central India in the south. His capital probably was Puruṣapura (Peshāwar, now in Pakistan). He may have crossed the Pamirs and subjugated the kings of the city-states of Khotan, Kashgar, and Yarkand (now in Chinese Turkistan), who had previously been tributaries of the Han emperors of China. Contact between Kaniṣka and the Chinese in Central Asia may have inspired the transmission of Indian ideas, particularly Buddhism, to China. Buddhism first appeared in China in the 2nd century AD.

As a patron of Buddhism Kaniṣka is chiefly noted for having convened the fourth great Buddhist council in Kashmir that marked the beginnings of Mahāyāna Buddhism. At the council, according to Chinese sources, authorized commentaries on the Buddhist canon were prepared and engraved on copper plates. These texts have survived only in Chinese translations and adaptations. Kaniṣka was a tolerant king and his coins show that he honoured the Zoroastrian, Greek, and Brahmanic deities as well as the Buddha. During his reign contacts with the Roman Empire led to a significant increase in trade and the exchange of ideas; perhaps the most remarkable example of the fusion of eastern and western influences in his reign was the Gandhāra school of art, in which Greco-Roman classical lines are seen in images of the Buddha.

Consult the INDEX *first*

Kanjeran Pluvial Stage, major division of Pleistocene deposits and time in Africa (the Pleistocene Epoch began about 2,500,000 years ago and lasted about 2,490,000 years). The Kanjeran Pluvial Stage followed the Kamasian Pluvial Stage and preceded the Gamblian Pluvial Stage; the African pluvials represent wetter spans of geologic time probably related to the widespread continental glacial episodes in the Northern Hemisphere. The Kanjeran Pluvial Stage is regarded by some authorities as contemporaneous with the early Würm Glacial Stage of classical European terminology, but by others with the earlier Riss Glaciation. Kanjeran lake deposits have produced abundant remains of fossil vertebrates as well as human artifacts and skeletal remains. Radiocarbon techniques have dated late Kanjeran objects as about 57,000 years old, of the same age as the early Würm Glacial Stage.

kanji, in Japanese writing, characters adapted from Chinese characters and usually employed for writing nouns, verb roots, adjectives, and other important words. The Japanese affixes for verb tenses, prepositions, and other grammatical markers, which do not exist in Chinese, are indicated by *hiragana* symbols written beside the *kanji.* The pronunciation of *kanji* symbols may be indicated as well by *hiragana* signs. *See also* kana.

Kankakee, city, seat (1853) of Kankakee County, northeastern Illinois, U.S., on the Kankakee River. The city was founded in the 1850s when the builders of the Illinois Central Railroad bypassed the French-Canadian town of Bourbonnais (now a suburb) and chose Kankakee as a station because it offered better

opportunities for townsite promotion. Kankakee is now a centre for agricultural trade and manufacturing. The Kankakee State Hospital for the mentally ill was established in 1877. Olivet Nazarene College was founded at Bourbonnais in 1907, and Kankakee Community College was opened in 1966. Inc. 1854. Pop. (1986 est.) city, 28,464; metropolitan area (MSA), 98,000.

Kankakee River, navigable stream rising near South Bend, northern Indiana, U.S., and flowing south and west approximately 135 miles (217 km) to be joined by the Iroquois River near Kankakee, Ill. It continues in a northwesterly direction to meet the Des Plaines River and to form the Illinois River. The Kankakee was first navigated by the French explorer Robert Cavelier, sieur de La Salle, in 1679, when he descended the St. Joseph River, portaged to the Kankakee, and entered the Illinois Valley.

Kankan, town, eastern Guinea. Located at the head of navigation of the Milo River (a tributary of the Niger), it was founded as a caravan centre (salt, gold, kola nuts) by Soninke merchants in the 18th century.

Kankan is now the nation's second largest town and—as the terminus of the 411-mile (661-kilometre) railway from Conakry and the hub of roads from Bamako (Mali), Siguiri, Kouroussa, and Nzérékoré—it is the commercial and transportation centre of Guinea's northeastern savanna region. It is also the chief trading centre of the Malinke and Diula peoples. Kankan has light manufacturing and traditional craft (gold, ivory, wood) industries. Educational institutions include the Institut Polytechnique Julius Nyerere (1968; a teacher-training college), the national police school (1959) at Camp Soundiata, a vocational school, and a rice research institute. Pop. (1983 prelim.) town, 88,760.

Kankan Mūsā (Mali emperor): *see* Mūsā.

Kankrin, Egor Frantsevich, Graf (Count), German GEORG GRAF VON CANCRIN, original name LUDWIG DANIEL VON CANCRIN (b. Nov. 16, 1774, Hanau, Hesse-Kassel [Germany]—d. Sept. 10, 1845, Pavlovsk, near St. Petersburg [now Leningrad], Russia), Russian minister of finance (1823–44) under Nicholas I. An extreme fiscal conservative, he resisted most efforts to modernize the Russian state. He was created a count in 1829.

The son of a German mining engineer employed in Russia, Kankrin left Germany in 1797 to enter the service of the Russian government. He was appointed to the State Council in 1821, becoming finance minister in 1823. His administrative efforts were devoted largely to reducing budget deficits by limiting expenditures. Kankrin viewed with cynicism any governmental attempts to stimulate the economy, and he reduced credit to industry and refused to permit private banks. He viewed railroads as a dubious investment and opposed their construction, although some were built anyway. He did, however, sponsor a technical school to increase the supply of skilled mechanics for Russian industry. Although his name is associated with the Kankrin monetary reform of 1839–43, which established a monetary exchange rate between the silver ruble and the devalued paper *assignat* ruble, many historians believe that the reform was mostly the work of others. His successors continued his conservative policies until the reign of Alexander II.

Kanmon Tunnel, world's first under-ocean tunnel, stretching 2.25 miles (about 3.5 km) between the islands of Honshu and Kyushu in Japan. During its construction (1936–44), nearly every known tunneling technique was employed: rock tunneling by drilling and blasting, shield tunneling in soft ground, tunneling with compressed air, and the immersed-tube method involving the sinking of pneumatic caissons. In the 1950s a highway and pedestrian tunnel was constructed east of the original rail tunnel; following a slightly shorter route and using improved equipment, it was completed with little difficulty.

Kannada language, also spelled KANNAḌA, also called KANARESE, language of the Dravidian family, spoken in southwestern India; it is the official language of Karnataka (formerly Mysore) state. There are a number of regional dialects of Kannada and at least three distinct social dialects (Brahman, non-Brahman, and Harijan [Untouchable]). A dichotomy, called diglossia, also exists between the formal, literary language and the informal, colloquial language. The language uses retroflex consonants (*e.g., ṭ, ḍ, ṇ;* sounds pronounced with the tip of the tongue curled back against the roof of the mouth), a typical Dravidian characteristic; and it indicates such grammatical categories as tense, number, person, and case with suffixes. The alphabet of Kannada is closely related to that of the Telugu language (*q.v.*).

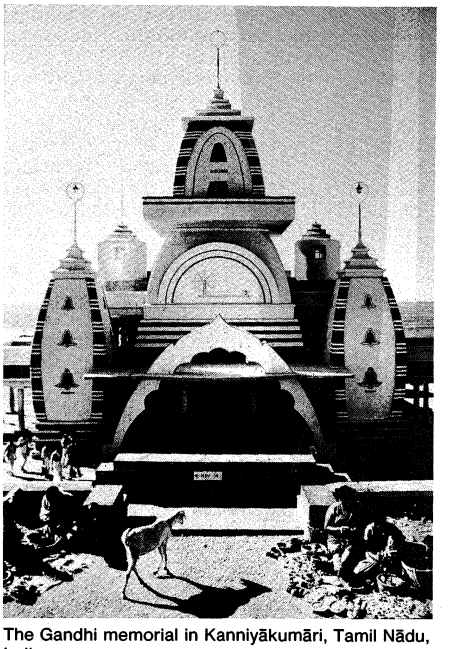
Kannada literature, also spelled KANNAḌA, also called KANARESE, the literature written in Kannada, which, like the other languages of South India, is of the Dravidian family. The earliest records in Kannada are inscriptions dating from the 6th century AD onward. The earliest literary work is the *Kavirājamārga* (*c.* AD 850), a treatise on poetics based on a Sanskrit model. Nearly all of the extant early texts in Kannada are poems on religious subjects written by Jaina authors. One of the most remarkable of these is the 12th-century *Rāmāyaṇa* of Abhinava Pampa; this work is a Jain version of the famous epic poem of the same name.

After the 12th century the Hindu sect known as Liṅgāyat replaced Jainism as the most important religious influence on Kannada literature. (The Liṅgāyats worship Śiva as the only deity.) Most Liṅgāyat works are simple in style, and many were meant to be sung. The most popular works were the *Vaçanakāvyas*, which were devotional poems to Śiva written in rhythmic prose. The earliest work in Kannada that may be termed a novel is Nemicandra's *Līlāvatī* (1370), a love story involving a prince and a princess. One of the most famous Kannada works is the *Rājaśekharavilāsa,* a fictional tale written in 1657 by Ṣaḍakṣaradeva in verse interspersed with prose. This work is a morality tale in which the divine intervention of Śiva saves a royal family from self-inflicted tragedy in their efforts to uphold the law.

Twentieth-century Kannada literature, like other Indian literatures, has modeled itself on European forms, especially the novel and short story.

Kannauj, also spelled KANAUJ, or CANNAUJ, historically KANYAKUBJA, town, central Uttar Pradesh state, northern India. Kannauj is situated near the Ganges River, northwest of Kānpur, with which it has road and rail connections. Its name probably has more popular spellings than any other place-name in India. Kannauj has existed since ancient times and contains numerous ruins and artifacts. It was important during the Gupta Empire, and in the early 7th century it became the capital of Harṣa's empire, which included much of northern India. The city entered a period of great splendour during the 9th and 10th centuries, at which time a large number of Hindu temples and Buddhist monasteries were built. In 1018, however, it was razed by Maḥmūd of Ghazna and was plundered again in 1194, by which time it was almost totally destroyed. Since then, Kannauj, though renowned for perfumes and tobacco, has been of minor importance. Pop. (1981) 41,016.

Kanniyākumāri, also spelled KANYĀKUMĀRI, town, southern Tamil Nādu state, southeastern India. The town is situated on Cape Comorin, which is the southernmost point on the Indian subcontinent. Kanniyākumāri is a tourist and pilgrimage centre noted for its



The Gandhi memorial in Kanniyākumāri, Tamil Nādu, India
Keystone

Shiva temple and its Gandhi memorial. Legend claims that the goddess Kanyā Kumārī (Youthful Virgin) killed a demon on the town site. Pilgrimage rites include bathing at Pitru and Matru Tirtha, two rocks over which a monument honouring Swāmī Vivekānanda, a Hindu religious leader and saint, was built in 1970.

The fertile soils inland from Kanniyākumāri support an extremely dense population, while the sandy coastal plain contains worked deposits of monazite and ilmenite. The area is primarily agricultural but has some handloom weaving industries. Pop. (1981) town, 14,087.

Kannon, in Japanese Buddhism, the *bodhisattva* of infinite compassion and mercy. *See* Avalokiteśvara.

To make the best use of the Britannica, consult the INDEX *first*

Kano, historic kingdom, traditional emirate, and state, northern Nigeria. According to the *Kano Chronicle* (1890s), the best-known native history of the Hausa people, the Kano kingdom was founded as one of the Hausa Bakwai (Seven True Hausa States) in 999 by Bagauda, a grandson of Bayajida (Abuyazidu), the legendary progenitor of the Hausa people. Its capital was moved from Sheme (to the north) to the present site of Kano city in King Gajemasu's reign (1095–1134). Malinke scholars from the Mali empire introduced Islām into the region in the 1340s, and Yaji (reigned 1349–85) was probably Kano's first Muslim Hausa king. Islām was blamed for Kano's defeat by Zaria *c.* 1400, and King Kanajeji renounced the faith; but in the 1450s new Malian teachers arrived, and Islām regained its influence.

In King Dauda's reign (1421–38), Kano became a tributary state of the Bornu kingdom (to the east), and under Abdullahi Burja (1438–52) trade relations with Bornu were established. Camel caravans brought prosperity under Mohamman Rumfa (1463–99), the greatest of Kano's Hausa kings, who estab-

lished the Kurmi Market, built the Juma'at Mosque (restored) and a palace (now used by the Fulani *amīrs*), and fought the first of a series of wars with Katsina (92 mi [148 km] northwest), Kano's principal rival in the trans-Saharan trade. Under Rumfa, Arabic writing was reintroduced and the administration codified under Islāmic law.

Kano became a tributary state of Songhai after its capture *c.* 1513 by Mohammed I Askia of the Songhai Empire. Later in the century, the state paid tribute to Zazzau, a Hausa kingdom to the south. After defeats in 1653 and 1671 by the Jukun (Kwararafa) people from the southeast, Kano was eclipsed by Katsina as a commercial centre. By 1734 it once again paid tribute to Bornu.

In 1804 the Fulani *jihād* ("holy war") leader, Usman dan Fodio, led a revolt against the Hausa overlords and, in 1807, Kano city was taken. One of dan Fodio's pupils, Sulaimanu (Sulemanu), became Kano's first *amīr;* his successor, Emir Ibrahim Dabo (1819–46) of the Sullibawa clan, founded the present dynasty.

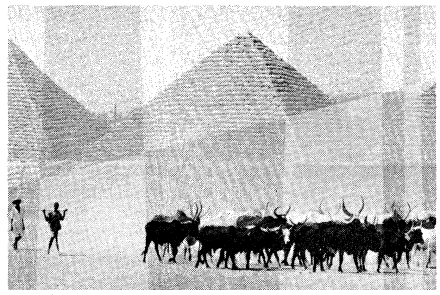
By the 1820s Kano had become the greatest commercial power in West Africa. Its leather and cotton goods were widely transported northward by caravan across the Sahara to Tripoli, Tunis, and Fès, and hence to Europe, where its red goatskin products were known as morocco leather. By the 1880s, however, trade diminished because of changing political conditions along the routes, the end of the slave trade, and the arrival of Europeans on the West African coast.

When Abdurrahman (Abdu), the *sarkin musulmi* ("commander of the faithful") at Sokoto (233 mi west-northwest), chose Mohamman Tukur as Kano's *amīr* in 1893, war broke out among the Kano Fulani. Aliyu Babba, the victor in 1894, pledged allegiance to Muhammadu Attahiru I, the new *sarkin musulmi;* but the British captured Kano city in 1903 and named Muhammadu Abbas Abdullahi *amīr* of Kano. Kano emirate was the largest and most populous of the emirates in Kano Province, created by the British in 1903.

Kano State, coterminous with Kano Province since 1967, was formed in 1968 and remained unchanged in the 1975–76 state reorganization. It consists of a 16,712-sq-mi (43,285-sq-km) region of wooded savanna in the south and scrub vegetation in the north. Drained by the Kano-Chalawa-Hadejia river system, its light sandy soils are excellent for growing peanuts (groundnuts), a major export. Other crops include cotton, onions, indigo, tobacco, and gum arabic; millet, sorghum, beans, cowpeas, cassava and corn (maize) are subsistence crops. Livestock grazing is widespread, and hides and skins are exported. Iron, tin, and columbite are mined; small uranium deposits in the south are unexploited.

Kano State includes Kano city, the state capital, and the towns of Gumel, Hadejia, and Kazaure. Most of its inhabitants are Hausa or Fulani, but there are also scattered groups of Maguzawa (animist Hausa), other Nigerians, Arab traders, and Europeans. Kano city, Gumel, Hadejia, Kazaure, Rano, Birnin Kudu (*qq.v.*), and Wudil are its chief market centres. The state is crossed by the main (Lagos–Nguru) railway and by highways that link it to Kaduna and Bauchi states. Kano city has an international airport. Pop. (1983 est.) state, 9,442,000.

Kano, also called KANO CITY, city and capital of Kano State, northern Nigeria, on the Jakara River. It was traditionally founded by Kano, a blacksmith of the Gaya tribe who in ancient times came to Dalla Hill in the locality in search of iron. The discovery of stone tools indicates prehistoric settlement of the site, which was selected for the capital of the Hausa state of Kano in the reign (1095–1134) of King Gajemasu. The present wall, replacing a 12th-century structure, probably



Pyramids of peanut (groundnut) bags at Kano, Nigeria

Marc & Evelyne Bernheim—Rapho/Photo Researchers

dates from the 15th century; it has 14 gates, is 12¼ mi (20 km) long, 40 ft (12 m) wide at the base, and 30 to 50 ft high.

Inside the old walled area along the Jakara River is the central Kurmi Market, a main caravan terminus. After the Fulani *jihād* ("holy war," 1804–07), Kano was chosen to be the capital of an emirate centred on the city. Its market became the chief emporium of the Western Sudan savanna and desert area extending from the Atlantic to the Nile. Cowrie shells were used as the chief medium of exchange. In return for Hausa leatherwork, cloth, and metalwares, Kano received kola nuts from Ghana; salt from the Sahara; slaves from the Bauchi and Adamawa emirates; natron from Lake Chad; and sword blades, weaponry, silk, spices, perfumes, and books brought from Europe by the trans-Saharan camel caravans. The city's capture by the British in 1903 and the opening of the railway from Lagos (715 mi southeast) in 1912 changed the direction of trade south to the Gulf of Guinea.

Modern Kano is a major commercial and industrial centre. Peanuts (groundnuts), a local subsistence crop and now the prime commodity, are bagged and stored in huge pyramids before being sent to Lagos for export. The second most important traditional export is that of hides and skins. There is a considerable livestock trade. Pigs, raised on local farms managed by non-Muslims, are shipped to Lagos. Eggs also are supplied to other parts of Nigeria. Traditional industries include leather tanning and decoration, mat making, metalworking, tailoring, and pottery manufacture. Local dye pits for cloth and leather have been used for centuries.

Much of the city's industry is centred in the industrial estate at Bompai. The city's food products include baked goods and pasta, processed meat, crushed bone, canned food, peanuts, peanut and vegetable oils, soft drinks, and beer. Light manufactures include textiles, knit fabrics, tents, bedding, foam rubber products, clothing, cosmetics, pharmaceuticals, soap, candles, polishes, plastics, leather goods, metal and wood furniture, hospital and office equipment, containers and packing cases, wire products, tiles, and enamelware. The heavy industries manufacture asbestos, cement, concrete blocks, metal structural products, bicycles, automobiles, trucks, and chemicals. There is also a steel-rolling mill and a printing plant.

Dalla Hill (1,753 ft [534 m]) and Goron Dutse Hill (1,697 ft [517 m]) dominate the old city, which has lowland pools and borrow pits, source of the mud for building its square, flat-roofed houses. The population is mostly Hausa, mainly Kano (Kanawa), but also includes the Abagagyawa, who claim descent from Kano's original inhabitants, and Fulani. The city is subdivided into about 100 *unguwa* ("hamlets"), each with a mosque and usually a market. The oldest building is the 15th-century Gidan Rumfa (now the *amīr*'s palace), next to which is the central mosque (1951), Nigeria's largest. Also facing Amīr's Square is the Gidan Makama (the Makama's House), among Kano's oldest structures and since 1959 housing a museum of Hausa and Fulani artifacts.

Besides the old walled area (recognized as Kano city in 1961) and Bompai, Kano has four other districts: the Fagge, inhabited by "stranger" Hausa people; the Sabon Gari, housing migrants from the south and east; the Syrian Quarters and adjoining Commercial Township (1912); and the Nassarawa, site of modern government buildings and exclusive European and African residences.

Kano has several general and specialized hospitals, a medical school, and a dental centre. It is the seat of Bayero University (1975), Kano State Institute for Higher Education, an Arabic law school (1934), several teacher-training institutes, a federal technical college, a commercial school, and an agricultural (peanut) research institute. The British Council Library and Kano State Library are located in the city. Kano is served by the railway network between Nguru and Lagos and Port Harcourt; it is also a crossroads for highways traversing Kano State. There is an international airport in the city. Pop. (1972 est.) 366,211.

Kanō Eitoku, original name KANŌ KUNINOBU (b. Feb. 16, 1543, Kyōto—d. Oct. 12, 1590, Kyōto), fifth-generation scion of the famous Kanō family of Japanese artists who created the style of the Azuchi-Momoyama period (1574–1600) screen paintings.

The grandson of Kanō Motonobu, who had established the aesthetic canons of the Kanō school, Eitoku made the Kanō style yet more monumental and gorgeous by introducing



"Chinese Lions," detail of painting by Kanō Eitoku, colour on gilded paper, 1580s; in the Imperial Collection, Japan

By courtesy of the Imperial Household Agency, Japan

a gold-leaf ground, upon which he applied brighter colours and heavier black-ink outlines. For his simplified designs he favoured large-scale motifs taken from nature—birds, animals, trees, flowers, rocks—which he executed on large folding screens (*byōbu*) and sliding panels (*fusuma*) used to decorate the interiors of castles and temples. As the leading artist of the Azuchi-Momoyama period, he was commissioned to paint for the military rulers Oda Nobunaga and Toyotomi Hideyoshi. He influenced many artists of his day, including his sons Mitsunobu and Takanobu and his son-in-law Sanraku, an outstanding artist of the period. Among the few original Eitoku paintings extant are "Chinese Lions," on a six-panelled folding screen in the Imperial Household Collection; "Landscapes and Flowers," on 16 sliding panels in the Tenkyū-in, Kyōto; and "24 Paragons of Filial Piety and of Hermits," on the walls of the Nanzen-ji, Kyōto.

Kanō Masanobu (b. 1434—d. 1530, Kyōto), chief painter to the Ashikaga shoguns (family of military rulers who governed Japan from 1338 to 1573) and founder of the hereditary line of artists who, as official painters to the shoguns, dominated Japanese painting for more than 300 years with their "Japanized" Chinese painting style.

Masanobu was influenced by the priest-painter Tenshō Shūbun and, like him, worked in the *suiboku* ("water-ink") painting tradition inspired by Chinese monochromatic ink painting. Unlike Shūbun, however, Masanobu was not a priest; in his *suiboku* landscapes the vague outlines and subtle ink washes expressive of Zen Buddhist mysticism are supplanted by the more carefully defined forms characteristic of native Japanese art. While Masanobu is reputed to have done figure paintings of saints and *bodhisattvas* in the manner of Shūbun, none of these survive. Among the few extant works by him are "The Sage Chou Mao-shu in a Lotus Pond" (Nakamura Collection, Tokyo) and a screen painting of a crane (Shinju-an monastery, Kyōto).

Kanō Morinobu: *see* Kanō Tanyū.

Kanō Motonobu (b. Aug. 28, 1476—d. Nov. 5, 1559, Kyōto), great master of Japanese painting.

Like his father, Masanobu, the first of the Kanō painters, Motonobu served the Ashikaga shoguns (a family of military rulers who governed Japan from 1338 to 1573) and inherited the Chinese-inspired monochromatic ink-painting style (*suiboku-ga,* "water-ink painting") favoured by the Ashikagas. Motonobu, however, was also the son-in-law of Tosa Mitsunobu, founder of the Tosa school of painting specializing in the native *Yamato-e* (Japanese Painting) style, and he effected a compromise by combining the strong brushwork of the Chinese *suiboku-ga* with the decorative appeal of the *Yamato-e.*



"Flowers and Birds," colour on paper by Kanō Motonobu; in the Daisen-in, Kyōto

By courtesy of the Daisen-in, Kyoto, Japan

The resulting style was especially suitable for large-scale compositions and practically dominated Japanese painting for the next 300 years.

A gifted and versatile artist, Motonobu excelled in landscapes (both in monochrome and in light colour), figures, and flower-and-bird pictures. He executed many paintings on the sliding panels of the Reiun-in monastery in Kyōto, where he decorated three rooms with landscapes painted in the styles of three different Chinese masters: the soft ink-wash style of Mu-ch'i Fa-ch'ang (late 12th–early 13th century); the hard, stiff style of Hsia Kuei (1195–1224); and the broken ink style of Yü Chien (*c.* 1230). Some of Motonobu's paintings, originally done on sliding panels, were subsequently mounted on hanging scrolls; these include the important "49 Landscapes with Flowers and Birds" (also in the Reiun-in monastery), which prefigure the monumental decorative compositions of the later Kanō artists, Eitoku (1543–1590) and Sanraku (1559–1635).

Kanō Naonobu (b. Nov. 25, 1607, Kyōto—d. May 7, 1650, Edo [Tokyo]), seventh-generation member of the Kanō family of Japanese artists, who served as painter to the third Tokugawa shogun, Iemitsu, and founded the Kobikichō branch of the Kanō family.

His paintings are closer to the *suiboku-ga* ("water-ink painting") tradition than are the more elaborately detailed paintings of his more famous brother, Tanyū. He was known for his "grass" (*sō,* a term borrowed from calligraphy, also called "running") style of brushwork, combining broad, free strokes with a simple ink wash to create an impression of brevity and freshness. Examples of his "grass" style are two screen landscapes in the Tokyo National Museum and the figures of two Chinese brothers Po I and Shu Ch'i painted on screens, now in the Boston Museum of Fine Arts. Other paintings, such as the one remaining section of the "Eight Views of the Hsiao and Hsiang Rivers" (Tokyo National Museum), are in subject matter and technique modelled after the work of the early-13th-century Chinese *suiboku-ga* artist Mu-ch'i Fa-ch'ang.

Kanō Sanraku, original name KANŌ MITSUYORI (b. 1559, Japan—d. Oct. 30, 1635, Kyōto), sixth-generation member of the famous Kanō family of painters to the Japanese shoguns.



"Red Plum Blossoms," painting on sliding door, colour and gold leaf on paper, by Kanō Sanraku, early 7th century; in the Daikaku-ji, Kyōto

By courtesy of the Daikaku-ji, Kyōto

He produced some of the greatest screen paintings of the Azuchi-Momoyama period (1574–1600). Sanraku was the disciple and adopted son of the leading painter of the day, Kanō Eitoku, and like him excelled in large-scale decorative designs executed in bold, sweeping lines and brilliant colours against gold-leaf backgrounds. He painted many folding screens and sliding panels, used to decorate the interiors of temples, castles, and palaces. Much of Sanraku's work still remains: "Birds of Prey," on the screens in the J. Nishimura collection, Kumamoto City; legendary Chinese figures on a pair of screens in the Tokyo National Museum; and "Trees, Flowers, and Tigers," on the walls of the Tenkyū-in chapel, Kyōto (designated as a national treasure). Sanraku also introduced a subject that became popular with later Kanō artists, historical figures selected from the Chinese book *Ti chien t'u shuo* (1573; "Illustrations of Exemplary Emperors"; Japanese trans., *Teikan zusetsu,* 1606).

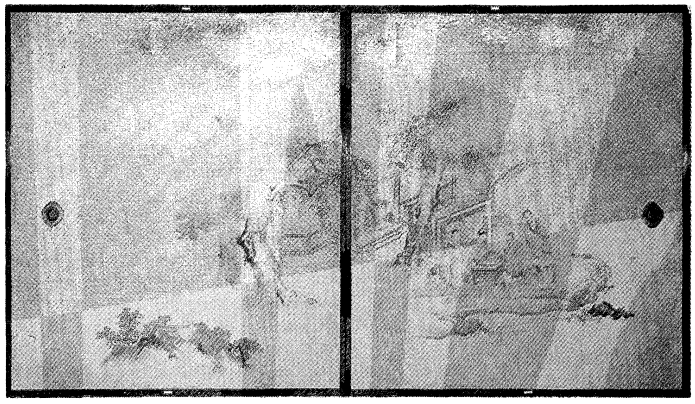
Kanō school, family of artists who painted in a style developed in Japan in the 15th–19th century. For seven generations, more than 200 years, the leading Japanese artists came from this family, and the official style remained in their hands for another century or more. Throughout their history the family served military masters, and the lofty and moral symbolism of the Kanō tradition was at the same time the political ideal.

The school arose at a time when Chinese cultural ideals were dominant, but by this time there had been a long history of ink painting in Japan. The Kanō style, Chinese though it appears in subject matter and ink technique, was actually thoroughly Japanese in its form of expression. Gradually the depth of a picture was worked into two planes, and later into a single plane of pictorial interest. The boldness of the brushwork is especially characteristic, and the sharpness of outline differed noticeably from that of the Chinese Sung models. Surface values and flat decorative treatment were emphasized on screens and sliding panels.

The first Kanō was an amateur artist of the samurai class named Kagenobu. His son Masanobu (1434–1530) became the accepted first generation, but it was Motonobu (1476–1559), his son, who crystallized the Kanō style. Eitoku (1543–90) created the style of the Azuchi-Momoyama period, lasting from 1574 to 1600, while Tanyū (1602–74) established the academic standards that pertained under the Tokugawa rulers (1603–1868).

Kanō Tanyū, original name KANŌ MORINOBU (b. March 4, 1602, Kyōto—d. Nov. 4, 1674, Edo [Tokyo]), most influential Kanō painter of the Tokugawa period in Japan.

His conservative choice of subject matter (*e.g.,* historical figures embodying Confucian ethical precepts) and his return to the subdued tones and designs of the early Kanō painters set the standards for later Kanō artists. His studied brushwork and dignified portrayal of figures appear in "Confucius and Two Disciples," a screen painting now in the Boston Museum of Fine Arts. The extent to which his art reflected the taste of the military rulers of his day may be deduced from the honours bestowed upon him. At 17 he was appointed



"Kinkisho Gazu," sliding screens by Kanō Tanyū, colour on paper; in the Nagoya Castle, Aichi Prefecture, Japan

By courtesy of the Nagoya Castle, Aichi Prefecture, Japan

painter to the shogun and given an estate at Kajibashi, which became the name associated with his school. He decorated the walls of various palaces and castles, including Nijō Castle in Kyōto, the shogun's castle at Nagoya, and the Kyōto Imperial Palace. He painted the scrolls illustrating events in the life of the first Tokugawa shogun, Ieyasu, and decorated the porticoes of his mausoleum, the Tōshō-gū shrine in Nikkō. At 34 he assumed the temple name Tanyū; two years later he was raised to an exalted position in the Buddhist clergy. Together with his grandfather Eitoku and his great-great-grandfather Motonobu, he is celebrated as one of the "three famous brushes" of the Kanō family.

Consult the INDEX *first*

kanōn (Greek: "canon"), one of the main forms of Byzantine liturgical office; it consists of nine odes, based on the nine biblical canticles of the Eastern Christian Church. (*Compare* canonical hours.) The *kanōn* is thought to have originated in Jerusalem in the 7th or 8th century to replace the biblical canticles in the morning office.

Each ode is made up of a model stanza (*heirmos*) and subsequent stanzas (*troparia*), usually three, that follow the rhythm and accentuation of the model stanza. The last *troparion* in an ode usually contains praises to the Virgin Mary and is therefore designated *theotokion* (from Theotokos, Mother of God). Some *kanōn*s contain an acrostic consisting of the first letters of each stanza and revealing either the name of the poet, a dedication for a feast, or both.

There are several *kanōn*s for each feast and saint of the ecclesiastical calendar. On weekdays during Lent only three odes were sung, hence the *Triōdion*, the liturgical book containing the Lent *kanōn*s. The melody of an ode is first stated by the *heirmos*; the accompanying *troparia* are supposed to be chanted to the same tune. In practice, however, except on important feasts, only the *heirmoi* are chanted, the *troparia* being recited. The *heirmoi* are often assembled in the *Heirmologion*, a special book for singers.

Among the most famous authors of *kanōn*s are St. John of Damascus, author of the famous Easter *kanōn* (Eng. trans. by John Mason Neale, " 'Tis the Day of Resurrection"), and Cosmas the Melodian, who wrote *kanōn*s of great poetical beauty for the major feasts. Hymnography also flourished in Syria and Asia Minor in this period. In 798, however, the centre of hymn writing shifted to Constantinople, where St. Theodore Studites (died 826) inaugurated a liturgical revival and St. Theophanes Graptos (died 845) and St. Joseph the Hymnographer (died 883) were the principal hymn writers.

The writing of new *kanōn*s continued in subsequent centuries in Greek and Slavic Orthodox lands.

Kanoya, city, Kagoshima Prefecture (*ken*), Kyushu, Japan, in the central part of the Ōsumi-hantō (Ōsumi Peninsula). The city developed rapidly with the establishment of an air base of the Imperial Japanese Navy in 1936. After World War II the base was taken over by the Japanese Self-Defense Force. The city retains its rural character, however, producing sweet potatoes and cereals, and alcohol and starch on a small scale. Kanoya also serves as a transport centre for the peninsula. Pop. (1980) 73,242.

Kānphaṭa Yogi, member of an order of religious ascetics in India that venerates the Hindu deity Lord Śiva. Kānphaṭa Yogis are distinguished by the large earrings they wear in the hollows of their ears (*kān-phaṭa,* "ear split"). They are sometimes referred to as tantric (esoteric) *sannyāsin*s (ascetics), because of their emphasis on the acquiring of supernatural powers in contrast to more orthodox practices of devotion and meditation. They are followers of Gorakhnāth (Gorakṣanātha), who is said to have lived in the 12th century or even earlier, and are also known by the name Gorakhnāthīs or Nāthapanthīs. The ideology of the Kānphaṭa Yogis incorporates elements of mysticism, magic, and alchemy absorbed from both Śaivite (Hindu) and Buddhist esoteric systems, as well as from Haṭha Yoga.

Kānpur, formerly CAWNPORE, city, administrative headquarters of Kānpur district, Uttar Pradesh state, northern India, southwest of Lucknow, on the Ganges River. Kānpur was only a village when it and the surrounding territory were acquired in 1801 by the British, who made it one of their frontier stations. In 1857, during the Indian Mutiny, the British troops in the town were massacred by native forces. The survivors are said to have been thrown into a well, where a memorial has since been built.

The largest city of Uttar Pradesh and one of the largest in India, Kānpur has an area of more than 100 sq mi (260 sq km). It is an important road and rail hub and a major commercial and industrial centre. The city proper lies northwest of the cantonment; most of its industry is still farther northwest. The urban area also includes three railway colonies and Armapur, a suburb. There is a military airfield nearby. Kānpur has a university; colleges of medicine, law, and education; the Indian Institute of Technology; and a government experimental farm. Notable buildings include a sacred Hindu glass temple and Kamla Retreat, a rest house on a small lake. There are several museums.

Kānpur district, about 2,400 sq mi in area, is a fertile stretch of alluvial plain between the Ganges and Yamuna rivers. It is watered by tributaries of the two rivers and by the Lower Ganges Canal. Crops include wheat, gram (chick-pea), jowar (sorghum), and barley. There are mango and mahua groves and a dhāk forest. Bithūr, a ruined town, is a Hindu holy place; the district contains many small temples built between the 6th and 9th centuries. Pop. (1981) city, 1,481,789; metropolitan area, 1,639,064; district, 3,742,223.

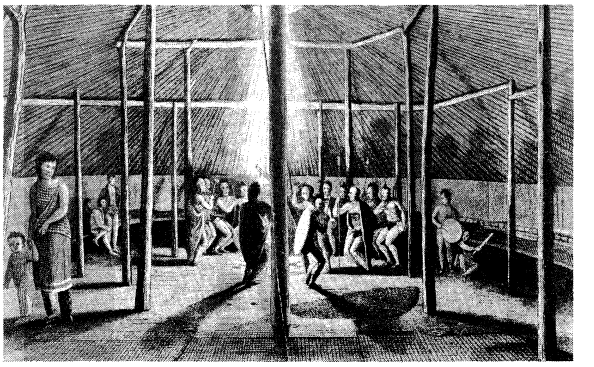
Kansa, also spelled KONZA, also called KAW, North American Indian people of Siouan linguistic stock who lived along the Kansas and Saline rivers in what is now central Kansas. They are related to the Omaha, Osage, Quapaw, and Ponca. The Kansa were a semi-sedentary people who combined hunting and farming. Their villages were loosely organized and presided over by chiefs chosen for wisdom and bravery. Later, chieftainship became hereditary. Two or three Kansa families might live together in a large conical-shaped lodge. The men wore breechclouts over deerskin trousers. They were notable for carefully plucking all their facial and head hair, except for a scalp lock running along the top and back of the head.

Religious beliefs involved a pantheon of mysterious spirits, or *wakan*s, of differing rank and power, associated with nature—*e.g.,* with the sun, light, darkness, woods, and plains. Adolescent boys went through a puberty rite known as the vision quest—a period of isolation and self-denial entered upon to invoke dreams of future exploits and supernatural phenomena. Burial customs were well developed and of considerable complexity. After the women of the tribe had painted the face of the corpse and covered it with bark and a buffalo robe, it was given directions to the land of the dead. The body, accompanied by garments, weapons, pipe, and a supply of food, was placed in a shallow grave on a hill and covered with rock slabs.

In 1846 the Kansa were assigned a reservation at Council Grove (Kansas), their last home before removal to Indian Territory (present Oklahoma) in 1873. In their early history the Kansa had migrated in stages, presumably from a prehistoric location on the Atlantic coast. Their numbers had been decimated by recurrent warfare with the Fox, Omaha, Osage, Pawnee, and Cheyenne. Pressure from white sources—Spanish, English, French, and, finally, U.S. land speculators—undermined their subsistence economy. Their estimated population in the late 18th century was 3,000. In the late 20th century there were fewer than 600 Kansa living in Oklahoma.

Kansan Glacial Stage, major division of Pleistocene deposits and time in North America (the Pleistocene Epoch began about 2,500,000 years ago and ended about 10,000 years ago). The Kansan glaciation followed the Aftonian Interglacial Stage and preceded the Yarmouth Interglacial Stage, both periods of moderate climatic conditions. The Kansan Glacial Stage was named for deposits studied in northeastern Kansas, although more representative and complete deposits exist near Afton, Iowa.

The Kansan glaciations appear to have been very extensive. Away from the ice margins, in present Kansas and southern Indiana, well-developed forests and mammalian faunas existed. Areas that are now generally arid or semi-arid were clearly moister. The Kansan fauna was diverse and abundant and essentially modern in composition. Animal ranges and distributions, however, were much different. Characteristic fossil forms of the Kansan Glacial Stage include the mammoth, musk-ox, moose, and extinct giant beaver. In the Midwest a widespread volcanic ash bed,



War dance in a Kansa lodge, engraving by C.G. Childs after a drawing by S. Seymour Del, 1822

By courtesy of the Library of Congress

the Pearlette Ash, is an important horizon marker; the Pearlette Ash was probably produced by volcanic eruption in the western Cordilleras.

Kansas, constituent state of the United States of America lying at the geographic centre of the contiguous 48 states.

A brief treatment of Kansas follows. For full treatment, *see* MACROPAEDIA: United States of America: *Kansas.*

Kansas is bounded by Nebraska on the north, Missouri on the east, Oklahoma on the south, and Colorado on the west. The capital is Topeka. Roughly rectangular in shape, the state extends about 410 miles (660 km) from east to west and 210 miles (340 km) from north to south.

The earliest evidence of human occupation is found in the area of the Republican and Blue rivers where there had been a thriving agricultural society from about 1200 to 1500. At the time of initial European contact the main Indian groups were the Kansa, Osage, Pawnee, and Wichita.

The first-known European explorer was Francisco Coronado, who in 1541 led a party northward from Mexico in search of gold. La Salle claimed the region for France in 1682, and French fur traders had a flourishing exchange with the Indians in what is now the northeastern part of the state in the 18th century. Kansas was acquired by the United States as part of the Louisiana Purchase from France in 1803. Until the Kansas–Nebraska Act of 1854 created the Kansas Territory and opened it to white settlement, Kansas had been the trailhead for the Sante Fe and Oregon Trails and a dumping point used by the federal government for displaced eastern Indians. In the decade before the American Civil War, conflicts over whether to allow slavery in the territory earned it the sobriquet "Bleeding Kansas." Kansas entered the Union as a free state in 1861.

Physiographically Kansas is a fairly continuous plain rising steadily in elevation from 700 feet (210 m) above sea level in the Central Lowlands of the southeast to more than 4,000 feet (1,200 m) in the Great Plains near the Colorado border. The state drains generally eastward to the Mississippi through the systems of the Arkansas and Kansas rivers.

The Kansas climate is temperate but continental, exhibiting great extremes between summer and winter temperatures. The average annual temperature is 55° F (13° C), with the growing season lasting from mid-April through mid-September. Annual precipitation, averaging from less than 20 inches (500 mm) in the west to more than 40 inches (1,000 mm) in the east, falls primarily as rain during the spring and summer months.

Early settlement of Kansas was primarily by homesteaders who were antislavery New Englanders or European immigrants. About 90 percent of the land is used for agriculture, and one-third of the population lives in areas classified as rural. Wichita, Kansas City, and Topeka are the only cities with populations of more than 100,000. Because of insufficient economic opportunities, Kansas loses a considerable number of its young people to other states.

Both agriculture and manufacturing contribute significantly to the state's economy—the former providing many of the raw materials for the latter. Farm and ranch production rank Kansas high among the U.S. states in wheat, sorghum, beef and veal, and hogs. Manufacturing includes meat-packing, grain-milling, and the assembly of machinery and general aviation aircraft. Petroleum and natural gas are among the state's principal mineral resources.

Kansas possesses an excellent system of more than a dozen railways. Spur lines and sidings connect to grain-storage elevators. Highways and airways crisscross the state. The Missouri River carries a great deal of barge traffic to and from the Mississippi River inland waterway system.

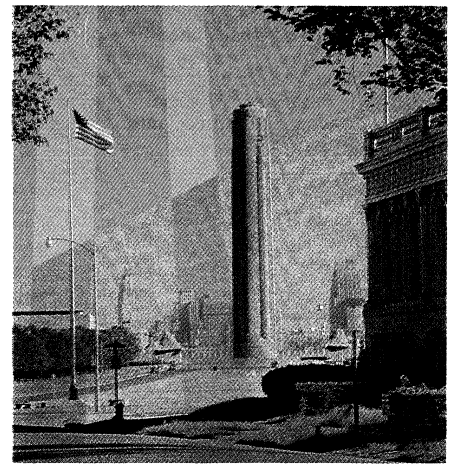
Wichita and Topeka support cultural activities and the arts, and numerous colleges and universities do so in many small communities across the state. The University of Kansas is located at Lawrence and has an outstanding museum of natural history and an art museum. Fort Larned and Fort Scott, frontier outposts of the mid-19th century, are preserved as national historic sites. Area 82,277 square miles (213,098 square km). Pop. (1990 est.) 2,492,000.

Kansas City, city, seat of Wyandotte county, northeastern Kansas, U.S., at the confluence of the Kansas and Missouri rivers and contiguous with Kansas City, Mo. Present-day Kansas City was formed by the consolidation of eight separate towns. The earliest, Wyandotte, was bought from an Indian tribe, laid out in 1857 by a town company, and incorporated in 1859. The founding of rival settlements by proslavery and Abolitionist supporters after passage of the Kansas–Nebraska Act (1854) brought rapid development. Wyandotte was the site of the writing of the Kansas constitution, under which the territory entered the Union in 1861. In 1863 Wyandotte became the eastern terminus of the Union Pacific, Eastern Division (later the Kansas Pacific), the first transcontinental railroad. Vast herds of Texas cattle were driven to Kansas Pacific railheads, and Wyandotte became a major marketing and reshipment point and, by the 1870s, the site of stockyards and meat-packing plants. Old Kansas City and Riverview (which became a part of Wyandotte in 1880) developed during the 1870s. The settlement of Armstrong developed on a hill south of Wyandotte. North of the Kansas River an industrial district, Armourdale, named for a meat-packing plant, was laid out in 1880. South of the Kansas, Argentine grew up around the Santa Fe shops and rail yards and became the site of a smelter. These, except for Argentine (annexed in 1910), combined as a first-class city on March 6, 1886, taking the name Kansas City. Rosedale, south of the Kansas, seat of the University of Kansas Medical Center, was annexed in 1922. Absorbed earlier was Quindaro, which had been founded by antislavery leaders as a free port on the Missouri. Serious damage was inflicted by floods in 1903, 1951, and 1977.

The city is now the site of a large proportion of the heavy industry of the Kansas City metropolitan area and is a leading meat-packing centre. Manufactures include chemicals, paper goods, automobiles, railroad cars, petroleum and soap products, fabricated steel, and dairy and agricultural commodities. In addition to the medical centre, Kansas City is the seat of Donnelly (junior) College (1949), Kansas City Kansas Community College (1923), a Baptist seminary, and the Kansas State School for the Visually Handicapped. Of interest are the Agricultural Hall of Fame and National Center, the Shawnee Methodist Mission (1839), and the Wyandotte County Museum. Pop. (1987 est.) city, 163,098; metropolitan area (MSA), 1,546,400 (Missouri–Kansas).

Kansas City, city, Clay, Jackson, and Platte counties, western Missouri, U.S., on the Missouri River, at the mouth of the Kansas (locally, the Kaw) River. Contiguous with Kansas City, Kan., it forms part of an urban complex that also includes Olathe, Prairie Village, and Overland Park in Kansas and Independence, Liberty, Gladstone, Raytown, Lee's Summit, Grandview, and North Kansas City in Missouri.

French fur traders, led by François Chouteau, were the first permanent settlers (1821), and in 1833 Westport was laid out and flourished as an outfitting post for western overland expeditions. Meanwhile, Chouteau's settlement, known as Westport Landing, prospered as a river port and as the terminus for the Santa Fe and Oregon trails. It was chartered in 1850 as



Liberty Memorial, Kansas City, Mo.
Jack Zehrt

the Town of Kansas (named for the river) and as a city in 1853. It became Kansas City under an 1889 charter in order to distinguish it from the territory. During the American Civil War, the city was sharply divided and was the target of several skirmishes, including raids by the Confederate guerrilla W.C. Quantrill. Rapid growth followed after Kansas City was reached (1865) by a railroad from St. Louis and linked with the Hannibal and St. Joseph Railroad (1869) by bridge across the Missouri River.

Kansas City is now the marketing and shipping centre for a vast agricultural region with a livestock exchange and stockyards and extensive grain-storage, meat-packing, and food-processing facilities. Its diversified industries include the manufacture of machinery, transportation equipment, steel, and chemicals, oil refining, auto assembling, and printing and publishing. Nearby Richards–Gebaur Air Force Base (Grandview, Mo.), Sunflower Army Ammunition Plant (De Soto, Kan.), and Lake City Arsenal (Independence, Mo.) are additional economic assets.

The University of Missouri at Kansas City was opened in 1963; colleges and institutions include Rockhurst (1910), Avila (1916), and several Metropolitan Community colleges, the Midwest Research Institute, the Missouri Institute of Technology (1931), the Kansas City College of Osteopathy and Medicine, and the Kansas City Art Institute (1895). Kansas City is the world headquarters for the Church of the Nazarene, the Unity School of Christianity, and the People-to-People Exchange Program. The American Royal Livestock, Horse Show, and Rodeo is an annual event.

The Liberty Memorial is a 217-foot (66-metre) World War I monument near Union Station. Nearby are the William Rockhill Nelson Gallery of Art–Atkins Museum of Fine Arts, the Lone Jack Civil War Museum, and Missouri Town 1855, a preservation of pioneer buildings at Lake Jacomo. Swope Park contains an open-air theatre and zoo. Kemper Arena (1975) hosts special shows and also serves as a sports facility. The Harry S. Truman Sports Complex houses Kansas City's football and baseball teams in two side-by-side stadiums. The Crown Center, an 85-acre (34-hectare) cultural and business centre, opened in 1973. Pop. (1987 est.) city, 444,382; metropolitan area (MSA), 1,546,400 (Missouri–Kansas).

Kansas City Group, division of Pennsylvanian rocks in the U.S. (the Pennsylvanian Period began about 325,000,000 years ago and lasted about 45,000,000 years); it was named for exposures studied in the region of Kansas City, Mo. Rocks of the Kansas City Group underlie those of the Lansing Group and overlie those of the Pleasanton Group, all of which are included within the Missourian Series. The Kansas City Group consists of six limestone formations that alternate with six shale units. The rocks are fossiliferous and contain important fusulinid genera useful for stratigraphic correlation.

Kansas City Star, evening daily newspaper published in Kansas City, Mo., the leading paper of the region and one of the great newspapers of the United States.

It was established in 1880 by William Rockhill Nelson and a partner, who soon retired. From its earliest days the *Star* conducted campaigns against such civic abuses as election frauds and dishonesty in government. As the *Star*'s editor, Nelson dominated every aspect of its activities. His *Star* in the 1890s successfully campaigned for a municipal auditorium, in keeping with Nelson's conviction that part of a newspaper's challenge was to "build things up."

After Nelson's death, in 1915, an employee-ownership plan was devised by his son-in-law, Irwin R. Kirkwood, and control of the paper passed to the employees. The *Star* had become famous for its crusading journalism and its thorough news coverage and editorials. Great attention was paid to maintaining a staff of the highest quality. Two of its alumni are Ernest Hemingway and Edgar Snow.

Kansas City style, music associated with jazz musicians who, though not all born there, were based around Kansas City, Mo., during the 1930s: pianists Pete Johnson and Mary Lou Williams; singer Joe Turner; trumpeter Oran "Hot Lips" Page; saxophonists Buster Smith, Ben Webster, and Lester Young; bassist-bandleader Walter Page; saxophonist-bandleader Andy Kirk; and pianist-bandleaders Bennie Moten, Jay McShann, and Count Basie.

Prominent characteristics of Kansas City style were the loose and relaxed rhythmic feeling (less stiff than Chicago and New York City counterparts) and a simplicity of arrangement that often took the form of syncopated, repeating phrases, called riffs, that were played by one section of the band antiphonally against another (saxes versus brass, for example). Saxophonists preferred a tone that was drier and had slower vibrato than was common on the East Coast.

The style received national attention when Count Basie broadcast and then toured with a band he formed from the remnants of Walter Page's Blue Devils and the Bennie Moten band. This was the Kansas City sound with Lester Young as star soloist. Then, under the influence of Buster Smith, a highly respected saxophonist and teacher, saxophonist Charlie Parker developed and was heard soloing with the Jay McShann band, before he helped to launch the modern jazz style known as bebop.

Though usually thought of as principally a swing era big band style because of the bands led by Andy Kirk, Jay McShann, and Count Basie, Kansas City jazz from the 1920s to the '40s developed much as it did in New York City and Chicago: first with New Orleans style combos, then larger combos (adding written and more elaborate arrangements), and finally culminating with the instrumentation of the swing era big band. Extended discussion, including speculation on the political and economic factors contributing to a fertile entertainment scene in 1930s Kansas City, is provided by Ross Russell's *Jazz Style in Kansas City and the Southwest* (1971) and in Leroy Ostransky's *Jazz City* (1978).

Kansas–Nebraska Act (May 30, 1854), in the antebellum period of U.S. history, critical national policy change concerning the expansion of slavery into the territories, affirming the concept of popular sovereignty (*q.v.*) over congressional edict. In 1820 the Missouri Compromise had excluded slavery from that part of the Louisiana Purchase (except Missouri) north of the 36°30′ parallel. The Kansas–Nebraska Act, sponsored by Democratic Sen. Stephen A. Douglas, provided for the territorial organization of Kansas and Nebraska under the principle of popular sovereignty, which had been applied to New Mexico and Utah in the Compromise of 1850.

Written in an effort to arrest the escalating sectional controversy over the extension of slavery, the Kansas–Nebraska Act ironically fanned the flame of national division. It was attacked by free-soil and anti-slavery factions as a capitulation to the proponents of slavery. Passage of the act was followed by the establishment of the Republican Party as a viable political organization opposed to the expansion of slavery into the territories. In the Kansas Territory a migration of proslavery and anti-slavery factions, seeking to win control for their respective institutions, resulted in a period of political chaos and bloodshed. *See* Bleeding Kansas.

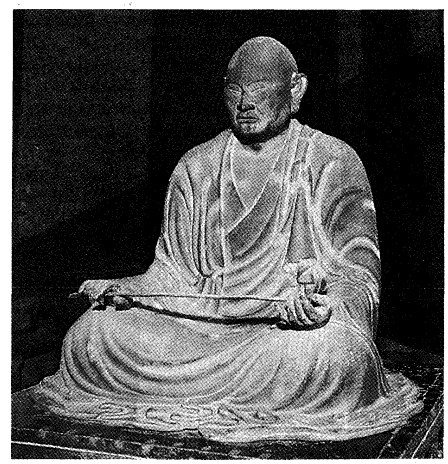
Kansas River, also called KAW RIVER, 169-mi (272-km) stream in northeastern Kansas, U.S., formed by the confluence of the Republican and Smoky Hill rivers at Junction City and joined by the Big Blue River near Manhattan. Flowing east into the Missouri River at Kansas City, it drains an area of 61,300 sq mi (158,770 sq km), including northern Kansas and parts of southern Nebraska and eastern Colorado. In July 1951, and again in September 1977, unusually heavy rains resulted in devastating flooding of the river area, especially around Kansas City.

Kansei reforms, series of conservative measures promoted (largely during the Kansei era [1789–1801]) by the Japanese statesman Matsudaira Sadanobu between 1787 and 1793 to restore the sinking financial and moral condition of the Tokugawa government.

Commerce, especially with the West, was curtailed, while agriculture was encouraged. Curbs were even placed on the migration of farmers to the cities, and debts to merchants incurred by retainers of the Tokugawa shogun, or hereditary military dictator of Japan, were either reduced or cancelled. Sadanobu also initiated a general policy of frugality and placed strict limitations on the expenditures of all classes. Chu Hsi Confucianism was promoted as the orthodox school of philosophy, and publications came under rigorous censorship. Although the measures resulted in less oppressive famine conditions and temporarily bolstered governmental finances, the reforms were gradually undone after Sadanobu's dismissal.

kanshitsu (Japanese: "dry lacquer"), technique of Japanese sculpture and decorative arts in which a figure or vessel is fashioned with many layers of hemp cloth soaked with lacquer, the surface details being subsequently modelled with a mixture of lacquer, sawdust, powdered clay stone, and other materials. The technique has two varieties: hollow *kanshitsu* (called *dakkatsu*), made by preparing the rough shape with clay and covering the surface with lacquered hemp cloth, the clay being subsequently removed to leave the inside hollow; and wood-core *kanshitsu* (*mokushin*), in which a hemp-cloth coating is applied over a core carved of wood. Vessels are made by the hollow *kanshitsu* method, sculpture by either method.

Kanshitsu was imported to Japan from T'ang China in the Nara period (645–794). Some bowls dating from this period are in the Tokyo National Museum, but because *kanshitsu* was employed at that time chiefly for Buddhist sculpture, extant statues are far more numerous than examples of decorative art. Among



Kanshitsu sculpture of the priest Gyoshin, late 8th century; in the Hōryū-ji, Nara, Japan

By courtesy of the Horyu-ji, Nara

the former are Hachi-bu-shū (Eight Supernatural Guardians of the Buddha) and six surviving Jū Dai Deshi (Ten Great Disciples of the Buddha) at the Kōfuku temple in Nara. In the 20th century the hollow *kanshitsu* technique is still used to create fine lacquer ware such as vases, plates, and bowls.

Kansk, city, Krasnoyarsk *kray* (territory), central Russian Soviet Federated Socialist Republic, on the Kan River where it is crossed by the Trans-Siberian Railroad. Founded in 1640 as a Russian fort, it is a centre of the Kansk-Achinsk lignite basin, which in the early 1980s was being developed into one of the largest coal areas of the U.S.S.R. It also has cotton, timber hydrolysis, and food industries. Pop. (1983 est.) 102,000.

Kansu, Wade–Giles romanization KAN-SU, Pinyin GANSU, *sheng* (province), administratively a part of the Northwest region, reaching into the geographic centre of the People's Republic of China. It is bordered by the Mongolian People's Republic to the north; by the Chinese provinces of Tsinghai and Szechwan to the south; by the Ningsia Hui Autonomous Region, the province of Shensi, and the Inner Mongolian Autonomous Region to the east; and by the Sinkiang Uighur Autonomous Region to the west. The narrow corridor of Kansu has served for several centuries as a passageway between the Upper Huang Ho (Yellow River) area and western China.

The article that follows is a summary of the significant detail about the Chinese province of Kansu; for additional detail about its geography, history, economy, and culture, *see* MACROPAEDIA: China.

Kansu became a part of Chinese territory during the Ch'in dynasty (221–206 BC). It was a well-travelled corridor, renowned as the entranceway into China used by Marco Polo. The name Kansu comes from the two districts, Kan-chou and Su-chou, which Kansu comprised in the Yuan dynasty (1279–1368). The province was under the Ch'ing dynasty from 1644 until 1911. One of the most prominent governors general during this time was Tso Tsung-t'ang (1812–85), who after the Taiping and Muslim rebellions brought the province a half century of peace. Its capital is Lan-chou, a city on the south bank of the Huang Ho.

Plateaus are the dominant physical features of Kansu. The area called the Kansu corridor is 120 mi. northwest of Lanchou. This is a

stretch of interior drainage where the land is relatively flat and glacier-fed streams, including the Hei Ho (Black River), disappear into the desert. Willows and poplars grow along the roads and ditches. Eastern Kansu is the principal centre of earthquakes in China. One of the greatest disasters of modern times occurred in 1920, when a violent earthquake centred in eastern Kansu caused great landslides. The death toll was estimated at 200,000; many cities and towns were totally destroyed.

The climate in Kansu undergoes sharp fluctuations of temperature in summer and winter. Rainfall is meagre, uneven, and unpredictable. The region is frequently subjected not only to earthquakes but droughts and famines as well.

The population is concentrated in the Lanchou Basin, in the fertile valley plains of the south and central sections where irrigation is possible, and in the dry terrace land of the Liu-p'an Mountains. The people are mainly Chinese, although there are groups of Mongols, Turks, and Tibetans. Most of the latter speak Chinese as a second language. Village life among the Chinese is similar to that elsewhere in northern China, with 20 to 30 families in a village. Dwellings are conventional types of mud huts. Some people live in caves, which may be elaborate, with fine furnishings, or simply scooped out of the porous yellow earth cliffs. Kansu represents a colourful mixture of races, customs, and cultures. The land abounds with mosques, lamaseries, and Chinese temples.

Kansu eating habits differ slightly from those of the Chinese in other parts of the country. Rather than rice, wheat flour is eaten. Wheat is the chief crop throughout the province; barley, millet, beans, and sweet potatoes are also important food crops, although the output is insufficient to feed the population. Cotton, wool, and tobacco are produced as cash crops. Lan-chou and its vicinity are known for fruit growing. The province is rich in minerals, including oil, coal, and iron ore.

Not until the 1950s were rail and highway links established between Kansu and the rest of the country. Area 141,500 square miles (366,500 square km). Pop. (1988 est.) 21,034,000.

Kant, Immanuel (b. April 22, 1724, Königsberg, Prussia [now Kaliningrad, Russian S.F.S.R.]—d. Feb. 12, 1804, Königsberg), German metaphysician and philosopher whose comprehensive and systematic work in the theory of knowledge, ethics, and aesthetics greatly influenced subsequent philosophy, especially the various German schools of Kantianism and idealism.

A brief treatment of the life and works of Immanuel Kant follows. For full treatment, *see* MACROPAEDIA: Kantianism, Kant and.

Kant's whole life was spent in Königsberg. He entered the university (1740) there as a theological student but was principally attracted to mathematics and physics, especially the work of Sir Isaac Newton. He served as a family tutor (1746–55) until he was able to complete his degree at the university. He then held the position of privatdocent (lecturer) for 15 years, during which time his fame as a teacher and lecturer increased and his interests broadened. During the 1760s he became increasingly critical of the philosophy of G.W. Leibniz, which was then prevalent in German universities, attacking both its mathematical methods and its leading ideas. In 1770 he was appointed to the chair of logic and metaphysics and began a period during which he published an astounding series of original works.

Kant's chief works were the *Kritik der reinen Vernunft* (1781; *Critique of Pure Reason*), a treatise about metaphysics; the *Kritik der praktischen Vernunft* (1788; "Critique of Practical Reason"), the standard source for his ethical doctrines; and the *Kritik der Urteilskraft* (1790; "Critique of Judgment"), a series of appendixes to the other two *Kritiks*.

Kantemir, Antiokh Dmitriyevich, also spelled ANTIOCH DMITRIEVICH CANTEMIR (b. Sept. 21 [Sept. 10, Old Style], 1708, Constantinople [now Istanbul], Tur.—d. April 11 [March 31], 1744, Paris, Fr.), distinguished Russian statesman who was his country's first secular poet and one of its leading writers of the classical school.

The son of Dmitry Kantemir, he was tutored at home and attended (1724–25) the St. Petersburg Academy. Between 1729 and 1731 he wrote several poems, the most important probably being two satires, "To His Own Mind: On Those Who Blame Education" and "On the Envy and Pride of Evil-Minded Courtiers." These poems denounced the opposition to the reforms of the emperor Peter the Great and enjoyed great success when circulated in manuscript (they were not printed until 1762). As ambassador to England (1732–36), he took to London the manuscript of his father's history of the Ottoman Empire, furnishing a biography of his father that appeared with the English translation of the history.

From 1736 until his death, Kantemir was minister plenipotentiary in Paris, where he formed friendships with Voltaire and Montesquieu and continued to write satires and fables. His Russian translations of several classical and contemporary authors include his 1740 translation of the French man of letters Bernard Le Bovier de Fontenelle's *Entretiens sur la pluralité des mondes* (1686; "Interviews on the Pluralitism of the World"), which was suppressed as heretical. He also wrote a philosophical work, *O prirode i cheloveke* (1742; "Letters on Nature and Man"), and a tract on the old syllabic system of Russian verse composition (1744).

Kantemir, Dmitry (Konstantinovich) Romanian DIMITRIE CANTEMIR (b. Nov. 5 [Oct. 26, Old Style], 1673, Orhei or Fălciu, Moldavia [now Fălciu, Rom.]—d. Sept. 1 [Aug. 21],



Dmitry Kantemir, detail from a portrait by an unknown artist, 1711

By courtesy of the Enciclopedica Romana, Bucharest

1723, Dmitrovka, near Kharkov, Russia [now in Ukrainian S.S.R.]), statesman and scientist, the greatest member of the distinguished Romanian-Russian family of Cantemir. He was prince of Moldavia (1710–11) and later imperial chancellor of Peter the Great of Russia.

The son of Prince Constantin Cantemir of Moldavia, Kantemir early won the favour of his country's Turkish overlords and hoped eventually to unite the principalities of Moldavia and Walachia under his rule. Named prince of Moldavia in 1710, he soon allied himself with Russia (April 1711), believing Turkish power to be nearing its end. Sharp Russian reverses in the ensuing Russo-Turkish war, however, caused him to flee to Russia, where he settled and was made imperial chancellor and a prince of the empire by Peter the Great. Versed in 11 languages, Kantemir wrote prolifically on Romanian and Ottoman history; his *Historia Incrementorum atque Decrementorum aulae Othomanicae* (1716; *History of the Growth and Decay of the Othman Empire*) provided the first serious history of the Ottoman Empire in any language. His other works include the first critical history of Moldavia-Walachia and the first comprehensive descriptions of Moldavia's geography, ethnography, and economy. He was elected a member of the Berlin Academy for his scientific work in 1714, and he also helped found the Academy of Sciences at St. Petersburg.

kantharos, also spelled CANTHAROS, drinking cup in Attic Greek pottery from the period of the red-figure and black-figure styles (*qq.v.*). The kantharos is in the form of a deep



Kantharos by Douris showing Heracles fighting the Amazons, *c.* 490 BC; in the Musées Royaux d'Art et d'Histoire de Bruxelles

By courtesy of the Musees Royaux d'Art et d'Histoire de Bruxelles; photograph, Louis Loose

cup, with loop-shaped handles arising from the bottom of the body and extending high above the brim.

Kantianism, the system of critical philosophy created by the 18th-century philosopher Immanuel Kant, or the philosophies that have arisen from the study of his writings and have drawn inspiration from his principles.

A brief treatment of the latter sense of the term follows. For full treatment of both senses, *see* MACROPAEDIA: Kantianism, Kant and.

In his general methodological approach, Kant sought to avoid the confusions of earlier thinkers who proposed theories about the nature of the world based on reason—a procedure he called dogmatic—by first examining the possibilities and limits of reason itself—a procedure he called transcendental or critical.

The Kantian movement comprises a loose assemblage of diverse philosophies that participate in the critical spirit and method of Kant and share his concern to explore the nature, and especially the limits, of human knowledge in the hope of raising philosophy to the level of a science. Inasmuch as the work of Kant himself constituted a synthesis of elements very different in origin and nature, each of the sub-movements of Kantianism has tended to focus on its own selection and reading of Kant's many concerns.

At the end of his chief work, the *Kritik der reinen Vernunft* (1781; *Critique of Pure Reason*), Kant enjoined his readers to enter with him upon the "narrow footpath" of critical thought. At the end of the 1790s, Kant's philosophy was being taught at virtually every major German university. Works on the critical philosophy were published in Holland and England by 1796, and by 1801 it had even come to the attention of the French Academy.

Almost immediately, the philosophy generated opposition and reinterpretation. Rationalists and empiricists objected to Kant's critical idealism, while some idealists decried his rationalism and intellectualism. A large group of disciples, especially in Berlin, set about rendering Kant's rigorous teachings

more widely accessible. There emerged in Germany a group of philosophers, often called the Semi-Kantians, who, while identifying themselves with the original Kantian standpoint, nonetheless found it necessary to adapt and reconstruct certain features of Kant's system that they viewed as inadequate, unclear, or even wrong. Notable among this group was Friedrich Schiller, who began his career as a dramatist and turned his attention to philosophy for a few years after reading Kant's *Kritik der Urteils Kraft* (1790; *Critique of Judgment*). Schiller agreed with Kant on the task and limits of philosophy, on the distinction between Realism and Idealism, and on many other points, but perceived a serious error in Kant's sharp distinction between reason and nature and in his location of freedom, morality, beauty, and the aesthetic impulse solely in the former. Schiller sought something that would unite the two, some third impulse to harmonize reason and nature, which he called the aesthetic impulse, or play.

Friedrich Bouterwek initially diverged from Kant in the realm of ethics, where he could not tolerate the lack of a material moral principle; in later writings, he introduced several more Realistic elements. Jakob Fries detested the "prejudice of the transcendental" and attempted to give a foundation of psychological analysis to Kant's critical theory.

The period from 1790 to 1835 was the age of the great system-builders in German philosophy. The numerous branches that diverged after the death of Hegel in 1831 became preoccupied with religious, social, and political questions. A major revival of interest in Kantian philosophy began about 1860, however, the motto for which was coined shortly thereafter by Otto Liebmann—"Zurück nach Kant!" ("Back to Kant!").

At first, Neo-Kantianism, as the revival came to be called, was primarily an epistemological movement, but it slowly extended over the whole domain of philosophy. The Neo-Kantians asserted that philosophy was to be considered not merely a personal conviction or point of view, but a science whose conditions had yet to be formulated. Yet, in attempting to repeat Kant's efforts to lead philosophy "into the safe road of a science," the Neo-Kantians found themselves confronted with a new model in science itself.

The first decisive impetus toward the reception and revival of Kant's fundamental ideas came from natural scientists. The physicist and physiologist Hermann von Helmholtz, for instance, applied physiological studies of the senses to the question of the epistemological significance of spatial perception raised by the "Transcendental Aesthetic" of the first *Critique*. Helmholtz abandoned transcendental for psychological inquiries; for him, the true and permanent achievement of Kantian philosophy was to show the participation of the innate laws of the mind in the formulation of ideas.

Neo-Kantianism reached its apex in the Marburg school of the early 20th century, which included Hermann Cohen and Paul Natorp. These philosophers repudiated the naturalism of Helmholtz and others and reaffirmed the importance of the transcendental method. Another major figure of Marburg Neo-Kantianism was Ernst Cassirer, who brought Kantian principles to bear on the whole realm of cultural phenomena, including art, religion, and mythology. Meanwhile, at Heidelberg, Wilhelm Windelband and Heinrich Rickert carried Kantianism into the realm of the philosophy of history.

The phenomenology of Edmund Husserl and of the early works of Martin Heidegger (who taught at Marburg from 1923 to 1928) relies upon transcendental concepts. Proponents of other modern schools of philosophy have continued to borrow heavily from Kant, but most have drawn as deeply from other sources as well, rendering the label "Neo-Kantian" inappropriate.

Kantipur (Nepal): *see* Kāthmāndu.

Kantō Plain, also spelled KWANTO PLAIN, Japanese KANTŌ-HEIYA, plain that is the most extensive lowland in Japan, located in central Honshu, facing the Pacific Ocean. Its 6,244 sq mi (16,172 sq km) contain the capital city, Tokyo, and constitute the most productive and populous area of the country. The plain is located to the east of the Japanese mountain arc, where it bends from a north–south trend to an east–west direction, and is walled by mountains (north and west) and hills (south). The geologic structure of the youngest rock formations accords with this surface expression, and the plain is often referred to as the Kantō structural basin.

The Kantō Plain is drained by the river systems of the Naka-gawa, Tone-gawa, and Sagami-gawa from northeast to southwest. The Tone-gawa system is the most important, covering the greater part of the plain and supplying hydroelectric energy.

Three kinds of physical features characterize the terrain. Hills, such as the Tama hills in the west, consist of older Quaternary deposits. Most of the plain is covered by tablelands which consist of unconsolidated fanglomerate (a product of alluvial fan formation) or shallow marine sediments. River valley lowlands separate the hills and tablelands into independent sections. Agriculture in this area consists of crops that can grow without irrigation. The upstream reaches of the valleys are gravelly and rather dry, while the central and downstream portions become deltaic, wet, and swampy. Decomposed red-brown volcanic ash soil, often called Kantō loam, covers the flat-topped tablelands.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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Kantō-sammyaku, English KANTŌ RANGE, or KWANTO RANGE, mountain range, on Honshu, Japan, lying to the west of the Kantō Plain. Extending 80 mi (130 km) from north to south and 50 mi from east to west, it forms the physical division between Kantō Region (*chihō;* east) and Chūbu Region (west).

Geologically the range displays crystalline schists and Paleozoic, Mesozoic, and Tertiary formations, which are zonally arranged from north to south. The Kantō-sammyaku joins with the Akaishi-sammyaku in the west.

The range may be divided into two distinct sections, which are separated by the Katsura-gawa (Katsura River), a tributary of the Sagami-gawa. The Chichibu Mountains in the north are the highest mountains of northeastern Japan, containing Kimpō-zan (Mt. Kimpō), which rises to 8,514 ft (2,595 m). The mountains are dissected by narrow, canyon-like valleys and are dominated by steep slopes. River terraces provide habitable regions in the interior. The intermontane basin of Chichibu, near the eastern limit of the range, has been an important settlement area throughout Japanese history.

The southern section of the Kantō-sammyaku is composed of the mountains associated with Tanzawa-yama (Mt. Tanzawa). They extend to the west in the Misaka–Tenshu range, which is crescent shaped and embraces a semicircular depression now buried by Fuji-san. The western extension contains Kenashi-yama (6,381 ft), which is the highest peak in the southern section. Kuro-dake (Mt. Kuro; 5,878 ft) crowns the main body of the Tanzawa Mountains.

Kanton Atoll, Kanton also spelled CANTON, also called ABARIRINGA, largest and northernmost of the Phoenix Islands, a coral group in the west central Pacific Ocean, part of Kiribati. Located 1,630 mi (2,610 km) southwest of Hawaii, Kanton's circular coral reef, occupying 3.5 sq mi (9 sq km), encloses a lagoon 7 mi by 3 mi. Sighted early in the 19th century, the atoll is named for a U.S. whaling ship wrecked there in 1854. After 1856 the atoll's guano deposits were worked until depleted, first by U.S. interests, then by British. Britain claimed Canton in 1889 for use as a transpacific cable station. In the 1930s the atoll gained importance as a transpacific air stop. Rival U.S. and British claims were settled in 1939 by an agreement under which Canton and Enderbury Atoll (32 mi southeast) were to be jointly administered for 50 years. Pan American World Airways built facilities there and began using Canton as a stop in 1940. During World War II it served as a strategic air base. British, U.S., and Australian airlines resumed using Canton after the war, but with the advent of long-range jet aircraft, the airfield is used only as an emergency stop. Starting in 1970, the atoll was used by the United States as a tracking station for antiballistic missiles. When, in 1979, the Phoenix Islands became a part of independent Kiribati, the spelling was changed to Kanton. There are no permanent inhabitants.

kantor (religious official): *see* cantor.

Kantorovich, Leonid Vitalyevich (b. Jan. 19 [Jan. 6, old style], 1912, St. Petersburg, Russia—d. April 7, 1986, U.S.S.R.), Soviet mathematician and economist who shared the 1975 Nobel Prize for economics with Tjalling Koopmans for their work on the optimal allocation of scarce resources.

Kantorovich was educated at Leningrad University, receiving his doctorate in mathematics (1930) there at the age of 18. He became a professor at Leningrad in 1934, a position he held until 1960. From 1971 he was a member of the staff of the Institute of Economic Planning. Kantorovich was elected to the prestigious Academy of Sciences of the Soviet Union (1964) and was awarded the Lenin Prize in 1965.

His most famous work is *The Best Use of Economic Resources* (1959). Kantorovich pioneered the technique of linear programming as a tool of economic planning, having developed a linear programming model in 1939. He used such mathematical techniques to show how the decentralization of decision making in a planned economy ultimately depends on a system in which prices are based on the relative scarcity of resources. Although his background was purely mathematical, his work showed a keen understanding of the economic aspects of problems. He developed a concept called resolving multipliers that corresponds to the shadow prices in Western economic literature. In his own country Kantorovich was a notable "reform" economist whose nondogmatic critical analyses of Soviet economic policy clashed with the views of his orthodox Marxist colleagues.

Kantorowicz, Hermann (b. Nov. 18, 1877, Posen, Ger.—d. Feb. 12, 1940, Cambridge, Cambridgeshire, Eng.), German teacher and scholar whose doctrine of free law (*Freirechtslehre*) contributed to the development of the sociology of law.

Specializing in criminal law, Kantorowicz taught at the universities of Freiburg (1908–29) and Kiel (1929–33) until the rise of the Nazis to power. Afterward, he taught at various universities in the United States, Italy, and (from 1935) Great Britain. His later writings include *Der Geist der englischen Politik und das Gespenst der Einkreisung Deutschlands* (1929; *The Spirit of British Policy and the Myth of the Encirclement of Germany,* 1931); *Dictatorships* (1935); *Studies in the Glossators*

of the Roman Law (1938; with William W. Buckland); and *The Definition of Law* (written 1938, published 1958), in which he elaborated the statement that law is "a body of rules prescribing external conduct and considered justiciable."

According to Kantorowicz' free-law doctrine, judicial decision-making is properly a kind of legislative function. Judges should apply pre-existing legal rules as individual cases require and should declare new law (derived from custom and social usage) to fill statutory gaps to which court proceedings call attention. In expounding these views, Kantorowicz clashed with the legal positivists. In 1911 he drew a distinction, sometimes obliterated by his followers, between the complementary disciplines of jurisprudence (a science of values) and sociology (a science of facts).

Kanuma, city, Tochigi *ken* (prefecture), Honshu, Japan. It lies at the eastern foot of the Ashio Highlands. The central part of the city was a post town during the Tokugawa period (1603–1867); it later developed as a market for hemp seed. Kanuma is now a minor industrial centre, producing lumber, furniture, rope, and brooms. The city is called the source of a certain gardening soil called Kanuma-tsuchi. The western part of the city is a prefectural natural park. From Kanuma, an avenue of Japanese cedars runs northwest to the ancient city of Nikkō. Pop. (1985) 88,078.

kanun (from Greek *kanōn,* "rule"), Arabic QĀNŪN, the tabulation of administrative regulations in the Ottoman Empire that supplemented the Sharīʿah (Islāmic law) and the discretionary authority of the sultan.

In Islāmic judicial theory there was no law other than the Sharīʿah. In the early Islāmic states, however, practical concessions had to be made to custom, to the exigencies of time and place, and to the will of the ruler and applied in separate administrative courts. Under the Ottomans, who devised an elaborate administrative system, the distinctions disappeared between the Sharīʿah and administrative law codified as *kanuns* and *kanunnames* (collection of *kanuns*). In theory, *kanuns* were to harmonize with the prescription of the Sharīʿah, giving the ulama (men of religious learning) the right to invalidate any regulation that contradicted Islāmic law. In practice, however, the ulama, organized in a hierarchy under the authority of the sultan, rarely repudiated his *kanuns,* thus giving the sultan freedom to legislate.

The first *kanunnames* were issued under Sultan Mehmed II (reigned 1444–46, 1451–81), though his predecessors had promulgated individual *kanuns.* The *kanuns* of Selim I (reigned 1512–20) and Süleyman I (reigned 1520–66), called Kanuni ("Law Giver"), were known for their political wisdom.

Kanuri, African people, the dominant element of the population of Borno state in northeastern Nigeria and also found in large numbers in southeastern Niger. The Kanuri language is classified as belonging to the Saharan branch of the Nilo-Saharan family.

The Kanuri developed a powerful state at the Sudanese terminus of the major trans-Saharan trade route through the Bilma oasis to Libya. This empire, called Borno, reached its zenith in the 16th century. The Kanuri have been Muslims since the 11th century and practice the Malikite code of Islāmic law.

Kanuri economy is based on millet agriculture; in recent times, however, peanuts (groundnuts) have become an important additional cash crop. The Kanuri live in settled villages and towns and farm the sandy soil of the surrounding countryside. Maiduguri is the capital of Borno state. The Kanuri are a commercial people with well-developed internal trade; they trade with the Fulani and Shuwa Arab herders for dairy products. Cowhide and goatskin are exported in quantity.

Kanuri society is stratified into several distinct classes. The family of the *shehu,* the political and religious head of all Kanuri, forms a royal lineage. Much pageantry continues to be connected with the court. Most Kanuri are in the class of commoners. Before the British came, there was also a class of slaves who could, nonetheless, rise to prominence in court. Kin groups are not important; the household of a rich, powerful, and noble individual becomes the central focus for many people. The Kanuri are polygynous. The typical household unit is the nuclear family of husband, wife, and children or the polygynous family living in a compound. Houses are of sun-dried mud bricks and may be square or round, with flat or thatched roofs, respectively.

Kanyakubja (India): *see* Kannauj.

Kanyākumāri (India): *see* Kanniyākumāri.

Kanye, village, southern Botswana. It lies along a main road southwest of Gaborone, the national capital. It is one of the country's largest villages and the traditional headquarters of the Bangwaketse people. Kanye is equipped with a mission hospital, an airfield, banks, and schools. Pop. (1984 est.) 23,000.

Kanze school, Japanese KANZE-RYŪ, school of nō theatre (*q.v.*) known for its emphasis on beauty and elegance. The school was founded in the 14th century by Kan'ami (*q.v.*), who founded the Yūzaki-za (Yūzaki troupe), the precursor of the Kanze school. The second master, Zeami Motokiyo, completed the basic form of the art under the protection of the shogun Ashikaga Yoshimitsu.

Since the Muromachi period (1338–1573) the Kanze school has been the largest nō group in Japan—registering several hundred nō musicians and more than half the dues-paying nō enthusiasts of Japan.

Kao Ch'i-p'ei, Pinyin GAO QIPEI (b. 1672, Liao-yang, Manchuria—d. 1734), one of the few Chinese landscape painters to be technically innovative—using his hands (palms, fingers, nails) in place of the traditional Chinese brush. Kao Ch'i-p'ei was precocious and gifted and served in an official capacity during the Ch'ing period. His larger paintings for the Manchu court were somewhat more orthodox, but he painted smaller works with great speed and facility, revealing in them his rather conscious attempts at originality.

Kao-hou, also called LÜ-HOU, or LÜ-SHIH, personal name (*hsing-ming*) LÜ O-HSÜ, or LÜ CHIH (d. 180 BC, China), the first woman ruler of China, wife of Kao-tsu, the first emperor of the Han dynasty (206 BC–AD 220).

After Kao-tsu's death, his and Kao-hou's young son, the emperor Hui-ti (reigned 195–188 BC), ascended the throne. Kao-hou, whose ambition had spurred her husband's rise to power, acted as regent and seized real power for herself. A cruel, vindictive woman, she consolidated her position by ignoring members of the ruling family and promoting her relatives to important posts.

When the emperor Hui-ti died, Kao-hou arranged for another infant to succeed him. When the new young ruler began to assert his independence, she had him imprisoned and replaced with yet another child. After her death, her efforts on behalf of the Lü clan were reversed by a coalition of high ministers and disgruntled princes of the imperial family who massacred the clan. Power returned to Kao-tsu's family when Wen-ti, his oldest living son by another wife, ascended the throne.

Kao-hsiung, *hsien* (county), southwestern Taiwan. With an area of 1,078 square miles (2,793 square km), it is bordered by the *hsiens* of T'ai-nan and Chia-i (north), T'ai-tung and Hua-lien (east), and P'ing-tung (south) and by the Taiwan Strait (west). Kao-hsiung city and its major international port with a large dry dock are situated in the western-coastal region of the *hsien.* The Yü Mountains, extending over most of the northern part, give rise to the Ch'i-shan and Lao-nung rivers and merge gradually with the fertile coastal plains in the south. Mount Yü (also called Mount Hsin-kao, formerly Mount Morrison), at 13,114 feet (3,997 m) above sea level, is Taiwan's highest peak. Rice, sugarcane, tobacco, bananas, and pineapples are grown in the *hsien.* The town of Mei-nung, known as the "tobacco kingdom," has about 4,950 acres (2,000 hectares) devoted to tobacco farming. One of the chief industrial regions of Taiwan, Kao-hsiung *hsien* produces cement, aluminum, paper, fertilizer, plywood, and small machinery; shipbuilding and oil refining are also important. Fo-kuan Hill in Hsin-tien has one of the largest Buddhist temples in southeast Asia. Ch'eng-ch'ing



Ch'un-ch'iu (Spring and Autumn) Pagodas in Kao-hsiung, Taiwan

George Holton—Photo Researchers/EB Inc.

Lake, the tomb of king Ning-ching, and the Ch'un-ch'iu (Spring and Autumn) Pagodas are major tourist attractions. Feng-shan is the administrative seat and is linked by railway to Chi-lung Keelung in northern Taiwan. The National Sun Yat-sen University was founded in 1980 at Kao-hsiung city. Pop. (1989 est.) 1,095,790.

Kao-hsiung, Japanese TAKAO, *shih* (municipality) and major international port in southwestern Taiwan, with an area of 59 square miles (154 square km). The site has been settled since the later part of the Ming dynasty (1368–1644). In early times the Chinese called the place Ta-kou, a rough rendering of the name of the local aboriginal tribe, the Makattao, or Takow. The Dutch, who occupied the area from 1624 to 1660, knew it as Tancoia. Settlement began in earnest in the late 17th century, when the place was known as Ch'i-hou. Opened in 1863 as a treaty port, subsidiary to the port of An-p'ing farther north on the coast, Kao-hsiung became a customs station in 1864 and then gradually became an important port for the southern Taiwan coastal plain. While it has a splendid natural harbour, its harbour entrance is narrow and rock-strewn and requires dredging.

Kao-hsiung's real importance began under the Japanese occupation (1895–1945). The Japanese needed a good port in southern Taiwan to serve those areas that were to become a major source of raw materials and food for Japan, and Kao-hsiung was chosen. It became the southern terminus of the main north-south railway line, and from 1904 to 1907 extensive harbour works were undertaken. In 1920 the port was given the name Takao, the Japanese pronunciation of the Chinese characters for

Kao-hsiung; in the same year, it became a municipality. Before and during World War II it was a major base for Japan's campaigns in Southeast Asia and the Pacific, and extremely ambitious plans for the construction of a massive modern port were drawn up. At the same time, it handled a growing share of Taiwan's agricultural exports to Japan. Toward the end of the war, too, the Japanese promoted some industrial development at Kao-hsiung, establishing an aluminum industry based on the abundant hydroelectric power produced by the Jih-yüeh Lake project in the mountains.

After it came under Chinese administration in 1945, Kao-hsiung developed rapidly. The port, badly damaged in World War II, was restored. It also became a fishing port for boats sailing to Philippine and Indonesian waters. Largely because of its climate, Kao-hsiung has overtaken Chi-lung as Taiwan's major port. As an exporting centre, it serves the rich agricultural hinterland of southern Taiwan, as well as the southeast. The main raw-material exports shipped from Kao-hsiung are rice, sugar, bananas, pineapples, peanuts (groundnuts), and citrus fruits.

Kao-hsiung is also a major industrial city. The 5,500-acre (2,225-hectare) Linhai Industrial Park, located on the waterfront, was completed in the mid-1970s. It includes a steel mill, shipyard, petrochemical complex, and other industries. The city also has an oil refinery, aluminum works, cement works, fertilizer factories, sugar refineries, brick and tile works, and salt-manufacturing and papermaking plants. Designated an export-processing zone in the late 1970s, Kao-hsiung has succeeded in attracting foreign investment to process locally purchased raw materials for export. A large canning industry in the city processes both fruit and fish.

Kao-hsiung has a number of colleges and junior colleges offering training in commerce, education, maritime technology, medicine, modern languages, nursing, and technology. An international airport and the Sun Yat-Sen Memorial Freeway serve the city. Pop. (1989 est.) 1,364,356.

Kao-hsiung Hsien (Taiwan): *see* Feng-shan.

Kao Huang-ti (ruler of China): *see* Nurhachi.

Kao Kang (Chinese official): *see* Gao Gang.

Kao Ming, Pinyin GAO MING, courtesy name (*tzu*) KAO TSE-CH'ENG (b. *c.* 1305, Yung-chia [Jui-an], China—d. *c.* 1370, Ning-hai, Chekiang province), Chinese poet and playwright whose sole surviving opera, *P'i-p'a chi* ("Lute Story"), set the tenor of Ming-dynasty drama.

Quitting a frustrating official career under the Mongol regime in 1356, Kao found a new vocation in the theatre. As a southerner, he shunned the fashionable *tsa-chü,* or "variety theatre," which was flourishing in the north under Mongol patronage, and instead wrote for the *nan-hsi,* or "southern drama," an operatic folk theatre associated with the former Sung capital of Hang-chou. His opera *P'i-p'a chi,* completed about 1367, won the favour of the founding Ming emperor and enjoyed sufficient popularity to restore this regional theatre to national stature. A moralistic tragicomedy, the opera tells how a devoted wife, Chao Wu-niang, wanders as an itinerant lute player to find her husband, Ts'ai Yung, an ambitious scholar who has abandoned her in quest of fame at court. The work won renown for both its libretto, which elevated the popular operatic verse into a polished poetic medium, and the melodiousness of its romantic southern music.

Kaō Ninga (fl. early 14th century, Japan), artist who painted some of the earliest Japanese *suiboku* works—a Chinese-inspired style of monochromatic ink painting favoured by Zen Buddhist priest-painters. His portrait of Kanzan, a mythical figure who represents the Zen way of life, and the techniques used in the portrait (strong abbreviated outlines that contrast with soft washes, asymmetrical composition, and significant empty space) foreshadow those of the *suiboku* school, which flourished in the 15th and 16th centuries.

There has been much confusion about the identity of Kaō, whose name appears on the portrait of Kanzan and on other early *suiboku-ga.* Some believe that Kaō was a high-ranking Zen priest named Kaō Sōnen; others have identified him as the painter Ryōzen, though the latter suggestion has been largely discounted on stylistic grounds. Still others have suggested that he was another professional Buddhist painter associated with the Takuma school. Whatever Kaō's true identity, his work, along with that of Mokuan, a Japanese priest-painter of the early 14th century, constitutes the foundation of ink painting in Japan.

Kao-ti (Chinese emperor): *see* Hung-wu.

Kao-tsu, Pinyin GAO ZU (temple name, or *miao-hao*), personal name (*hsing-ming*) LIU PANG, or LIU CHI, posthumous name (*shih*) KAO HUANG-TI (b. 256 BC, China—d. 195 BC, China), founder and first emperor of the Han dynasty (206 BC–AD 220), under which the Chinese imperial system assumed most of the characteristics that it was to retain until it was overthrown in 1911/12. He reigned from 206 to 195 BC.

Born of a peasant family, Liu Pang began his career as a police officer under the Ch'in dynasty (221–206 BC). He turned rebel after the death of the Ch'in emperor Shih huang-ti, who had been the first to unify China. The rebels were under the nominal leadership of Hsiang Yü, a warlord who defeated the Ch'in armies and then tried to restore the pre-Ch'in feudal system, reinstating many of the former nobles and dividing the land among his generals. Liu Pang, by then an important rebel leader, received control of the kingdom of Han in West China, now Szechwan and southern Shensi provinces. The former allies soon turned against each other, and Liu's peasant shrewdness led him to victory over the militarily brillant but politically naive Hsiang Yü. The civil war ended when Hsiang Yü took his own life in 202 BC, upon which Kao-tsu became the ruler of China.

Liu was a coarse man who once urinated into the formal hat of a court scholar to show his disdain for education. Nevertheless, he was a pragmatic and flexible ruler who recognized the need for educated men at court. He showed particular concern for reviving the rural economy and for lightening the tax burden of the peasants. Though generally humane in civil matters, he dealt harshly with those who threatened his reign from within China. His conduct of foreign affairs was a skillful combination of diplomacy and the use of force. His descendants continued the process of consolidating and expanding the empire.

Kao-tsu (Chinese emperors): *see* Hsiao-wen ti; Wu-ti; Yang-ti.

Kao-tsu, Pinyin GAO ZU (temple name, or *miao-hao*), personal name (*hsing-ming*) LI YÜAN (b. 566, Ch'eng-chi, Shansi province, China—d. 635, Ch'ang-an), the founder and first emperor of the T'ang dynasty (618–907).

Although Kao claimed to be of Chinese descent, his family was intermarried with nomadic tribes of North China. As an official of the Sui dynasty (581–618), Kao-tsu was expected to suppress peasant revolts and prevent incursions of Turkish nomads into North China. With the Sui dynasty about to disintegrate, Li Yüan—urged on by Li Shih-min (later T'ai-tsung), his ambitious second son—rose in rebellion in 617. Aided by Turkish allies, Li Yüan captured the capital at Ch'ang-an. The next year, he proclaimed the T'ang dynasty. Thereafter, he worked to reform taxation and coinage, while Li Shih-min finished eliminating rival claimants to the throne. In 626 Li Yüan abdicated to Li Shih-min, who had meanwhile destroyed his rival brothers.

Kao-tsung, Pinyin GAO ZONG (temple name, or *miao-hao*), personal name (*hsing-ming*) LI CHIH (b. 628, Ch'ang-an, China—d. 683, Ch'ang-an), third emperor of the T'ang dynasty and husband of the empress Wu Hou (625–705). He expanded the T'ang empire into Korea.

In 649 Kao-tsung succeeded his father, T'ai-tsung. He continued his father's foreign campaigns, conquering the Korean peninsula and making Korea a vassal state in 668. In domestic affairs he ended the lavish expenditure on palace construction carried out by his father. But he proved to be a weak ruler and in his later years was dominated by his consort, the empress Wu, a former concubine of his father. Kao-tsung had rescued her from the convent to which she had been sent upon T'ai-tsung's death. After Kao-tsung's death, Wu attempted to rule through a series of puppets until 690, when she usurped the throne herself.

Kao-tsung, Pinyin GAO ZONG (temple name, or *miao-hao*), personal name (*hsing-ming*) CHAO KOU (b. 1107, China—d. 1187, China), first emperor of the Southern Sung dynasty (1127–1279). He fled to the South when the nomadic Juchen tribesmen overran North China and captured Kao-tsung's father, the abdicated emperor Hui-tsung (reigned 1100–25/26), and Kao-tsung's brother, the emperor Ch'in-tsung (1125/26–27). Kao-tsung reestablished the dynasty in the South with greatly reduced territory in 1127. The Juchen had pursued him, but the great general Yüeh Fei held off the invaders, who in any case were having difficulty using their cavalry in the rivers and hills of South and Central China.

The war caused great hardship, and a debate arose within the Cabinet over the value of continuing it. The peace faction prevailed, Yüeh Fei was executed, and in 1141 a peace treaty was signed. In 1162 the war again erupted for a short period. After a new peace treaty was signed in that same year, Kao-tsung abdicated. Despite its reduced size, the Southern Sung became in many ways a wealthier country than the combined Sung empire had been.

Kao-tsung (1711–99): *see* Ch'ien-lung.

Kao-yao (China): *see* Chao-ch'ing.

Kaokoland, also called KAOKOVELD, geographic region, northwestern Namibia. It is inhabited by the Bantu-speaking Herero, Ovahimba, and Ovatjimba nomadic pastoralists. Kaokoland is bordered by Angola and the Kunene River to the north, the Owambo geographic region to the east, the Hoanib River to the south, and the Atlantic Ocean to the west. It is an arid, sparsely populated, and extremely isolated region that was originally settled by the Herero, who migrated from central Africa in the mid-16th century. In the 1870s Boers trekking northwestward from western Transvaal settled in Kaokoland for a time before pressing on to Angola; the ruins of their buildings can be seen at Otjitunduwa and Kaoko Otavi.

Much of inland Kaokoland is mountainous, with an average elevation of about 4,500 feet (1,400 m). Numerous relatively short, rugged mountain ranges in the region are covered with a variety of grasses, succulents (such as aloe), and scattered dwarf trees. Between the mountain ranges and the Atlantic coast is a nearly uninhabited section of the Namib Desert that supports little vegetation except occasional succulents. A region of gravel plains and rock platforms, the desert's narrow

coastal belt, called the Skeleton Coast, is often foggy and humid because of cool offshore currents. Water is scarce except along the Kunene River; elsewhere in Kaokoland pools of water are sometimes found in otherwise dry riverbeds. There are a few springs adequate to support limited irrigation of garden crops. The local nomadic tribes raise cattle, sheep, and goats; hunt wild game; and gather wild roots and berries after rains. Diamonds are sometimes found along the coast, and iron ore has been discovered inland. Opuwo (also called Ohopoho) and Kaoko Otavi are the main settlements.

Kaolack, town, west-central Senegal, western Africa, on the right bank of the Saloum River, 95 miles (150 km) east-southeast of Dakar. An ocean and river port with an important export trade in peanuts (groundnuts) and salt, it is linked by rail with Guinguinéo (13 miles northeast) and the Dakar–Niger railway. It is also the hub of the road network that serves both the southern and eastern parts of Senegal. Kaolack is the centre of the Tijānīyah order of Islām, whose great mosque of al-Ḥājj Ibrāhīm Niasse is just outside the town. Pop. (1984 est.) 126,947.

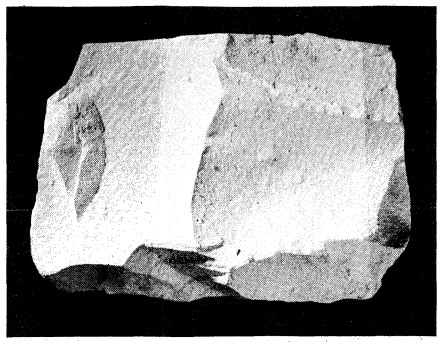
kaolin, also called CHINA CLAY, soft white clay that is an essential ingredient in the manufacture of china and porcelain and is widely used in the making of paper, rubber, paint, and many other products. Kaolin is named after the hill in China (K'ao-ling) from which it was mined for centuries. Samples of kaolin were first sent to Europe by a French Jesuit missionary around 1700 as examples of the materials used by the Chinese in the manufacture of porcelain.

In its natural state kaolin is a white, soft powder consisting principally of the mineral kaolinite, which, under the electron microscope, is seen to consist of roughly hexagonal, platy crystals ranging in size from about 0.1 micrometre to 10 micrometres or even larger, and also in vermicular and booklike forms. Occasionally macroscopic forms approaching millimetre size are found. Kaolin as found naturally usually contains varying amounts of other minerals such as muscovite, quartz, feldspar, and anatase. In addition crude kaolin is frequently stained yellow by iron hydroxide pigments. It is often necessary to bleach the clay chemically to remove the iron pigment and to wash it with water to remove the other minerals in order to prepare the kaolin for satisfactory commercial use.

When kaolin is mixed with water in the range of 20 to 35 percent, it becomes plastic (*i.e.,* it can be molded under pressure), and the shape is retained after the pressure is removed. With larger percentages of water, the kaolin forms a slurry, or watery suspension. The amount of water required to achieve plasticity and viscosity varies with the size of the kaolinite particles and also with certain chemicals that may be present in the kaolin. Kaolin has been mined in France, England, Saxony (Germany), Czechoslovakia, and in the United States, where the best known deposits are in the southeastern states.

Approximately 40 percent of the kaolin produced is used in the filling and coating of paper. In filling, the kaolin is mixed with the cellulose fibre and forms an integral part of the paper sheet to give it body, colour, opacity, and printability. In coating, the kaolin is plated along with an adhesive on the paper's surface to give gloss, colour, high opacity, and greater printability. Kaolins used for coating are prepared so that most of the kaolinite particles are less than two micrometres in diameter.

Kaolins are used extensively in the ceramic industry, where their high fusion temperature



Kaolin from Dry Branch, Georgia
B.M. Shaub

and white burning characteristics make them particularly suitable for the manufacture of whiteware (china), porcelain, and refractories. The absence of any iron, alkalies, or alkaline earths in the molecular structure of kaolinite confers upon it these desirable ceramic properties. In the manufacture of whiteware the kaolin is usually mixed with approximately equal amounts of silica and feldspar and a somewhat smaller amount of a plastic light-burning clay known as ball clay. These components are necessary to obtain the proper properties of plasticity, shrinkage, vitrification, etc., for forming and firing the ware. Kaolin is generally used alone in the manufacture of refractories.

Substantial tonnages of kaolin are used for filling rubber to improve its mechanical strength and resistance to abrasion. For this purpose, the clay used must be extremely pure kaolinite and exceedingly fine grained. Kaolin is also used as an extender and flattening agent in paints. It is frequently used in adhesives for paper to control the penetration into the paper. Kaolin is an important ingredient in ink, organic plastics, some cosmetics, and many other products where its very fine particle size, whiteness, chemical inertness, and absorption properties give it particular value.

kaolinite, group of common clay minerals that are hydrous aluminum silicates; they comprise the principal ingredients of kaolin (china clay). The group includes kaolinite and its rarer forms, dickite and nacrite, halloysite, and allophane, which are chemically similar to kaolinite but amorphous.

Kaolinite, nacrite, and dickite occur as minute, sometimes elongated, hexagonal plates in compact or granular masses and in mica-like piles. They are natural alteration products of feldspars, feldspathoids, and other silicates. Anauxite, which was previously regarded as a kaolinite-group mineral possessing a higher than usual silica–alumina ratio, is now considered to be kaolinite and free silica (mainly noncrystalline). For chemical formula and detailed physical properties, *see* Clay minerals (table).

kaolisol, soil that is formed under the heat and heavy rainfall of the tropics, which leaches out the silica and the bases. Thus, the soil is silica-poor; highly weathered, sometimes to a depth of many yards and therefore poor in weatherable minerals; rich in iron, which is released by weathering, is not bound to the clay, and forms concretions that are often large and abundant; and very permeable, because the clay minerals formed do not swell when wet and thus interfere with permeation. The clay content often increases with depth because of the accumulation of clay minerals transported by water from the upper layers and because of the permeability of the soil. The cation-exchange capacity, or the ability of a charged metal atom in the structure to exchange places with another in aqueous solution, is low. Once formed, kaolisols may subsequently become the parent material for new soils.

kaon, subatomic particle that constitutes an important form of meson (*q.v.*).

Kaonde, also spelled KAHONDE, also called BAKAHONDE, a Bantu-speaking people who inhabit the northwestern region of Zambia. Their wooded highlands average 4,000 feet (1,220 m) in elevation; to the southeast begin open plains noted for their abundant game.

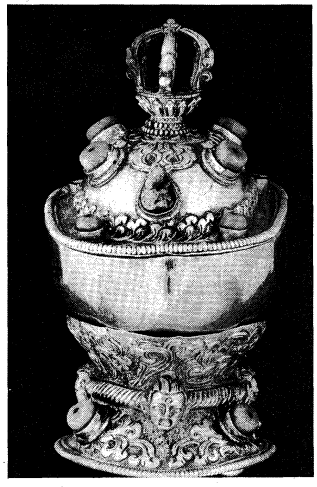
Three groups with different histories are known as Kaonde; all are probably descended from the Luba people residing in what is now Zaire. When they settled their present area in the 16th and 17th centuries, the Kaonde recognized the paramount chief of the Lunda Empire to the north as their overlord. Several autonomous Kaonde chiefships (especially that of Kasempa) arose in the 18th century, however, and came to prominence in the 19th century, a period marked by battles with the Lozi and by Kaonde slave raids against the Ila to their south.

Kaonde observe matrilineal descent and reside virilocally in large villages. Corn (maize), cassava, millet, sorghum, yams, squash, and beans are grown. Traditionally, the Kaonde piled and burned felled trees and underbrush and then planted crops in a square area of ash-enriched soil. Many wild fruits are gathered. Men hunt small highland game (cane rats, duiker, bushbuck) when it is available and fish by poisoning river pools during the arid months of June and July.

Kaonde share many cultural traits with other Central Bantu speakers. Ancestral spirits are supplicated by the Kaonde, as they are throughout northern Zambia and southern Zaire. Many Kaonde seek work in mining centres of the Copperbelt. Kaonde is one of the eight official languages of Zambia and is used in Radio Zambia broadcasts.

Kapaa, city, Kauai County, on the east-central coast of Kauai Island, Hawaii, U.S. Since the 1960s, tourism, diversified agriculture, and service industries have replaced pineapple growing as the main sources of income. Various legends, reminiscent of Gulliver and the Lilliputians, are connected with the Sleeping Giant, a mountain formation a few miles south of Kapaa. Another nearby feature is Holo-Holo-Ku Heiau, restored (1933) by the Bishop Museum of Honolulu and one of the oldest heiaus (temples) in Hawaii; it contained the sacred birthstones where Kauai queens came to bear their children. The temple was sacred to the grim god Ku, whose rites included human sacrifice. The historic Wailua River Reserve is nearby. Pop. (1980) 4,467.

kapāla (Sanskrit: "skull"), Tibetan THOD PA, cup made of a human skull, frequently offered



Kapāla, silver inlaid with coral and turquoise, Tibetan, 17th–18th century; the Seattle Art Museum, Washington
By courtesy of the Seattle Art Museum, Washington, Eugene Fuller Memorial Collection

by worshipers to the fierce Tantric deities of Hindu India and Buddhist Tibet. In Tibet the skull cup is displayed on the Buddhist altar and is used in ritual to offer to the ferocious *dharmapāla* ("defender of the faith") divinities either wine, which symbolizes blood, or dough cakes, which are shaped to resemble human eyes, ears, and tongues. The skull cup is often a handsomely worked object and rests on a triangular pedestal representing a sacrificial fire with skulls. The cup is mounted in metal, usually heavily embossed silver or gilt bronze, and topped with a lid shaped like half a skull, with a *vajra-* ("thunderbolt-") shaped handle.

Kāpālika and Kālāmukha, members of either of two groups of extreme Hindu ascetics most prominent in India during the medieval period (10th–11th centuries), notorious for their practices of worship, which were said to include human sacrifice. They were offshoots of the Pāśupata sect, the earliest sect of Śaivites (worshipers of the Lord Śiva as supreme deity).

The Kāpālikas (worshipers of Kāpālin, the skull bearer, a name of Śiva) and the Kālāmukhas (Black-faced, so-called because of the black mark, or *tilaka,* customarily worn on their foreheads) were often confused. They were both designated as *mahāvratins* ("observers of the great vows"), which referred to such practices as going naked, eating and drinking liquor from a human skull, eating the flesh of the dead, and smearing themselves with the ashes of corpses. They frequented lonely cremation grounds where they meditated on the *yoni,* the symbol of the female sexual organ, and were said to engage in many strange orgiastic rites.

Some otherwise puzzling sculptures on medieval Indian temples are sometimes explained as depicting Kāpālika ascetics. An inscription at Igatpuri in Nasik district (Mahārāshtra state) confirms that the Kāpālika were well established in that region in the 7th century; another important centre was probably Śrīparvata (modern Nāgārjunīkoṇḍā), in Andhra Pradesh, and they apparently spread throughout India. In an 8th-century Sanskrit drama, *Mālatī-Mādhava,* the heroine narrowly escapes being sacrificed to the goddess Cāmuṇḍā by a pair of Kāpālika ascetics. Successors to the Kāpālikas in modern times are the Aghorīs, or Aghorapanthīs.

Kapampangan (people): *see* Pampangan.

Kapfenberg, town, *Bundesland* Steiermark (federal province of Styria), southeast central Austria, at the confluence of the Mürz and Thörlbach rivers just northeast of Bruck. Founded around a fortress in the late 12th century, it was first mentioned in 1256. It had ironworks as early as the 15th century. A summer and winter resort, it has important steelworks and manufactures cable, chemicals, and building materials. Pop. (1981) 25,716.

Kapila (fl. 550 BC?), Vedic sage and founder of the system of Sāṃkhya, one of six schools of Vedic philosophy.

Hindu sources on Kapila are replete with myth and contradiction. He has been described as a descendant of Manu, the mythical lawgiver, and he has been deified as a son of the creator-god Brahmā. The *Bhagavadgītā* pictures him as a recluse. Buddhist sources present him as a well-known philosopher whose students built the city of Kapilavastu, according to one tradition the birthplace of the Buddha. Though there are many similarities in the philosophies of the Buddha and Kapila (*e.g.,* stress upon meditation as a technique for removing suffering, belief that the Vedic gods were subject to limitations and conditions, and dislike of ritual and of Brahmanic doctrines), Kapila did not preach his ideas to the masses or establish a religious community like the Buddha's *saṅgha.* Thus, Kapila's system has not had a great affect upon the Hindu tradition as a whole but has remained important to a small group of philosophers from the 6th century BC through the present.

Kapital, Das, English CAPITAL (3 vol., 1867, 1885, 1894), one of the major works of the 19th-century economist Karl Marx, in which he expounded his theory of the capitalist system, its dynamism, and its tendencies toward self-destruction. He described his purpose as to lay bare "the economic law of motion of modern society." The second and third volumes were published posthumously, edited by his collaborator Friedrich Engels.

Much of *Das Kapital* deals with Marx's concept of the "surplus value" of labour and its consequences for capitalism. In Marx's mind, it was not the pressure of population that drove wages to the subsistence level but rather the existence of a large army of unemployed, which he blamed on the capitalists. He held that under the capitalistic system, labour was merely a commodity and could get only its subsistence. The capitalist, however, could force the worker to spend more time on his job than was necessary to earn his subsistence, and the excess product, or surplus value, thus created, was taken by the capitalist.

Because all profit results from this "exploitation of labour," the rate of profit—the amount per unit of total capital outlay—depends largely on the number of workers employed. Machines cannot be "exploited"; they can therefore not contribute to total profits, although they help labour produce more useful things. Only payroll capital—"variable capital"—is productive of surplus value and consequently of profit. The introduction of machines is profitable for the individual entrepreneur, to whom they give an advantage over his competitors; but, as outlay for machinery grows in relation to outlay for wages, profit declines in relation to total capital outlay. The capitalist will receive less and less per hundred dollars of capital and can only try to postpone his bankruptcy by pressure upon the workers; finally, the "capitalist class becomes unfit to rule, because it is incompetent to assure an existence to its slave within his slavery." Consequently the system collapses, and the working class inherits the power.

Kapiti Island, uninhabited island at the northern entrance to Cook Strait, 5 miles (8 km) off the mouth of the Waikanae River, southwestern North Island, New Zealand. It is 9 square miles (23 square km) in area and may be part of a land bridge that once connected North and South islands. Generally rugged and half forested, Kapiti rises from cliffs on its seaward edge to the peak of Titeremoana, 1,780 feet (543 m). The British navigator Capt. James Cook named it Entry Island in 1770. During the early 1800s it was a whaling station; but by 1897 almost all of the island had been included within a wildlife reserve.

Kapitsa, Pyotr Leonidovich (b. July 8 [June 26, Old Style], 1894, Kronshtadt, Russia [Russian S.F.S.R.]—d. April 8, 1984, Moscow), Soviet physicist who shared the Nobel Prize for Physics in 1978 for his research in magnetism and low-temperature physics. He discovered that helium II (the stable form of liquid helium below 2.174 K, or −270.976° C) has almost no viscosity (*i.e.,* resistance to flow). This property is called superfluidity.

Educated at the Petrograd Polytechnical Institute, Kapitsa remained there as a lecturer until 1921. After his first wife and their two small children died of illness during the chaos of the civil war that followed the Revolution, he went to England to study at the University of Cambridge. There he worked with Ernest Rutherford and became assistant director of magnetic research at the Cavendish Laboratory in 1924, designing apparatus that achieved a magnetic field of 500,000 gauss, which was not surpassed in strength until 1956. He was made a fellow of Trinity College, Cambridge, in 1925 and elected to the Royal Society in 1929, one of only a small number of foreigners to become a fellow. The Royal Society Mond Laboratory was built at Cambridge especially for him in 1932.

In 1934, before he had published his paper on an expansion engine that liquefies helium, Kapitsa went to a professional meeting in the Soviet Union, where his passport was seized and he was detained there by Stalin's orders. In 1935 he was made director of the Institute of Physical Problems of the Soviet Academy of Sciences in Moscow and managed through the intercession of Rutherford to have the Mond Laboratory apparatus shipped to Moscow. He continued his research in low-temperature physics and discovered superfluidity in helium II while investigating its heat-conduction properties. His findings were first published in 1938, with further research on the subject described in *The Heat Transfer and Superfluidity of Helium II* (1941) and *Research into the Mechanism of Heat Transfer in Helium II* (1941). In 1939 he built apparatus for producing large quantities of liquid oxygen for the Soviet steel industry during World War II. For his achievements in science during the 1930s and 1940s, Kapitsa was given many honours by the Soviet government, including the title Hero of Socialist Labour (1945), the Soviet Union's highest civilian award.

In 1946 Kapitsa apparently refused to work on nuclear weapons development and as a result fell out of favour with Stalin. He was dismissed from his post as head of the Institute for Physical Problems and resided at his country house, or dacha, until after Stalin's death in 1953. He conducted original researches on ball lightning during his seclusion. Kapitsa was then restored (1955) as director of the institute, a position he kept until his death.

Kapitsa's research on high-power microwave generators in the late 1950s turned his interests to controlled thermonuclear fusion, upon which he published a series of papers beginning in 1969. An outspoken advocate of free scientific thought, in the 1960s he was one of the Soviet scientists who campaigned to preserve Lake Baikal from industrial pollution. He was also active in the Pugwash movement, a series of international conferences aimed at channeling scientific research into constructive rather than destructive purposes.

Consult the INDEX *first*

Kaplan, Mordecai Menahem (b. June 11, 1881, Švenčionys, Lithuania—d. Nov. 8, 1983, New York City), American rabbi, educator, theologian, and religious leader who founded the influential Reconstructionist movement in Judaism.

Kaplan emigrated with his family to the United States in 1889. After graduating from the College of the City of New York (1900) and Columbia University (1902), he was ordained (1902) at the Jewish Theological Seminary of America. Although Kaplan's conception of the nature of Judaism diverged from that of the seminary, he maintained a long association with the institution, teaching there for 50 years; he also became principal of its teachers' institute in 1909, dean in 1931, and dean emeritus in 1947. He retired in 1963.

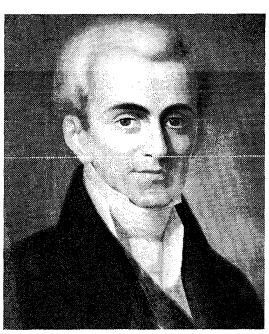
In 1916 he organized the Jewish Centre in New York, a secular community organization with a synagogue as its nucleus, the first of its kind in the United States, and was its rabbi until 1922. In that year he established the So-

ciety for the Advancement of Judaism, which later became the core of the Reconstructionist movement. Reconstructionism was an attempt to adapt Judaism to modern-day realities that Kaplan believed created the necessity for a new conception of God. The movement was well defined in Kaplan's book *Judaism as a Civilization: Toward the Reconstruction of American-Jewish Life* (1934). Its goals were further refined in subsequent works such as *The Meaning of God in Modern Jewish Religion* (1937); *Judaism Without Supernaturalism* (1958); and *The Religion of Ethical Nationhood* (1970). In 1935 the *Reconstructionist,* a biweekly periodical under Kaplan's editorship, appeared and adopted the following credo: "Dedicated to the advancement of Judaism as a religious civilization, to the upbuilding of Eretz Yisrael [the Land of Israel] as the spiritual center of the Jewish People, and to the furtherance of universal freedom, justice, and peace."

Kaplan was a coeditor of the Reconstructionist *Sabbath Prayer Book* (1945), in which, among other unorthodoxies, he denied the literal accuracy of the biblical text. As a result, the Union of Orthodox Rabbis of the United States and Canada declared his theories unacceptable.

Consult the INDEX *first*

Kapodístrias, Ioánnis Antónios, Komis (Count), Italian CONTE (Count) GIOVANNI ANTONIO CAPO D'ISTRIA (b. Feb. 11, 1776, Corfu [Greece]—d. Oct. 9, 1831, Návplion, Greece), Greek statesman who was prominent in the



Kapodístrias, detail of a portrait by an unknown artist, 19th century; in the Historical and Ethnological Museum of Greece, Athens

By courtesy of the Mouseion tis Istorikis kai Ethnologikis Etaitias tis Ellados, Athens

Russian foreign service during the reign of Alexander I (reigned 1801–25) and in the Greek struggle for independence.

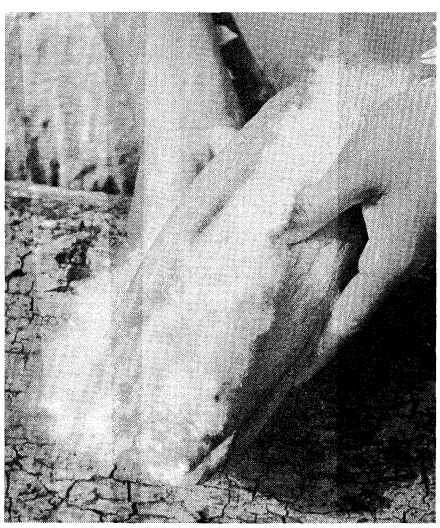
The son of Conte (Count) Antonio Capo d'Istria, he was born in Corfu (at that time under Venetian rule), studied at Padua, and then entered government service. In 1799 Russia and Turkey drove the French from the Ionian Islands and organized them into the Septinsular Republic. Kapodístrias participated in writing the new state's second constitution (adopted 1803) and became its secretary of state (1803). France regained control of the islands (1807), however, and Kapodístrias entered the Russian foreign service (1809). He became an expert on Balkan affairs, which earned him a post with the commander of Russia's armed forces on the lower Danube River (1812). After the army marched north to oppose Napoleon's invasion of Russia (1812), Kapodístrias was assigned as a diplomat to the army staff (1813) and later was sent by Alexander I on a special mission to Switzerland (1814).

After attending the postwar Congress of Vienna as one of Russia's representatives (1814–15), Kapodístrias became a highly influential adviser of the Emperor; and, after January 1816, he was given equal responsibility with Karl Robert Nesselrode, the director of the Ministry of Foreign Affairs, for the conduct of Russia's foreign policy.

Kapodístrias, however, expressed doubts about Alexander's Holy Alliance with Austria and Prussia and objected to Russia's approval of Austria's suppression of the revolts in Naples and Piedmont (1820–21). Consequently, he gained the political enmity of Austria's chancellor Metternich, who used his increasing influence over Alexander to undermine Kapodístrias' position. When Alexander refused to support the Greek revolt against Turkey (begun March 1821), Kapodístrias, who had a deep sympathy for the cause of Greek independence, although he had earlier refused to lead the major Greek revolutionary organization, found himself in an intolerable position. In 1822, therefore, he took an extended leave of absence from the Russian service and settled in Geneva, where he devoted himself to supplying material and moral relief to the Greek rebels until April 1827, when he was elected provisional president of Greece.

Resigning from the Russian service, he then toured Europe seeking financial and diplomatic support for the War of Greek Independence and arrived at Návplion (Nauplia), Greece's capital, in January 1828. He subsequently directed his energies toward negotiating with Great Britain, France, and Russia (which had all joined the war against the Turks) over the settlement of Greece's frontiers and the selection of its new monarch. He became leader of a party with pro-Russian sympathies. He also worked to organize an effective government apparatus and to subordinate powerful, semiautonomous local leaders to the authority of the new state. In the process, however, he acquired many enemies, two of whom, Konstantinos and Georgios Mavromikhalis of Maina, assassinated Kapodístrias as he entered a church.

kapok, also called JAVA COTTON, CEIBA, or JAVA KAPOK, seed-hair fibre obtained from the fruit of the silk cotton, or kapok, tree, *Ceiba pentandra.* The kapok tree is a large, tropical tree of the Bombacaceae family and has a spreading crown, huge trunk, and large, palm-shaped leaves. It is grown chiefly in Asia and Indonesia and is an important product of Java. The fibre, sometimes referred to as silk cotton, is lustrous, yellowish brown in colour, and light in weight. It contains both lignin, a woody plant substance, and cellulose, a carbohydrate plant material.



Fibrous floss of kapok (*Ceiba pentandra*) seedpod

Lyn—Annan Photo Features

The mature tree bears hundreds of pods, up to 6 inches (15 cm) long, filled with fibrous seeds. The pods, either cut down or gathered when they fall, are broken open with mallets. The seed and fibre, removed by hand, are stirred in a basket; the seeds fall to the bottom, leaving the fibres free. The seeds may be processed to obtain oil for soap manufacture, and the residue is used as fertilizer and cattle feed.

Individual fibres are 0.3 to 1.25 inches (0.8 to 3.2 cm) long, averaging 0.7 inch (1.8 cm), with diameters of 30 to 36 microns (a micron is about 0.00004 inch). Kapok is a moisture-resistant, quick drying, resilient, and buoyant fibre. The fibres are inelastic and too brittle for spinning, and the floss is used in life preservers and other water-safety equipment, supporting as much as 30 times its own weight in water. Buoyancy is lost slowly, with one test showing only 10 percent loss after 30 days of water immersion. Kapok is also used as stuffing for pillows, mattresses, and upholstery, as insulation material, and as a substitute for absorbent cotton in surgery. It is highly flammable, and its importance has decreased with the development of such materials as foam rubber, plastics, and man-made fibres.

Indian kapok, floss from *Bombax malabarica,* native to India, has many of the qualities of the Java type but is more brownish yellow in colour and less resilient. Immersed in water, it supports only 10 to 15 times its own weight.

Kaposi's sarcoma, also called IDIOPATHIC MULTIPLE PIGMENTED HEMORRHAGIC SARCOMA, rare and usually lethal cancer characterized by red-purple or blue-brown macules, plaques, and nodules of the skin and other organs. The skin lesions may be firm or compressible, solitary or legion.

The disease was reported in 1872 by Moritz Kaposi. Before its appearance in those afflicted with acquired immune deficiency syndrome (AIDS), Kaposi's sarcoma was considered an extremely rare cancer. It was noted primarily among older men of Mediterranean descent but had also been observed in an endemic form among African men. A unique form of Kaposi's sarcoma—with internal (especially lymphatic) rather than cutaneous involvement—had also been recognized among young children in certain areas of equatorial Africa. The lack of health statistics in Africa seriously hampered efforts to study the history of the disease there, and the reason or reasons for the variation in forms of the cancer remain unclear.

Since about 1980 Kaposi's sarcoma has become increasingly evident in AIDS victims. Of the groups that have been identified as high-risk for AIDS, young male homosexuals are far more likely to develop the cancer than are other AIDS victims. Kaposi's sarcoma, in fact, was the disease that indicated the presence of AIDS in nearly half of the U.S. cases of AIDS that were reported to the Centers for Disease Control in Atlanta, Ga. The breakdown of the immune system and the presence of one or more viruses seem to encourage its occurrence—*i.e.,* it is considered an opportunistic tumour. There is no known cure for Kaposi's sarcoma, although partial and complete remissions have been accomplished. The AIDS victim is nonetheless subject to the return of the disease, and average survival time among AIDS victims is less than two years. *See also* acquired immune deficiency syndrome.

Kaposvár, town, seat of Somogy *megye* (county), southwestern Hungary. On hills flanking the upper valley of the Kapos River (which flows northeast to the Sió), it is the chief market town of the county and has played an important role in Hungarian art and poetry. There are ruins of a castle taken three times by the Turks in the 16th and 17th centuries. The remodeled parish church dates from 1737–

44, and the ruins of an 11th-century Benedictine monastery were excavated and restored in 1966. The area produces rye, potatoes, sugar beets, and tobacco. Kaposvár's industries include textiles, the manufacture of bricks and agricultural machinery, and sugar refining. It is on the trunk railway line from Budapest to Zagreb and Rijeka (Italian: Fiume) in Yugoslavia. Pop. (1989 est.) 74,000.

Kapp, Wolfgang (b. July 24, 1858, New York, N.Y., U.S.—d. June 12, 1922, Leipzig, Ger.), reactionary Prussian politician who led the Kapp Putsch (1920), which attempted to overthrow the fledgling Weimar Republic and establish a rightist dictatorship.

Kapp's father, a revolutionary of 1848, had immigrated to the United States in 1849 but in 1870 returned to Germany, where he became a liberal member of the Reichstag. Kapp received a doctorate in law, after which he managed an estate in East Prussia. In 1900 he became a councillor at the Prussian ministry of agriculture and from 1906 to 1920 served as director general of the East Prussian agricultural credit banks. A Pan-German annexationist, Kapp was a member of the conservative opposition in World War I and, with Admiral Alfred von Tirpitz, founded the German Fatherland Party (Deutsche Vaterlandspartei) in 1917. After the 1918 revolution he was elected to the Reichstag and worked for the restoration of the monarchy. The immediate cause of the Kapp Putsch was the government's resolve to force the demobilization of the right-wing Freikorps brigades, Ehrhardt and Baltikum. With the cooperation of the commander of the Berlin army district, however, the Ehrhardt troops took Berlin (March 13, 1920). When Kapp formed a government with the help of Erich Ludendorff, Germany's World War I chief of staff, the legitimate republican regime, having been denied the support of the army, fled to southern Germany. Within four days, however, a general strike called by labour unions and the refusal by civil servants to follow Kapp's orders led to the collapse of the coup. Kapp and several other conspirators fled to Sweden but returned to stand trial. He died awaiting trial in 1922.

kappa, in Japanese folklore, a type of vampire-like lecherous creature that is more intelligent than the devilish *oni* (*q.v.*) and less malevolent toward men. *Kappa* are credited with having taught the art of bonesetting to humans. They are depicted in legend and art as being the size of a 10-year-old child, yellow-green in colour, and resembling monkeys, but with fish scales or tortoise shells instead of skin. On the top of their head they have hollow indentations that are filled with water; if the water is spilled, they are said to lose their supernatural powers. Legends of encounters with *kappa* invariably include a reference to their capacity for keeping a promise, extracted from them after forcing their heads down or by tricking them into bowing low, thus spilling out the water. They have a taste for cucumbers, and a standard way of placating *kappa* is to throw a cucumber into the water where they live.



Kappa riding on a cucumber, painting by Hokuga; in the Victoria and Albert Museum, London

By courtesy of the Victoria and Albert Museum, London; photograph, A.C. Cooper Ltd.

Kappel Wars (1529 and 1531), two incidents of the Swiss Reformation; the name derives from the monastery of Kappel, on the border between the cantons of Zürich and Zug.

The first incident arose when five Catholic member states of the Swiss confederacy, Luzern, Uri, Schwyz, Unterwalden, and Zug, formed the Christian Union, which allied itself with Austria to prevent Zürich from spreading Protestantism over the common lordships (territories ruled by the Swiss confederates jointly). Zürich thereupon launched an expedition against the Christian Union, but the fighting was negligible, and an armistice signed at Kappel on June 26, 1529, was followed by an agreement whereby the Catholic districts renounced their Austrian alliance and conceded freedom of religion in the common lordships.

The five Catholic confederates, however, soon felt that Protestantism was in fact being forced on the Thurgau (one of the lordships); and in October 1531 they suddenly declared war against Zürich. Zürich's hastily raised troops, under Jörg Göldli, were defeated in the Battle of Kappel (Oct. 11, 1531), and Zürich's Protestant leader, Huldrych Zwingli, was killed. The second Peace of Kappel (Nov. 24, 1531) upheld the claims of Catholicism throughout the controversial areas.

Kapsukas, formerly (until 1955) MARIJAMPOLĖ, administrative centre of a *rayon* (sector), Lithuania, U.S.S.R. Kapsukas lies along both banks of the Šešupė River. The settlement developed as a monastic centre in the 18th century, when it was known as Starapolė, and achieved urban status in 1758. After World War II it developed as an industrial city, specializing in equipment for the food industry, automotive parts, furniture, building materials, textiles, and foodstuffs. There is a teacher-training school, a museum, and a theatre. Pop. (1976 est.) 35,600.

Kapteyn, Jacobus Cornelius (b. Jan. 19, 1851, Barneveld, Neth.—d. June 18, 1922, Amsterdam), Dutch astronomer noted for his use of photography and statistical methods in determining the motions and distribution of stars.

Kapteyn attended the State University of Utrecht and in 1875 became a member of the staff of Leiden Observatory. In 1877 he was elected to the chair of astronomy and theoretical mechanics at the State University of Groningen.

Kapteyn was not the first to use photographic methods in astronomy, but his breadth of scientific vision and capacity for carrying through large programs made him a key figure in the development of photographic astronomy. Using measurements of the positions of star images on photographic plates made at the Cape of Good Hope by Sir David Gill, Kapteyn compiled the *Cape Photographic Durchmusterung,* (1896–1900; *Cape Photographic Examination*), a catalog of roughly 454,000 southern stars. He devised a sampling system in which the thorough counting of stars in small, selected areas gave an indication of the structure of the Milky Way Galaxy. While recording the motions of many stars, he discovered the phenomenon of star streaming; *i.e.,* that the peculiar motions (motions of individual stars relative to the mean motions of their neighbours) of stars are not random but are grouped around two opposite, preferred directions in space. Many later investigations of the distances and spatial arrangement of the stars of the Milky Way Galaxy stemmed from his work.

Kapuas River, Indonesian SUNGAI KAPUAS, Dutch KAPOEAS RIVIER, chief waterway of western Indonesian Borneo. The river rises in the Kapuas Hulu Mountains in the central part of the island and flows 710 miles (1,143 km) west-southwest, reaching the South China Sea in a great marshy delta west-southwest of Pontianak. It is navigable along most of its length.

Kapuni, locality and natural gas and oil field south of Mount Egmont, western North Island, New Zealand. Petroleum from the locality is piped to Auckland and Wellington, principally for use as a household fuel. Natural gas produced at Kapuni supplies a wide area. It is conveyed by pipeline to the principal cities of North Island. The town of Kapuni, on the Kaupokonui River, is a service centre for an area that has one of the highest rural population densities in the nation. It lies on a rail line to New Plymouth. Pop. (1981) 335.

Kapūrthala, city, north-central Punjab state, northwestern India. Kapūrthala was founded in the 11th century. In 1780 it became the capital of the princely state of Kapūrthala, and it remained the capital until that state was incorporated into India in 1948. The city lies west of Jullundur. It is an agricultural market and has several manufacturing industries, producing chemicals, paints, and pharmaceutical products. Several colleges affiliated with Guru Nānak Dev University, a hospital, and an old palace are located there.

The area in which Kapūrthala is situated is a flat alluvial plain with an agricultural economy. Wheat, sugarcane, cotton, and other crops are grown. Pop. (1981) city, 50,300.

Kapuskasing, town, Cochrane district, east-central Ontario, Canada. It lies along the Kapuskasing River. Known as MacPherson until 1917, when it received its present Indian name, the town originated in 1914 as a station on the National Transcontinental line (now the Canadian National Railway) 80 miles (130 km) northwest of Timmins. It was a World War I prisoner of war camp. Kapuskasing later became the site of a government experimental farm and the Spruce Falls Power and Paper plant (1922), powered from Smoky Falls, 50 miles (80 km) north. The mills, which produce newsprint, cellulose, paper tissue, and pulp, are the town's main source of employment. Pop. (1986) 11,378.

Kara-Bogaz-Gol Gulf, Russian ZALIV KARA-BOGAZ-GOL, inlet of the eastern Caspian Sea in northwestern Turkmenistan, Soviet Union. With an area of 4,600–5,000 square miles (12,000–13,000 square km), it averages only 33 feet (10 m) in depth and has an exceptionally high rate of evaporation. As a result, the water is extremely saline, and 7,000–11,000 cubic feet (200–300 cubic m) of water a second are drawn in from the Caspian through the narrow strait between the two sandy spits that separate the gulf from the sea. The gulf contains the world's largest deposit of natural marine salts.

Kara-e (Japanese: "Chinese-style painting"), in Japanese art, decorative painting deriving from art of the Chinese T'ang dynasty (AD 618–907). It was chiefly composed of imaginative landscapes in the Chinese manner and illustrations of Chinese legends and tales.

The style was employed in the Nara (645–794) and Heian (794–1185) periods. In spite of the increasing popularity of *Yamato-e,* an evolving native style of painting, *Kara-e* was practiced throughout the 10th, 11th, and 12th

centuries, though its use was confined to official and religious materials.

Kara-Kalpak, also spelled QARAQALPAQ, Turkic-speaking people with a Mongol admixture who live in Central Asia, chiefly in the Kara-Kalpak Autonomous Soviet Socialist Republic in the Uzbek Soviet Socialist Republic of the U.S.S.R. In 1979 they numbered about 303,000. The first historical reference to them dates from the end of the 16th century, when they lived on the lower reaches of the Syrdarya (river). In language and culture the Kara-Kalpak are closely related to the Kazakh (*q.v.*).

Kara-Kalpak Autonomous Soviet Socialist Republic, also spelled QARAQALPAQ, also called KARA-KALPAKIYA, administrative division of the Uzbek Soviet Socialist Republic, situated southeast and southwest of the Aral Sea and covering an area of 63,670 sq mi (164,900 sq km).

On the east the republic occupies the western half of the Kyzylkum Desert, a vast plain covered with shifting sands. The central part consists of the valley and delta of the Amu Darya (Amu River), a low-lying area distinguished by meadow gray soils and intersected by watercourses, canals, and lakes. On the west the republic includes the southeastern part of the Ustyurt Plateau, a slightly undulating area with gray-brown or white alkali soils, characterized by flat summits rising to some 958 ft (292 m) above sea level. The climate is continental (*i.e.,* marked by extreme conditions), with an average yearly temperature of 50° to 55° F (10° to 13° C). The average yearly rainfall is only 3 to 4 in. (75 to 100 mm).

The Kara-Kalpak people are closely allied to the Kazakhs. Like many other Turkic peoples, they are of obscure origin. The first historical reference to them dates from the end of the 16th century. During the 18th century they settled in the Amu Darya region, came partly under Russian rule in 1873, and by 1920 were totally incorporated into the Soviet Union. Established as an autonomous *oblast* (region) of the Kazakh A.S.S.R. in 1925, Kara-Kalpakiya came under the administration of the Russian S.F.S.R. in 1930 and two years later was constituted as an autonomous republic. In 1936, while retaining its status, it was made a part of the Uzbek S.S.R. The population is comprised mainly of Kara-Kalpaks, Uzbeks, and Kazakhs (31, 31 and 27 percent, respectively, in 1979), with smaller numbers of Turkmens and Russians. About 47 percent of the population lives in urban areas. Nukus (*q.v.*), the capital, Khodzheyli, Biruni, Takhiatash, Chimbay, Turtkul, and Altykyl are the chief cities.

The economy is predominantly agricultural. The industrial sector, while limited, includes light manufacturing; refineries that process oil from nearby petroleum fields; a shipyard in Khodzheyli; several building-materials plants that utilize the limestone, gypsum, asbestos, marble, and quartzite of the area; and a power station in Takhiatash that generates electricity for the entire republic. Cotton, the principal agricultural commodity, is cultivated in the southern part of the Amu Darya Valley and is processed at Chimbay, Kungrad, Biruni, Takhtakupyr, Khodzheyli, and Mangit. A well-developed system of irrigation canals supplies water to the crops. Besides cotton, crops include alfalfa, rice, and corn (maize). Cattle and Karakul sheep are raised in the Kyzylkum Desert, while in the Amu Darya delta the largest muskrat-breeding region of the Soviet Union is found. Many farmers engage in silkworm breeding, and there are farms for breeding horses and camels. Fishing is important along the shores of the Aral Sea. Transport facilities in the republic include a railway from Kungrad to Chardzhou in Turkmenistan, motor roads that link several cities of the republic, and air connections with Moscow, Tashkent, Ashkhabad, and other cities of the U.S.S.R. Pop. (1985 est.) 1,075,000.

Kara Koyunlu, also spelled QARA QOYUNLU, English BLACK SHEEP, Turkmen tribal federation that ruled Azerbaijan and Iraq from *c.* 1375 to 1468.

The Kara Koyunlu were vassals of the Jalāyirid dynasty of Baghdad and Tabriz from *c.* 1375, when the head of their leading tribe, Kara Muḥammad Turmush (reigned *c.* 1375–90), ruled Mosul. The federation secured its independence with the seizure of Tabriz (which became its capital) by Kara Yūsuf (reigned 1390–1400; 1406–20). Routed by the armies of Timur in 1400, Kara Yūsuf sought refuge with the Mamlūks of Egypt but by 1406 was able to regain Tabriz. He then secured the Kara Koyunlu position against threats from the Ak Koyunlu (*q.v.*; "White Sheep"), a rival Turkmen federation in the province of Diyār Bakr (modern Iraq), and from the Georgians and Shīrvān-Shāhs in the Caucasus and Timur's successors in Iran. The capture of Baghdad in 1410 and the installation of a subsidiary Kara Koyunlu line there hastened the downfall of the Jalāyirids themselves.

Despite the dynastic struggles for primacy in the years following Kara Yūsuf's death (1420) and continuing Timurid pressure, the Kara Koyunlu maintained a firm grip on their possessions. Jihān Shāh (reigned *c.* 1438–67) established a temporary peace with the Timurid Shāh Rokh, who had helped him gain the Kara Koyunlu throne; but after Shāh Rokh's death in 1447, Jihān Shāh annexed portions of Iraq and the eastern coast of the Arabian Peninsula as well as Timurid western Iran. Jihān Shāh's rule was repeatedly troubled, however, by his rebellious sons and by the semiautonomous Kara Koyunlu rulers of Baghdad, whom he expelled in 1464. An attempt to take Diyār Bakr from the Ak Koyunlu in 1466 ended in Jihān Shāh's defeat and death, and within two years the Kara Koyunlu succumbed to the superior Ak Koyunlu forces.

Kara-Kum Desert, Russian PESKI KARAKUMY, or KARAKUMY, great sandy region in central Asia comprising about 70 percent, or approximately 135,000 sq mi (350,000 sq km), of the area of the Turkmen Soviet Socialist Republic in the Soviet Union.

The following article summarizes information about the Kara-Kum Desert; for full details, *see* MACROPAEDIA: Asia.

The Turkmen Kara-Kum is bordered by the Sary-Kamysh Depression on the north, by the Amu Darya Valley (Amu River Valley) on the northeast and east, and by the Karabil Highlands and Badkhyz semidesert on the southeast. In the south and southwest the desert runs parallel to the foot of the Kopet-Dag Mountains, and in the west and northwest the Kara-Kum borders the course of the ancient valley of the Uzboy River near the Caspian Sea. The name is also applied to another, smaller desert northeast of the Aral Sea in the Kazakh S.S.R. called the Priaralskiye Kara-Kum (Russian: Priaralskiye Karakumy).

The relief of the Turkmen Kara-Kum is quite sharp and well defined and may be subdivided into three parts: the elevated northern Zaunguzskiye Karakumy, the surface of which has been eroded by violent winds; the low-lying plain of the Central Kara-Kum (Tsentralny Nizmennye Karakumy); and the southeastern Kara-Kum, through which a chain of salt-marshes runs. Wind-accumulated, half-overgrown sand ridges in the desert region range in height from 5 to 100 ft (1.5 to 33.5 m), depending on their age and local wind velocities. Large crescent-shaped dunes, some of them more than 250 ft in height, cover somewhat less than 10 percent of the area.

The climate of the Turkmen Kara-Kum is continental, with long, hot summers and unpredictable but generally warm winters. The average annual rainfall varies from 2.75 in. (70 mm) in the north to 6 in. (150 mm) in the south; precipitation occurs mainly in autumn and early spring. The vegetation is quite varied, consisting chiefly of grass, small shrubs, bushes, and trees. Some of the vegetation can be used as hay in winter by camels, sheep, and goats.

The population of the desert is composed of Turkmen, most of whom were formerly nomadic but have since settled into agricultural pursuits, or fishing on the shores of the Caspian Sea. Irrigation has made the desert suitable for the raising of livestock on a large scale, especially Karakul sheep; fine-fibred cotton is grown in the oasis areas. Intensive economic development after World War II brought an industrial revolution to the Kara-Kum, resulting in the construction of factories, gas lines, railroads, highways, and power stations.

Kara Mustafa Paşa, Merzifonlu (b. 1634, Merzifon, Ottoman Empire—d. Dec. 25, 1683, Belgrade), Ottoman grand vizier (chief minister) in 1676–83, who in 1683 led an unsuccessful Ottoman siege of Vienna.

During the grand vizierate (1661–76) of his brother-in-law Fazıl Ahmed Köprülü, Kara Mustafa served as captain of the fleet, vizier in the State Council, and deputy grand vizier. Succeeding Fazıl Ahmed as grand vizier, he led unsuccessful campaigns against Poland and then Russia. Meanwhile, a Hungarian revolt against Habsburg rule in 1678 allowed Kara Mustafa to move against Austria. The Ottoman army, under his command, laid siege to Vienna (July 17–Sept. 12, 1683) but was defeated by the Austrian–Polish army under John III Sobieski, king of Poland. Kara Mustafa Paşa was beheaded at Belgrade that same year on orders from the Sultan, and his head was brought to the Sultan on a silver dish.

Kara Sea, Russian KARSKOYE, KARSKOE, or KARSKOJE MORE, marginal sea of the Arctic Ocean, located off Western Siberia (Soviet Union), between the Novaya Zemlya islands (west), Franz Josef Land (northwest), and the Severnaya Zemlya islands (east). It is connected with the Arctic Basin (north), the Barents Sea (west), and the Laptev Sea (east). It has an area of 340,000 sq mi (880,000 sq km). Average depth is 417 ft (127 m) and the maximum depth is 2,034 ft.

Several deep inlets of the Kara Sea cut into the mainland. The largest rivers flowing into the sea are the Yenisey, Ob, Pyasina, and Kara, from which the sea derives its name. Numerous islands, concentrated primarily in the north, are diverse in origin and landscape. Some are mountainous, others are completely covered by icy domes, and many are low-lying and sandy.

The Kara Sea lies on the Siberian Shelf; thus, about 40 percent of it is less than 160 ft deep, and only 2 percent is more than 1,600 ft deep. The shelf is cut in the north by two wide, deep-sea troughs—the Svyatoy Anny east of Franz Josef Land, with a depth of 2,034 ft, and the parallel Voronin Trough, some 180 mi to the east, with a depth of 1,475 ft. East of Novaya Zemlya stretches the Novaya Zemlya Trough, 650–1,300 ft deep.

The Kara Sea formed as a result of deglaciation during the last Ice Age, traces of glacial ice being found under a thin layer of silty sediment. Rocky soils are found in the northeast part of the sea. There are also sandbars and sandy mainland shores.

Salinity varies greatly, from 10–12 parts per thousand near the mouths of the Ob and the Yenisey to 33 parts at Franz Josef Land.

Air temperatures below 32° F (0° C) prevail in the north 9 to 10 months a year and in the south 7 to 8 months. The average temperature

in January is from −18° to −4° F (−28° to −20° C), and the minimum is −51° F (−46° C). In July, averages are from 30° to 43° F (−1° to 6° C), with a maximum of 61° F (16° C). Winter brings frequent gales and snowstorms, while summer brings snow, snow squalls, and fogs. For most of the year the sea is covered with ice.

The water masses of the Kara Sea are extremely cold and stratified. In the winter the water temperature averages 29.1° F (−1.6° C); in the summer it reaches 43° F (6° C) in the southwestern part of the sea and 36° F (2° C) in the north. Currents move in two slow, counterclockwise rotations in the southwestern and northeastern parts of the sea.

Fish found in the Kara Sea include cod, salmon, and sturgeon. The sea's mammals include the seal, sea hare, white whale, walrus, and polar bear.

The Kara Sea is on the Soviet Northern Sea route. The main port along it is Dikson. Timber, building materials, furs, and foodstuffs are the most important cargoes transported across it. The importance of the Kara Sea route has increased following the discovery in the Ob–Yenisey region of large deposits of oil and natural gas.

kara-yo (Japanese: "Chinese style"), one of the three main Japanese styles of Buddhist temple architecture in the Kamakura period (1192–1333). *Kara-yo* originally followed Chinese forms that featured strict symmetry on a central axis. The word *kara-yo* is written with the character that stands for the Chinese T'ang dynasty (618–907), but the style seems to have represented the official building code of the Southern Sung dynasty ruling from Hang-chou (1127–1279). Sectarian use of the *kara-yo* style began in the mid-13th century in Japan, notably at the Zen monasteries of Engaku, Daitoku, and Kenchō. Though there was a determined effort to adopt the style in complete and correct form, the verticality of the original became tempered by the Japanese preference for the horizontal.

Buildings constructed in the *kara-yo* style are impressive for their decorativeness and for the complex multiplication of their parts. One of the style's most important features is the use of a series of complex brackets, rather than columnal axes, to support the eaves. The structural ingenuity of the style was masked by the ornamental effect, while bracketing itself sometimes became pretentious. *Kara-yo* gradually merged with the native architectural style to constitute a basis for all later temple building in Japan.

Karabagh rug, Karabagh also spelled KARABAKH, floor covering handmade in the



Detail of a Karabagh rug, late 19th century; in a private collection in New York state

In a private collection, New York state; photograph, Otto E. Nelson—EB Inc.

district of Karabakh (Azerbaijan S.S.R.), just north of the present Iranian border. As might be expected, Karabagh designs and colour schemes tend to be more like those of Persian rugs than do those made in other parts of the Caucasus, and it is difficult to distinguish Karabagh runners from those of Karzdagh, in Iran, to the south. Certain Karabagh rugs also resemble those of Shirvan to the north in the Azerbaijan S.S.R.

Commonly stout and comparatively coarse, Karabagh rugs are all made of wool and have longer pile than rugs found elsewhere in Caucasia. The heavy, curving bands of the Dragon rugs appear in some examples, framing a central medallion. Other carpets feature elaborate "pole-medallion" arrangements that are based on the fine Persian carpets of an earlier day. Mirror Karabaghs are distinguished by oval medallions enclosing bouquets in the French manner, and Talysh rugs may have a perfectly plain field of dark blue with a delicate reciprocal edging. As has occurred in other areas of the Caucasus, a number of new definitive names have been coined, and the well-known Eagle and Cloudband Kazak patterns are now claimed for Karabagh.

Karabük, town, northwestern Turkey, on the Yenice River. Once a small hamlet, it has grown rapidly since the establishment of Turkey's first major iron and steel complex there in 1940. The works were expanded greatly in the 1950s and '60s. Facilities include a coking plant, blast furnaces, a foundry, and tube works; chemical plants produce sulfuric acid and phosphates. The mills receive coal and manganese by rail from Zonguldak and iron ore from the Divriği mines; dolomite and limestone are obtained locally. Karabük lies on the Ankara–Zonguldak railway line and is linked by road with Ankara and Kastamonu. Pop. (1985) 94,818.

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Karachay-Cherkess, also spelled KARACHAI-CHERKESS, autonomous *oblast* (province), Stavropol *kray* (region), southwestern Russian Soviet Federated Socialist Republic. Its area of 5,450 square miles (14,100 square km) extends from the foreland plains across the northern ranges and deep intervening valleys and gorges of the Great Caucasus Mountains as far as the crestline, which reaches 13,277 feet (4,047 m) in Mount Dombay-Ulgen. Cherkessk is the administrative centre. The *oblast's* scenery is spectacular, with densely forested mountains rising through alpine meadows to rock and ice. Tourism is important.

The *oblast* was first formed in 1922 for the Circassian (Cherkess; *see* Circassians) and Turkic Karachay peoples. The *oblast* was dissolved in 1926, becoming Karachay autonomous *oblast* and Cherkess autonomous *oblast*. Karachay autonomous *oblast* was dissolved during World War II, when the Karachays were exiled to Central Asia for their alleged collaboration with the Germans. In 1957 they were returned to form the present Karachay-Cherkess autonomous *oblast*. During their exile, part of the territory was incorporated into the Georgian S.S.R. Today the Karachay and Cherkess peoples comprise only a little more than one-third of the population, while most of the rest are Russians. The majority of the *oblast's* population lives on the northern plains, which are in intensive agricultural use. Large numbers of sheep and cattle are kept. Most industry is concerned with processing farm produce, but nonferrous ores and some coal are mined. Pop. (1989 prelim.) 418,000.

Karāchi, city and capital of Sind province, southern Pakistan. Karāchi is Pakistan's principal seaport, largest city, and former capital. It is located on the coast of the Arabian Sea immediately northwest of the Indus River delta. The impetus to the city's development originally came from its role as the port serving the Indus River valley and the Punjab region of British India. Today this bustling, crowded city is a major industrial and commercial centre.

A brief treatment of Karāchi follows. For full treatment, *see* MACROPAEDIA: Karāchi.

Karāchi's natural harbour is protected from storms by Kiamāri Island, Manora Island, and Oyster Rocks. The city is built on a large plain that rises to 120 feet (37 m) from a low-lying coastal strip. The seasonal Malīr and Layāri rivers run through the city.

Karāchi's climate is characterized by hot summers (mean maximum temperature in May and June of 93° F [34° C]), with occasional enervating temperatures of up to 105° F (41° C), and cool winters (mean minimum in January and February of 56° F [13° C]). The average annual rainfall of 8 inches (203 mm) falls mainly during a brief spell in June, July, or August.

The basis of the city's prosperity is manufacturing and trade; services and professions, however, employ nearly as many people. Principal industries include the manufacture of textiles, footwear, metal products, paper, furniture, machinery, chemicals, leather, rubber, and electrical goods. Printing and the processing of food and beverages and of petroleum are also important, as are handicrafts and cottage industries that produce handloomed cloth, lace, carpets, and various metal and ceramic goods. Karāchi's port handles nearly all of the seaborne trade of Pakistan and its landlocked neighbour, Afghanistan. The city is a centre of banking and insurance, and it has a stock exchange.

The most striking feature of Karāchi's layout is the east–west alignment of the four arterial roads, which begin near Mereweather Tower in the vicinity of the port and run through the centre of the city. The old town lies near the port; unplanned, it is reminiscent of medieval towns of the Middle East and Europe. East of the old town are such districts as the Drigh Cantonment, the Civil Lines (residential areas for senior civil-service officers), and the Saddar Bazar. The outer areas are dominated by dormitory suburbs and planned industrial areas.

About half of Karāchi's population are migrants (or their offspring) who came to the city after 1947 from India, other cities in Pakistan, or other countries; no ethnic group predominates. Cultural and social activities essentially revolve around religion, which is overwhelmingly Muslim. The Pakistan Arts Council is the primary cultural institution. Ghanshyam Art Centre and the Bulbul Academy promote Pakistani dancing and other activities. Karāchi's small museum has archaeological and ethnological collections. The University of Karāchi (1951) offers graduate training in a number of fields, and its library is the city's largest.

Express roads radiate from Karāchi's centre, and a circular railway serves both commuters and local freight traffic. Highways link the city to the interior of Pakistan as well as to Iran and other Middle Eastern countries. Karāchi is the terminus of Pakistan's freight and passenger railway system. The port is one of the busiest east of Suez, and the city's airport is a major international traffic centre. Area city, 228 square miles (591 square km). Pop. (1981) 5,208,132.

Karadagh rug: *see* Karaje rug.

Karadeniz (Europe–Asia): *see* Black Sea.

Karadeniz Boğazi (Turkey): *see* Bosporus.

Karadenizereğlisi (Turkey): *see* Ereğli.

Karađorđe (Serbian leader): *see* Karageorge.

Karađorđević DYNASTY: *see* Karageorgević dynasty.

Karadžić, Vuk Stefanović (b. Nov. 6, 1787, Tršić, Serbia, Ottoman Empire—d. Feb. 6, 1864, Vienna), language scholar and the father of Serbian folk-literature scholarship, who, in



Karadžić, lithograph

By courtesy of the Osterreichische Nationalbibliothek, Vienna

reforming the Cyrillic alphabet for Serbian usage, created one of the simplest and most scientific and logical spelling systems.

He learned to read and write in the old monastery Tronosha (near his native village), and was engaged as writer and reader of letters to the commander of the insurgents of his district at the beginning of the first Serbian rising against the Turks in 1804. Mostly in the position of a scribe to different vaivodes (military leaders), sometimes as schoolteacher, he served his country during the first revolution (1804–13). At the collapse of the revolution he left Serbia, but instead of following Karageorge and other leaders to Russia he went to Vienna. There he was introduced to Slavonic scholarship and was encouraged to collect poems and popular songs and to write a grammar of the Serbian language and, if possible, a dictionary.

Karadžić established that Serbian contains 30 distinct sounds, for six of which the Cyrillic alphabet had no special letters. He introduced new letters for those sounds, at the same time discarding 18 letters for which Serbian had no use. Though there was strong opposition to his reform from the church and from writers, the government in 1859 finally permitted the printing of books with Karadžić's amended alphabet. In 1818 he first published his great work *Srpski rječnik* ("Serbian Lexicon"), a Serbo-Germanic-Latin dictionary containing 26,270 words and many important sidelights on folklore. The second edition (1852), expanded to 46,270 words, remains a classic work and was reprinted in 1934.

In his effort to collect folk literature, he travelled frequently through Serbia, Bosnia, Croatia, and other areas comprising modern Yugoslavia. The results appeared largely in *Srpske narodne pjesme,* 4 vol. (1823–33; "Serbian Folk Poems"). Other works include a book of popular stories (1821), a collection of Serbian proverbs (1837), and a Serbian translation of the New Testament (1847).

Karaga, also spelled KARAGAS (people): *see* Tofalar.

Karaganda, *oblast* (administrative region), central Kazakh Soviet Socialist Republic, occupying an area of 33,000 sq mi (85,400 sq km), much reduced from its pre-1973 area of 154,000 sq mi by the creation in that year of Dzhezkazgan (*q.v.*) *oblast* from its former southern and western parts. It lies mostly in the Kazakh Uplands in a dry steppe zone, rising gradually in elevation eastward to a maximum in the Karkaraly Mountains of 5,115 ft (1,559 m) in the Gory (mountains) Kosubay. The principal rivers, the Nura and Sarysu, are in the west, in the Musbel lowland. The climate is continental (tending to extremes) and dry, with severe winters, marked by prolonged snowstorms and hurricane-force winds. The principal economic resource of the *oblast* is the Karaganda coal basin, although manganese, tungsten, molybdenum, and lead and zinc are also mined; other mineral resources of the *oblast* include barite, nickel, iron ore, and copper.

Spring wheat and fodder grasses are grown, and sheep, horses, and camels are bred in more arid regions of the west. Dairying, truck gardening, and the cultivation of millet are carried on around Karaganda, but must be supported by irrigation, the water being brought by the Irtysh-Karaganda Canal, which also supplies the industry of Karaganda city. Although large-scale industrialization only began about 1930, partly through the use of forced labour, Karaganda (*q.v.*) is now a major industrial centre of the Soviet Union. The chief cities, after Karaganda, the capital, are Temirtau, Shakhtinsk, Saran, Abay, and Karkaralinsk. The population is about 86 percent urban, with the Kazakhs predominating. Russians, Ukrainians, Germans, Tatars, and Belorussians also live there, many of the last four groups having been deported from their European homelands by Soviet authorities. Pop. (1983 est.) 1,301,000.

Karaganda, city and administrative centre of Karaganda *oblast* (administrative region), Kazakh Soviet Socialist Republic, at the centre of the important Karaganda coal basin.

It is the second largest city in the republic and derives its name from the caragana bush, which grows abundantly in the surrounding steppe. The first settlement appeared in 1856, and small-scale coal mining began in 1857 to supply a nearby copper smelter. Mining ceased in the 1920s but expanded quickly after 1931 following completion of a railway link and a decree that the Karaganda Basin was to be developed as the country's third major coal-mining area to supply industry in the Urals. Karaganda was made a city in 1934 and an *oblast* centre in 1936; by 1939 its population had swollen to 166,000. Forced labour was extensively used in its development.

The city's importance increased during World War II, when the Germans occupied the Donets Basin, and the Parkhomenko coal-mining machinery works was among those evacuated to Karaganda. Coal mining and the production of coal-mining machinery still dominate Karaganda's industry, but there are also major iron and steel works, utilizing ore from Karazhal and Lisakovsk; in addition, there are large cement plants and also food and other light industries. By 1972 the concentration of industry in Karaganda had reduced water supplies in a region already semi-arid and necessitated the construction of the Irtysh-Karaganda Canal, dedicated in that year.

The city consists of several dozen settlements scattered over an area of approximately 300 sq mi (800 sq km), but there are two main areas, the Old and New towns. The Old Town grew up in a haphazard fashion in the early years and includes more than 20 pit settlements, whereas the New Town, to the south, begun in 1934 and designed as the cultural and administrative centre, has wide streets, parks, and such monumental buildings as the Miners' Palace of Culture. There are five institutions of higher education, including a university (1972) and medical and polytechnic institutes. There are also a number of research and design institutes, a museum, two theatres, a television centre, and a botanical garden. Pop. (1983 est.) 600,000.

Karageorge, byname of GEORGE PETROVIĆ, Serbo-Croatian KARAĐORĐE, or ĐORĐE PETROVIĆ (b. Nov. 14 [Nov. 3, old style], 1762, Viševac, Serbia—d. July 25 [July 13, O.S.], 1817, Radovanje), leader of the Serbian people in their struggle for independence from the Turks and founder of the Karageorgević dynasty.

The son of a peasant, Karageorge (Black George), so named because of his dark complexion and penetrating eyes, in his youth herded swine and goats. In 1787 he migrated to Austria, where he joined the army and served with distinction in Italy and against the Turks. At the end of the Austro-Turkish war in 1791, Karageorge made his home in Topola and prospered by trading in livestock. Among his seven children was Alexander, a future prince of Serbia (1842–58).

In the spring of 1804 the Serbs decided to rise against the tyrannical regime of the Janissaries, the elite corps of the Turkish Army, and elected Karageorge their leader. The Janissaries were swiftly defeated with the tacit approval of the sultan, Selim III, who regarded them as rebels. His Serbian subjects, however, flushed by their successes, wanted local autonomy. When Selim refused their demands, Karageorge launched a war of independence in 1805. A brilliant guerrilla fighter and a natural leader, he defeated the Turks and liberated his country. When Russia went to war with Turkey (1807), the Serbs had a powerful ally, but the Russians offered only a token force. Their failure to mention Serbia in the truce of Slobozia with Turkey convinced Karageorge that his nation was regarded as a mere pawn in the turbulent politics of the Napoleonic era. When Russian influence threatened to become paramount, the State Council gave Serbia its first constitution and declared Karageorge the "first and supreme Serbian hereditary leader" (1808).

Serbo-Russian relations improved when Russia renewed the war with the Turks in 1809. A Serbo-Russian army defeated the Turks at Varvarin and Loznica (1810). In 1812, however, on the verge of Napoleon's invasion, the Russians concluded a hasty treaty with the Turks at Bucharest, leaving Serbia with little more than paper guarantees of autonomy. The Sultan, his powerful forces freed, invaded Serbia from three sides. Soon all opposition was crushed (1813).

Sick with typhus and broken in spirit, Karageorge fled to Austria. Serb autonomy was, however, lost only temporarily, for in 1815 another national leader, Miloš Obrenović, arose to direct a successful rebellion against the Turks. Karageorge, regarded by Miloš as his enemy, was not allowed to return. After living for a time in Russia, where he was well received, he secretly returned to Serbia hoping to organize an uprising against the Turks in alliance with Greek patriots. Fearing the presence of such a dangerous rival, Miloš had him murdered in his sleep. To ingratiate himself with the Sultan, he sent the slain man's head to Constantinople. The assassination initiated a vendetta between the rival dynasties descending from the two leaders that plunged Serbia into bloodshed for more than a century.

Karageorgević DYNASTY, Serbo-Croatian KARAĐORĐEVIĆ, rulers descended from the Serbian rebel leader Karageorge. It rivalled the Obrenović dynasty for control of Serbia during the 19th century and ruled that country as well as its successor state, the Kingdom of Serbs, Croats, and Slovenes (called Yugoslavia after 1929), in 1842–58 and 1903–45.

The first prince, Alexander (son of Karageorge), reigned from 1843 to 1858. Thereafter, for nearly half a century, the Obrenović dynasty was in power. Finally, in 1903, Alexander's son Peter I became king; he reigned as king of Serbia from 1903 to 1918 and then as king of the Kingdom of the Serbs, Croats, and

Slovenes until his death in 1921. He was followed by his son, Alexander I (reigned 1921–34), who in 1929 changed the name of the state to Yugoslavia; Alexander's son and successor, Peter II, reigned from 1934 to 1945, when the monarchy was abolished.

Karagöz (Turkish: "Black Eyes," or "Gypsy"), type of Turkish shadow play, named for its stock hero, Karagöz. The comically risqué plays are improvised from scenarios for local audiences in private homes, coffee shops, public squares, and innyards. The Karagöz play apparently was highly developed in Turkey by the 16th century and was adapted in Greece and North Africa. In the 20th century, however, Karagöz plays have lost some popularity to cinema and other forms of entertainment. Their performance in Turkey has been mostly confined to the Muslim holy month of Ramaḍān.

The character of Karagöz is a good-natured underdog who usually gets his turban knocked off in fights. He exchanges satiric and vulgar repartee with his friend Hacivot, a pompous Turk with an affected accent, and with other stock characters, such as a newly rich peasant, a conniving dervish, and a Jewish merchant.

Kāraikāl, town, Pondicherry union territory, an enclave on the Coromandel Coast within eastern Tamil Nādu state, southeastern India, near the mouth of the Arasalār River. The chief town of the Kāraikāl territory and a former French colony in India, it is in the fertile Cauvery Delta, the most important rice-growing area of Tamil Nādu.

The area was part of the Cōḷa empire in the 10th century, and it was conquered successively by Vijayanagar, Marāṭhā, Muslim, and French troops, becoming French in the late 18th century. Since 1954 the area has been a popular seaside tourist resort of the union territory. Pop. (1981) 43,408.

Karaïskákis, Geórgios (b. *c.* 1780, Mavrommati, Ágrafa, Epirus [Greece]—d. May 5, 1827, Athens), a klepht, or brigand chief, who played an important role in the Greek War of Independence. He is remembered both for his treachery and for his reckless courage.

A native of the district of Ágrafa in Epirus, a region known for its bandits and rebels, Karaïskákis served in the *armatoli,* or militia, and participated in the struggles between the Turkish authorities and the rebel Ali Paşa, pasha of Ioánnina (Janina). He served in Ali's bodyguard (1808–20) but was on the Turkish side when the pasha was defeated and killed in February 1822. During the next few years he fought with the Greek patriots in western Greece but capitulated to the Turks whenever the struggle for independence seemed a poor risk.

Despite his treachery and selfish ambition, Karaïskákis was a brave warrior and one of the few Greek commanders the Turks actually feared. Pardoned by the Greek central government at Nauplia, he put down a regional revolt in the Peloponnese in the autumn of 1824; in April 1826, as commander of the *armatoli,* he attempted to relieve the second siege of Missolonghi; his illness and the lack of discipline of the *armatoli,* however, prevented him from giving the Missolonghiots effective support in their attempt to break through Turkish lines, and few of the defenders survived. He was killed at the relief of the siege of the Acropolis in Athens in 1827.

Karaism, also spelled KARAITISM, or QARAISM (from Hebrew *qara,* "to read"), a Jewish religious movement that repudiated oral tradition as a source of divine law and defended the Hebrew Bible as the sole authentic font of religious doctrine and practice. In dismissing the Talmud as man-made law substituted for the God-given Torah, Karaism set itself in direct opposition to rabbinic Judaism.

The movement began in 8th-century Persia. Though its members were never numerous, it spread to Egypt and Syria and later into Europe by way of Spain and Constantinople.

Karaism proclaimed the Bible to be self-explanatory and sanctioned personal interpretations of the Scriptures. The movement, however, soon found it necessary to develop an oral tradition of its own in applying scriptural principles to daily life. Asceticism became so severe that adherents were not only forbidden to kindle a fire on the sabbath but even to warm themselves or use the light from a fire lit on Friday. The festival of Ḥanukka was suppressed, and great rigour was applied to dietary laws, ritual purity, fasting, clothing, and marriage (adherents were forbidden to marry outside the sect). An uncompromising monotheism led to the exclusion of traditional Jewish ritual objects such as phylacteries and mezuzahs.

Initially, supporters of the movement were called Ananites, after Anan ben David, the first literary figure of the group, who worked out a code of life independent of the Talmud. During the 9th or 10th century, the name Karaites was adopted to underscore the group's emphasis on a personal reading of the Bible.

For a long time the movement suffered from numerous schisms and from a lack of competent scholars to defend its position on the Bible. Sa'adia ben Joseph (10th century) was an outspoken and effective opponent of Karaism and tried to exclude Karaites from Jewish communities. He and others, however, were forced by Karaism to develop Jewish philosophy and sharpen their exegesis to defend rabbinic Judaism's use of oral tradition (and the Talmud in particular). These controversies stimulated both sides into producing a great mass of polemical literature in Hebrew and Aramaic, the largest collection of which is now in the Leningrad Public Library.

Karaites still exist today, about 10,000 of them living in or near Ramla, outside Tel Aviv–Yafo, and probably small enclaves survive in Poland and the U.S.S.R. Their liturgy is less rich than that of other Jewish congregations, having little poetry but many readings of scriptural texts.

Karajá (people): *see* Carajá.

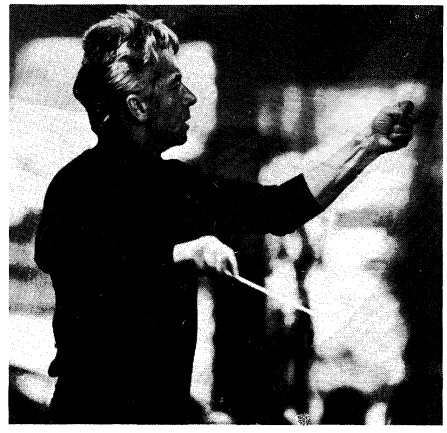
Karajan, Herbert von (b. April 5, 1908, Salzburg, Austria—d. July 16, 1989, Anif, near Salzburg), Austrian-born orchestra and opera conductor, a leading international musical figure of the mid-20th century.

A child prodigy on the piano, Karajan studied at the Mozarteum in Salzburg and made his conducting debut in 1927 at Ulm, Ger. From 1927 to 1941 he conducted at Ulm and Aachen and from 1938 to 1945 led the Berlin State Opera. In 1955 he became music director of the Berlin Philharmonic.

A Nazi Party member (1933–42), Karajan was exonerated by an Allied tribunal after World War II, but his U.S. debut in 1955 precipitated public protests. From the late 1950s Karajan was often simultaneously associated with the Vienna State Opera (director, 1956–64), the Salzburg Festival (artistic director, 1956–60), and the London Philharmonia. He was also a chief conductor at La Scala, Milan, and a guest conductor at the New York Philharmonic. In 1967 Karajan founded the Salzburg Easter Festival. He conducted L'Orchestre de Paris (1969–70) and returned to the Vienna State Opera in 1977. Throughout these associations the Berlin Philharmonic generally remained the centre of his musical activities, though after 1983 a series of disputes caused estrangement between the orchestra members and Karajan.

Karajan's musical interpretations were noted for their precision and objectivity. In the 1970s and '80s, however, his conducting was characterized by a more personal style.

A biography, *Herbert von Karajan* by Roger Vaughan, was published in 1986.



Karajan, 1968

By courtesy of Deutsche Grammophon; photograph, Lauterwasser

Karaje rug, also called KARADAGH, floor covering handmade in or near the village of Qarājeh (Karaje), in the Qareh Dāgh (Karadagh) region just south of the Soviet border, northeast of Tabriz, Iran. The best-known pattern shows three geometric medallions that are somewhat similar to Caucasian carpets. The central one has a latch-hooked contour and differs in colour from the others, which are eight-pointed stars.



Detail of a Karaje rug from Iran, late 19th century; in a Philadelphia private collection

Philadelphia private collection; photograph, Otto E. Nelson—EB Inc.

The rugs are all-wool and Ghiordes-knotted. Karadagh runners are similar to those of Karabagh but are more Persian in appearance.

Karak (Korean tribal league): *see* Kaya.

Karak, al-, also spelled KERAK, town, west-central Jordan, on the Wadi al-Karak, 10 miles (16 km) east of the Dead Sea. Built on a small, steep-walled butte, about 3,100 feet (950 m) above sea level, the town is the Kir-hareseth, or Kir-heres, of the Old Testa-

ment, one of the capitals of ancient Moab. The ancient name means "Wall of Potsherds" in Hebrew, or "City of Potsherds" in ancient Moabite; the modern Arabic form can be traced back through Greek *charax,* "palisade," to the corresponding Hebrew word *kir* (modern transliteration *qir*), as found in the Bible.

The siege of the ancient Moabite stronghold of Kir-hareseth by the combined forces of Israel, Judah, and Edom, and their subsequent withdrawal after Mesha, king of Moab, offered his heir as a burnt offering on the city wall, is vividly described in the Old Testament (II Kings 3). Isaiah and Jeremiah, in their prophecies of doom for Moab, also mention the city (Isaiah 15, 16; Jeremiah 48). The natural fortress has evidences of settlement throughout postbiblical times; in the 3rd century AD it was known to the classical geographer Ptolemy as Characmoba. Subsequently settled by the Byzantines, who had a bishopric there, it is represented as a walled city on the Ma'dabā mosaic map, the oldest known map of the Holy Land and environs (6th century AD). Le Krak du Désert, a heavily fortified crusader citadel, was built on the site of the ancient fortress in 1132; it fell to the Muslims in 1188, the year after the crusaders' defeat at the Battle of Ḥaṭṭīn (in Galilee), in which they lost control of Palestine to Saladin. The town's present name is first mentioned in Islāmic chronicles of the 13th century.

In modern times, al-Karak was a centre of revolt of Bedouin tribes against the Turks (late 19th and early 20th centuries). It is now a market town for the sparsely settled surrounding country; there is a local chamber of commerce, and regional government offices and courts are there. Al-Karak also has remains of several Byzantine churches. Pop. (1986 est.) 15,700.

Karakhan Manifesto, manifesto issued on July 25, 1919, by Lev Karakhan, a member of the foreign ministry of the newly formed Soviet republic, in which he offered to relinquish all Soviet claims to the special rights and privileges won by the Russian tsarist government in China. The proposal, even after it was later somewhat modified, created a favourable impression in China; it was the first unilateral expression of friendship and offer of equality from a European country.

The climate created by this manifesto encouraged an interest in Marxism among Chinese intellectuals, who two years later formed the first Chinese Communist Party. Because of the precarious position of both the Soviet and Chinese governments in 1919, the proposal was not immediately taken up, and it did not become generally known in China until March 1920. Meanwhile, in September 1920, Karakhan repeated his proposal, this time offering it as a basis for negotiations between the two nations. After extended negotiations, a treaty was finally signed on May 31, 1924, and it actually reaffirmed much of the former tsarist position in North China. Under the treaty the Russians surrendered their rights of extraterritoriality—that is, the right of foreigners to be tried by their own consuls and to govern themselves in China. The Russians insisted, however, on the joint Chinese–Soviet administration of the Chinese Eastern Railway, the railroad line running through the northeastern Chinese provinces of Manchuria from Siberia to the Russian warm-water port of Vladivostok on the Sea of Japan. The railway had been built originally by the Russians around the turn of the century. During the Soviet Civil War the line had been placed under the control of a commission of the Western powers. Now the Russians reclaimed it, agreeing in principle, however, to the eventual purchase of the railway by China.

The treaty also provided for the preservation of Russian influence in the crucial border country of Outer Mongolia. Karakhan was allowed to become a full ambassador, which made him the highest-ranking foreign minister in China.

Karakhanid DYNASTY: *see* Qarakhanid dynasty.

Karakol (Kirgiz S.S.R.): *see* Przhevalsk.

Karakoram Highway, Chinese (Wade-Giles romanization) K'A-LA-K'UN-LUN KUNG-LU, roadway that connects Kashgar, China, with Islāmābād, Pak. The road, which took almost 20 years (1959–78) to complete, extends for about 800 km (500 miles) through some of the most rugged and inaccessible terrain in Asia; it runs through or near the Hindu Kush, the Kunlun Mountains, the Karakoram Range, and the northernmost Himalayas.

The highway was a joint Pakistani and Chinese project and required the skills of about 24,000 workers. Mud slides, rockfalls, and other avalanches were a constant danger, and the road's construction was particularly hampered by the unforeseen movement of glaciers in the region. Even after its completion, the highway continued to require heavy maintenance, but it reportedly had had a notable economic impact on the Uighur, Tadzhik, and Kirgiz peoples who inhabit the mountainous region.

Karakoram Range, Chinese (Wade-Giles romanization) K'A-LA-K'UN-LUN SHAN, great mountain system of central Asia extending approximately 300 miles (480 km) from easternmost Afghanistan southeastward into Jammu and Kashmir.

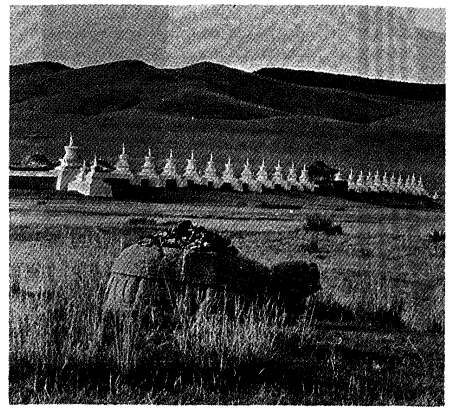
A brief treatment of the Karakoram Range follows. For full treatment, *see* MACROPAEDIA: Asia.

The Karakorams consist of a group of parallel ranges with several spurs and are characterized by craggy peaks, steep slopes, and heavy glaciation. The range forms one of the highest mountain systems in the world, with an average height of about 20,000 feet (6,100 m). Four peaks exceed 26,000 feet (7,900 m) in elevation, the highest being K2 at 28,251 feet (8,611 m), the second highest peak in the world. The international boundaries of the Soviet Union, China, Pakistan, Afghanistan, and India all converge within the highest mountains of the system.

The Karakorams serve as a watershed for the basins of the Indus and Tarim rivers, whose principal sources are the melted waters of both seasonal and perpetual snows and glaciers. The regional climate in the Karakorams is for the most part semiarid and sharply continental. The southern slopes are exposed to the humidifying influence of the monsoons coming in from the Indian Ocean, but the northern slopes are extremely dry. Surrounded by a number of other very high mountain ranges with immense glaciers, the Karakorams are virtually inaccessible. Mountain passes are situated at elevations of about 16,000 feet (about 4,900 m) and are open only five or six months of the year. The completion of the Karakoram Highway in 1978 improved transportation in the region.

Owing to severe natural conditions, the mountain population is very sparse, with only a few tens of thousands of people making their home in the 80,000-square-mile (207,200-square-kilometre) area of the Karakorams. Most are Tibetan farmers who live in villages at elevations up to 14,800 feet (4,500 m); they grow barley, oats, and millet and breed cattle. Wild animals of the region include the snow leopard, wild yak, and Tibetan antelope.

Karakorum, Chinese (Wade-Giles romanization) K'A-LA-K'UN-LUN, also spelled KHARA-KHORIN, or HAR HORIN, ancient capital of the Mongol empire, whose ruins lie on the upper



Ancient stone tortoise in front of the monastery of Erdeni Dzu, Karakorum, Mongolian People's Republic

George Holton—Photo Researchers/EB Inc.

Orhon Gol (river) in north-central Mongolian People's Republic.

The site of Karakorum may have been first settled about 750. In 1220 Genghis Khan, the great Mongol conqueror, established his headquarters there and used it as a base for his invasion of China. In 1267 the capital was moved to Khanbaliq (modern Peking) by Kublai Khan, greatest of the successors of Genghis Khan and founder of the Mongol (Yüan) dynasty (1206–1368) in China. In 1235 Genghis Khan's son and successor, Ögödei, surrounded Karakorum with walls and built a rectangular palace supported by 64 wooden columns standing on granite bases. Many brick buildings, 12 shamanistic shrines, and two mosques were once part of the city, which also was an early centre for sculpture, especially noteworthy for its great stone tortoises.

In the Battle of Puir Nor in 1388, Chinese forces under the leadership of the emperor Hung-wu invaded Mongolia and won a decisive victory, capturing 70,000 Mongols and destroying Karakorum. Later it was partially rebuilt but was subsequently abandoned. The Buddhist monastery of Erdeni Dzu (built 1585), which today remains only as a museum, was built on the city site.

In 1889 the precise location of Karakorum was discovered by two Russian orientalists, and in 1948–49 the ruins were explored by members of the Academy of Sciences of the U.S.S.R. Among their discoveries were the site of Ögödei's palace (in the southwestern part of the city) and the remains of a late 12th- or early 13th-century Buddhist shrine.

Karaköse (Turkey): *see* Ağrı.

Karakul, sheep breed of central or west Asian origin, raised chiefly for the skins of very young lambs, which are covered with glossy, tightly curled black coats and are called Persian lamb in the fur trade. The wool of mature Karakul sheep, classified as carpet wool, is a mixture of coarse and fine fibres, from 6 to 10 inches (15 to 25 cm) long, of colours varying from black to various shades of brown and gray. The Karakul was first imported into the United States in 1909.

Karakumsky Canal, also called KARA-KUM CANAL, waterway in Turkmenistan, U.S.S.R. The main section, completed in 1967 and running some 520 miles (840 km) from the Amu Darya to Geok-Tepe, west of Ashkhabad, skirts the Kara-Kum Desert. Water from the canal, which is navigable for 280 miles (450 km), is used principally for irrigation, and fishing has been developed on the canal.

Karamanlis, Konstantinos, also spelled CONSTANTINE CARAMANLIS (b. March 8, 1907, Próti, near Sérrai, Macedonia), Greek statesman who was prime minister from 1955 to

1963 and again from 1974 to 1980. He then served as president from 1980 to 1985.

The eldest of seven children of a poor schoolteacher, Karamanlis was able, with the help of local benefactors, to attend secondary school and the University of Athens. He received a law degree in 1932 and practiced law in Athens. Launched into politics by the Populist Party, he was elected to Parliament in 1935 for Sérrai, which continued to reelect him. In 1952 he entered the government of Alexandros Papagos as minister of public works, and when Papagos died in October 1955, King Paul chose Karamanlis as prime minister.

Karamanlis formed not only his government but also his own party, the National Radical Union (ERE), and in parliamentary elections in February 1956 obtained 161 seats out of 300; he retained a parliamentary majority in elections held in 1958 and 1961. He improved Greece's relations with Yugoslavia, but those with Turkey and, especially, Great Britain remained strained because of the issue of tensions between the ethnic Greek and Turkish communities on Cyprus. In order to restore friendly relations with NATO powers, Karamanlis decided to disentangle the awkward Cyprus problem by establishing an independent republic on the island, an action taken, with the agreement of Turkey and Great Britain, in 1960. On June 11, 1963, he resigned after King Paul rejected his advice that the king's state visit to London be postponed. Living in Paris, he maintained public silence on Greek affairs.

On July 24, 1974, after the fall of the military junta, Karamanlis returned to Athens as prime minister. He demanded and obtained the subordination of the armed forces to civilian authority and averted a catastrophic war with Turkey over Cyprus without loss of prestige. In parliamentary elections held in November that year, his New Democracy Party won 220 of 300 seats. In May 1980 Karamanlis resigned as prime minister and was elected president. When in March 1985 the Socialist prime minister Andreas Papandreou unexpectedly withdrew his party's support for Karamanlis' upcoming reelection, Karamanlis resigned from the presidency.

Karamay, also spelled KARAMAI, Wade–Giles romanization K'O-LA-MA-I, city in northern Uighur Autonomous Region of Sinkiang, China. Located in the Dzungarian Basin, it is about 200 miles (320 km) northwest of Wu-lu-mu-ch'i (Urumchi), the provincial capital. Rich oil reserves were discovered in this area in 1955, and the first oil field was developed in the late 1950s and early 1960s. Production was greatly increased after the construction of a railway to Wu-lu-mu-ch'i. There are two main productive fields, one at Karamay itself in the north and another at Wu-su, about 60 miles (97 km) south. Wu-su and Karamay are joined by pipelines and have refineries. The reserves of both oil fields are substantial. Pop. (1985 est.) city centre, 167,200; city, 180,100.

Karamojong, also spelled KARIMOJONG, eastern Nilotic pastoral people of northeastern Uganda. The Karamojong are the largest of a cluster of culturally and historically related peoples, including the Jie, Teso, Dodoth (or Dodos), and Labwor of Uganda and the Turkana of neighbouring Kenya. They speak an Eastern Nilotic language in the Chari-Nile branch of the Nilo-Saharan family.

The history of the seminomadic, pastoral Karamojong is marked by misfortune: epizootic diseases have decimated cattle herds, locust plagues and drought have caused crop failures and famine, and epidemics have been common. Ivory attracted 19th-century Swahili and European traders, some of whom controlled and plundered the Karamojong.

Cattle are the most valuable and valued assets of the Karamojong, and the possession of cattle is regarded as necessary for both social esteem and personal satisfaction. Herds are divided so that some animals are kept around permanent homesteads for milking while most are sent off to distant pastures, where young men tend them and live off their milk, sometimes supplementing a meagre and monotonous diet with blood obtained by bleeding the cattle. Intertribal cattle raiding has historically been endemic among the Karamojong and neighbouring pastoral peoples. Settled agriculture is increasingly practiced by them, however; fields for sorghum, corn (maize), millet, peanuts (groundnuts), and squash may be plowed by men but are generally tended by women.

Most of the population remains in homesteads protected by heavy, circular fences of stakes. A husband and his wife or wives, their sons, and their wives or a set of brothers inhabit each homestead. Clans are reckoned by patrilineal descent, wives join their husbands' clans, and cattle are given distinctive clan brands. Hamlets are groups of homesteads whose residents are of mixed clan affiliation; economic and religious cooperation exists within these hamlets. A named generation of 25 to 30 years has a recognized leader, and each generation is divided into three age sets that cut across kin and residence affiliations. Wives and daughters join the age sets of their husbands and fathers and wear the distinctive ornaments of each set.

Karamzin, Nikolay Mikhaylovich (b. Dec. 12 [Dec. 1, Old Style], 1766, Mikhaylovka, Simbirsk province, Russia [now Russian S.F.S.R.]—d. June 3 [May 22], 1826, St. Petersburg [Leningrad]), Russian historian, poet, and journalist, the leading exponent of the sentimentalist school in Russian literature.

From an early age, Karamzin was interested in Enlightenment philosophy and western European literature. After extensive travel in western Europe, Karamzin described his impressions in his *Pisma russkogo puteshestvennika Letters of a Russian Traveller, 1789–1790*), the most important of his contributions to a monthly review, *Moskovsky zhurnal* (1791–92; "Moscow Journal"), that he founded on his return. Written in a self-revealing style influenced by Jean-Jacques Rousseau and Laurence Sterne, the "Letters" helped introduce to Russia the sentimental style then popular in western Europe. Karamzin's tale *Bednaya Liza* (1792; "Poor Liza"), about a village girl who commits suicide after a tragic love affair, soon became the most celebrated work of the Russian sentimental school.

In 1803 Karamzin's friendship with the emperor Alexander I resulted in his appointment as court historian. The rest of his life was devoted to his 12-volume *Istoriya gosudarstva rossiyskogo* (1816–29; "History of the Russian State"). Though based on original research, this first general survey of Russian history was conceived as a literary rather than an academic work. The history is, in effect, an apology for Russian autocracy. It is the first such Russian work to have drawn on a great number of documents, including foreign accounts of historical incidents. Uncompleted at his death, the work closes with the accession of Michael Romanov (1613). As history it has been superseded, but it remains a landmark in the development of Russian literary style; it provided a main source for Pushkin's drama *Boris Godunov*. His *History* is also considered to have contributed much to the development of Russian literary language, for in it he sought to bring written Russian—then rife with cumbrous locutions—closer to the rhythms and conciseness of educated speech and to equip the language with a full cultural vocabulary.



Karamzin, portrait by V.A. Tropinin, 1815; in the State Literature Museum, Moscow

By courtesy of the State Literature Museum, Moscow

Karankawa, several groups of North American Indians (now extinct) that lived along the Gulf of Mexico from about Galveston Bay to Corpus Christi Bay. They were first encountered by the French explorer La Salle in the late 17th century, and their rapid decline began with the arrival of Stephen Austin and other white settlers in the 1820s and 1830s. The Karankawa fought on the side of the Texans in the Texan war of independence.

The Karankawa were hunters and gatherers of wild plants. Virtually nothing is known about their social or political organization, except that they had war leaders and hereditary chiefs.

Karaosmanoğlu, Yakup Kadri (b. March 27, 1889, Cairo—d. Dec. 13, 1974, Ankara), writer and translator, one of the most renowned figures in modern Turkish literature, noted for vigorous studies of 20th-century Turkish life.

Educated at a French school in Cairo and then in İzmir, he moved to Constantinople (now Istanbul) in 1908. He attracted attention as a writer by his outstanding prose poems, and he became connected with the Fecr-i âti ("Dawn of the Future") literary school, which formed itself after the Young Turk Revolution. His first book, a collection of short stories, was published in 1913. A journalist during the Turkish War of Liberation (1919–22), he became a member of parliament and later had an extensive diplomatic career (1934–54).

His novels are powerful studies of Turkish society since the advent of the republic. In *Hüküm gecesi* (1927; "The Night of Judgment"), he describes the interparty struggles after the adoption of the constitution of 1908. *Sodom ve Gomore* (1928; "Sodom and Gomorrah") is about life in occupied Constantinople after World War I. *Yaban,* perhaps his best-known novel (1932; "The Stranger"), deals with the psychological distance between the Turkish peasant and the urban intellectual. He also wrote poetry and several works of nonfiction.

Karası DYNASTY, Turkmen dynasty (*c.* 1300–60) that ruled in the Balıkesir-Çanakkale region of western Anatolia.

Founded by Karası, a frontier ruler under Seljuq suzerainty, the principality had two branches, with their respective centres in Balıkesir and Bergama (Pergamum). Of the sons of Karası, Demirhan was defeated by the Ottoman ruler Orhan, and Balıkesir was annexed (*c.* 1345). The coastal region of Çanakkale-Troy was ruled by Karası Süleyman. His territory was incorporated into the Ottoman Empire *c.* 1360.

karat, also spelled CARAT, a measure of the fineness (*i.e.,* purity) of gold. It is spelled *carat* outside the United States but should not be confused with the unit used to measure the weight of gems, also called carat. A gold karat is $1/24$ part, or 4.1667 percent, of the whole, and the purity of a gold alloy is expressed as the number of these parts of gold it contains. Thus, an object that contains 16 parts gold

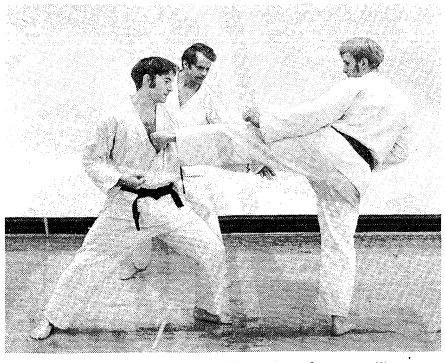
and 8 parts alloying metal is 16-karat gold, and pure gold is 24-karat gold.

This system of indicating the relative proportion of gold originated with a medieval coin called a mark. A mark weighed 24 carats (in this case, the carat was the same as that used in the weighing of gems and was theoretically equal to the weight of the seed of the coral tree). Pure gold could not be used to produce marks because it was too soft, so copper or other metals were added to produce a hard alloy; the purity of the coin was then expressed by the proportion of its carat weight that was actually contributed by gold.

Karatau, mountain range, a northwestern spur of the Tien Shan, in southern Kazakh Soviet Socialist Republic. The name is Turkic, meaning "black mountain." The range extends for 260 miles (420 km) along the Syr River and rises to 7,139 feet (2,176 m), with an average elevation of 3,300–5,000 feet (1,000–1,525 m). The summits are smooth, and small snow-fed streams flow down the steep slopes in spring. On the eastern slopes the richest deposits of phosphorites in the Soviet Union are mined in the Karatau at Zhanatas and, since 1979, at Kokdzhon; the ores are processed at Chimkent, Dzhambul, and (since 1979) at Novo-Dzhambul. Lead and zinc are mined and processed at Achisay and Kentau.

karate (Japanese: "empty hand"), unarmed-combat system employing kicking, striking, and defensive blocking with arms and legs. Emphasis is on concentration of as much of the body's power as possible at the point and instant of impact. Striking surfaces include the hands (particularly the knuckles and the outer edge), the ball of the foot, heel, forearm, knee, and elbow. All are toughened by practice blows against padded surfaces or wood. Pine boards up to several inches in thickness can be broken by the bare hand or foot of an expert. Timing, tactics, and spirit, however, are each considered at least as important as physical toughening.

In sporting karate and sparring (*kumite*) in training, blows and kicks are stopped short, preferably within an inch of contact. Sporting matches commonly last only three minutes, to a decision, if neither contestant has scored a clean "killing" point in the estimation of the judges. Contests of form (*kata*) are also held, in which single competitors perform predetermined series of movements simulating defense



A roundhouse kick (*mawashi-geri*), referee calling score behind contestants

Ken Brown

and counterattack against several opponents. Performances are scored by a panel of judges, as in gymnastics.

Karate evolved in the Orient over a period of centuries, becoming systematized in Okinawa in the 17th century, probably by people forbidden to carry weapons. It was imported into Japan in the 1920s. Several schools and systems developed, each favouring somewhat different techniques and training methods. Karate, like other Oriental fighting disciplines, stresses mental attitude, rituals of courtesy, costumes, and a complex ranking system (by colour of belt). There is some overlapping of technique with other fighting styles.

Karatepe (Turkish: "Black Hill"), site of a Late Hittite fortress city, located in the piedmont country of the Taurus Mountains in south-central Turkey. The city, dating from the 8th century BC, was discovered in 1945 by Helmuth T. Bossert and Halet Çambel. It was built with a polygonal fortress wall and an upper and lower gateway of monumental proportions. The gate chambers are lined with inscribed orthostates (carved stone slabs set



Relief carvings from Karatepe

Hannelore Marek

against the base of a wall), which show traces of Assyrian and Egypto-Phoenician motifs and influences.

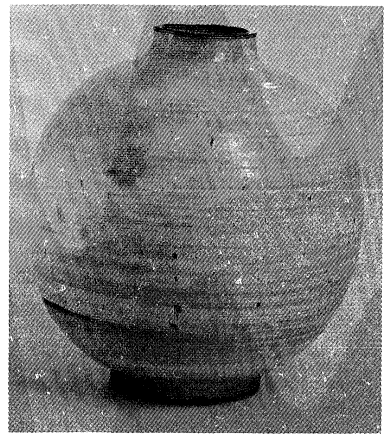
The importance of Karatepe lies in its inscriptions. At the beginning of the excavations a long Phoenician text was discovered. The gateways were found to contain extensive versions of the same text in both Phoenician script and Hittite hieroglyphs. By comparing the two inscriptions, archaeologists greatly increased their understanding of the Hittite hieroglyphic script and language.

According to the text, the founder and ruler of the city was Asitawandas, king of the Danunians, a vassal of Awarikus of Adana. Asitawandas claimed descent from the "house of Mopsus"; Mopsus is known in Greek legend as an emigrant from Ionia and founder of nearby Cilician Mopsuestia (modern Misis). The Assyrians probably destroyed the city in about 700 BC, when the last remaining principalities in the region were subjugated.

Karatsu, city, Saga *ken* (prefecture), Kyushu, Japan, facing Karatsu Bay. Its name is derived from the Japanese terms *kara* (referring to China) and *tsu* ("port"), reflecting the city's history as an ancient trading port with China and Korea. The Karatsu coal mines were opened in the early 20th century, and after World War II the western part of the city developed as an industrial district, centring on the fishing harbour. Manufactures include chemicals and ceramics. The eastern part of Karatsu—rich in historic sites and scenic beauty—serves as a tourist centre for Genkai Quasi-national Park. Pop. (1985) 78,744.

Karatsu ware, Japanese ceramic ware of Korean origin produced in Kyushu. The actual date of production is thought to be sometime during the first half of the 16th century, in the late Muromachi period.

The generic term Karatsu is applied to many different types of ceramics. The clays were sandy and high in iron content. Ordinarily, all vessels were covered with ash, feldspar, or *temmoku* glazes. They are of two types: undecorated, with only a plain ash slip glaze, and pictorial, or decorated, painted with an iron underglaze. Since they are built up by the coiling method and manually pounded into shape, they are simple and unsophisticated but have great strength and feeling for nature.



Karatsu jar, 18th century, Edo period; in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston, Hoyt Collection

The development of Karatsu was fostered by the adoption of entirely new techniques taken to Japan from Korea, and the earliest Karatsu ceramics undoubtedly were made in Korean style and according to Korean techniques. It is actually impossible to tell some contemporary Korean and Karatsu wares apart. The development of Karatsu was strongly stimulated by two invasions of Korea carried out during the closing years of the 16th century, after which Korean craftsmen were brought to Japan. Behind much of this development lay the popularity of the tea ceremony, which was sweeping Japan at this time. The Korean-style Kyushu wares were felt to be quite appropriate to the *wabi-cha* school of formal tea drinking.

Karavelov, Lyuben Stoychev (b. 1834, Koprivshtitsa, Rumelia [now in Bulgaria]—d. Jan. 21, 1879, Ruse, Bulg.), Bulgarian writer and revolutionary who contributed to the national reawakening of Bulgaria.

Emigrating to Russia at 23, Karavelov studied ethnography in Moscow, where he was greatly influenced by Russian radical thought, and soon began writing political polemics and tales and studies of his homeland for various periodicals. Because his safety was threatened by his revolutionary contacts, he moved to Serbia (1867) but was shortly expelled for collaborating with the Serbian liberal opposition. Later, moving to Bucharest, he took up the Bulgarian revolutionary cause in his journals *Svoboda* (1869–72; "Freedom") and *Nezavisimost* (1873–74; "Independence"), but his spirit was eventually broken by revolutionary failures, personal hardship, and betrayal. An important figure in Bulgarian letters, his leading works include the patriarchal novel *Bălgare ot staro vreme* (1867; "Bulgars of Olden Times") and his pictures from Bulgarian life *Maminoto detentse* (1875; "Mother's Child").

Karawanken, Italian CARAVANCHE, Serbo-Croatian KARAVANKE, mountain range of the Eastern Alps, extending eastward along the Yugoslavian-Austrian border for 50 miles (80 km) from the town of Tarvisio in Italy. The range lies between the Drava River (north) and the upper Sava River (south) and rises to Hochstuhl (7,342 feet [2,238 m]) in the eastern part. The Karawanken, consisting mainly of limestone, is crossed by road at Wurzen, Loibl, and Seeberg passes. A 5-mile- (8-kilometre-) long tunnel cuts through the range and connects Villach, Austria, with Jesenice, Yugos. The Karawanken is noted for its view to the north of Lake Wörther and other smaller lakes.

Karbalā', also spelled KERBELA, city, central Iraq. The city is Iraq's foremost holy city and lies 55 miles (88 km) southwest of Baghdad, with which it is connected by rail.

The city's religious importance derives from the Battle of Karbalā' (AD 680) between the Sunnite and Shī'ite sects of Islām. Ḥusayn ibn 'Alī, the Shī'ite leader and grandson of Muḥammad, was killed, and his tomb remains one of the greatest Shī'ite shrines and pilgrimage centres. It was destroyed in 1801 but was soon rebuilt. Shī'ite Muslims consider burial in Karbalā' a sure means of reaching paradise; the city therefore has extensive cemeteries. The city is also a departure point for pilgrimages to Mecca.

Karbalā' still functions as a trade centre. The city's older section is enclosed by a wall, with the newer buildings to the south. Karbalā' has often been a centre of discontent with the country's rulers, both foreign and native. About half of the city's population is of Iranian descent, with some Indians and Pakistanis.

The surrounding area is a flat region extending from the Euphrates River in the east to the Saudi Arabian border in the west. Except for the area around the river, the region is sparsely populated. Dates are grown in the east. West of Karbalā', out in the desert, are the ruins of the castle al-Ukhaidir. There is controversy about its date and purpose, but this fortified palace was probably built in the late 8th century. It is Sāsānian in style. Pop. (1985 est.) city, 184,574.

Karbalā', Battle of (Oct. 10, 680 [10th of Muḥarran AH 61]), brief military engagement in which Ḥusayn ibn 'Ali, grandson of the Prophet Muḥammad and pretender to the caliphate, was defeated and killed by an army sent by the Umayyad caliph Yazīd I. It helped secure the position of the Umayyads, but, among Shī'ite Muslims, followers of Ḥusayn, the 10th of Muḥarran (or 'Āshūrā') became an annual holy day of public mourning.

When Yazīd I succeeded his father to the caliphate (spring 680), the many partisans of Muḥammad's late son-in-law 'Ali rose in the city of Kūfah and invited Ḥusayn to take refuge with them, promising to have him proclaimed caliph in Iraq. Meanwhile, Yazīd, having learned of the rebellious attitude of the Shī'ite in Kūfah, sent 'Ubayd Allāh, governor of Basra, to restore order. The latter did so, summoning the chiefs of the tribes and making them responsible for the conduct of their people. Ḥusayn nevertheless set out from Mecca with all his family, expecting to be received with enthusiasm by the citizens of Kūfah; but, on his arrival at Karbalā', west of the Euphrates, he was confronted by an army sent by 'Ubayd Allāh and under the command of 'Umar ibn Sa'd, son of the founder of Kūfah. Ḥusayn gave battle, vainly relying on the promised aid from Kūfah, and fell with almost all his family and followers.

Though it was a rash expedition, it did involve the grandson of the Prophet and thus many members of his family. Ḥusayn's devout partisans at Kūfah, who by their overtures had been the principal cause of the disaster, regarded it as a tragedy, and the facts gradually acquired a romantic and spiritual colouring. 'Umar, 'Ubayd Allāh, and even Yazīd came to be regarded as murderers, and their names have ever since been held accursed by Shī'ite Muslims. They observe the 10th of Muḥarram as a day of public mourning; and, among Iranians especially, as well as in Karbalā', passion plays are enacted, representing the misfortunes of the family of 'Ali. The tomb of the decapitated martyr Ḥusayn at Karbalā' is to them the holiest place in the world.

Kardelj, Edvard (b. Jan. 27, 1910, Ljubljana, Slovenia, Austria-Hungary [now in Yugoslavia]—d. Feb. 10, 1979, Ljubljana), Yugoslav revolutionary and politician, a close colleague and chosen successor of Josip Broz Tito. He was regarded as the chief ideological theoretician of Yugoslav Marxism, or Titoism.

The son of a railroad worker, he graduated from the Ljubljana Teachers' College. From the age of 16 he had been a member of the outlawed Communist Party, initially in its youth league. He was imprisoned (1930–32) for his trade-union and party activities, and in 1934 he fled into exile, eventually making his way from Czechoslovakia to the Soviet Union, where he received indoctrination in underground methods. It was in 1934, prior to his leaving, that Kardelj first met Tito. Back in Yugoslavia from 1937 on, he was arrested several times and imprisoned.

After the German occupation of Yugoslavia (1941), Kardelj helped organize the resistance front in Slovenia and thereafter accompanied Tito in much of the partisan fighting. After the war he served as vice president (1945–53) under Tito, and he drew up (1946) the Soviet-inspired federal constitution of Yugoslavia. He became one of the country's major theoreticians and legalists, directing the creation of all the succeeding constitutions of 1953, 1963, and 1974.

Over the years Kardelj handled many foreign missions and tasks as well, though he officially held the post of foreign minister only from 1948 to 1953. Throughout, he was a key figure in the collective leadership of the Yugoslav Communist Party, known as the League of Communists.

Kardelj was the main architect of a theory known as socialist self-management, which served as the basis of Yugoslavia's political and economic system and distinguished it from the Soviet system. In foreign affairs he pioneered the concept of nonalignment between the West and the Soviet Union.

Karder (Zoroastrian priest): *see* Kartēr.

Kardhítsa, market town and capital, *nomós* (department) of Kardhítsa, Greece, in the southwestern Thessaly (Thessalía) plain near the Pámisos River. Laid out in rectilinear fashion by the Turks, it serves the Ágrafa region of the eastern Pindus range as well as western Thessaly. Kardhítsa serves as a commercial centre for agricultural products. There are deposits of methane gas in the vicinity. In the Pindus, 12 miles (19.5 km) west-southwest, is a hydroelectric dam and its reservoir on the Mégdhova, a tributary of the Achelous River. Kardhítsa is the birthplace of General Nikolaos Plastiras, leader of the revolution of 1922 and prime minister of Greece in 1945. Pop. (1981) 27,291.

Kărdzhali (Bulgaria): *see* Kŭrdzhali.

Karel (Czech, Dutch, Polish personal name): *see under* Charles.

Karelia, officially KARELIAN AUTONOMOUS SOVIET SOCIALIST REPUBLIC, administrative division of the Russian Soviet Federated Socialist Republic, in northwestern European Russia. It is bordered by the Gulf of Kandalaksha (north), the White Sea (east), Lake Ladoga (south), and Finland (west). It covers an area of 66,550 square miles (172,400 square km).

Underlain by a part of the ancient rock of the Baltic crystalline shield, the surface of the republic is largely a broad, flat, and swampy plain that was greatly affected by the Ice Age. Finger-shaped lakes and swampy depressions between long, narrow ridges of glacial deposition occur in the south; in the north, glaciation has scoured away the surface deposits, leaving thousands of lake-filled hollows and rock outcrops that produce innumerable rapids in the many short rivers. About half of Karelia is forested, with dense taiga dominated by pine, spruce, and birch growing in podzolic soils that are poor and thin. In the swampy areas sphagnum peat bogs are common. The cold winter climate is modified by warm, humid air masses from the west, but incursions of Arctic air cause severe cold spells. During February, the coldest month, temperatures average 14° F (−10° C) in the south and 7° F (−14° C) in the north. Summers are short, cool, and liable to frosts, with average temperatures of 61° F (16° C) in the south and 57° F (14° C) in the north. Precipitation, mostly in the form of snow, varies from 16 inches (400 mm) a year in the north to 24 inches (600 mm) a year in the south, with snow cover in the Ladoga region accumulating to 40 inches (1,000 mm).

Eastern Karelia has been a part of Russia since 1323, but western Karelia and its boundary with Finland were not established until 1947. Since the October Revolution in 1917, the status of Karelia has changed several times; in 1923 it became an autonomous republic; in 1940, after the addition of western Karelia, it was given full union-republic status; and in 1956 Karelia reverted to its present status and title. Russians comprise the majority of the population (nearly 70 percent), but there are also large numbers of Karelians, Belorussians, Ukrainians, and Finns.

Mining, metallurgy, and timber working and processing are the major industries. Others include power engineering, machine building, and food processing. Iron ore, copper, mica, titanium, and pegmatite are the chief minerals mined. The metallurgical industry is concentrated at Petrozavodsk and Vyartsilya near the Finnish border. Timber cutting and processing is the largest industry, producing saw timber, pit props, railway ties, paper and pulp, furniture, veneer, and prefabricated materials. Agricultural land occupies less than 3 percent of the total area; of this, only one-third is sown in rye, oats, and vegetables, with the remaining farmland used for pasture to support dairy cattle and other livestock or to breed mink and blue polar foxes for fur. Fishing is important on lakes, rivers, and along the White Sea coast.

The Kirov railway connects Petrozavodsk (*q.v.*), the capital, with Leningrad, Murmansk, and the other cities of the republic, most of which lie along the line. Equally important is the White Sea–Baltic Canal (141 miles [227 km]), built in 1931–33, to permit oceangoing vessels to travel from Belomorsk on the White Sea to Leningrad on the Baltic. Highways link railway stations with towns, regional centres, and outlying settlements. Pop. (1987 est.) 795,000.

Karelian Isthmus, neck of land lying between Lake Ladoga (east; in Leningrad *oblast* [province]) and the Gulf of Finland (west; part of the Baltic Sea). The isthmus shows evidence of ancient glaciation; its long, winding morainic hills, which reach an elevation of about 570 feet (175 m) in the south, are separated by countless lake-filled hollows and swamps, and its soil, sand, and rocks reveal glacial deposition. Much of the region is covered by evergreen forests.

Claimed by the Soviet Union to have been part of Rus from the 9th century, the isthmus was captured by Sweden at the beginning of the 17th century. It was ceded to Russia in 1721 with the Treaty of Nystad, but it was further negotiated as part of independent Finland in 1918. In about 1929, Finland began to construct the fortifications of the so-called Mannerheim Line (named for General Carl Gustaf Mannerheim) across the isthmus. The purpose of this demarcation was to guard against the threat posed by the Soviet Union, which sought (in part) a section of the isthmus in order to protect Leningrad. Refusing to negotiate, the Finnish government was forced by the Soviet victory in the four-month Russo-Finnish War to give up the isthmus and other territories.

Remains of 13th- and 14th-century fortifications, as well as the Swedish fortress at Vy-

borg, are attractions, and a number of cities on the shores of the isthmus are popular resort areas. The isthmus was the headquarters of V.I. Lenin for several periods between 1906 and 1917, and the artist I.Y. Repin lived in Kuokkala (now Repino) from 1902 to 1930.

Karelian language, member of the Finno-Ugric branch of the Uralic language family, spoken in the Karelian Autonomous Soviet Socialist Republic of the Russian S.F.S.R. and by emigrants elsewhere in the Soviet Union and in neighbouring Finland. There are two dialects of Karelian—Karelian proper and Olonets. Ludic, a minor group of dialects spoken to the southeast of Karelia, is considered to be a blend of Karelian and Veps, a related Finno-Ugric language spoken to the south of the Karelian A.S.S.R. A four-line fragment written in Karelian dates from the 13th century. In the 16th and 17th centuries Karelian translations of poetry and Russian–Karelian lexicographic lists appeared. P.S. Pallesa's *Comparative Dictionary of All Languages and Dialects* (1786) contains up to 300 Karelian words. *See also* Finno-Ugric languages.

Karen, variety of tribal peoples of southern Myanmar (Burma), speaking languages of the Sino-Tibetan family. They are not a unitary group in any ethnic sense, differing linguistically, religiously, and economically. One classification divides them into White Karen and Red Karen. The former consist of two groups, the Sgaw and the Pwo; the Red Karen include the Bre, the Padaung, the Yinbaw, and the Zayein. They occupy areas in southeastern Myanmar on both sides of the lower Salween River, in contiguous parts of Thailand, in the Pegu Yoma range in lower Myanmar, and also in the Irrawaddy delta land of southern coastal Myanmar. They are the second largest minority in Myanmar.

After the country attained its independence in 1948, a condition of sporadic civil war developed between the government and various dissident groups calling themselves Karen. By the early 1980s the principal unifying factor among Karen was a common distrust of political domination by Myanmar; the assimilation of this minority into the state of Myanmar remained a pressing political problem in the country.

Karen languages, languages spoken in lower Myanmar (Burma) and on the borders of Thailand. The Karen languages are usually divided into three groups: northern (including Taungthu), central (including Bwe and Geba), and southern (including Pwo and Sgaw); only Pwo and Sgaw of the southern group have written forms.

Leading scholars believe the Karen languages to be related to the Tibeto-Burman group of the Sino-Tibetan language family, but the relationship does not appear to be a close one. Languages of the Karen group have been greatly influenced by languages of the Tai and Austro-Asiatic families.

Distinctive features of the Karen languages include the use of tones to distinguish between words with identical sequences of consonants and vowels and the placing of the verb between the subject and object (in other Tibeto-Burman languages the verb occurs after the subject and object).

karez (water-supply system): *see* qanāt.

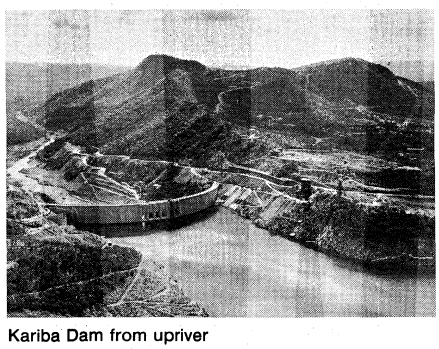
Karg-Elert, Sigfrid (b. Nov. 21, 1877, Oberndorf-on-Neckar, Ger.—d. April 9, 1933, Leipzig), a principal German organ composer of his generation.

After study at the Leipzig Conservatory, in 1919 Karg-Elert became a member of the staff there. Influenced in his earlier works by Claude Debussy, Aleksandr Scriabin, and Arnold Schoenberg, he later developed an original style influenced by Impressionism and by Renaissance and Baroque polyphony. A virtuoso organist, he also performed in concert tours on the Kunstharmonium. Among his best-known works are the 33 stylistic studies for harmonium, ranging from Giovanni Pierluigi da Palestrina to Schoenberg, and the *Sixty-Six Chorale Improvisations,* and *20 Chorale Preludes and Postludes for organ.*

Kariba, town, northern Zimbabwe. Situated on the south bank of the Zambezi River and built on the twin hills of Botererkwa overlooking the Kariba Gorge and the man-made Lake Kariba (one of the world's largest man-made lakes), the town was established in 1957 by the Federal Power Board to accommodate Kariba Dam's construction staff as well as settlers. The name means "where the waters have been trapped." During the five-year construction of the dam, the Batonka people living in the areas to be flooded were relocated, as, later, were the animals marooned by the formation of the lake. Kariba has become one of Zimbabwe's major tourist resorts and has an international airport. Pop. (1982) 12,387.

Kariba, Lake, lake in central Africa, between Zambia and Zimbabwe. It was formed by damming the Zambezi River in the Kariba Gorge, where the river narrows between hills of hard rock 250 miles (400 km) below Victoria Falls. After 1960 the hydroelectric facilities of the Kariba Dam served the towns of Zambia, the Harare (formerly Salisbury) and Bulawayo areas, and the southern part of Zimbabwe. The lake, covering about 2,000 square miles (5,200 square km), extends upstream 175 miles (280 km) to Devil's Gorge and has a maximum width of 30 miles (48 km), with a deeply indented shore and many islands. Its depth is irregular (295 feet [90 m] near the dam), and its full capacity is 130,010,000 acre-feet (160,368,000,000 cubic m). The overall project included four harbour sites, the resettlement of river dwellers, the rescue of game, and the introduction of *Tilapia* fish to the waters to give a 15,000-ton yield annually.

Kariba Dam, concrete arch dam across the Zambezi River at Kariba Gorge, on the border between Zambia and Zimbabwe. Completed in 1959, the structure is 420 feet (128 m) high with a crest 1,899 feet (579 m) in length and a volume of 1,350,000 cubic yards (1,032,000 cubic m). The dam creates Lake Kariba, and it supplies some 6,700,000,000 kilowatt-hours of electricity annually, generated by Kariba North Bank and South Bank companies (Zambia and Zimbabwe, respectively). Its creation required the resettlement of more than 30,000 Batonka tribespeople of Zambia and the evacuation of thousands of wild animals ("Operation Noah"). Some Africans initially opposed construction of the dam, seeing it as a symbol of the unpopular Federation of Rhodesia and Nyasaland, which dissolved into Rhodesia (now Zimbabwe) and Zambia in 1963. Later, however, the dam was accepted because of the inexpensive electric power it furnishes to Zambia's prosperous copper industry.



Kariba Dam from upriver
De Wys Inc.

Kariera, Aboriginal tribe of Western Australia that became one of the type groups for the study of Aboriginal social organization and religion. The Kariera originally occupied the coastal and neighbouring inland regions in the vicinity of Port Hedland and part of the Yule and Turner rivers. The tribe was composed of about 20 to 25 local groups, each with its own territory of 100–200 square miles (260–320 square km); there was an average of about 30 persons per group.

Groups were patrilineal (*i.e.,* descent was traced through the male line) and exogamous (wives came to live in the husband's territory). Members of the local group often camped together, each family of parents and children having its own shelter. There were four named tribal sections, or categories, and when a man of one section married a woman of another, the children became members of a third section. Local groups were named after a plant or animal species and constituted the religious, or totemic, unit; each region contained a ceremonial ground, or totem centre, on which the men performed rituals. Men hunted and fished, and women gathered wild seeds and roots.

Karīm Khān Zand (Moḥammad) (b. *c.* 1705—d. March 1779, Shīrāz, Zand Iran), first Zand ruler of Iran. He restored peace to the kingdom after the strife following the collapse of the Ṣafavid dynasty.

Of humble tribal origin, Karīm Khān became one of the generals of his predecessor, Nāder Shāh. In the chaotic aftermath of Nāder Shāh's assassination in 1747, Karīm Khān became a major contender for power but was challenged by several adversaries. In order to add legitimacy to his claim, Karīm Khān in 1757 placed on the throne the infant Shāh Ismāʿīl III, the grandson of the last official Ṣafavid king. Ismāʿīl was a figurehead king, real power being vested in Karīm Khān, who never claimed the title of *shāhānshāh* ("king of kings") but used that of *vakīl* ("regent").

By 1760 Karīm Khān had defeated all his rivals and controlled all of Iran except Khorāsān, in the northeast, which was ruled by Shāh Rokh, the blind grandson of Nāder Shāh. During Karīm Khān's rule Iran recovered from the devastation of 40 years of war. He made Shīrāz his capital, constructing many fine buildings. Moreover, he reorganized the fiscal system of the kingdom, removing some of the heavy burdens of taxation from the agricultural classes. An active patron of the arts, he attracted many scholars and poets to his capital.

Karīm Khān also opened Iran to foreign influence by allowing the English East India Company to establish a trading post in Bushire, the Persian Gulf port (1763). In advancing his policy of developing trade, in 1775–76 he attacked and captured Basra, the Ottoman port at the mouth of the Persian Gulf, which had diverted much of the trade with India away from Iranian ports.

The civil war that followed Karīm Khān's death ended only with the final establishment of the Qājār dynasty in 1796.

Karīmnagar, town, northern Andhra Pradesh state, southern India. The town is an agricultural (millet, rice, oilseeds, and cotton) centre and road junction.

The surrounding region is a mainly agricultural area on the Deccan Plateau, and it is drained by the Godāvari River. Pop. (1981) town, 86,125.

Karimojong (people): *see* Karamojong.

Kariotákis, Kóstas, Kariotákis also spelled KARYOTÁKIS (b. 1896, Trípolis, Greece—d. July 20, 1928, Préveza), Greek poet influenced by the 19th-century French Symbolist poets.

Kariotákis spent most of his lonely childhood in Crete. He read law at Athens and won a

prize for poetry in 1920. After obtaining his degree he worked as a government clerk in Athens, where he developed a friendship with the young poet Maria Polidoúri. Later he was transferred to Pátrai and thence to Préveza, where he shot himself.

Karyotákis' two volumes of poetry show the influence of the New School of Poetry of Athens, founded in about 1880 by Kostís Palamás, which revolted against Katharevusa, the stilted and archaic official language of Greece, and against the emotionalism of the Romantics. His poetry also reveals the Symbolist influence in addition to the loneliness and despair of his childhood.

Karisimbi, Mount, highest peak (14,787 feet [4,507 m]) in the volcanic Virunga Mountains of east-central Africa. It lies on the border of the republics of Zaire and Rwanda, 18 miles (29 km) northeast of Goma, Zaire, in the Virunga National Park. Karisimbi is the habitat of gorillas and is known for its exotic plants; it also has four belts of vegetation, from the dense forest at its base to the barren volcanic core.

Kariya, city, Aichi *ken* (prefecture), Honshu, Japan, southeast of Nagoya. It was founded as a small castle town in 1533 by the Mizuno clan and was passed to various daimyo families during the Tokugawa period (1603–1867). The city became a station on the Tōkaidō Line (railway) in 1888. Closely linked to nearby Toyota, Kariya produces automobile parts, as well as textile and farm machinery and ceramic tiles. Pop. (1989 est.) 118,027.

Karkar, also spelled QARQĀR, ancient fortress on the Orontes River, northwest of Ḥamāh, in western Syria. It was the site of two ancient battles.

Karkar, a strategic outpost of Hamath (modern Ḥamāh), was attacked by Shalmaneser III of Assyria in 853 BC. The city was defended by a coalition of Aramaeans led by Benhadad I of Damascus and Irhuleni of Hamath and their allies, including King Ahab of Israel. Although Assyrian records claim that the battle was a victory for Shalmaneser, the further advance of his forces into Syria was halted; thus the battle was probably fought to a stalemate. In 720 BC Arpad, Simirra, Damascus, and Samaria joined Iaubidi, king of Hamath, in battle against Sargon II of Assyria at Karkar. Sargon defeated them, captured and burned Karkar, and made Hamath an Assyrian province.

Karkavítsas, Andréas (b. 1866, Lekhainá, Greece—d. Oct. 10, 1922, Amaroúsion), Greek novelist and short-story writer whose subject was village life.

Karkavítsas studied medicine at Athens and became an army doctor. In this capacity he traveled to many villages in the provinces. His short stories tell of the life, traditions, and legends of the villages. He belonged to the National Language Society, which worked for the acceptance of the Demotic, or spoken, language in literature. His short stories are powerful, but his greatest achievement is thought to be his realistic novel *O zitiános* (1899; "The Beggar").

Karl (German, Norwegian, Russian, Swedish, etc., personal name): *see under* Charles.

Karl August (German personal name): *see under* Charles Augustus.

Karl Friedrich (German personal name): *see under* Charles Frederick.

Karl Marx Peak, Russian PIK KARLA MARKSA, mountain peak in the extreme southwestern Pamirs in Gorno-Badakhshan autonomous *oblast* (province) of the Tadzhik S.S.R. At an elevation of 22,067 feet (6,726 m), it is the highest summit of the Shakhdarin Mountains, which extend in a roughly east-west direction between the valleys of the Shakhdara River to the north and of the Pyandzh to the south. The peak was first climbed from the Shakhdara valley by Soviet alpinists in September 1946.

Karl-Marx-Stadt (Germany): *see* Chemnitz.

Karl Theodor (German personal name): *see under* Charles Theodore.

Karl Wilhelm Ferdinand (German personal name): *see under* Charles William Ferdinand.

Karle, Jerome (b. June 18, 1918, New York, N.Y., U.S.), American crystallographer who, along with Herbert A. Hauptman, was awarded the Nobel Prize for Chemistry in 1985 for their development of mathematical methods for deducing the molecular structure of chemical compounds from the patterns formed when X rays are diffracted by their crystals.

Karle was a classmate of Hauptman's at City College in New York, from which they both graduated in 1937. Karle went on to earn his Ph.D. degree in physical chemistry at the University of Michigan in 1943. After working on the Manhattan Project in 1943–44, he joined the Naval Research Laboratory in 1944, becoming in 1967 its chief scientist for research on the structure of matter.

After World War II Karle and Hauptman began collaborating at the Naval Research Laboratory on the study of crystal structures. The two men devised mathematical equations to describe the arrangements of numerous spots that appear on photographic film as a result of a crystal's diffraction of X rays. Their equations enabled the location of atoms within the crystal's molecules to be pinpointed based upon an analysis of the intensity of the spots. Their method was neglected for some years after its publication in 1949, but the efforts of Karle's chemist wife, Isabella, to point out its potential applications gradually induced crystallographers to begin using the method to determine the three-dimensional structure of thousands of small biological molecules, including those of many hormones, vitamins, and antibiotics. Before Karle and Hauptman developed their method, it took two years to deduce the structure of a simple biological molecule; in the 1980s, using powerful computers to perform the complex calculations demanded by their method, the task took about two days.

Karlfeldt, Erik Axel (b. July 20, 1864, Folkärna, Swed.—d. April 8, 1931, Stockholm), Swedish poet whose essentially regional, tradition-bound poetry was extremely popular and won him the Nobel Prize for Literature posthumously in 1931; he had refused it in 1918.



Karlfeldt, detail of an oil painting by Carl Larsson, 1918; in Gripsholm Castle, Sweden

By courtesy of Svenska Portrattarkivet, Stockholm

Karlfeldt's strong ties to the peasant culture of his rural homeland remained a dominant influence on him all his life. He published his most important works in six volumes of verse: *Vildmarks-och kärleksvisor* (1895; "Songs of Wilderness and of Love"), *Fridolins visor* (1898; "Fridolin's Songs"), *Fridolins lustgård* (1901; "Fridolin's Pleasure Garden"), *Flora och Pomona* (1906), *Flora och Bellona* (1918), and finally, four years before his death, *Hösthorn* (1927; "The Horn of Autumn"). Some of his poems have been published in English translation in *Arcadia Borealis: Selected Poems of Erik Axel Karlfeldt* (1938). In time, even some of his admirers criticized him for employing his gifts so exclusively in the service of a dying local culture.

Kārli, village, Mahārāshtra state, west-central India, situated about 32 miles (51 km) northwest of Pune and noted for its rock-cut chaitya, or Buddhist sanctuary.

The chaitya is of the normal apsidal plan, 124 feet (38 m) long, 46.5 feet (14 m) wide, and about 45 feet (13.5 m) to the crown of its teak-ribbed vault. Dedicated in the first quarter of the 2nd century AD, it is the largest and most elaborate of the cave temples of Hīnayāna (early, doctrine-emphasizing) Buddhism. Kārli differs from earlier chaityas in that its entrance screen—other than the teak-wood lotus window—is of stone; and the nave columns are elaborated with vase bases and campaniform capitals crowned with groups of figures riding elephants. The effect is at once simple and grand, and it marks the apex of the early period of rock art in western India. The entrance-screen reliefs, depictions of Buddha, date from the sanctuary's conversion for Mahāyāna (later, Buddha-worshiping) ritual, probably in the 6th century AD.

Karlmann (German personal name): *see under* Carloman.

Karloca (Yugoslavia): *see* Sremski Karlovci.

Karloff, Boris, original name WILLIAM HENRY PRATT, OR CHARLES EDWARD PRATT (b. Nov. 23, 1887, London, Eng.—d. Feb. 3, 1969, Midhurst, West Sussex), English actor who became internationally famous for



Karloff

AP/Wide World Photos

his sympathetic and chilling portrayal of the monster in the classic horror film *Frankenstein* (1931). The king of horror films for more than 20 years, he also achieved success on Broadway in roles as evil characters.

Karloff emigrated to Canada in 1909 and in 1910 joined a touring company. A motion-picture extra as well as a stage actor from 1918, he played minor roles in silent films until he earned recognition for his portrayal of a convict turned killer in the sound film *The Criminal Code* (1931), a part he had played on Broadway in 1930. *Frankenstein,* Hollywood's first important monster film, brought Karloff overnight fame. Typecast as a villain, Karloff followed with the sequels *Bride of Frankenstein* (1935) and *Son of Frankenstein* (1939), and with other famous characterizations in his traditional speechless robotlike style, such as

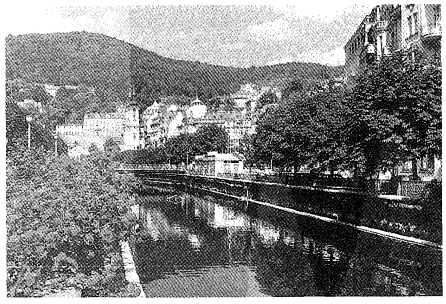
that of the deaf-mute killer in *The Old Dark House* (1932) and the preserved corpse in *The Mummy* (1932), who reawakens to claim his reincarnated lover in one of the screen's most chilling scenes. He also played the sinister Fu Manchu in *The Mask of Fu Manchu* (1932) and the Chinese detective in the Mr. Wong series (1938–39).

Returning to the stage in 1941, Karloff appeared on Broadway in *Arsenic and Old Lace* and later as Captain Hook in *Peter Pan* (1950). He also made frequent radio and television appearances.

Karloman (Danish, Dutch, etc., personal name): *see under* Carloman.

Karlovac, German KARLSTADT, Hungarian KÁROLYVÁROS, city in Croatia, Yugoslavia, southwest of Zagreb at the confluence of the Korana and Kupa rivers. It has Eastern Orthodox and Roman Catholic cathedrals and the oldest public library in Croatia. An important railway and road junction, Karlovac has a considerable transit trade in timber, grain, wine, spirits, and honey. In the city are woolen mills, tanneries, and boot and chemical factories. The fortress of Karlovac, built in 1579 to stem the advance of the Turks, was named for the Habsburg archduke Charles, the first commander of the military frontier against the Turks. The Turks made several unsuccessful attempts in the 16th and 17th centuries to capture the fortress. Pop. (1981) mun., 78,363.

Karlovy Vary, German KARLSBAD, also spelled CARLSBAD, spa city, Západočeský *kraj* (region), Czechoslovakia, on the Teplá River where it flows into the valley of the Ohře River. The word *teplá* means "warm"; *var* means "boiling." The surrounding highland areas were once subject to volcanic activity, which accounts for the thermal springs and for the many minerals in the vicinity. Of more than a dozen active warm springs, the best-known and hottest, Vřídlo (German Sprudel), gushes a geyser of hot water (162° F [72° C]) to a height of 37 feet (11 m).



Karlovy Vary, Czech.
Walter S. Clark—Photo Researchers/EB Inc.

Possibly known to the Romans, the spa was discovered or rediscovered and developed in about 1358 by Holy Roman Emperor Charles IV, and the town was chartered in 1370. The alkaline sulfur springs, valued for treating digestive disorders and liver diseases, were patronized by many medieval rulers, princes, noblemen, and ecclesiastics; visitors' books date from 1569. Frequent guests of the spa included the composers Ludwig van Beethoven, Frédéric Chopin, Johannes Brahms, and Bedřich Smetana; the poets Johann Wolfgang von Goethe, Friedrich Schiller, and Aleksandr Pushkin; and Tsar Peter I the Great. The spa's great popularity dates primarily from the 19th century, when the main baths, colonnades, hotels, and sanatoria were built. Before World War I, it was a gathering place for Europe's wealthy invalids. The focal point of the modern spa is the Czech-Soviet Friendship Colonnade (formerly Mill Colonnade), the work of Josef Zítek, the Prague architect.

Industrial development associated with the expansion of coal mining nearby has resulted in air pollution that endangers the spa. Industry includes the manufacture of porcelain and glassware, textiles and gloves; wafers and dietary biscuits and mineral salts are also produced. Pop. (1987 est.) 56,621.

Karlowitz (Yugoslavia): *see* Sremski Karlovci.

Karlowitz, Treaty of (1699): *see* Carlowitz, Treaty of.

Karlsbad (Czechoslovakia): *see* Karlovy Vary.

Karlsbad Decrees (1819): *see* Carlsbad Decrees.

Karlsburg (Romania): *see* Alba Iulia.

Karlsefni, Thorfinn (Icelandic explorer): *see* Thorfinn Karlsefni.

Karlskoga, town, in the *län* (county) of Örebro, south-central Sweden, at the north end of Möckeln, a lake. This modern industrial town was incorporated in 1940. With the exception of the church (*c.* 1400), most of the important buildings are of 20th-century origin. Rail lines connect it with Stockholm and Oslo, and a major highway runs through the town. Nearby at Bofors is an armament plant formerly owned by Alfred Nobel and today renowned for its manufacture of antiaircraft and antitank guns. Pop. (1988 est.) mun., 34,-395.

Karlskrona, town and port, capital of the *län* (county) of Blekinge, southern Sweden, on the Baltic coast. Founded by Charles XI in 1679 as a Baltic base, it has been Sweden's chief naval base ever since. It was carefully planned as a city that would reflect Sweden's grandeur, and it continues to be an outstanding example of town planning in the Renaissance style. Among the notable buildings from the 17th and 18th centuries is the Admiralty Church (1685), the town's oldest building and the largest wooden church in Sweden. The fishing harbour is among the largest in Sweden. Other industries include the manufacture of telephones, porcelain, and hats. Pop. (1988 est.) mun., 58,650.

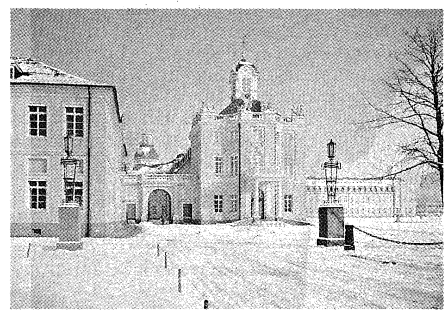
Karlsruhe, *Regierungsbezirk* (administrative district), northwestern Baden-Württemberg *Land* (state), southwestern Germany. Karlsruhe is bordered by France and Rhineland-Palatinate *Land* to the west, the *Länder* of Hesse and Bavaria to the north, and the *Regierungsbezirke* of Stuttgart and Tübingen to the east and Freiburg to the south. The district occupies an area of 2,671 square miles (6,918 square km) and is coextensive with the northern portion of the larger historic region of Baden (*q.v.*). First created as a district of the new *Land* of Baden-Württemberg in 1952, Karlsruhe was known as Nordbaden until an administrative reform in 1973. The *Regierungsbezirk* takes its contemporary name from that of the second largest city and administrative seat of the district.

The Rhine River forms Karlsruhe's western border with France and Rhineland-Palatinate. The river flows from south to north across the Upper Rhine Plain, a depression 20 to 25 miles (32 to 40 km) wide overlain in fertile alluvial and loess soils and favoured by a mild climate. The plain is both a rich agricultural region supporting vegetable and fruit crops, most notably asparagus, and a leading industrial area. In southern Karlsruhe the northern Black Forest rises in a steep scarp from the Upper Rhine Plain, its highest peak, the Hornisgrinde, reaching 3,819 feet (1,164 m) in elevation. More than two-thirds of the highland's broad sandstone ridges are covered with dense fir forests. The scenic Black Forest Ridgeway begins in Baden-Baden, an international health resort in the western foothills, and tours the famous mineral and health resorts of the northern Black Forest, ending in Freudenstadt. The Kraich Region, a western lowland plain of the Gau plateaus, lies north of the Black Forest between the Rhine and Neckar rivers. The undulating plain averages 820 feet (250 m) in elevation and is covered with very fertile loess-loam soils. More than three-quarters of the region is under cultivation, planted mainly in grains, sugar beets, and vegetables. North of the Kraich Region the Oden Forest uplands form a natural frontier with the *Länder* of Hesse and Bavaria. Much of the area is overlain by thin soils of reddish brown sandstones that are unsuitable for farming and pasture but are well suited to support thick beech forests.

The northern Upper Rhine Plain is the most populated region of the *Regierungsbezirk*. Mannheim, located at the confluence of the canalized Neckar River and the Rhine, is the district's largest city and one of Europe's largest inland ports. Mannheim's manufactures include electrical products, motor vehicles, machinery, and chemicals. Karlsruhe produces electrical equipment, steel products, and machinery and has large oil refineries linked to the Marseille–Ingolstadt pipeline. Germany's oldest university, Ruprecht-Karl University (founded in 1386), is located in the popular tourist city of Heidelberg. Pforzheim, situated on the northern fringe of the Black Forest, is the centre of German jewelry and watch industries.

The native population of the northern Black Forest are descendants of the Alemanni and speak the Low Alemannic dialect. The Franconians of northern Karlsruhe are descendants of the Franks and speak South Franconian. The influence of the Palatinate population is very strong in the northwest. Protestants and Roman Catholics are about equally represented in the district. The rural settlement pattern of the Black Forest and Oden Forest uplands is one of dispersed farmsteads and small linear villages, while in the agricultural areas of the Kraich Region and the Upper Rhine Plain, irregular compact villages dominate. Pop. (1989 est.) 2,433,836.

Karlsruhe, city, Baden-Württemberg *Land* (state), southwestern Germany, at the northern edge of the Black Forest, a few miles from the Rhine. Once the capital of the former Baden state, it is now the seat of justice of the federal republic. It originated in 1715 when Karl Wilhelm, margrave of Baden-Durlach, built a castle near his hunting lodge, Karlsruhe ("Karl's retreat"). The castle tower became the focal point of a fan-shaped town layout. Frederick Weinbrenner gave it its essential character by erecting many buildings in Neoclassical style, including the town hall and the Evangelical and Catholic churches. The city sustained severe damage in World War II, but many noteworthy buildings have been restored. The Federal Constitutional Court meets in the city. Educational establishments include a college of music, an academy of fine arts, and the Fridericiana, a technical



Grand Ducal Palace, Karlsruhe, Ger.
R. Waldkirch—ZEFA/EB Inc.

university, which was the first of its kind in Germany (founded 1825). Former teachers at the Fridericiana include Fritz Haber, the Nobel Prize-winner in chemistry, and Heinrich Hertz, noted for his study of electromagnetic waves. Places of interest include the many museums (such as the city's art museum), the Wildpark Stadium, the Schöneck Sports School, the mint, and the Pyramid in the marketplace (the town symbol).

Karlsruhe has an industrial harbour (established 1901). Its post-World War II economic rehabilitation was stimulated by the building of a nuclear reactor and research centre (1956) and pipelines to Marseille and Strasbourg, in France, and to Ingolstadt, on the Danube. Oil refineries were established nearby on the Rhine with special harbour facilities. In collaboration with the European Atomic Energy Community (Euratom), the building of the Transuranium Elements Institute was begun in 1961. Electrical products, machinery and steel products, building equipment, bicycles and motorcycles, perfumes, pharmaceuticals, and jewelry are manufactured and exported. Pop. (1989 est.) 265,100.

Karlstad, city and capital of Värmland *län* (county), southwest-central Sweden, on the island of Tingvalla and on the northern shore of Lake Vänern, at the mouth of the Klar River. Originally called Tingvalla after the *ting,* or meetings of the legislature, that were held there, it was renamed in honour of Charles IX, who chartered it in 1584. It was made a cathedral city in 1645 and the seat of the county government in 1779. In 1905 it was the site of negotiations ending the union of Sweden and Norway.

After being almost completely destroyed by fire in 1865, Karlstad was rebuilt along modern lines, with broad avenues and large parks. Only a few buildings antedate that period. The East Bridge (1761–70) across the Klar is impressive with its 13 arches. The museum contains collections of art and cultural objects from Värmland. The University of Karlstad was founded in 1970 as an affiliate of the University of Göteborg.

Karlstad's industry is based largely on forest products and heavy machinery. Connected with the ocean via Göteborg and the North Sea, it has a large export-import trade. Pop. (1988 est.) mun., 74,892.

Karlstadt (Yugoslavia): *see* Karlovac.

Karlstadt, Andreas Rudolf Bodenstein von (b. *c.* 1480, Karlstadt, Bishopric of Würzburg—d. Dec. 24, 1541, Basel, Switz.), German theologian and early supporter of Martin Luther who later dissented from Lutheran views by pressing for more radical church reforms, particularly concerning the Eucharist.

Educated at Erfurt and Cologne, Karlstadt was appointed professor of Thomistic philosophy at the University of Wittenberg in 1505. There he assisted his younger colleague Martin Luther in replanning theological studies around Augustine and "the old Fathers" of Roman Catholic tradition.

With the opening of the indulgence controversy, in which Luther opposed the elaborate Catholic system for pardoning sinners and exempting them from purgatorial punishment, Karlstadt came to Luther's defense against Johann Eck in the Leipzig disputation of July 1519; Eck, however, was considered the victor. The papal bull issued by Leo X in 1520, threatening Luther with excommunication, also mentioned Karlstadt. In 1521 Karlstadt went to Denmark at the request of King Christian II, but the reformation he intended proved abortive, and he returned to Germany in June. He published numerous tracts on clerical celibacy, private masses, and communion by both bread and wine, so that by the end of 1521 he had gained a reputation as a radical Reformer. On Christmas Day, without vestments and with an abridged service, he administered communion to the laity.

At Wittenberg in January 1522 the magistrates carried through practical reforms stemming in part from Luther's ideas and Karlstadt's initiative. But, because of his iconoclastic tract *Von Abtuhung der Bylder* (1522; "On the Rejection of Images"), Karlstadt was called in February by the elector Frederick the Wise to account for his part in the prevailing revolutionary ferment. Luther, who during the turmoil had been in the Wartburg, came out of hiding to urge restraint. In a series of masterful sermons stressing the need for care of the weaker brethren, Luther disputed Karlstadt's vehement impatience for further reform.

Karlstadt soon fled and began to dress as a peasant, calling himself "Brother Andreas" and denouncing all academic degrees and distinctions. In 1523 he retired to Orlamünde and introduced his own program for reformation. Influenced by the mystic Johann Tauler, he published, from Jena, a stream of pamphlets full of mystical jargon. He dramatically encountered Luther again at Jena in August of the next year, when Luther tossed a golden coin at him in token of an open feud. As Luther left, Karlstadt preached against him amid pealing bells.

Karlstadt had overextended himself, however, and his exile soon followed. His new series of bitter tracts seriously harmed Luther's cause by championing a merely symbolic presence of Christ in the Eucharist. The dispute over the Eucharist remained an open wound in the Reformation movement, and Karlstadt's tract *Ob man gemach faren soll* ("Shall We Go Slowly?") was eagerly read by the radicals from whom the Anabaptists (those advocating the Baptism of adults) later arose. Luther, nevertheless, provided refuge for Karlstadt in Wittenberg (1525–29) after Karlstadt made certain retractions. After short stays in Holstein, Friesland, and Zürich, Karlstadt became professor of Old Testament theology at Basel in 1534. There he became involved in yet another controversy by demanding that the local clergy submit to university discipline and earn doctoral degrees in order to improve their credentials. Thus, in supporting the position of the university, Karlstadt reversed his earlier opposition to academic discipline and a learned ministry. A man of eccentric personality, Karlstadt persisted in his intense and outspoken style until his death during an outbreak of the plague.

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Karm, Dun, pseudonym of CARMELO PSAILA (b. Oct. 18, 1871, Zebbug, Gozo, Malta—d. Oct. 13, 1961, Valletta), Malta's national poet, sometimes called "the bard of Malta," or "the Chaucer of Malta." His work has both romantic and classical affinities. His love of nature and his motherland together with his religious sensibility exemplify the former; his fondness for traditional metre (notably in his sonnets, which are considered particularly fine) exemplifies the latter.

Karm was ordained a priest at the age of 23 and worked as a seminary lecturer and diocesan grammar-school teacher until his dismissal by the ecclesiastical authorities in 1921. He then became assistant director of the National Library, retiring in 1936. He subsequently worked as lexicographer on the official English-Maltese dictionary. Karm was awarded a doctorate of letters by the Royal University of Malta in 1945, and in 1956 he was made a Commander of the Order of the British Empire.

He had already won distinction as a writer in Italian before being invited by the journal *Il-Habib* ("The Friend"), in 1912, to contribute verse in Maltese. Karm influenced several generations of Maltese writers and has been considered instrumental in paving the way for the adoption of Maltese as the official language of the island in 1934. He wrote the lyrics of the national anthem, *Innu Malti* (1923; "Hymn of Malta"). His works have been translated into English, French, Arabic, and Esperanto. Karm himself translated into Maltese the poem *I Sepolcri* (*The Sepulchres*) by the late 18th- and early 19th-century Italian poet Ugo Foscolo, adding a coda of his own.

Karm's home in Valletta, where he lived from 1910 to 1936, became a tourist attraction after World War II.

Karm Island, island, in the scenic Ryfylke region of Rogaland *fylke* (county), southwestern Norway. It lies in the North Sea just north of the mouth of Bokna Fjord. With its principal axis running north–south, Karm Island is about 19 miles (31 km) long and 6 miles (10 km) across at its widest point and has an area of 68 square miles (176 square km). It is separated from the mainland by narrow Karm Strait. Karm is hilly and has numerous mounds and burial sites dating to the Stone and Bronze ages. Olaf I Tryggvason, first Christian king of Norway (reigned 995–*c.* 1000), lived at Avaldsnes, at the island's north end, near which stands a 13th-century church and a runic stone, 26 feet (8 m) long, called the Virgin Mary's Needle. Most of the island's inhabitants live in coastal fishing villages; fishing (herring, mackerel, and lobster), farming (grains and fruit), and copper mining are the principal occupations. Kopervik is the largest town. Just off the northern tip of the island is the mainland port of Haugesund. Pop. (1987 est.) 34,559.

karma, Sanskrit KARMAN ("act"), Palī KAMMA, in Indian philosophy, the influence of an individual's past actions on his future lives, or reincarnations. The doctrine of karma reflects the Hindu conviction that this life is but one in a chain of lives (saṃsāra) and that it is determined by man's actions in a previous life. This is accepted as a law of nature, not open to further discussion. The moral energy of a particular act is preserved and fructifies automatically in the next life, where it shows up in one's class, nature, disposition, and character. The process is mechanical, and no interference by God is admitted, except by some of the later and more extreme theists. Thus the law of karma explains the inequalities that are observed among creatures.

In the course of the chain of lives, an individual can perfect himself, until he reaches the eminence of the god Brahmā himself, or he can degrade himself in such an evil way that he is reborn as an animal. Not only do past acts influence the circumstances of the next life, they also determine one's happiness or unhappiness in the hereafter between lives, where he will spend a time in either one of the heavens or one of the hells until the fruits of his karma have been all but consumed and the remainder creates a new life for him.

Buddhism and Jainism incorporated doctrines of karma as part of their common Indian legacy. The Buddhists interpret it strictly in terms of ethical cause and effect. In Jainism, karma is regarded not as a process but as a fine particulate substance that produces the universal chain of cause and effect and of birth and death.

Karmah, also spelled KERMA, market town, north-central Sudan, 30 miles (48 km) north

of Dunqulah (Dongola) on the right bank of the Nile above its Third Cataract. An American expedition from Harvard University carried out extensive archaeological excavations there from 1913 to 1915. Swiss excavations of the 1970s and 1980s have greatly increased knowledge of the site.

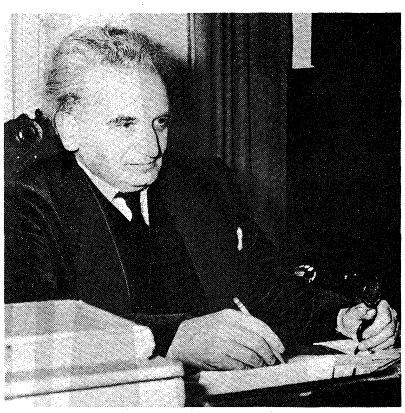
An indigenous Nilotic culture, long misidentified as an Egyptian outpost, flourished in the rich agricultural region that surrounds the site. Gold from the eastern desert, cattle pastoralism, and trade along the Nile were other sources of wealth. Possibly the land of Yam mentioned by Harkhuf of the 6th dynasty lay here, as calcite vases with the names of 6th-dynasty pharaohs excavated at Karmah might suggest, but the first historical reference was made by Sesostris I (1918–1875 BC), who called the area Cush. Sesostris III encountered the Cushites when he invaded Sai Island in about 1826 BC, but he withdrew and established the Egyptian frontier at Semna. Erecting a series of forts in the Second Cataract area, he forbade the Cushites to pass north of Semna except to trade at Iken (Mirgissa).

During the weakening 13th dynasty (*c.* 1756–*c.* 1630 BC) the Karmah princes overran the fortresses of Wawat and about 1630 BC raided Egypt itself. It was from these contacts that the rich Middle Kingdom artifacts found at Karmah in the rulers' tumulus tombs stemmed. Karmah took over the Egyptian fortress at Buhen, where some expatriate Egyptians served as mercenaries and left memorials. The Hyksos maintained contact with Karmah, and, after Kamose, the 17th-dynasty Theban ruler, attacked them, Auserre Apopi I, the Hyksos king, sought an alliance with Karmah. Kamose, however, intercepted the messenger, thwarting the plan.

As they repelled the Hyksos, the Thebans also penetrated Nubia; the warlike Medjay desert tribesmen gave valued service in the war of liberation. Thutmose I (1493–*c.* 1482 BC) mounted a major offensive, capturing Karmah and destroying the Cushite state.

The Karmah rulers were buried in large multicompartment tumulus tombs, resting on beds, surrounded by hundreds of their sacrificed courtiers. Their pottery included a highly polished, very hard, black-top red ware. Some Hyksos pottery, seals, and scarabs were found in the richest graves. Rich inlays with Egyptian motifs found in the tombs were made in the industrial building excavated on the town site. Egyptians may have been among the craftsmen employed there. The richest tombs contained Middle Kingdom Egyptian artifacts. Pop. (1973) 7,095.

Kármán, Theodore von (b. May 11, 1881, Budapest—d. May 6, 1963, Aachen, W.Ger.), Hungarian-born American research engineer best known for his pioneering work in the use of mathematics and the basic sciences in aeronautics and astronautics. His laboratory at the California Institute of Technology later became the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory.



Von Kármán
By courtesy of the California Institute of Technology, Pasadena

Early life. Von Kármán was the third of five children of Maurice and Helene von Kármán. His father, a professor at the University of Budapest and commissioner of the Ministry of Education, reformed the secondary-school system of the country and founded the Minta (Model) Gymnasium, which his son attended, as did the atomic physicists George de Hevesy and Leo Szilard. Von Kármán showed a natural mathematical facility at an early age and was well on his way to becoming a child prodigy when his father, fearing that he would become a mathematical freak, guided him toward engineering.

On completing his undergraduate studies in 1902 at the Royal Polytechnic University in Budapest, he decided to pursue his engineering career in the academic world, which would enable him to fulfill his wide scientific interests and to practice the art of teaching, which his father had inspired in him. In later years, he was delighted when engineers to whom he had imparted his scientific attitude and methodological approach acknowledged him as their teacher.

Between 1903 and 1906 he served on the faculty of the Polytechnic University and as consultant to the principal Hungarian engine manufacturer. The research that von Kármán conducted on the strength of materials prepared the way for important later contributions to the design of aircraft structures. He was awarded a two-year fellowship to the University of Göttingen, Germany, in order to obtain a doctor's degree, but before completing it he went to the University of Paris. There, after an all-night party, a friend suggested that, instead of going to sleep, they watch the French aviation pioneer Henri Farman fly his machine. Farman successfully completed a 2-kilometre (1.25-mile) course, unknowingly providing the inspiration for the young man who was to become a founder of the aeronautical and astronautical sciences.

Shortly thereafter, Ludwig Prandtl, a pioneer of modern fluid mechanics, invited von Kármán to return to Göttingen as his assistant on dirigible research and to complete his degree. The environment at the university was admirably suited to develop von Kármán's talents. He responded, in particular, to the school of the eminent mathematician Felix Klein, which stressed the fullest use of mathematics and of the basic sciences in engineering to increase technological efficiency. In 1911 he made an analysis of the alternating double row of vortices behind a bluff body (one having a broad, flattened front) in a fluid stream, now famous as Kármán's Vortex Street. The use of his analysis to explain the collapse, during high winds, of the Tacoma Narrows Bridge in the state of Washington, in the United States, in 1940, is one of the most striking examples of its value.

In 1912, after a short stay at the College of Mining Engineering in Hungary, he became director of the Aeronautical Institute at Aachen (Aix-la-Chapelle), Ger., at the age of 31, remaining until 1930. In World War I he was called into military service and, while at the Military Aircraft Factory at Fischamend in Austria, led the development of the first helicopter tethered to the ground that was able to maintain hovering flight. After the war, as his international reputation grew, so did that of the institute. Students came from many countries, attracted by the intellectual and social atmosphere he had created. To help reestablish contacts and friendships broken by the war, he was instrumental in calling an international congress on aerodynamics and hydrodynamics at Innsbruck, Austria, in 1922. This meeting resulted in the formation of the International Applied Mechanics Congress Committee, which continues to organize quadrennial congresses, and gave birth, in 1946, to the International Union of Theoretical and Applied Mechanics, with von Kármán as honorary president.

Von Kármán never married. His mother and his sister, Josephine, lived with him from 1923 onward in The Netherlands near Aachen and later in Pasadena, Calif. His sister was his manager and hostess until her death in 1951 in America. Brother and sister were devoted to each other, and her death plunged von Kármán into deep depression for several months, during which he was unable to work.

Work in the United States. He began traveling widely in the 1920s as a lecturer and consultant to industry. After his first visit to the United States in 1926, he was invited in 1930 to assume the direction of the Guggenheim Aeronautical Laboratory at the California Institute of Technology (GALCIT) and of the Guggenheim Airship Institute at Akron, Ohio. His love for Aachen made him hesitate, but the darkening shadow of German Nazism caused him to accept. He never regretted his decision. When President John F. Kennedy presented to him the first National Medal of Science in 1963, he "pledged his brain as long as it lasted" to the country of which he had become a citizen in 1936.

Shortly after his arrival at the California Institute of Technology, his laboratory became again a mecca of the world of the aeronautical sciences. Two years later he became a founder of the U.S. Institute of Aeronautical Sciences, consultant to various American industries and to the government. His personal scientific work continued unabated with important contributions to fluid mechanics, turbulence theory, supersonic flight, mathematics in engineering, aircraft structures, and wind erosion of soil.

His open-mindedness was well demonstrated by his involvement in the development of astronautics. In 1936, in spite of the general disbelief in academic circles in the possibilities of rocket propulsion and its applications, he supported the interest of a group of his students in the subject. Within two years the U.S. Army Air Corps sponsored a project at his laboratory on the use of rockets to provide superperformance for conventional aircraft—especially to reduce their distance of takeoff from the ground and from naval aircraft carriers. In 1940 von Kármán, together with Frank J. Malina, showed for the first time since the invention of the black-powder rocket in China in about the 10th century that it was possible to design a stable, long-duration, solid-propellant rocket engine. Shortly thereafter, the prototype of the famed jet-assisted takeoff (JATO) rocket was constructed. This became the prototype for rocket engines used in present-day long-range missiles, such as the Polaris, Minuteman, and Poseidon of the U.S. armed forces. In 1941 von Kármán participated in the founding of the Aerojet General Corporation, the first American manufacturer of liquid- and solid-propellant rocket engines. In 1944 he became the cofounder of the present NASA Jet Propulsion Laboratory at the California Institute of Technology when it undertook America's first governmental long-range missile and space-exploration research program for the U.S. Ordnance Department.

When he took leave from the institute in 1944 to establish in Washington, D.C., the Air Corps Scientific Advisory Group for General Henry H. Arnold, commander of the U.S. Army air forces in World War II, von Kármán could look back on his participation in a number of major contributions to rocket technology: America's first assisted takeoff of aircraft with solid- and liquid-propellant rockets, flight of an aircraft with rocket propulsion alone, and development of spontaneously ig-

niting liquid propellants of the kind that were to be used in the Apollo Command and Lunar Excursion modules some 25 years later.

His dedication to international scientific cooperation led him in 1947 to propose to the United Nations the establishment of an international research centre for fluid and soil mechanics in the Middle East, which, though unfulfilled, contributed to the development by UNESCO of the Arid Zone Research Project in 1950. He conceived the idea of cooperation among aeronautical engineers of the member nations of the North Atlantic Treaty Organization (NATO) and, in 1951, obtained approval to launch the Advisory Group for Aeronautical Research and Development (AGARD), of which he was chairman until his death. In 1956 his efforts brought into being the International Council of the Aeronautical Sciences (ICAS) and, in 1960, the International Academy of Astronautics. One of the outstanding activities of the academy under his presidency was its sponsorship, in 1962, in Paris, of the First International Symposium on the Basic Environmental Problems of Man in Space, at which for the first time scientists from the United States and the Soviet Union, as well as other countries, exchanged information in this field. Between 1960 and 1963 he led NATO-sponsored studies on the interaction of science and technology.

During his lifetime, laboratories were named after von Kármán at the California Institute of Technology, the Arnold Engineering Development Center of the U.S. Air Force at Tullahoma, Tenn., and the NATO institute for fluid dynamics at Sint-Genesius-Rode, Belg. A crater on the Moon has carried his name since 1970.

An appreciation of von Kármán's personality must also take account of his nonscientific talents. He was much interested in poetry and literature and could always supply a story appropriate to any occasion. When the atmosphere became charged with tension in a scientific meeting, he was able to restore balance by drawing on his collection of anecdotes. He had a fantastic capacity for work and left behind him wherever he went a trail of bits of paper covered with calculations. He was an optimist and believed in the future, despite the prevailing difficulties in the world.

(F.J.Ma.)

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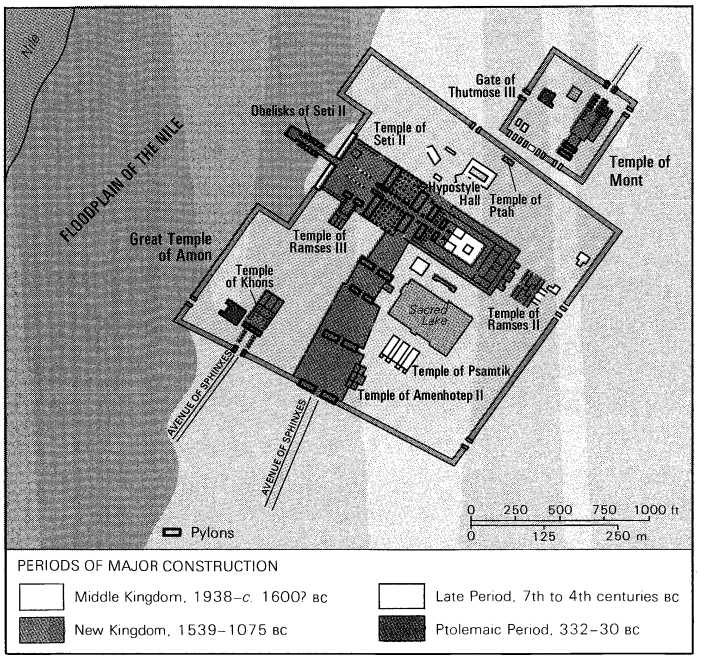
karmasthāna (Buddhism): *see* kammaṭṭhāna.

Karmatians (Islāmic sect): *see* Qarāmiṭah.

Karmi'el, also spelled CARMIEL (Hebrew: "Vineyard of God"), town, northern Israel, in the Valley of Bet Kerem, on the boundary of Upper and Lower Galilee, just off the main east–west highway from 'Akko (Acre) to Ẕefat (Safed). One of Israel's development towns, Karmi'el is the first Jewish town in an area settled almost entirely by Arabs. It has a linear business and commercial centre, with an intersecting band of parkland, surrounded by residential and industrial areas, the whole encircled by a ring road. Multilevel housing hugs the slopes of the Galilean hills. The town, inhabited since 1964, was planned for an optimum population of 50,000. Industries include manufacture of textiles (shirts and blouses) and building materials and light metalworking. Pop. (1987 est.) 18,800.

Karnak, also called AL-KARNAK, village in Qinā *muḥāfaẓah* (governorate), Upper Egypt, which has given its name to the northern half of the ruins of Thebes on the east bank of the Nile, with the ruins of the Great Temple of Amon.

Recent excavations have pushed the history of the site back to the Gerzean period (*c.* 3200 BC), when a small settlement was founded on the wide eastern bank of the Nile floodplain. The northern part of the large ancient city of Nowe, it contains the northern group of city temples, called in ancient times Ipet-isut, or Eptesowe, "Chosen of Places." The ruins of Karnak cover a considerable area and are still impressive, though nothing remains of the houses, palaces, and gardens that must have surrounded the temple precinct in ancient times. The most northerly temple is the Temple of Mont, the war god, of which little now remains but the foundations. The southern temple (not pictured), which has a horseshoe-shaped sacred lake, was devoted to the goddess Mut, wife of Amon; this also is much ruined. It was built largely by Amenhotep III, whose architect was commemorated by statues in the temple.

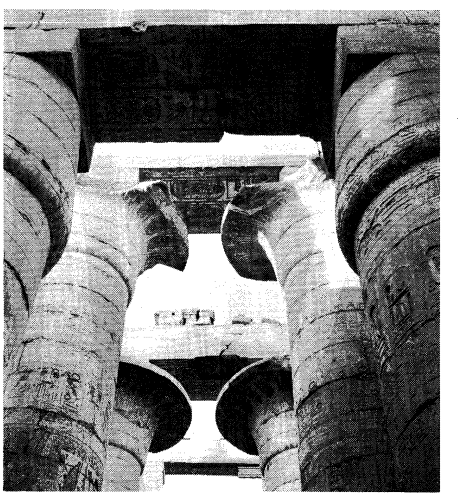


Temple complex at Karnak

Adapted from *Westermann Grosser Atlas zur Weltgeschichte*; Georg Westermann Verlag, Braunschweig

Between these two precincts lay the largest of all Egyptian temples, and one of the largest in the world, the great metropolitan temple of the state god, Amon-Re. It is in fact not one temple but a complex of temples, added to and altered at many periods and lacking, in consequence, a coherent plan. It has been called a great historical document in stone. In it are reflected the fluctuating fortunes of the Egyptian empire. There are no fewer than 10 pylons, separated by courts and halls and nowadays numbered for convenience from west to east, number one being the latest. The seventh and eighth pylons were erected by Thutmose III and Queen Hatshepsut; the ninth and tenth, of Horemheb's reign, formed a series of processional gateways at right angles to the main axis, linking the temple with that of Mut to the south, and further, by way of the avenue of sphinxes, with the temple at Luxor 2 miles (3 km) away.

The history of the temple must be briefly sketched. The original Middle Kingdom temple has left no trace save a small jubilee shrine of Sesostris (Senusret) I, now reconstructed from fragments found inside the third pylon. At the beginning of the 18th dynasty, Thutmose I enclosed the 12th-dynasty temple and fronted it with two pylons, the fifth and fourth, with a pillared hall of gilded cedarwood between. Hatshepsut pierced the roof with two tall obelisks, one of which still stands. In the reign of Thutmose III the temple was greatly enlarged; not only did he add to the existing structures and add a pylon and pillared courts containing halls in which he inscribed the annals of his campaigns but he also built to the east of the Middle Kingdom area a transverse temple in the form of a jubilee pavilion. On the walls of one of the rear rooms of this temple is carved a kind of pictorial catalogue of the strange animals and plants he had brought home from Asia in the 25th year of his reign. He was probably also the builder of the wall that runs round the temple from the fourth pylon eastward and of the sacred lake to the south of it, on which the bark of Amon floated. Small additions were made by his successors, and Amenhotep III added a pylon (number three) to the west and greatly embellished the temple.



Capitals and lintels of the massive hypostyle hall, Great Temple of Amon, Karnak, Egypt

EB Inc.

The most striking feature of the temple at Karnak is the hypostyle (pillared) hall (built by Ramses I) that occupies the space between the third pylon and the second. The area of this vast hall, one of the wonders of antiquity, is 5,800 square yards (about 4,850 square m). It was decorated by Seti I and Ramses II, to whom much of the construction must be due, though it may have been planned and begun earlier. Fourteen enormous columns, 78 feet (24 m) high, raised the roofing slabs of the central nave above the level of the rest so that light and air could enter through a clerestory. Seven lateral aisles on either side brought the number of pillars to 140. Historical reliefs on the outer walls show the victories of Seti in Palestine and Ramses II defeating the Hittites at the Battle of Kadesh.

Ramses III built a small temple to Amon outside the Ramesside pylon and at right angles to it, confronting a triple shrine erected by Seti II. The Bubastite kings of the 22nd dynasty, in adding a vast court to the front of the temple, incorporated both these small temples. The Bubastite Gate at the southeast corner of this court commemorates the victories won by Sheshonk I, the biblical Shishak, in Palestine in the reign of Rehoboam. The Napatan pharaoh Taharqa planned a tall colonnade, of which one pillar still stands, and perhaps began the giant first pylon, 370 feet (113 m) wide and 143 feet (44 m) high, which was continued by King Nectanebos (Nekhtnebef) in the 4th century BC but never completed. Beyond it, an avenue of sphinxes dating from Ramses II's reign leads to the quayside.

Within the enclosure of the Great Temple of Amon are included a number of other notable small shrines and temples. A temple to Ptah, in the north side of the enclosure, was built by Hatshepsut and Thutmose III and added to by the Ptolemies, who also embellished the Great Temple of Amon by the addition of granite shrines and gateways. To the south, Ramses III dedicated a temple to Khons, the moon god, which merits attention. A small late temple to Opet, the hippopotamus goddess, adjoins it.

Karnak presents a continual problem to the architects who seek to preserve it, for the foundations are inadequate and moisture from the Nile's annual flood has disintegrated the sandstone at the base of walls and columns. The work of repairing and strengthening goes on continuously, and in carrying out this work new discoveries are constantly being made. In one of the pylons, thousands of fragments were found from a temple built at Thebes by Akhenaton to his god Aton; this temple was destroyed when the cult of Amon was restored.

Karnāl, city, east-central Haryāna state, northwestern India. It lies along the west bank of the Yamuna River and is just east of the Western Yamuna Canal. The name is said to be derived from that of Karṇa, a warrior in the ancient epic poem the *Mahābhārata* and the town's legendary founder. Connected by road and rail with Delhi (south) and Amritsar (northwest), Karnāl is an important trade centre for grain, salt, metal, and cotton. Its industries include vegetable-oil and saltpetre refining, liquor and perfume distilling, and light manufacturing. A horse fair is held annually.

Of historic interest is the marble tomb built by Emperor Ghiyās-ud-Dīn of Ghūr in the 12th century. Constituted a municipality in 1867, Karnāl has two hospitals and a dairy-science institute and several colleges affiliated with Kurukshetra University (1956). Pop. (1981) 132,107.

Karnāl, Battle of (Feb. 24, 1739), contest between the forces of Nāder Shāh, a Persian adventurer, and Muḥammad Shāh, the Mughal emperor of India, at Karnāl, 70 miles (110 km) north of Delhi; the Mughals suffered a decisive defeat. Nāder led about 55,000 troops, and Muḥammad about 15,000, but both sides, especially the Indian, had large numbers of noncombatants.

Nāder began his invasion by pursuing fugitives from Qandahār to Mughal-held Kābul. Divided counsels prevented a Mughal stand until Nāder reached Karnāl. Jealousy and rashness led to the Indian defeat, and the emperor was besieged in his entrenched camp. Nāder marched to Delhi and massacred its inhabitants on March 11. He left Delhi on May 5 with plunder, including the famous Peacock Throne of Shāh Jahān. The Mughal Empire never recovered from this blow to its prestige.

Karnaphuli River, major watercourse of the Chittagong region, Bangladesh. Rising in the Lushai Hills of Mizorām state, India, it flows 170 miles (270 km) south and southwest through the southeastern arm of Bangladesh to empty into the Bay of Bengal, 12 miles (19 km) below the city of Chittagong. In the Chittagong Hill Tracts area it is known as the Kynsa Khyoung. The river is navigable by steamer to Rāngāmāti and is extensively used for transporting cotton and forest products. The river's Karnaphuli hydroelectric project provides power for tea-, jute-, tobacco-, and cotton-processing industries; the reservoir irrigates a vast agricultural area.

Karnātaka, formerly (until 1973) MYSORE, constituent state of the Republic of India situated on the southwest coast. It is bounded by the states of Goa and Mahārāshtra to the north, Andhra Pradesh to the east, Tamil Nādu to the southeast, and Kerala to the south and by the Arabian Sea to the west.

A brief treatment of Karnātaka follows. For full treatment, *see* MACROPAEDIA: India.

In the Kannaḍa language, Karnātaka means "lofty land." The name Mysore comes from the word for "buffalo town," derived from the destruction of the buffalo-demon Mahīṣasura by the goddess Cāmundā. The prehistory of the area is lost in legends relating to the struggles in southern India between invading Aryans and the original inhabitants. Various dynasties ruled the area over the centuries, with none of them succeeding in ruling the whole region occupied by the Kannaḍa-speaking peoples. British commissioners governed from 1831 to 1881, when Mysore became a princely state. The transfer of additional territories to Mysore in 1953 and 1956 united the Kannaḍa-speaking peoples, gave the landlocked state an outlet to the sea, and greatly extended its boundaries. The state assumed the name Karnātaka in 1973.

Karnātaka is divided into four physical regions—the coastal plain, the hill ranges (the Western Ghāts), the Karnātaka Plateau to the east, and the black cotton-growing soil tract to the northwest. The coast is difficult of access except by sea. To the east the land rises sharply to the slopes of the Western Ghāts, which have an average elevation of 2,500 to 3,000 feet (760 to 915 m). The plateau region has an average elevation of about 2,600 feet (800 m).

The population of Karnātaka is predominately Dravidian; the Dravidians were India's original stock and are related to the peoples of the Malay Peninsula, Sumatra, and Madagascar. Kannaḍa is the language spoken by about seven-tenths of the people, although Hindustanī (a mixture of Hindī and Urdū) is often used in trade and business. The major religion is Hinduism, but Jainism and Buddhism—once widespread—still survive. While about three-quarters of the population is rural, the trend toward urbanization is becoming more marked as industrialization increases.

Agriculture is the occupation of about 80 percent of the population. The coastal plain



Transplanting rice near Mangalore, Karnātaka, India
Baldev—Shostal Assoc./EB Inc.

is intensely cultivated, with rice as the main food crop and sugarcane as the principal cash crop. Other food crops are sorghum and millet; cotton, tobacco, cashews, cardamom, and grapes are additional cash crops. Coffee and tea plantations are found in the Western Ghāts, with Karnātaka producing much of India's coffee. Tea is grown in the higher hills. In the eastern region, bananas and oranges, some rubber, and sugarcane are grown under irrigation. The state is rich in forest products such as teak, bamboo, and sandalwood as well as tanning dyes, gums, lac (used in varnish), and ivory.

Karnātaka has India's only sources of gold and silver; other mineral resources include iron ore, manganese, mica, chromite, copper, and bauxite. These resources provide the basis for the iron and steel industry at Bhadrāvatī and the heavy-engineering works at Bangalore (the capital). Other industries include cotton milling, sugar processing, and the manufacture of textiles, fertilizers, cement, and paper. Both Mysore city and Bangalore have old-established silk industries producing most of India's mulberry silk.

Karnātaka has sufficient hydroelectric power to supply surplus energy to neighbouring states, and it has about 2,000 miles (3,200 km) of railway track—a mixture of 1-metre and narrow- and broad-gauged. The state's trade depends mainly on road transportation, but many roads in the western part become impassable during the rainy season. National highways run from Bangalore east to Madras, north to Hyderābād, northwest to Bombay, and west through Hassan to the coast at Mangalore. Airports are at Bangalore, Belgaum, and Mangalore.

Karnātaka possesses a rich cultural heritage, drawn from successive dynasties and fostering various religions and philosophies that have influenced literature, architecture, folklore, music, and painting. Mauryan architecture can be seen at Sravana Belgola, 56 miles (90 km) from Mysore, where there is a giant stone figure representing Bāhubali (Gommateśvara), the Jaina saint. Huge monolithic Jaina statues are peculiar to the Kannaḍa culture.

The state is one of the more educationally advanced in India, having more than 36,000 schools. For higher education, Karnātaka has the University of Mysore at Mysore; the Karnātaka University at Dhārwār; the Gulbarga University at Gulbarga; the Mangalore University at Mangalore; and Bangalore University, the University of Agricultural Sciences, and the Indian Institute of Science—all at Bangalore. Area 74,051 square miles (191,791 square km). Pop. (1981) 37,135,714.

Articles are alphabetized word by word, not letter by letter

Karnātaka, also called CARNATIC, or KARNATIC, linguistic region of the Deccan Plateau, south-central India, generally corresponding to Karnātaka (formerly Mysore) state. Of irregular shape, and defined as the area in which Kannaḍa (Kanarese) is spoken, Karnātaka was unified during the Vijayanagar kingdom (*c.* 1300–1600) until successive con-

quests by the Muslim kings of the Deccan, the Mughals, and the states of Marāṭhā and Hyderābād greatly reduced its size. (The term has also been applied to the southern Coromandel Coast of the Bay of Bengal because the Vijayanagars retired there in defeat.) The remaining kingdom continued as the independent Hindu state of Mysore until British conquest in 1799. The Kannaḍa-speaking people were leaders in the successful movement for the linguistic reorganization of India (1953 and 1956), which resulted in the addition of territories from Bombay, Hyderābād, and Madras (Tamil Nādu) to form Mysore state. The state was renamed Karnātaka in 1973.

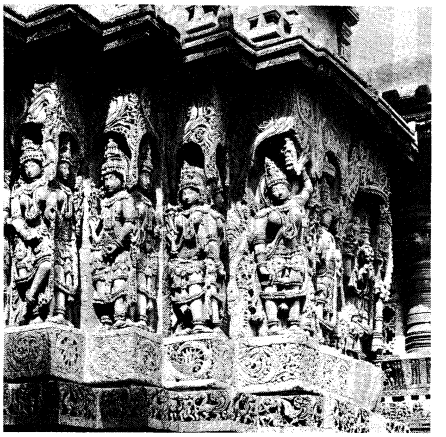
Karnātaka Coast, coastal lowlands in western Karnātaka state, southwestern India, with an area of about 4,000 sq mi (10,000 sq km). It is bounded by the Arabian Sea on the west, the Western Ghāts on the east, Konkan on the north, and the Kerala Plains on the south. Stretching from north to south for about 140 mi (225 km), it has a maximum width of about 40 mi in the south. Historically the coast was a contact zone between Indian merchants and European and African traders. It was successively ruled by the Kadambas, Rattas, Cālukyas, Yādavas, and Hoysaḷas, until it passed to the Muslims (*c.* 16th century)—with short interludes of Marāṭhā supremacy. The British annexed the coast in 1789. The coastline is sandy and in places rocky cliffs overhang the sea. Sloping from east to west, it comprises a narrow belt of coastal sand dunes, marshes, and valley plains backed by a higher erosional platform, in turn succeeded by isolated hills that are 300 ft (90 m) to 1,000 ft high farther inland. Coconuts and casuarinas grow on the saline sandy beaches, mangroves live in the marshes and estuaries, and bamboo and scrub are found on the hills. The coast is drained by the Kāli Nadi, Gangavāli, Bedti, Tadri, Sharāvati, and Netrāvati rivers, which have carved out narrow valleys with steep gradients and generally flow in a westerly direction. Alluvial soils occur in the south; the rest of the coast has infertile red soils that are often gravelly and sandy. The region forms a transitional zone between Mahārāshtra and Kerala states. The southern, or Mangalore, region has plantations of coconut and casuarina; the northern, or Udipi, region produces rice and pulse (legumes). Industries are mostly located at Mangalore, an important regional centre and major coffee port of India, and at Udipi. The ports of Kārwār, Kumta, Honāvar, and Malpe have lost their importance with the development of railways in the interior. Mangalore and Kārwār have been developed as deepwater ports for the export of mineral ores.

Karnātaka Plateau, plateau in Karnātaka state, southern India. The name of the plateau is derived from Karnād (Land of Black Soil). The plateau has an area of about 73,000 sq mi (189,000 sq km) and an average elevation of about 2,600 ft (800 m). It consists of the Dharwar system of volcanic rocks, crystalline schists, and granites. The major rivers include the Godāvari, Krishna, Cauvery, Tungabhadra, Sharāvati, and Bhīma. The Sharāvati has the highest (830 ft) waterfall in India, known as Jog Falls. These falls are the largest single source of hydroelectric power in the country and are also a major tourist atttraction. The plateau merges with the Nīlgiri Hills in the south. Rainfall varies from 80 in. (2,030 mm) in the southern hills to 28 in. in the northern region. Sandalwood is exported, and teak and eucalyptus are used chiefly to make furniture and paper. Manganese, chromium, copper, and bauxite are mined. There are large reserves of iron ore in the Bāba Budan hills and gold in the Kolār Gold Fields. Jowar (sorghum), cotton, rice, sugarcane, sesame seeds, peanuts (groundnuts), tobacco, fruits, coconuts, and coffee are the major crops. Textile manufacturing, food and tobacco processing, and printing are the principal industries. Bangalore, capital of Karnātaka state, is the site of most of the industrial development. Important towns include Mysore, Belgaum, Gulbarga, Bellary, and Bijāpur.

Karnatic music: *see* Carnatic music.

Karnatic temple architecture, style of architecture employed largely in the Karnātaka (formerly Mysore) area of southern India. Closely allied to the South Indian style, it developed a distinctive idiom in the mid-12th century under the Hoysaḷa dynasty.

The temples of this dynasty are characterized by multiple shrines around a central hall and above all by the extreme exuberance of



Detail of the wall of the Hoysaḷeśvara temple at Halebīd, Karnātaka state, India, chloritic schist, Hoysaḷa dynasty, 12th century

P. Chandra

the sculpture and ornamental decoration. The high plinths of the temples are elaborately covered with horizontal bands of floral and animal motifs, separated from one another by deeply shadowed recesses; a series of divine and semidivine figures each under its own foliated canopy covers the walls. The availability locally of a chloritic schist that is soft when quarried and hardens on exposure to the air contributed to the development of the highly ornate, deeply cut style.

The double-shrine Hoysaḷeśvara temple at Halebīd is a typical example of the 12th-century Karnatic style, though the *kūṭina*-type superstructure is missing and may never have been completed. The profusion of carving often tends to obliterate the sense of architectural form, but the enormous skill and labour expended are astonishing.

Karnatic Wars: *see* Carnatic Wars.

Karnian Stage, division of Triassic rocks and time (the Triassic Period began about 225,000,000 years ago and lasted about 35,000,000 years). Rocks of the Karnian Stage overlie those of the Ladinian and underlie rocks of the Norian Stage; the Karnian is the lowermost stage of the Upper Triassic. First studied in the Alps of Europe, it consists largely of marine rocks that were deposited in varying depths of water. In Bavaria, shallow-water sandstones with characteristic fossil forms occur, while in the Karnic Alps, coral limestones and dolomites deposited in deeper water predominate. The record of the Karnian is complex, and numerous environments of deposition are represented.

Karnische Alpen (Austria–Italy): *see* Carnic Alps.

Kärnten, also called CARINTHIA, *Bundesland* (federal province), southern Austria, bordered by *Bundesländer* Salzburg (north and east) and Steiermark (Styria; north), on the south by Yugoslavia and Italy, and on the west by East Tirol. Drained by the Drava (Drau), Gail, Möll, Gurk, and Lavant rivers, it occupies an area of 3,681 sq mi (9,533 sq km) and is predominantly Alpine but also contains the low-lying Klagenfurt basin. Parts of the geological troughs within the basin are occupied by two of the main Kärnten lakes—the Ossiacher See and the Wörther See. The Rosental (valley) is a southern trough along which the Drava flows between the Sattnitz Hills and the Karawanken Mountains. Another valley, the Lavanttal, contains a fertile basin. These areas, plus the Gurktaler Alpen, Sanalpe, Koralpe, and Karawanken ranges of the eastern Central Alps, form lower Kärnten. Upper Kärnten consists of the more mountainous western part of the province, including part of the Hohe Tauern, the upper Drava Valley, the low and well-rounded Gailtaler Alpen, the wide and swampy valley of Gailtal, and the Austrian section of the rugged Karnische Alpen (Carnic Alps). In the Grossglockner group (northwest), Austria reaches its highest point (12,457 ft [3,797 m]) and contains its longest glacier, the Pasterze Glacier, 6 mi (10 km) in length. There are two large lakes, Weissensee and Millstätter See.

The area was the core of the Celtic kingdom of Noricum, which became a Roman province in 16 BC and later was invaded by Teutonic tribes, Avars, Slavs, and Bavarians after the breakdown of Roman rule. Attached to Bavaria in the 8th century, it was further colonized by the Bavarians, who gradually assimilated most of the Slav population. In 976 Carantania (Carinthia) became a duchy in its own right, including Steiermark and the present East Tirol. For a short time it became part of the state of Otakar II of Bohemia after the extinction of the Carinthian ducal line. It passed in 1276 to the German king Rudolf I of Habsburg, who granted it to the Count of Tirol in 1286. It returned to the Habsburgs and became a crown land in 1335. It was made a *Bundesland* in 1918, a status that was restored in 1945 after it had formed part of the Reichsgau Kärnten (Reich's province) in greater Germany during the *Anschluss*, or incorporation of Austria into the Reich (1938–45). After World War I, 128 sq mi of territory were ceded to Yugoslavia and 172 sq mi to Italy. Ethnically, the population of Kärnten is more than 90 percent German, with a Slovene minority of about 4 percent. The inhabitants are predominantly Roman Catholic. The chief towns are the capital, Klagenfurt, Villach, Wolfsberg, and Spittal.

Agriculture and forestry are the principal economic activities, each using more than 40 percent of the land surface. Livestock farming is dominant, but wheat, rye, and oats are grown in the Klagenfurt basin and the Lavanttal; corn (maize) in the Gailtal; and fruit along the lakeshores. Most of the forests are privately controlled, and timber cutting is considerably in excess of natural growth. Iron ore is mined at Hüttenberg, lead–zinc–molybdenum ore west of Villach, magnesite near Spittal, and lignite in the Lavanttal. There are hydroelectric plants in the Mölltal and at Schwabegg and Lavamünd. Industry is less well-developed and is centred at Villach, Wolfsberg (in the Lavanttal), and Klagenfurt. Timber is the most important raw material, supporting paper and cellulose plants; metal products, chemicals, and textiles are also manufactured. Villach is Kärnten's main railway junction. The main road to Salzburg city is via the Katschberg Pass (5,384 ft [1,641 m]), and the Grossglockner-Hochalpenstrasse (route) to Italy climbs to more than 8,000 ft. Pop. (1981 est.) 536,727.

Karo, Joseph ben Ephraim, Karo also spelled CARO, or QARO, also called MARAN

(Aramaic: "Our Master") (b. 1488, Spain—d. March 24, 1575, Safed, Palestine), Spanish-born Jewish author of the last great codification of Jewish law, the *Bet Yosef* ("House of Joseph"); its condensation, the *Shulḥan ʿarukh* ("The Prepared Table," or "The Well-Laid Table"), is still authoritative for Orthodox Jewry.

When the Jews were expelled from Spain in 1492, Karo and his parents settled in Turkey. In about 1536, he emigrated to Safed in Palestine, then the centre for students of the Talmud (the rabbinical compendium of law, lore, and commentary) and the Kabbala (the influential body of Jewish mystical writings).

Because of the partial disintegration in Jewish life after the Spanish expulsion, and the diversity of Talmudic authorities in different countries, Karo undertook two major works to standardize Judaism's customs and laws, many derived from the Talmud. The first and greater of his works was the commentary *Bet Yosef* on the codification *Arbaʿa ṭurim* (1475; "Four Rows") of Jacob ben Asher (*c.* 1269?–?1340). Following Asher's topical arrangement, Karo brought together the legal decisions of three leading representative Talmudists: Moses Maimonides (1135–1204), Isaac Alfasi (1013–1103), and Asher ben Jehiel (*c.* 1250–1327). When he found disagreement among the three, Karo took the majority opinion as final. That procedure, however, gave a Sefardic bias to the work, since Maimonides and Alfasi usually agreed and both were Sefardic, *i.e.,* Jews of Spanish and Portuguese descent. In addition, Karo often decided difficult points of law on his own authority. In the scope of sources used, *Bet Yosef* went far beyond the code of Maimonides (chiefly confined to the Talmud) and systematized the vast body of material produced by post-Talmudic rabbinical writers.

Because of the complexity and erudition of the *Bet Yosef,* Karo produced a popular condensation, *Shulḥan ʿarukh* (1565), which provoked the strictures of Moses Isserles (*c.* 1525–72), a learned Polish rabbi. Isserles objected to the work's Sefardic bias as slighting the customs of the Ashkenazim (Jews of German and Polish descent). A corrective commentary by Isserles, *Mappa* (1571; "The Tablecloth"), made Karo's code acceptable to Sefardic and Ashkenazi Jews alike. Since that time the commentary has been published with Karo's digest.

Karo was also the author of another major work, a strange, mystical diary, entitled *Maggid mesharim* ("Preacher of Righteousness"; published 1646), in which he recorded the nocturnal visits of an angelic being, the personification of the Mishna (the authoritative collection of Jewish Oral Law). His visitor spurred him to acts of righteousness and even asceticism, exhorted him to study the Kabbala, and reproved him for even slight moral laxities.

Károly (Hungarian personal name): *see under* Charles.

Károlyi, Mihály, Gróf (Count) (b. March 4, 1875, Fót, Hung., Austria-Hungary—d. March 20, 1955, Vence, Fr.), Hungarian statesman who before World War I desired a reorientation of Austro-Hungarian foreign policy toward friendship with states other than Germany and advocated concessions to Hungary's non-Magyar subjects. After the war, as president of the Hungarian Democratic Republic in 1919, Károlyi was nevertheless unable to hold the lands of the former kingdom together and was soon forced into exile.

Károlyi was a member of one of the most famous and wealthiest families of the Hungarian aristocracy. Entering the Hungarian Parliament as a conservative in 1910, he soon drifted to the left. His policies—the breakup of large estates, universal suffrage, equality of nationalities, and a maximum of freedom in the joint institutions of Austria-Hungary—were radical positions in conservative prewar Hungary; he had little actual power and almost no following. When, however, the military situation turned against the Central Powers toward the end of World War I, Károlyi emerged as an influential figure, and, on Oct. 25, 1918, he formed a national council composed of his followers, bourgeois radicals, and Social Democrats. King Charles IV (also Emperor Charles I of Austria) appointed him Hungarian prime minister on October 31 and recognized Hungary as a separate state with a separate army. Károlyi hoped to gain a favourable peace settlement from the Allies but was disappointed. Czechoslovakia, Romania, and Yugoslavia seized extensive stretches of Hungary, and, when the Allies demanded yet further territorial concessions, he resigned (March 20, 1919) the presidency he had held since January 11. He was replaced by Béla Kun and the Hungarian Soviet Republic. After fleeing abroad in July 1919, Károlyi became a left-wing Socialist, returning to Hungary in 1946. Ambassador to Paris (1947–49), he resigned after the arrest of László Rajk and protested, from Paris, against Rajk's death sentence.

Karonga, administrative headquarters of Karonga District, Northern Region, Malawi, situated on the western shore of Lake Nyasa. A site of Stone Age settlement, the lakeshore was later inhabited by primitive agriculturalists. By 1877 Karonga had become the stronghold of the notorious Arab slaver Mlozi. The modern town was founded, however, with the opening of a British trading post there in 1883. The British explorer Sir Harry Johnston took possession of the post in 1895 and ended the slave trade on the western shore. Karonga then grew as a commercial centre and entrepôt for local agricultural produce.

Bordering on Tanzania, the district covers a land area of 1,141 sq mi (2,955 sq km). The economy, based on the cotton and rice production along the lake and on coffee and livestock in the west, is augmented by subsistence fishing. Exports depend on water transport and seasonal roads to the railhead at Salima, 350 mi (563 km) south. The district is involved in the multi-purpose Chitipa-Karonga Rural Development Project. Pop. (1977) town, 12,051; (1984 est.) district, 127,600.

Karoo, also spelled KARROO, arid to semi-arid geographical region of interior Cape Province, South Africa, best exemplified by its vegetation—assorted succulents and low scrub bushes spaced from one foot to several feet apart. Barren of surface water, the Karoo's name is derived from the Khoisan word meaning "land of thirst." Its subregions include the intermontane vales of Little Karoo and Great Karoo (*qq.v.*) in the lesser-elevated areas of southern Cape Province, and the main Karoo (or Upper Karoo) spanning the vast highland plateau of central Cape Province to the north and east of the Great Escarpment (*q.v.*). Altogether the Karoo occupies about 153,000 sq mi (395,000 sq km); about one-third of the total area of South Africa.

Different varieties of sheep raised for mutton, wool, or pelts commonly graze the Karoo, and citrus crops, in particular, are cultivated within the region's irrigated schemes.

Karoo System, also spelled KARROO, geological system of rocks outcropping over a 1,560,000-square-kilometre (600,000-square-mile) area of Africa from the Equator south to the Cape of Good Hope. The time span of the Karoo System extends from the Permo-Carboniferous (about 280,000,000 years ago) to the Late Triassic (about 190,000,000 years ago). At its thickest, the Karoo consists of more than 10,500 metres (35,000 feet) of rocks. The presence of coal seams, along with some petroleum, makes it commercially important. Of scientific interest is the almost singular glimpse the Karoo affords of reptilian life, especially the mammal-like therapsid reptiles, among whose ranks are to be found the progenitors of the true mammals.

The Karoo System is subdivided into four series, which from youngest to oldest are the Stormberg Series (Upper Triassic), Beaufort Series (Upper Permian–Lower Triassic), Ecca Series (Lower Permian), and Dwyka Series (Lower Permian).

Karoo sediments are nonmarine and consist of shales, red beds, siltstones, and great quantities of volcanics. The flora and fauna of the Karoo are terrestrial and appear to record a gradual climatic shift toward ever-increasing aridity. Glacial deposits in the Dwyka Series are matched by apparently contemporaneous deposits in South America, India, and Australia.

Kárpathos, Italian SCARPANTO, island of the Dodecanese group in the Aegean Sea, Greece. The principal town of the 116.3-sq-mi (301.2-sq-km) island is Pigádhia in the south behind the Órmos (bay) Pigádhia. Closely tied to the island of Rhodes in antiquity and the Middle Ages, the island was under Venetian rule from 1306 to *c.* 1540, when it fell to the Turks. In 1912 it passed to Italy; after World War II it was awarded to Greece.

The inhabitants of the rocky island, treeless except in the south, are engaged mostly in farming, horticulture, and grazing, but there is some fishing. The dialect, containing ancient Doric as well as modern Italian words, resembles that of Rhodes and Cyprus, and in the northern regions the men still wear traditional costume to work. Pop. (1981) 4,645.

Karpov, Anatoly Yevgenyevich (b. May 23, 1951, Zlatoust, Russian S.F.S.R.), Soviet Chess master who dominated world competition from the mid-1970s to the mid-1980s.

Karpov moved to Leningrad with his family early in life. A child prodigy, he learned to play Chess at the age of four and was rated a first-category player by the time he was nine. In 1969 he won the World Junior championship at Stockholm, and a year later, at age 19, he became the world's youngest grand master. An almost uninterrupted series of successes in tournaments during 1971–74 made him the official challenger to Bobby Fischer of the United States for the 1975 world Chess championship. Karpov became world champion that year without having to play when Fischer declined to play a match except under his own conditions. Karpov narrowly retained his title against the Soviet defector Viktor Korchnoi in 1978 and beat Korchnoi again handily in 1981.

Karpov defended his title against his fellow countryman Gary Kasparov in 1984–85. Karpov gained a commanding lead early in the series, but Kasparov eventually rallied. The match became a grueling endurance contest that stretched to 48 games before it was halted on the grounds that both players were exhausted. In their rematch during 1985 Karpov lost his title to Kasparov after 24 games had been played.

Though slim and of small stature, Karpov had notable powers of endurance. His style of play was without noticeable weaknesses; he tended to prefer defense to attack, inexorably building up minute advantages through flawless but colourless maneuvers to eventually achieve victory.

Karre, Monts, mountain range, western Central African Republic, in western Ouham-Pendé and northern Nana-Mambéré *préfectures.* The range rises to 4,659 ft (1,420 m) at Mt. Gaou, the highest point in the Central African Republic. The granite hills, split by southwest–northeast fractures, extend west-

ward across the border into Cameroon. Southward and eastward spurs are marked by great round boulders. The range forms part of the watershed between the Congo (Zaïre) River system to the south and the Lake Chad basin to the north. Noteworthy falls include the Lancrenon waterfall on the Ngou River near Bocaranga. Rainfall of nearly 60 in. (1,500 mm) per year supports livestock grazing. Cotton is grown in the northern foothills. Bouar, Bouala, and Bocaranga are the major towns.

Karrer, Paul (b. April 21, 1889, Moscow—d. June 18, 1971, Zürich), Swiss chemist who investigated the constitution of carotenoids, flavins, and vitamins A and B_2, for which he shared the 1937 Nobel Prize for Chemistry with Sir Walter Haworth of Great Britain.

Born in Russia of Swiss parents, Karrer was educated in Switzerland and received his doctoral degree at the University of Zürich in 1911. After a year spent in the Chemical Institute at Zürich he joined Paul Ehrlich at the Georg Speyer Haus in Frankfurt am Main, where he remained for six years. In 1918 Karrer returned to Zürich as professor of chemistry and in 1919 became director of the Chemical Institute there.

Karrer's best known researches were on plant pigments, particularly the yellow ones (carotenoids), which are related to the pigment in carrots. He not only elucidated the chemical structure of the carotenoids but also showed that some of these substances are transformed into vitamin A in the animal body. In 1930 he established the correct formula for carotine—the chief precursor of vitamin A—and this was the first time that the chemical structure of a vitamin had been established. Shortly afterward he was able to determine the constitution of vitamin A itself. He also confirmed the constitution of vitamin C proposed by Albert Szent-Györgyi, showed lactoflavin to be part of the complex originally described as vitamin B_2, and also studied vitamin E. His *Lehrbuch der organischen Chemie* (1928; *Organic Chemistry*) passed through many editions in German and English during the 1930s and '40s.

Kars, city, capital of Kars *il* (province), northeastern Turkey. Kars is situated on a plateau 5,740 ft (1,750 m) above sea level on Kars Çayı (stream), a tributary of the Aras River, near the border of the Soviet Union. The city, divided into an older upper section and a newer part to the south, stretches out on either side of the Kars Çayı; the two sections of the city are linked by an ancient bridge built by the Seljuq Turks.

The seat of an independent Armenian principality during the 9th and 10th centuries, Kars was captured by the Seljuqs in the 11th century. Taken by the Mongols in the 13th century and by Timur (Tamerlane) in 1387, it was incorporated into the Ottoman Empire in 1514. After withstanding a siege by Iranians in 1731 and successfully resisting the Russians in 1807, it fell to the Russians in 1828 and 1855 and was formally annexed by Russia in 1877–78. It was returned to Turkey in 1918, though the Soviet Union later (1945–47) tried unsuccessfully to reclaim it as part of the Armenian S.S.R.

Historical buildings include Kümbet Camii, originally an Armenian church converted into a mosque and now housing a small museum; a bath dating from the Ottoman period; and an old citadel overhanging the river, once a strong military post (probably late 16th century). Kars is important as a centre for trade in livestock and is also noted for its cheese. It also produces coarse woollens, carpets, and felts. An important military station, it is linked by rail and road with the principal Turkish cities.

Kars *il,* 7,437 sq mi (19,261 sq km) in area, is bordered on the north and east by the Soviet Union, on the northwest by the



The citadel of Kars, Tur., and (foreground) the conical roof of Kümbet Camii

V-Dia—SCALA from Art Resource/EB Inc.

Yalnızçam Range, and on the southeast by Mt. Ararat (Ağrı Dağı). It comprises a high plateau traversed by mountain ranges. Winters are severe, with heavy snowfalls. Rainfall is moderate. The alpine meadows in Kars reach up to 9,000 ft (2,750 m), affording excellent pasture in spring and summer. The *il* is heavily forested, with firs and birches to 7,000 ft and vines to 3,000 ft. Cereals ripen well, and barley and corn (maize) are grown up to considerable elevations. Stock raising is a major activity, and salt deposits are worked at Kağızman. Part of the Armenian kingdom in antiquity, Kars contains a number of sites dating from that period. Ani, west of Kars city and by the Soviet frontier, was the Bagratid capital in the 10th century. Pop. (1980) city, 58,799; (1983 est.) *il,* 696,400.

Karsavina, Tamara (Platonovna) (b. March 9/10, 1885, St. Petersburg, Russia—d. May 26, 1978, Beaconsfield, Buckinghamshire, Eng.), Anglo-Russian ballerina whose partnership with Vaslav Nijinsky in Michel Fokine's avant-garde ballets helped to revive interest in ballet in western Europe.



Tamara Karsavina in *Petrushka*

BBC Hulton Picture Library

The daughter of a famous dancer, Platon Karsavin, she was educated at the Imperial Ballet School, St. Petersburg, under such teachers as Cecchetti, Christian Johansson, and Paul Gerdt, and graduated in 1902. As ballerina at the Mariinsky Theatre she included in her repertoire *Giselle* and Odette-Odile in *Swan Lake.* Karsavina is best known as the leading ballerina of Sergey Diaghilev's Ballets Russes from its beginning in 1909 until 1922. Between 1909 and 1914 (paired with Nijinsky until 1913) she created the majority of famous roles in Fokine's Neoromantic repertoire, including *Les Sylphides, Le Spectre de la Rose, Carnaval, Firebird, Petrushka,* and *Thamar.* She also created leading roles in Massine's *The Three-Cornered Hat* and *Pulcinella.* She came out of semiretirement in the early 1930s to revive some of her more famous roles for Ballet Rambert and to create new ones for Frederick Ashton.

After marrying the English diplomat Henry James Bruce, Karsavina went to London (1918), where she helped found the Royal Academy of Dancing (1920), for which she organized the Teachers' Training Course and the Camargo Society (1930). She also coached Margot Fonteyn. Her writings include articles on technique for the journal *Dancing Times,* her autobiography *Theatre Street* (1930), and the text *Classical Ballet: The Flow of Movement* (1962).

Karsh, Yousuf (b. Dec. 23, 1908, Mardin, Tur.), Canadian photographer best known for portraits of the great personages of his time.

As an Armenian in Turkey, the young Karsh endured persecution and privation. At the age of 16 he emigrated to Canada, joining his uncle, who was a photographer in Sherbrooke, Que. From 1928 to 1931 he served as an apprentice to a prominent Boston painter and portrait photographer and briefly attended art school. Returning to Canada in 1932, he was employed by an Ottawa photographer, whose studio Karsh leased after his employer retired. He was appointed official portrait photographer of the Canadian government in 1935.

Karsh's portrait of Sir Winston Churchill, made in Ottawa in 1941, brilliantly conveyed the dogged determination of Britain's wartime leader and brought Karsh his first real international fame. Karsh went on to photograph an enormous number of the world's most prominent personalities, including royalty, statesmen, artists, and writers. He has also continued to make portraits of world leaders. Karsh's style as a portraitist was formal. He used subtle lighting to meticulously model his subjects' faces, thereby obtaining a monumental and idealized presentation that was in accord with their public image. His books include *Faces of Destiny* (1946), *Portraits of Greatness* (1959), *In Search of Greatness* (1962), *Karsh Portfolio* (1967), *Faces of Our Time* (1971), *Karsh Portraits* (1976), and *Karsh Canadians* (1978).

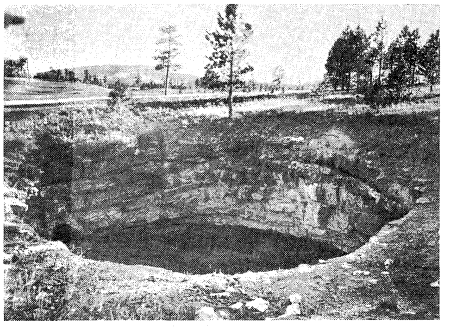
Karshi, also spelled KARŠI, city and administrative centre of Kashkadarya *oblast* (region), Uzbek Soviet Socialist Republic, in the Karshi oasis, on the Kashkadarya (*darya,* river). At least 1,000 years old, it lay on the caravan route from Samarkand and Bukhara to Afghanistan and India; it was known as Nakhsheb, or Nesef, until the 14th century, when a fort (Turkic *karshi,* "against") was built there. Later, as part of the khanate of Bukhara, it was the residence of a ruler and traded in grain, wool, vegetable oils, and dried fruits. The present city is a railway junction, with industries processing agricultural raw materials and producing the best pileless carpets in Uzbekistan. The population doubled in the 1960s, when it became the headquarters for major irrigation works in the Karshi Steppe. Karshi has a teacher-training institute and a theatre. Pop. (1985 est.) 133,000.

Karşiyaka, town, İzmir *il* (province) west central Turkey, located on the northern shore of İzmir Körfezi (gulf), northwest across the gulf from İzmir city, the provincial capital. It is mainly a shipbuilding centre with port

facilities and is now a part of İzmir *belediya* (greater metropolitan area). The surrounding area is predominantly agricultural; manufactures include cotton and woolen textiles, tobacco, canned fruit and vegetables, chemicals, footwear, and furniture. Pop. (1980) 227,790.

karst, terrain usually characterized by barren, rocky ground, caves, sinkholes, underground rivers, and the absence of surface streams and lakes. It results from the excavating effects of underground water on massive soluble limestone. The term was originally applied to the Karst, a limestone area along the Dalmatian coast of Yugoslavia, but by extension has been applied to all areas exhibiting similar features.

Karsts are found in widely scattered sections of the world—in the Causses of France; the



Sinkhole in limestone with abrupt sides not modified by erosion, Cambria, Wyo.
By courtesy of the U.S. Geological Survey; photograph, N.H. Darton

Kwangsi area of China; the Yucatán Peninsula; and the Middle West, Kentucky, and Florida in the United States.

Conditions that promote karst development are well-jointed, dense limestone near the surface; a moderate to heavy rainfall; and good groundwater circulation. Limestone (calcium carbonate) dissolves relatively easily in slightly acidic water, which occurs widely in nature. Rainwater percolates along both horizontal and vertical cracks, dissolving the limestone and carrying it away in solution. Limestone pavements are produced by the removal of surface material, and the vertical fissures along joints are gradually widened and deepened, producing a grooved and jagged terrain. As it flows along cracks underground, the water continues to widen and deepen the cracks until they become cave systems or underground stream channels into which narrow vertical shafts may open. Most, but not all, of the principal cave areas of the world are areas of karsts. Features such as lapies, natural bridges, and pepino hills are characteristic of karsts.

If a cave becomes large enough and the top extends close enough to the surface, the top collapses. This produces depressions called sinkholes, which are among the most characteristic features of karst topography. Sinkholes commonly coalesce into much larger depressions called poljen, which are often flat-floored and covered with soil that is derived from the insoluble residues of the limestone. These poljen may be the only areas where cultivation can be carried on. However, limestones vary in solubility and in the proportion of insoluble components; hence the general surfaces of some karst areas can be farmed. Over broad areas, surface streams may be totally absent. In fact, in some karst areas with heavy rainfall, all precipitation may disappear underground so completely that even water for domestic purposes may be difficult to find. In other places water may surface as large springs, flow as a stream across the surface, and then disappear again underground.

In arid regions, percolating groundwater often washes out the finer soil particles to form small tubes or pipes that eventually empty into the heads of gullies. When these pipes collapse, a pseudokarst topography is formed that may even exhibit sinkholes, although they do not extend down below the water table as do many true sinks. *See also* thermokarst.

Kartēr, also spelled KARTIR, or KARDER (fl. 3rd century AD, Iran), influential high priest of Zoroastrianism, whose aim was to purge Iran of all other religions, especially the eclectic Manichaeism founded by the 3rd-century Persian prophet Mani. What little is known of Kartēr comes from inscriptions on cliff faces, mostly dating from the reign of Shāpūr I (241–272). On more than 700 cliffs he proclaimed the fundamental doctrines of the religion of Zoroaster.

Beginning his career under King Ardashīr I (ruled 224–241), Kartēr restored the purity of the Mazdean religion (Zoroastrianism). Under Shāpūr I, he held the title of *ehrpat* ("master of learning"). Later, under another king, Hormizd, he was elevated to the rank of *magaput*, or chief, of the Magi of Hormizd, a title previously unknown to the Magi, the priestly caste of ancient Persia.

When Bahrām I (ruled 273–276) assumed the throne, Kartēr was at last afforded an opportunity to get rid of his archrival Mani, who had been protected by Shāpūr. Bahrām put Mani in prison, where he finally died. Kartēr managed to reestablish orthodox Zoroastrianism and proceeded to persecute all other religions, especially the Zandīks (Zoroastrian heretics, perhaps Zurvanites), who insisted on interpreting the Avesta in the light of their own thinking. After the death of Kartēr, a degree of religious tolerance gradually reasserted itself, and the many titles created for Kartēr or taken by him were recovered by other priests.

karting, driving and racing miniature, skeleton-frame, rear-engine automobiles called karts, or GoKarts. The sport originated in the



Karting at the Oulton Park circuit, Heysham, Eng.
London Daily Express—Pictorial Parade/EB Inc.

United States in the 1950s after the kart had been devised from unwanted lawn-mower engines. The karts usually have no protective bodywork, and the driver sits only a few inches above the ground. Some of the vehicles, nevertheless, are capable of speeds well over 100 miles (160 kilometres) per hour.

After kart racing developed into an international sport in Europe, there was little American participation in the world championship event until 1970. Races are run on tracks similar to those for other kinds of auto racing but only about 1,000 yards or metres in length. Karts are grouped by engine displacement into 100- and 200-cubic-centimetre categories. Price limits on classes in some areas have enhanced the sport's popular appeal.

Kartini, Raden Adjeng, (Lady) (b. April 21, 1879, Majong, Java [Indonesia]—d. Sept. 17, 1904, Rembang Regency, Java), Javanese noblewoman whose letters made her an important symbol for the Indonesian independence movement and for Indonesian feminists.

The daughter of a Javanese aristocrat working for the Dutch colonial administration as governor of the Japara Regency (an administrative district), Kartini had the unusual opportunity to attend a Dutch school, which exposed her to Western ideas and made her fluent in Dutch. During adolescence, when she was forced to withdraw to the cloistered existence prescribed by tradition for a Javanese girl of noble birth, she began to correspond with several Dutch friends from her school days. She also knew and was influenced by Mevrouw Ovink-Soer, wife of a Dutch official and a dedicated socialist and feminist. In her letters Kartini expressed concern for the plight of Indonesians under conditions of colonial rule and for the restricted roles open to Indonesian women. She resolved to make her own life a model for emancipation and, after her marriage in 1903 to a progressive Javanese official, the Regent of Rembang, she proceeded with plans to open a school for Javanese girls.

Kartini died at the age of 25 of complications after the birth of her first child, but J.H. Abendanon—former director of the Department of Education, Religion, and Industry—arranged for publication of her letters in 1911, under the title *Door duisternis tot licht* ("Through Darkness into Light"). The book enjoyed great popularity and generated support in The Netherlands for the Kartini Foundation, which in 1916 opened the first girls' schools in Java, thus fulfilling Kartini's ambition. Her ideas were also taken up by Indonesian students attending Dutch universities, and in 1922 an Indonesian translation of the letters was published. Although Indonesian nationalist aims went far beyond her ideas, she became a popular symbol, and her birthday was made a national holiday.

Kārttikeya (Hindu god): *see* Skanda.

Kartvelian languages, also called SOUTH CAUCASIAN LANGUAGES, or IBERIAN LANGUAGES, family of languages including Georgian, Svan, Mingrelian, and Laz that are spoken south of the chief range of the Caucasus.

A brief treatment of Kartvelian languages follows. For full treatment, *see* MACROPAEDIA: Languages of the World: *Caucasian Languages.*

Of the Kartvelian language family, only Georgian, the official language of the Georgian S.S.R., has an ancient literary tradition. It dates to the 5th century AD. The Georgian written form is also used by speakers of the other languages, which are nonliterate. Some scholars consider Mingrelian and Laz to be

dialects of a single language rather than independent languages.

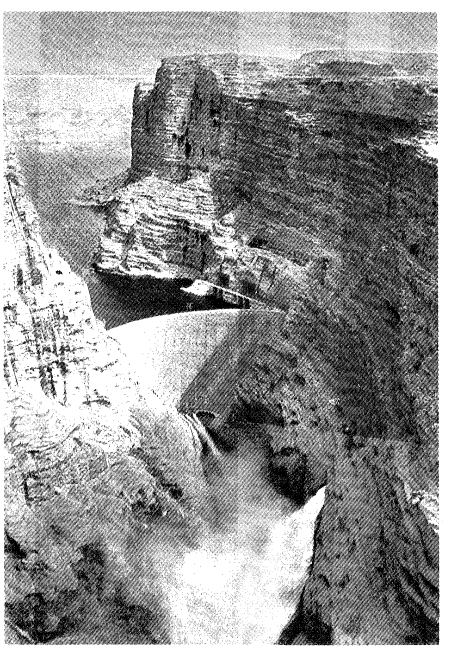
The linguistic characteristics of South Caucasian languages indicate descent from a common protolanguage. The phonology of Kartvelian languages is fairly uniform, though Svan has several distinctive vowels. Other grammatical characteristics—including the systems of word inflection, derivation, and syntax, as well as a common vocabulary—also exhibit a great correspondence. From these common features, linguists have postulated a Proto-Kartvelian language with certain features that are strikingly parallel to Indo-European. They have further concluded that Svan, which retains a number of archaic structural features, was separated from the other three languages at a fairly early stage in their development. *See also* Georgian language; Svan language; Mingrelian language; Laz language.

Kārūn River, Persian RŪD-E KĀRŪN, ancient ULAI, or EULAEUS, river in southwestern Iran, a tributary of the Shatt al-Arab, which it joins at Khorramshahr. It rises in the Bakhtiārī Mountains west of Eṣfahān and follows a tortuous course; its length is 515 miles (829 km), though the direct distance from its source to the junction with the Shatt al-Arab is only 180 miles (290 km). Its catchment basin up to Ahvāz has an area of 22,069 square miles (57,059 square km), of which 7,000 square miles (18,130 square km) belong to its main tributary, the Dez. Most of the area is mountainous, forming part of the limestone Zagros ranges.

The river's course divides into three parts: from the sources to Gatvand, where the river emerges from the hills; from Gatvand to Band Qīr, where it is joined by the Dez; and from Band Qīr through Ahvāz to the Shatt al-Arab. In its upper course it is a powerful stream, increasing in volume as it is successively joined by its tributaries. For long stretches it flows rapidly between high precipices. At Band Qīr the river, enlarged by the Dez, is navigable to its mouth except for about 2 miles (3 km) of rapids at Ahvāz. Below Ahvāz the river is sometimes too shallow for navigation, especially during the dry season. Seasonal variation in discharge rate shows the lowest water level to be in October, and the highest, as the result of combined precipitation and meltwater, in April.

Formerly the Kārūn had a lower course that was separated from and to the east of the Shatt al-Arab. There are three old riverbeds (apparently used successively) that branch off at the left of the Kārūn; they are known as Shatt al-Qadimi (Farsi: "Ancient River"), Shatt al-'Ameh (Farsi: "Blind River"), and Rūdkhāneh-ye Bahmanshīr. Rūdkhāneh-ye Bahmanshīr delimits the eastern edge of the island of Abadan. In 1765, however, the river changed to its present course through the apparently artificial Haffār Channel. According to the geographer al-Maqdisī, it was dug in AD 986 to facilitate water communication between Ahvāz and Basra. This change resulted in frontier disputes between the Ottoman Empire and Persia, disputes that were settled by the treaty of Erzurum (1847), giving Persia access to the eastern bank of the Shatt al-Arab and the right to use the waterway.

The Kārūn up to Ahvāz was opened to international navigation in 1888, and boat services were later established between Ahvāz and Band Qīr. Shipping on the lower Kārūn has become increasingly important owing to oil drilling and refining. To increase the water supply of Eṣfahān, a dam and tunnel on the river were completed in 1971.



Dam on the Kārūn River, Iran
Dennis Briskin—Tom Stack & Associates

karuna, in Buddhism, the perfect virtue of compassion. *See* brahmavihāra.

Karuzi, town, central Burundi. The town, located on the Ndurumu River (a tributary to the Ruvubu), is a market centre with a government dispensary and a place of worship for Roman Catholics. A road connects it with the towns of Muyinga to the northeast and Gitega to the southwest.

The town lies on Burundi's central plateau, which has elevations ranging from 4,100 to 6,600 feet (1,250 to 2,000 m). The surrounding region is drained south and north by the Ruvubu River and its tributaries. Most of this area is devoted to raising cattle, goats, and sheep and growing bananas, cassava, beans, corn (maize), sorghum, and coffee.

Karve, (Maharishi) Dhondo Keshav (b. April 18, 1858, Sheravali, India—d. Nov. 9, 1962, Poona [Pune]), Indian social reformer and educator, noted for supporting the education of women and for organizing associations for the remarriage of Hindu widows.

While an instructor in mathematics (1891–1914) at Fergusson College, Poona, Karve became concerned with breaking down orthodox Hindu opposition to widow remarriage and established the Widow Marriage Association in 1893. In the same year, he shocked public opinion by himself marrying a widow; his first wife had died in 1891. Karve also founded (1896) an educational institution, Hindu Widows Home, in Poona, to help widows support themselves if they could not remarry.

Karve became increasingly concerned with illiteracy among women, and on his retirement from Fergusson College he started Shreemati Nathibai Damodar Thackersey Women's University in 1916. He later widened his social reform efforts to include the establishment of societies for village primary education and the abolition of caste. Karve's autobiography was entitled *Atmavritta* (1915). On his 100th birthday he was awarded India's highest honour, the Bharat Ratna ("Gem of India").

Karviná, mining city, Severomoravský *kraj* (Northern Moravia region), Czechoslovakia. The city is situated east of Ostrava, on the eastern bank of the Olse River, near the Polish frontier. It was held by Poland from 1938 to 1945, with a period of German occupation after 1939, and in 1949 its municipal area was enlarged by the absorption of the town of Fryštát. It is one of many mining towns in the Silesian coalfields, producing a high-grade coal. Other industries include the manufacture of chemicals (notably fertilizers) and iron and a gasworks. Pop. (1985 est.) 76,428.

Karyotákis, Kóstas: *see* Kariotákis, Kóstas.

Kasai River, Portuguese RIO CASSAI, river in central Africa, the chief southern tributary of the Congo River (locally Zaire), into which, at Kwamouth, 125 miles (200 km) above Malebo (Stanley) Pool, it empties a volume approaching one-fifth that of the main stream. The longest river in the southern Congo Basin system, it measures 1,338 miles (2,153 km) from its source in the *planalto central* (principal plateau) of Angola to Kwamouth. Its headstream runs east for 250 miles (402 km), then turns north for nearly 300 miles (483 km) to form the frontier between Angola and Zaire. This stretch is interrupted by several spectacular rapids and waterfalls, the river flowing in deeply trenched valleys at elevations of about 2,000–3,000 feet (600–900 m). The Kasai eventually crosses a further series of rapids and falls, broadening and deepening to make navigation by large sternwheelers, tugs, and barges possible. Traffic is especially heavy on the 510-mile- (820-kilometre-) long waterway from Kinshasa to Ilebo (formerly Port-Francqui). Above Ilebo, navigation is impeded by sandbanks, but shallow-draft boats can reach Djokupunda. There the Mai-Munene Falls require goods to be carried 40 miles (64 km) by rail to the next navigable reach, from Mukumbi to Mai-Munene. In its lower reaches the river enters the equatorial rain forest. Below its confluence with the Kwango it forms Wissmann Pool and then receives the Fimi–Lukenie, bringing the waters of Lake Mai-Ndombe. Thereafter, it is known as the Kwa.

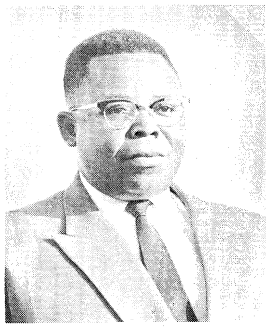
Kasanje, historic African kingdom on the upper Kwango River in what is now Angola. It was founded about 1620 by a group from Lunda, led by a warrior named Kasanje. They conquered and settled the plains west of the Kwango and named the new state after their leader. The people became known as the Imbangala; their king was called the *jaga.* (Jaga was also the name of a neighbouring kingdom, whose people were also called Imbangala.)

By the mid-17th century, Kasanje enjoyed a thriving trade with Lunda and other states of the interior. It also established political and commercial ties with the Portuguese traders on the Atlantic coast. As other kingdoms in the region became distracted by petty wars, Kasanje won control of the main trade routes between the interior and the Portuguese colony of Angola, which, by the 1670s, extended inland as far as the Kasanje border. At the market of Cassange (the capital of Kasanje), Portuguese cloth and guns were exchanged for slaves to work in Brazil. The Imbangala monopoly of inland Portuguese–African trade lasted from the 1650s until the 1850s, when the nearby state of Ovimbundu succeeded in opening alternative routes and markets. Kasanje repulsed a Portuguese military expedition in the mid-19th century but was occupied and incorporated into Portuguese Angola in 1910–11. Its long success in blocking the Portuguese advance had lasting effects: some of the lands farther east, inaccessible to Angola in the 19th century, were instead absorbed into the Congo Free State and are today a part of Zaire.

Kasaoka, city, southeastern Okayama *ken* (prefecture), Honshu, Japan, facing the Inland Sea. It was an old temple town until its port flourished during the Tokugawa period (1603–1867). The opening of a major railway line and a textile plant made the city the commercial centre of the Kobi plateau by the early 20th century. Flowers and fruit are grown in the area. Since 1965 land has been reclaimed for agricultural, industrial, and residential development. Pop. (1980) 61,917.

Kasatkin, Ivan Dmitrovich (Orthodox saint): *see* Nikolay Kasatkin, Saint.

Kasavubu, Joseph (b. 1910?, Tshela, Belgian Congo—d. March 24, 1969, Boma, Congo [Zaire]), statesman and first president of the independent Congo republic from 1960 to



Kasavubu
AP/Wide World Photos

1965, who shortly after independence in 1960 ousted the Congo's first premier, Patrice Lumumba, after the breakdown of order in the country.

Educated by Roman Catholic missionaries in the Congo, Kasavubu became a lay teacher. In 1942 he entered the civil service; he attained the rank of chief clerk, the highest position open to Congolese under the Belgian colonial administration.

An early leader in the Congo's independence movement, Kasavubu during the late 1940s held important offices in Congolese cultural societies and alumni associations that were actually political organizations operating in defiance of Belgian authorities. As a member of the powerful Bakongo (or Kongo), one of the largest tribal groups in the country, Kasavubu in the 1950s sought an independent Congo with a federal structure that would ensure a certain measure of Bakongo autonomy.

Kasavubu became president (1955) of Abako (Alliance des Ba-Kongo), the powerful cultural-political association of the Bakongo. In 1957 Abako candidates swept the first municipal elections permitted by Belgian authorities in Léopoldville (now Kinshasa), and Kasavubu was elected mayor of the Dendale district.

In the Congo's first national elections in 1960, Lumumba's party outpolled Kasavubu's Abako and its allies, but neither side could form a parliamentary coalition. As a compromise measure, Kasavubu and Lumumba formed an uneasy partnership with the former as president and the latter as premier.

Shortly after independence, the Congo was wracked by an army mutiny, Belgian military intervention to protect the remaining Belgian residents, and the secession of the province of Katanga under Moise Tshombe. United Nations aid proved ineffective in restoring order in the country, and there were reports that Premier Lumumba had accepted offers of Soviet military aid to prop up the faltering central government. With the backing of the army under Col. Joseph Mobutu, Kasavubu dismissed Lumumba and appointed a new government. Kasavubu then tacitly supported Mobuto's first coup in late 1960, and later engineered the accession of Tshombe to the premiership in 1964. Kasavubu's role in Congolese politics effectively ended, however, with Mobutu's second, and final overthrow of the government in 1965. Kasavubu then retired to his farm at Boma in the Lower Congo.

kasb (Arabic: "acquisition"), a doctrine in Islām adopted by the theologian al-Ashʿarī (d. 935) as a mean between predestination and free will. According to al-Ashʿarī, all actions, good and evil, are originated by God, but they are "acquired" (*maksūb,* whence *kasb*) by men. As for the criticism that his *kasb* theory attributes evil to God, al-Ashʿarī explained that, by creating evil, God is not an evildoer.

Al-Ashʿarī chose the term *kasb* to avoid attributing *khalq* (creation) to anyone but God. His main concern was to maintain God's total omnipotence and at the same time allow men a degree of responsibility for their actions. Al-Ashʿarī rejected the assertion of the Muʿtazilah theological school, of which he had been a member, that man has the power to will an act or its opposite. He maintained rather that man has the power to will only the act, not the opposite. Man does not initiate anything; he merely acquires what God has created. Thus man's responsibility comes from his decision as to which actions he should acquire.

Because of its limiting of man's scope and its emphasis on God's omnipotence, the *kasb* doctrine was regarded by many Muslim theologians as being indistinguishable from pure predetermination. Despite the efforts of al-Ashʿarī and his followers (the Ashʿarīyah) to clarify *kasb,* it remained one of the most vague theories in Islāmic theology, as the proverb *aḍaqq min kasb al-Ashʿarī* ("more subtle than the *kasb* of al-Ashʿarī") indicates.

Kaschau (Czechoslovakia): *see* Košice.

Kaschnitz, Marie Luise, full name MARIE LUISE VON KASCHNITZ-WEINBERG, *née* VON HOLZING BERSTETT (b. Jan. 31, 1901, Karlsruhe, Ger.—d. Oct. 10, 1974, Rome), German poet and novelist noted for the hopeful and compassionate viewpoint in her numerous writings.

Marie Luise grew up in Potsdam and Berlin, and after completing her education she became a book dealer in Rome. She then travelled widely with her archaeologist husband, and the awareness of the classical past she acquired from their visits to historic Mediterranean sites greatly influenced her writing. Kaschnitz's published literary production before World War II was limited to two novels, both describing the romantic problems of young women: *Liebe beginnt* (1933; "Love Begins") and *Elissa* (1937). After the war, however, she emerged as an important lyric poet who combined modern and traditional verse forms with a highly original diction. In such works as *Totentanz und Gedichte zur Zeit* (1947; "Dance of Death and Poems of the Times") and *Zukunftsmusik* (1950; "Music of the Future"), she expressed an anguished, unflinching vision of the modern world that was nevertheless tempered by guarded feelings of optimism and hope. Such later collections of poems as *Dein Schweigen, meine Stimme* (1962; "Your Silence, My Voice") reflect the sorrow and loneliness Kaschnitz experienced upon the death of her husband, and her subsequent search for meaning and stability in her life.

Kaschnitz also wrote autobiographical novels, including *Wohin denn ich* (1963; "Whither Then I"), and the notable short-story collection *Lange Schatten* (1960; "Long Shadows"). She also wrote essays as well as radio and stage plays.

Kāshān, also spelled KASHAN, city, Markazī (Tehrān) *ostān* (province), west central Iran, on a desert at the eastern foot of the Central Iranian Range, on a once-important caravan route. It is on the southeastern branch of the Trans-Iranian Railway. Kāshān is an ancient city; 2 mi (3 km) southwest is the site of prehistoric Tepe Sialk, which yielded the most ancient remains of settled life so far found on the Iranian plateau. Kāshān was the centre of Persian ceramics, producing decorated pottery and glazed tiles exported throughout the Near East. Its lustrewares were especially famous. Its woollen and silk carpets are among Iran's finest, but modern industrial development is modest. Pop. (1976) 84,545.

Kāshān carpet, wool or silk floor covering handwoven in or near the central Iranian city of Kāshān, long known for its excellent textiles. Three classes of all-silk carpets of the Ṣafavid period (16th century) are credited to Kāshān. The first includes three large extant carpets with medallion systems and varied hunting scenes that appear between centerpiece and corners. The two best known of these are counted among the world's finest carpets. The second class is represented by more than a dozen small carpets with silken pile and prominent red coloration. Most have medallion designs; four have rows of isolated animal figures or animals in combat. Members of the third class are not pile carpets but silken kilims, in tapestry weave of exceptional delicacy, often with bits of metal enhancing certain colours to provide sparkle. The designs



Detail of the medallion and field of a silk kilim from Kāshān, Iran, 16th or 17th century; in the Textile Museum, Washington, D.C.
Textile Museum Collection, Washington, D.C.; photography, Otto E. Nelson—EB Inc.

of several include human or angelic figures. It is thought that many silk Polish carpets were also made in 17th-century Kāshān.

From the 17th through the 19th century, nothing is known of Kāshān carpets, but with the dawn of the 20th century there arose a large commercial production of pile carpets in both wool and silk. These new carpets rank among the best Persian products, with some of the most sophisticated designs, consisting of sleek medallions, curving, blossom-laden vine work, and repeats of vases with flowers. With Kermān and Tabrīz, Kāshān has been the principal source for the collector of special pieces—personage rugs, symbolic rugs, and ornate prayer rugs—otherwise unusual in Persia. Kāshān carpets are Senna (Sehna) knotted on silk or cotton foundations, depending upon the fibre of the pile. Most of the dye in recent carpets has been European.

kasher (Judaism): *see* kosher.

kashf (Arabic: "uncovering," "revelation"), in Sūfism (*i.e.,* Islāmic mysticism), the privileged inner knowledge that mystics acquire through personal experience and direct vision of God. The truths revealed through *kashf* cannot be transmitted to those who have not shared with them the same experience. The Ṣūfīs regard *kashf* as the alternative to *ʿilm* ("knowledge"), which applies systematic theology, logic, and speculative philosophy to the study of the nature of God. When the Muslim jurist and theologian al-Ghazālī (d. 1111) felt that philosophy and speculative theology had failed him, he turned wholeheartedly to Ṣūfism, abandoning his teaching profession in

the hope of finding the peace of mind that he did not find in his intellectual pursuits. After a period of mystical contemplation, he became certain that pure philosophical systems are contradictory and illusory and that the intellect should be used only to destroy trust in human logic. He concluded that *kashf* is the only means through which true and trustworthy knowledge can be attained and described it as "a light with which God floods the heart of the believer."

Kashgai rug: *see* Qashqā'ī rug.

Kashgar, Wade–Giles romanization K'A-SHIH, Pinyin KASHI, oasis city in the Sinkiang Uighur Autonomous Region (*tzu-chih-ch'ü*), China. Kashgar is the administrative centre of K'o-shih Prefecture (*ti-ch'ü*) and a county-level municipality (*shih*). Kashgar lies at the far western end of the Tarim Basin, in a fertile oasis of loess (silt deposited by the wind) and alluvial soils watered by the K'a-shih-ka-erh Ho (Kashgar River) and by a series of wells. The climate of the area is extremely arid, with variable rainfall averaging about 4 in. (100 mm) a year; most of the rain falls during the hot summer months. Average temperatures range from 21° F (−6° C) in January to 79° F (26° C) in July.

Kashgar's historical importance has been primarily as a trading centre. Situated at the foot of the Pamir Mountains, where the ranges of the Tien Shan and the Kunlun Mountains join, Kashgar commanded historic caravan routes to the Fergana Valley in the Soviet Union (west), to Jammu and Kashmir (south), and to Urumchi and the I-li Ho Valley (north).

The Chinese first occupied Kashgar at the end of the 2nd century BC, taking it from the Yüeh-chih people, who had been driven out of Kansu Province. Chinese control, however, did not survive the 1st century AD, when the Yüeh-chih reoccupied the area. After complex waves of conquest by peoples from the north and east had swept over the area, the Chinese again conquered it during the late 7th and early 8th centuries under the T'ang dynasty (618–907), but it was always on the farthest frontier of Chinese control. After 752 the Chinese were again forced to withdraw, and Kashgar was successively occupied by the Turks, the Uighurs (in the 10th and 11th centuries), the Kara-kitai (12th century), and then in 1219 by the Mongols, under whom the overland traffic between China and Central Asia flourished as never before. In the late 14th century Kashgar was sacked by Timur (Tumerlane), and in the next centuries it suffered many wars. It was finally reoccupied by the Ch'ing dynasty (1644–1911) in 1755. In the period from 1862 to 1875, Kashgar was first a centre of the Muslim Rebellion and then became the capital of the Muslim general Yakub Beg. Another Muslim rebellion, led by Ma Chung-ying, broke out in the area from 1928 to 1937, being finally suppressed by the provincial warlord Sheng Shih-ts'ai with Soviet aid. Control by the Chinese central government was not restored until 1943.

The oasis is very fertile, growing wheat, corn (maize), barley, rice, beans, and a great deal of cotton. The oasis also produces fruit and is known for its melons, grapes, peaches, apricots, and cherries. There is some fishing in the rivers of the oasis. The oasis peoples engage in a variety of handicrafts; both cotton and silk textiles are produced, together with felts, rugs, furs, leatherware, and pottery. Some copper is produced in the area, which also ships wool, hides, and a variety of animal products to other parts of China. Pop. (1953) 91,000; (1980 est.) 100,000.

Kashgar Range (China): *see* Mu-shih-t'a-ko Range.

Kashgar rug, floor covering handwoven at Kashgar in Chinese Turkistan (now Sinkiang Uighur Autonomous Region). The Kashgar



Kashgar rug from Chinese Turkistan, 19th century; in the H. McCoy Jones Collection

In the collection of H. McCoy Jones; photograph, Bruce A. Humphrey

rugs are difficult to distinguish from the similar ones of Khotan and Yarkand (So-ch'e).

All three types were called Samarkands in the market. The principal differences between Kashgar rugs and the other two Sinkiang products are a tendency toward Persian draftsmanship, Persian-oriented border patterns, and, further, the greater use of dark outlines about the various forms.

Kashihara, city, Nara Prefecture (*ken*), Honshu, Japan, in the southern corner of Nara-bonchi (Nara Basin). Of cultural importance since prehistoric times, the city is important to Japanese archaeology. The Kashihara palace is believed to have been the place where the emperor Jimmu, the legendary first emperor of Japan, ascended the throne. The palace site is now occupied by a shrine built by the emperor Meiji in 1889. Other historic monuments include the tombs of the emperor Jimmu and other early emperors and remains of palaces of the Fujiwara family. Tourists are also attracted by the Three Mountains of Yamato—Unebi-yama, Miminashi-yama, and Amanokagu-yama—which rise to the north and east of the city. Pop. (1983 est.) 111,656.

Kashiwa, city, Chiba Prefecture (*ken*), Honshu, Japan, on the Jōban Line (railway), northeast of Tokyo city. It was formed in 1954 by the merger of the towns of Kashiwa and Kogane and two smaller hamlets. A small post town on the Mito road during the Tokugawa era (1603–1867), Kashiwa was a railway hub and local commercial centre until World War II. With electrification of one of the railway lines in 1951, Kashiwa rapidly became a residential suburb of the Tokyo–Yokohama Metropolitan Area. Pop. (1983 est.) 262,043.

Kashiwazaki, city, Niigata Prefecture (*ken*), Honshu, Japan, in the Kashiwazaki plain, facing the Sea of Japan. During the Tokugawa era (1603–1867), it was a post town on the Hokuriku-kaidō (Hokuriku Highway), which was known as the transportation route of gold from Sado Island to Edo (now Tokyo). Oil refineries were established in the city in the early 20th century, following the opening of the Nishiyama oilfields and the construction of two railways. Other products include machinery, industrial glass, and lumber. Kashiwazaki is also a resort, known for its hot springs. Pop. (1980) 83,499.

Kashkadarya, also spelled KASHKADARIA, or KAŠADARJA, *oblast* (administrative region), southern Uzbek Soviet Socialist Republic. Created in 1964, it has an area of 10,950 sq mi (28,400 sq km) and consists largely of the Karshi Steppe, an extensive foothill plain intersected by the Kashkadarya (*darya*, river). In the east and southeast are spurs of the Zeravshan, Gissar, and Kugitangtau mountains. The climate is continental and dry, precipitation occurring mainly in winter. Cotton, grown on irrigated land along the river, is the chief crop; but grain, fruit, and vines also are cultivated. Karakul sheep are raised on the desert and semidesert pastures in the south.

Natural gas is extracted at Mubarek and Mirdash in the northwest, but otherwise industry consists largely of processing agricultural raw materials. Traditional embroidered skullcaps and wall hangings (*syuzane*) are still produced. The chief cities are Karshi, the administrative centre, and Shakhrisabz. Uzbeks make up some 85 percent of the population. There are smaller numbers of Tadzhiks, Russians, and Tatars. The population is predominantly rural. Pop. (1983 est.) 1,285,000.

Kashku (ancient Anatolian people): *see* Kaska.

Kashmir (India–Pakistan): *see* Jammu and Kashmir.

Kashmir, Azad (Pakistan): *see* Azad Kashmir.

Kashmir, Vale of, scenic intermontane valley between the main Himalayan ranges (northeast) and the Pīr Panjāl Range (southwest), in northwestern India. The valley is an ancient lake basin 85 mi (140 km) long, 20 mi wide, and 5,300 ft (1,620 m) high. Drained by the upper Jhelum River, the valley is lined by 12,000–16,000-ft-high mountains that help shelter it from the wet southwest monsoon. It is the centre of population for the Kashmir area; Srīnagar is the capital of the Indian-held sector of the state of Jammu and Kashmir. The fertile alluvial soil yields rice, corn (maize), fruit, and vegetables, and the scenic mountains and lakes (notably Wular and Dal) attract many tourists. The valley was the resort of Mughal emperors, notably Jahāngīr, the early 17th-century emperor of Hindustān (northern India) who constructed picturesque gardens and buildings for his empress, Nūr



Terraced rice fields in the Vale of Kashmir, Indian-held sector of Jammu and Kashmir, India

Christina Gascoigne

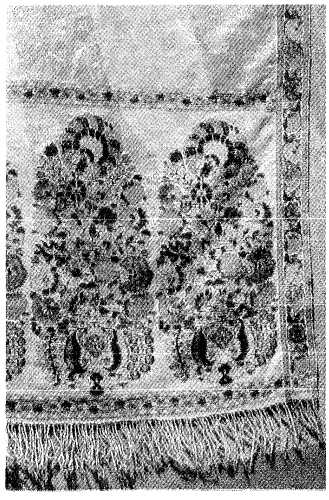
Jahān. The vale is sometimes referred to as the "happy valley," perhaps because it gives a feeling of isolation from the rest of the world.

Kashmir Śaivism, also called PRATYABHIJÑĀ (Sanskrit: Recognition), an important religio-philosophical system of India that worships Lord Śiva as the supreme reality. The school is idealistic and monistic, as contrasted with the realistic and dualistic school of Śaiva-siddhānta (*q.v.*).

The principal texts of the school are the *Śivasūtra,* said to have been revealed to Vasugupta; Vasugupta's *Spanda-kārikā* ("Verses on Activity"; 8th–9th century); Utpala's *Pratyabhijñā-śāstra* ("Manual on Recognition"; *c.* 900); Abhinavagupta's *Paramārthasāra* ("The Essence of the Highest Truth"), *Pratyabhijñā-vimarśini* ("Reflections on Recognition"), and *Tantrāloka* ("Lights on the Doctrine"), 10th century; and Kṣemarāja's *Śiva-sūtra-vimarśini* ("Reflections on the Aphorisms on Śiva").

Śiva is seen as the sole reality and both the material and efficent causes of the universe. His power is known in five aspects: *cit* ("consciousness"), *ānanda* ("bliss"), *ichā* ("desire"), *jñāna* ("knowledge"), and *kriyā* ("action"). For the adherents of Kashmir Śaivism, liberation comes about through intense meditation on the Lord and recognition of the identical nature of the individual soul and the Lord. (*Compare* Śaivism.)

Kashmir shawl, type of woolen shawl woven in Kashmir. According to tradition, the founder of the industry was Zayn-ul-ʿĀbidīn, a 15th-century ruler of Kashmir who introduced weavers from Turkistan. Although



Detail of the border decoration on a shawl from Kashmir, late 18th century; in the Prince of Wales Museum of Western India, Bombay
P. Chandra

woolen shawls were mentioned in writings of the 3rd century BC and the 11th century AD, it is only in the 16th century that the first specific references to Kashmir work appeared.

The earliest examples have a plain ground with end borders featuring large floral sprays, flower vases, and pinecones. Kashmir shawls are woven partly or wholly from goat hair called *pashm.* In the 19th century, shawls were classified as *pashm shāla* (made from the hair of domesticated goats) and *aslī tūsh* (made from the hair of wild goats). By this time, Kashmir shawls had also become fashionable in Europe. In response to foreign tastes, the traditional designs were replaced by or adapted to patterns supplied by foreign dealers. France and Great Britain established mechanized shawl industries, one of the most important centres being Paisley, Scot., where the Kashmir shawl was imitated and woven entirely by machine. This cheaply produced article offered keen competition to the genuine one and forced Kashmir weavers to compromise on quality and to imitate the designs of the Paisley workshops. These efforts were unsuccessful, and, by around 1870, the Kashmir industry had almost collapsed. A strong effort began in mid-20th century to revive the industry under government patronage.

Kashmiri language, language spoken in the Vale of Kashmir and the surrounding hills. By origin it is a Dardic language, but it has become predominantly Indo-Aryan in character. Reflecting the history of the area, the Kashmiri vocabulary is mixed, containing Dardic, Sanskrit, Punjabi, and Persian elements. Religious differences are evident in vocabulary and choice of alphabet. Muslims employ Persian and Arabic words freely; they also use the Persian form of the alphabet to write Kashmiri, although it is not truly suited to the task as it lacks symbols for the many Kashmiri vowel sounds. The majority of educated Kashmiris are Hindu; they favour words derived from Sanskrit and write Kashmiri in the Sarada alphabet, a script of Indian origin. In printed books, the Devanāgarī character is used. There is a small amount of Kashmiri literature. The only important spoken dialects are Kishtwari, Poguli, and Rambani.

kashruth (Hebrew: "fitness," "kosher state"), also spelled KASHRUT, or KASHRUS, in Judaism, regulations that prohibit the eating of certain foods and require that other foods be prepared in a specified manner. The term also denotes the state of being kosher according to Jewish law. Most prescriptions regarding kashruth are found in the Old Testament books of Leviticus, Deuteronomy, Genesis, and Exodus. Efforts have been made to establish a direct relationship between these laws and health, but for observant Jews no other motive is required than the fact that God has so ordained them. During times of persecution, Jews often heroically resisted attempts to force them to violate their dietary laws. Though Reform Jews regard kashruth as no longer meaningful, they may observe the laws out of deference to observant guests.

Briefly, and in general, Jews observing kashruth may eat only those fish that have both fins and scales (*i.e.,* not shellfish), certain birds, and mammals that chew the cud and have cloven feet. These mammals and birds must be slaughtered according to a ritual that, if violated, makes the meat "unfit" for use. Food ritually unfit, for whatever reason, is called "forbidden" (terefah), the opposite of kosher ("fit," "proper"). Since animal blood may not be eaten, meat must undergo a ritual process of presoaking and "salting" (*meliḥa*) to draw off any blood that may remain within the meat after the ritual slaughter (shehitah).

Strict separation of meat and dairy products is enjoined, both in eating and in preparation. This restriction not only forbids the eating of these two types of food at the same meal but also requires that distinct sets of dishes, cutlery, utensils, and table linens be used for meat and dairy products during the time of preparation. Some foods are "neutral" (pareve) and may be eaten freely with meat or milk. No restrictions apply to the use of vegetables and fruit. As to kosher wine, ultra-Orthodox Judaism requires that non-Jews be excluded from its preparation. During the festival of Passover (Pesaḥ), special dietary laws exclude the use of leaven in bread and other baked goods. *See also* kosher.

Kasimir (Danish, German, Polish, etc., personal name): *see under* Casimir.

Kaska, also spelled KASHKU, or GASGA, member of an ancient Anatolian people who inhabited the remote valleys between the northern border of the Hittite Kingdom and the Black Sea. The Kaskans did not have a written language and did not build cities. They are known only through Hittite accounts, which describe them as weavers of linen and raisers of pigs. The Hittites and Kaskans launched repeated attacks on one another from about 1600 to about 1193 BC. The tribal organization and guerrilla tactics of the Kaskans prevented the Hittites from achieving a conclusive conquest in spite of numerous military campaigns. Mursilis II (reigned *c.* 1346–*c.* 1320 BC) had to build a chain of forts across the northern Hittite border to defend against continual Kaskan raids. Kaskan pressure became so intense that the next king, Mutawallis (*c.* 1300 BC), had to abandon the capital city of Hattusas, which the Kaskans may have sacked. The Kaskans were last mentioned as having fought Sargon II of Assyria in about 700 BC.

Kaskaskia, village, Randolph county, southwestern Illinois, U.S., situated on Kaskaskia Island in the Mississippi River, just west of Chester. The original settlement (now under water) was founded in 1703 as an Indian village and a Jesuit mission and developed as a French trading post and a farming community. Fort Kaskaskia (built in 1733 by the French) was destroyed in 1763 by the villagers when the British occupied the region. George Rogers Clark captured the place in 1778 for the United States. Kaskaskia became the capital of the Illinois Territory in 1809; Illinois attained statehood in 1818, and Kaskaskia served as the state capital until 1820. The original village (inc. 1818) was, after 1844, gradually inundated when the Mississippi changed its course, creating the island; its last remnant disappeared with the great flood of 1881, and its name was transferred to the present village, a little to the south.

The nearby home of Pierre Menard, the first lieutenant governor of Illinois, is preserved as a state historic site. The Kaskaskia Bell in the parish church was a gift from King Louis XV of France (1741). Fort Kaskaskia historic site is situated immediately north. Pop. (1984 est.) 28.

Kaskaskia River, partly navigable stream in Illinois, U.S., rising in Champaign county near Urbana and flowing southwest to enter the Mississippi River north of Chester, in Randolph county, after a course of 320 miles (515 km). Near its source the Kaskaskia flows through Lake Shelbyville, a reservoir impounded by a dam, and it then passes through another reservoir, created by Carlyle Dam. The river is notorious for its variation in volume. In the late 19th century there were heavy floods at its influx into the Mississippi, which finally inundated the village of Kaskaskia, the first capital of Illinois. The shifting Mississippi adopted the bed of the Kaskaskia and cut through a peninsula to create the present Kaskaskia Island. Kaskaskia is an Indian tribal name meaning "uncertain."

Kasparov, Gary, in full GARRI KIMOVICH KASPAROV, original name GARRI WEINSTEIN (b. April 13, 1963, Baku, Azerbaijan S.S.R.), Soviet chess master who became the world chess champion in 1985.

Born to a Jewish father and an Armenian mother, Kasparov began playing chess at age six. By age 13 he was the Soviet youth champion, and he won his first international tournament at age 16 in 1979. He became an international grand master in 1980. From 1973 to 1978 he studied under former world champion Mikhail Botvinnik, and after that his trainer was Aleksandr Nikitin.

Kasparov's continued successes in tournament play made him the challenger to reigning world champion Anatoly Karpov in a 1984–85 match. Kasparov lost four out of the first nine games but then adopted a careful defensive stance, taking an extraordinarily long series of drawn games with the champion. With Kasparov finally having won three games from the exhausted Karpov, the International Chess Federation halted the series after 48 games, a decision protested by Kasparov. In the two players' rematch in 1985, Kasparov narrowly defeated Karpov in a 24-game series, thus becoming the youngest champion in the history of the game. Kasparov's style of play was brash, involving bold pawn sacrifices and aggressive, turnaround maneuvers.

Kasperle, most prominent puppet character in Germany and Austria, where *Kasperltheater* became synonymous with puppet theatre. The character developed in late 17th-century Austria from Hanswurst, the cunning peasant servant of the Viennese popular theatre. Named Kasperle in the early 18th century, he was brought to Germany by traveling puppeteers and became an extraneous but popular character in marionette productions of *Faust.* Kasperle was established as a hand puppet in the mid-19th century when he was given his



Kasperle, from Papa Schmid's Marionettentheater, Munich, 1860; in the Puppentheater-Sammlung, Munich

By courtesy of the Puppentheater-Sammlung, Munich

workingman's identity and traditional yellow-trimmed red jacket. Like the English Punch, Kasperle adapts jokes to local audiences and beats his associates with a slapstick, but his performance is much refined in Germany today.

Kasprowicz, Jan (b. Dec. 12, 1860, Szymborze, German Poland—d. Aug. 1, 1926, Zakopane, Pol.), the first great Polish poet of peasant origin and a translator who made an enormous range of classical and modern European literature available to Polish readers.

After studying at the universities of Leipzig and Breslau, Kasprowicz moved to Lwów, Pol., in 1889 to escape Prussian persecution for his radical activities. He attended the university there and later worked as a journalist until, in 1909, he became a professor of comparative literature at the University of Lwów.

His earliest poetry depicts the suffering, poverty, and ignorance of the peasants and is marked by a concern for social justice. Subsequently, in *Krzak dzikiej róży* (1898; "The Wild Rose Bush"), he lyrically describes the countryside of Poland in the Tatra mountain area. *Ginącemu światu* (1901; "To a Dying World") is a cycle of poems that expresses his concern with humanity's sufferings and metaphysical longings. The cycle used techniques that anticipated the early poetry of T.S. Eliot: free verse, quotations, and a style that progresses by associations, rather than by logical connections. Later works such as *Księga ubogich* (1916; "Book of the Poor") reveal a mellowing temper and a newfound religious faith. The astonishing range of his translations includes the complete works of Shakespeare, Aeschylus, Euripides, and works by Shelley, Byron, Swinburne, Blake, Browning, and Yeats. He also translated voluminously from German, French, and Italian.

Kassa (Ethiopian emperor; b. *c.* 1818—d. 1869): *see* Tewodros II.

Kassa (Ethiopian emperor; d. 1889): *see* Yohannes IV.

Kassa (Czechoslovakia): *see* Košice.

Kassa, Pact of (1374): *see* Koszyce, Pact of.

Kassák, Lajos (b. March 21, 1887, Érsekújvár, Hung., Austria-Hungary—d. July 22, 1967, Budapest), poet and novelist, the first important Hungarian working-class writer.

At the age of 20 Kassák began traveling on foot throughout Europe and so gained a cosmopolitan outlook. A pacifist during World War I, in 1915 he founded the journal *Tett* ("Action") to express his views. A socialist, he welcomed the first but short-lived Communist regime of Béla Kun in 1919. After its collapse, Kassák emigrated to Vienna, where he edited a journal of radical opinion, *Ma* ("Today").

Kassák published several novels and volumes of poetry, but his most important work is his long (8 vol.) autobiography, *Egy ember élete* (1928–39; "A Man's Life"). He generally found favour with the Communist government of post-World War II Hungary, although this government deleted from later editions of Kassák's autobiography the final chapters dealing with his growing disenchantment with Communism. In the more relaxed atmosphere that followed the 1956 revolution in Hungary, Kassák's image was reevaluated, and in the last decade of his life he enjoyed full official recognition.

Kassalā, *mudīrīyah* (province), Eastern Region, east central Sudan, bounded by al-Baḥr al-Aḥmar province on the north and northwest, an-Nīl, al-Karṭūm, and al-Jazīrah provinces on the west, an-Nīl al-Azraq province on the south, and Ethiopia on the east. Created in 1975 from the northern part of former Kassalā province, it has an area of 44,075 sq mi (114,154 sq km). The Nahr (river) ʿAṭbarah, an important tributary of the Nile, flows northwestward through Kassalā province and causes seasonal floods during torrential summer rains. Rocky deserts dominate the centre of the province; in the north is the Butana Plain, with sandy clay soils and occasional low hills with short grass and some mountain thicket vegetation; the south is underlain by Nubian sandstone.

Around 590 BC the area came under control of the 25th, or Kushite, Egyptian dynasty. The Kushites were later conquered by the kingdom of Axum (Aksum), and the people were largely Christianized. There were Muslim raids into the region during the Mamlūk dynasty of Egypt (ruled 1250–1517). In the early 16th century the people were converted to Islām, when the area was ruled by the Arab Abdallabi dynasty. The subsequent Muslim Funj dynasty of Sennār used the province as a base for their wars with Ethiopia in 1618–19. In 1821 the area was conquered by Egypt under Muḥammad ʿAlī, and became part of Egyptian Sudan. In 1881 al-Mahdī, a religious reformer and Sudanese political leader, successfully rebelled against Egypt, and the province was ruled by the Mahdists until their defeat in 1898 by Anglo-Egyptian forces. Its boundary with Ethiopia was in dispute until a treaty with Great Britain in 1902. The province was part of the Anglo-Egyptian Condominium until Sudan's independence in 1956.

Most of Kassalā's population is engaged in agricultural pursuits, and cereals, oilseeds, cotton, and peanuts (groundnuts) are produced there. Cattle and camels are raised in the northern and southern parts of the province. Industries include cotton ginning and spinning mills, sugar refineries, oilseed mills, and soap factories. Minerals mined include iron ore, manganese, kaolin, asbestos, chromium, tungsten, vermiculite, and magnesite. Kassalā, the provincial capital, is linked by road and railway with al-Qaḍārif and Eriba. Arabs comprise the large majority of the population, with the Bejas and the Nubians constituting ethnic minorities. Pop. (1983) 1,512,335.

Kassalā, town, capital of Kassalā *mudīrīyah* (province), northeastern Sudan. Founded in 1834 as an Egyptian garrison, it was occupied by the Mahdists (1885–94) and briefly by the Italians (1940–41). Kassalā is built on the inland delta of the seasonal al-Qāsh (Gash) River at an elevation of 1,624 ft (495 m) and



Local market in Kassalā town, The Sudan

Todd Webb—Photo Researchers

is protected to the east and south by the *jibāl* (mountains) Kassalā and Mokram. The town has declined as a cotton centre but has an extensive market trade and fruit gardens. It is linked by road, railway, and air to Khartoum and Port Sudan. Pop. (1973) 99,652.

Kassándra, promontory, westernmost of the three prongs of the Chalcidice Peninsula, Macedonia, Greece, projecting into the Aegean Sea. It is a part of the *nomós* (department) of Khalkidhikí. Upon the narrow isthmus that links Kassándra with Chalcidice stand the sparse ruins of the Corinthian colony of Potidaea, a port founded *c.* 600 BC; its site is the village of Néa Potídhaia just south of the ship canal cut through the isthmus in 1937.

The classical history of Kassándra revolves around the communities of Olynthus and Potidaea. Settled by non-Greek Bottiaians in the 7th century BC, Olynthus was subdued by Sparta (382–379), which dissolved the Chalcidian League that it had dominated for a decade. In 357/356 Potidaea was so completely obliterated by Philip II of Macedon that the Athenian orator Demosthenes wrote that a visitor would not be able to identify the site. As a result of the Olynthian War (349–347) that destroyed Olynthus, Potidaea was revived as Kassandreia, which became very prosperous; in the Third Macedonian War (171–168) it repulsed a Roman fleet. In the early Middle Ages it was destroyed by the Huns. Kassándra was occupied largely by cattle and sheep ranchers before the War of Greek Independence (1821–29), during which its inhabitants were massacred by the Turks for joining the revolt. The peninsula has great natural beauty, fine beaches, and has become the most important tourist centre of northern Greece.

Kassel, *Regierungsbezirk* (administrative district), northern Hesse *Land* (state), central Germany. Kassel is bordered by Thuringia *Land* to the east, Bavaria *Land* to the southeast, the *Regierungsbezirke* of Giessen and Darmstadt to the south, and the *Länder* of North Rhine-Westphalia to the west and Lower Saxony to the north.

The largest of three districts in Hesse, it occupies an area of 3,200 square miles (8,288

square km) and is coextensive with the historic region of Hesse-Kassel, which was itself a *Regierungsbezirk* of the Prussian province of Hesse-Nassau from 1867 to 1944. In 1945 Kassel was created as the northernmost of two *Regierungsbezirke* in the new *Land* of Hesse. In a 1980 administrative reorganization, Kassel lost a small part of its southwestern territory to the newly formed district of Giessen. Kassel *Regierungsbezirk* takes its name from that of the largest city and administrative seat of the district.

Kassel is dissected by two north–south corridors, both of which serve as major transportation routes connecting southern Germany with the Northern Lowlands and their seaports. The largest of the two, the West Hesse Depression, follows the Schwalm valley and extensive Kassel Basin through the district to the north-flowing Weser River. The fertile loess and loam soils of the depression yield large crops of sugar beets, potatoes, and cereals, making it one of Hesse's leading agricultural areas. An extensive sandstone plateau, divided into two sections by the Eder River and its large dammed lake, the Edersee, lies west of the West Hesse Depression. The southern part of this plateau comprises the heavily forested Kellerwald, an eastern projection of the Middle Rhine Highlands rising more than 1,900 feet (600 m). North of the Eder the lower lying Waldeck region consists of pastureland interspersed with arable fields. The peaks of the Rothaargebirge (mountains) reach elevations exceeding 2,600 feet along the western border, forming a natural frontier with North Rhine-Westphalia. The second and narrower north–south corridor, the East Hesse Depression, runs from the city of Fulda north through Bad Hersfeld to the Eichenberg gap, following sections of both the Fulda and Werra rivers, tributaries of the Weser. Some of the district's most varied scenery can be found in the basalt-capped sandstone hills of the Knüll and Meissnerland, which are part of the Hesse Central Upland's northern axis situated between the depressions. The Thüringer Wald (Thuringian Forest) and the volcanic basalt highlands of the Rhön plateau rise east of the East Hesse Depression. The remote Rhön landscape is covered by forest and great expanses of mountain pasture and is topped by the district's highest peak, the Wasserkuppe (3,117 feet).

Population densities in the district range from fewer than 50 persons per square mile (20 per square km) in many of the highlands to densities averaging more than 1,300 persons per square mile at the northern end of the West Hesse Depression near the city of Kassel. Kassel is northern Hesse's principal cultural, economic, and rail centre and a major manufacturer of locomotives and heavy commercial vehicles. Fulda is a banking and financial centre and a major producer of textiles. Brown coal is mined in the Kassel Basin and used primarily for electrical generation. Germany's largest potash fields are located in the Werra valley.

The majority of the population of Kassel *Regierungsbezirk* are of Hessian Frankish descent and speak the Rhenish Franconian dialect. Nearly three-quarters are Protestants and about one-quarter are Roman Catholics. More than two-thirds of the population live in towns or villages with fewer than 20,000 inhabitants. The rural settlement pattern in the valleys and basins is one of irregular, compact villages, while isolated farmsteads and small hamlets are more common in the upland regions with more severe climates. Traditional costumes are still worn by many of the farm people in the Schwalm valley. The University of Kassel is the centre of higher education in the district. Pop. (1989 est.) 1,165,160.

Kassel, also spelled CASSEL, city, Hesse *Land* (state), central Germany, on the Fulda River. First mentioned in 913 as Chassala (Chassela), the name, usually spelled Casle in the late Middle Ages, was derived from the Latin-Franconian *castella* ("stronghold"). Probably a seat of the Franconian kings, it was chartered in 1180 and became the residence of the landgraves of Hesse *c.* 1277. An extension, Neustadt (New Town), was added, of which St. Martin's Church (14th century) became the centre; the Oberneustadt (Upper New Town) was built in the 17th century for Huguenot refugees. Kassel was the capital of Hesse-Kassel (later the Electorate of Hesse) from 1567 to 1866; it was also capital of the short-lived kingdom of Westphalia (1807–13) and, after 1866, of the Prussian province of Hesse-Nassau (until 1944). A centre of German airplane and tank production in World War II, it was almost totally destroyed by Allied bombing but has been carefully rebuilt.

Historical landmarks include the Orangery Palace (1701–11) in the Karlsaue Park and the Ottoneum (1604–07; largely rebuilt in 1697), which is claimed to be the oldest theatre building in Germany and which now houses a natural history museum. Numerous museums include the additional Landesmuseum (with an important collection of paintings); the Tapetenmuseum, which contains an unusual wallpaper collection; the Museum Fridericianum, the site of Documenta, an international art exhibition; and the Brüder Grimm Museum. The city is the site of technical schools and of an academy of applied art. Wilhelmshöhe, a mountain just west of the city, is the site of a palace (1786–1801); celebrated cascades, topped by a statue of Hercules (symbol of Kassel), are also there.

An important rail junction and industrial centre, Kassel's manufactures include transportation equipment, optical and precision instruments, and textiles. Pop. (1989 est.) 189,156.

Kassem, Abdul Karim, also spelled ʿABD AL-KARĪM QĀSIM (b. 1914, Baghdad—d. Feb. 9, 1963, Baghdad), army officer who overthrew the Iraqi monarchy in 1958 and became head of the newly formed Republic of Iraq.

Kassem attended the Iraqi military academy and advanced steadily through the ranks, until by 1955 he had become a high-ranking officer. Like many Iraqis, he disliked the socially conservative and pro-Western policies of the monarchy. By 1957 Kassem had assumed leadership of the several opposition groups that had formed in the army. On July 14, 1958, Kassem and his followers used troop movements planned by the government as an opportunity to seize military control of Baghdad and overthrow the monarchy. Kassem became prime minister and assumed direction of a new republic.

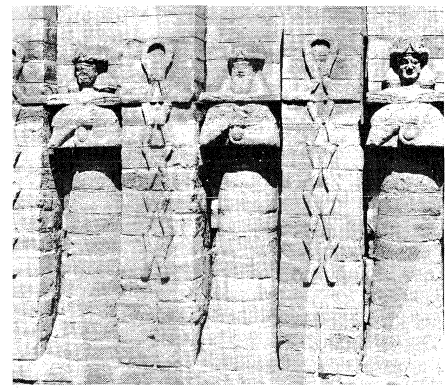
The major issue facing Kassem was that of Arab unity. The union of Egypt and Syria into the United Arab Republic (U.A.R.) early in 1958 had aroused immense enthusiasm in the Arab world. Despite strong Pan-Arab sentiment in Iraq, Kassem was determined to achieve internal stability before considering any kind of federation with the U.A.R. In turn the Egyptian president, Gamal Abdel Nasser, came to resent Kassem's rule and tried to bring about its downfall. ʿAbd as-Salām ʿĀrif, a close supporter of Kassem but also an ardent Nasserist, toured Iraq, praising Nasser. In March 1959 Pan-Arab opponents of Kassem launched an open rebellion in Mosul. The bulk of the army remained loyal, and the uprising was crushed with little difficulty; Kassem removed some 200 army officers of whose loyalty he could not be certain. Among civilians he was forced to rely for support mostly upon Communists, who were eager for a chance to strike at their right-wing opponents, the Pan-Arabs, and now pushed for a larger voice in the determination of government policy. Kassem resisted their demands, and several months later purged Communist elements from the police and the army.

Kassem's support as prime minister steadily narrowed. By 1960 he had suspended organized political activity and repressed both right- and left-wing civilian and military elements when it seemed that they might compete with his authority. His rule was supported only by the army, but in the spring of 1961 a rebellion broke out among the Kurds—an ethnic group acutely conscious of its cultural differences from the Arabs and to which Kassem had neglected to fulfill a promise for a measure of autonomy within the Iraqi state. This Kurdish revolt undermined even Kassem's military support, as much of the army became tied down in a seemingly endless and fruitless attempt to put down the rebellion. This situation, along with the discontent produced by repeated military purges, drew a number of officers into open resistance to the Kassem regime. ʿAbd as-Salām ʿĀrif led dissident army elements in a coup in February 1963, which overthrew the government and killed Kassem himself.

Kasser Said, Treaty of: *see* Bardo, Treaty of.

Kasserine (Tunisia): *see* Qaṣrayn, al-.

Kassite, member of an ancient people known primarily for establishing the second, or middle, Babylonian dynasty; they were believed (perhaps wrongly) to have originated in the Zagros Mountains of Iran. First mentioned in Elamite texts of the late 3rd millennium BC, they penetrated into Mesopotamia in the 2nd millennium, were repulsed by Hammurabi's son, but secured holdings within the Tigris–Euphrates Valley on the northern frontiers of Babylonia and later established the second Babylonian dynasty. Chronicles and king lists are imprecise, and although the Kassite kings traditionally ruled over Babylonia for 576 years, it is probable that the first kings reigned in Babylonia simultaneously with the last kings of the first Babylonian dynasty; thus Gandash, the first Kassite king, possibly began his reign about the middle of the 18th century BC, but not at Babylon.



Water gods, facade relief of molded bricks from the Temple of Inanna at Erech, Kassite period; in the Iraq Museum, Baghdad

By courtesy of the Iraq Museum, Baghdad

The Kassite kings appear to have been members of a small military aristocracy but were apparently efficient rulers and not locally unpopular. Their capital city was Dur-Kurigalzu. The horse, the sacred animal of the Kassites, probably first came into use in Babylonia at this time. Contemporary Kassite records are not numerous. Most belong to the archives of the *guenna* (provincial governor) of the city of Nippur and seem to indicate a feudal system of government during the 14th and 13th centuries.

One Kassite invention was the boundary

stone (*kudurru*), a block of stone that served as a record of a grant of land by the king to favoured persons. The interest of the boundary stones for modern scholars is not only economic and religious but also artistic. The temples that the Kassite kings built or rebuilt are mainly in the Babylonian tradition, although one Kassite innovation was the use of molded bricks to form figures in relief.

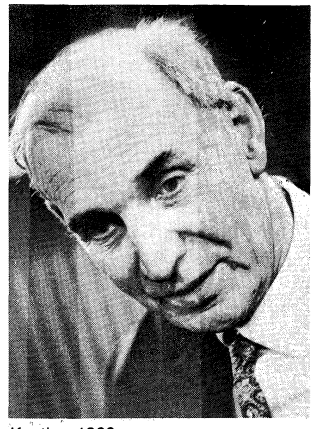
In the 12th century Elam struck the final blow at Kassite power in Babylonia, already weakened by local insurrection. In the 1st millennium the Kassites withdrew to the Zagros Mountains, where they opposed the eastward expansion of Assyrian power and paid tribute to Persia. They were conquered by Alexander the Great but later regained their independence.

Kastamonu, historically CASTAMON, city, north-central Turkey. It is situated near the Gök (ancient Amnias) River. It lies in a sparsely populated high basin south of the densely populated Black Sea coastal plain. As Castamon, it was on the northern trunk route to the Euphrates River and was an important Byzantine town captured by the Seljuq Turks in the late 11th century AD. It was taken by rival emirs in the next century and was for a time the seat of another Muslim principality before its absorption into the Ottoman Empire in 1393. Notable buildings of the city include a ruined Byzantine fortress on a rocky hill above the town, around which the old town was clustered; a group of religious buildings containing a theological college, mosque, and a hospice for the poor (16th century); and a colourful covered bazaar (16th century). Modern Kastamonu is known for its copper utensils and has a sugar factory. The city has a small museum and a teacher-training school. Pop. (1985) 46,986.

Kastellórizon, Italian CASTELROSSO, officially MEGISTE, easternmost of the Dodecanese (*q.v.*) group of islands in the Aegean Sea, Greece, just off the southwestern coast of Turkey. Kastellórizon has an area of 3 square miles (7.3 square km). Its present name is a corruption of Château-Roux (Red Castle), given it by the medieval Knights of Rhodes and inspired by its red rocks. Some grapes and olives are grown on the island, but sponge fishing is the chief economic activity. The coastline is precipitous and accessible only on the east side, site of the one village, Kastellórizon. The island was occupied successively by the Knights of St. John, the Sultan of Egypt, and the King of Naples. The Turks occupied it from 1512 except for brief intervals until 1915. It was the only Dodecanese island not ceded to Turkey in 1918, but it was captured by the French during World War I and given to Italy under the treaties of Sèvres and Lausanne (1923). Since 1920 it has shared the fortunes of the Dodecanese. Pop. (1981) island, 222.

Kastler, Alfred (b. May 3, 1902, Guebwiller, Ger. [now in France]—d. Jan. 7, 1984, Bandol, Fr.), French physicist who won the Nobel Prize for Physics in 1966 for his discovery and development of methods for observing Hertzian resonances within atoms.

In 1920 Kastler went to Paris to study at the École Normale Supérieure. After serving on the science faculties at Bordeaux and Clermont-Ferrand in France and Louvain in Belgium, he returned to the École Normale Supérieure to teach (1941–68). He was professor and codirector of the laboratory of physics there at the time of the Nobel award. During his long and fruitful teaching career he trained an entire generation of French physicists. From 1968 until his retirement in 1972, Kastler served as director of research at the National Centre of Scientific Research. He was active in peace movements and in groups opposed to nuclear proliferation.



Kastler, 1966
By courtesy of the Nobel Foundation, Stockholm

Kastler's Nobel-Prize-winning research facilitated the study of atomic structures by means of the radiations that atoms emit under excitation by light and radio waves. His method of stimulating atoms in a particular substance so that they attain higher energy states was called "optical pumping." Since the light energy used to stimulate the atoms was reemitted, optical pumping marked an important step toward the development of the maser and the laser.

Kästner, Erich (b. Feb. 23, 1899, Dresden, Ger.—d. July 29, 1974, Munich), German satirist, poet, and novelist who is especially known for his children's books. He was the most durable practitioner of the style of witty, laconic writing associated with the highbrow cabaret, the Berlin weekly *Die Weltbühne* ("The World Stage"), and the Neue Sachlichkeit (New Objectivity) movement of the mid-1920s.

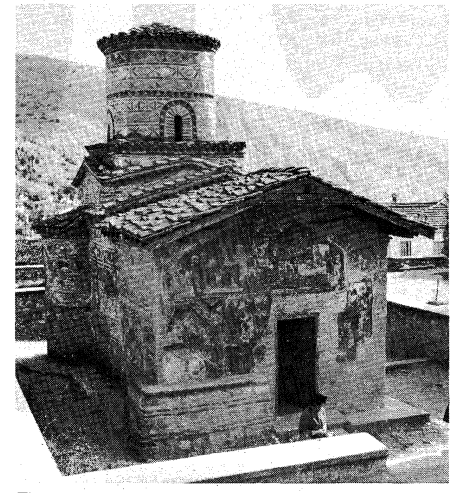
Kästner studied at Rostock, Leipzig, and Berlin to become a teacher. Later, as a journalist, he became a free-lance writer (1927). Four



Kästner, 1970
Archiv fur Kunst und Geschichte, Berlin

volumes of light but fundamentally serious poetry appeared before 1933. He also wrote the remarkable tragic novel *Fabian* (1931). His children's books are notable for their humour and respect for the child's moral seriousness. The most famous of these, *Emil und die Detektive* (1929; *Emil and the Detectives*), was several times dramatized and filmed. Prevented by the Nazis from publishing in Germany (1933–45), he printed his works in Switzerland. After the war, Kästner became magazine editor of *Die Neue Zeitung* of Munich and subsequently founded a children's paper. From 1952 to 1962 he was president of the German branch of PEN, an international organization of writers. His post-World War II works are characterized by a greater emphasis on social philosophy but do not sacrifice their elegance and entertaining qualities. These include *Das doppelte Lottchen* (1950; "The Double Lottie"); *Zu treuen Händen* (1950; "Into Faithful Hands"); the play *Die Schule der Diktatoren* (1956; "The School of Dictators"); and *Als ich ein kleiner Junge war* (1957; "When I Was a Young Man"). Kästner's collected works, *Gesammelte Schriften,* 7 vol., appeared in 1959.

Kastoría, town, capital of the *nomós* (department) of Kastoría, Macedonia, northern Greece. The town stands on a promontory reaching out from the western shore of Lake Kastorías. The lake is formed in a deep hollow that is surrounded by limestone mountains. The town was apparently named for the beavers that have long been the basis of a local fur trade, though trading in mink now predominates in the area. Kastoría has been identified with ancient Celetrum, which was captured in 200 BC by the Romans. According to the 6th-century-AD Byzantine historian



The church of the Virgin Mary Koumbelidiki, Kastoría, Greece
Shostal—EB Inc.

Procopius, the site was later renamed Justinianopolis. In 1083 it was captured by the Norman adventurer Robert Guiscard from a small English garrison. In the 12th century it was contested by the Despotate of Epirus and the Byzantine emperors seated at Nicaea, and from 1331 to 1380 it was held by the Serbs. The Turks took over *c.* 1385 and retained control until 1912, when it passed to Greece. A number of the town's 54 (originally 72) Byzantine and medieval churches have been restored, thus making Kastoría a centre for the study of basilica architecture and frescoes. The town serves as the seat of a metropolitan bishop. Pop. (1981) town, 20,660; *nomós,* 53,169.

Kastrioti, George, Albanian GJERGJ KASTRIOTI: *see* Skanderbeg.

Kasugai, city, Aichi *ken* (prefecture), Honshu, Japan. It lies just northeast of Nagoya, the prefectural capital. Army arsenals were constructed nearby in 1939, and many of their workers were moved into the city. By 1945 the population of Kasugai had reached 60,000. After World War II the land used by the military was converted to industrial use; factories now include a large paper-manufacturing plant. Peach plantations are located in the alluvial plains of the Toki River to the east. Kasugai is also a residential suburb of Nagoya. Pop. (1987 est.) 262,168.

Kasungu, town, central Malawi. The economy of Kasungu depends mainly on tobacco production, and tourism in the city has developed with the opening of the nearly 914-square-mile (2,367-square-kilometre) Kasungu National Park (1970). The town is situated near the farm where the nation's first president, Dr. Hastings Kamuzu Banda, was born. The surrounding area is mainly composed

of "sand veld," brown loams underlain with sandy clays, and is deficient in soil nutrients and water supply. Pop. (1977) town, 6,488; (1984 est.) district, 248,300.

Kasūr, city and administrative headquarters, since 1976, of a newly created Kasūr District, Lahore Division, Punjab Province, Pakistan, on the border of India. Traditionally it is said to have been founded by Kuśa, son of the legendary Hindu figure Rāma. During the Mughal period it was settled by a Pashtun colony and in 1807 was captured by the Sikhs. It was incorporated as a municipality in 1867. It is an aggregation of 26 fortified hamlets (*koṭs*) overlooking the alluvial valleys of the Beās and Sutlej rivers. Connected by road with Amritsar and Fīrozpur and by rail with Lahore and Karāchi, it is a local trade centre. Industries include tanning, cotton ginning, oil pressing, weaving, and leather-goods production. Among its institutions are a hospital and a college affiliated with the University of the Punjab.

The *tahsil*s of Kasūr and Chūniān make up the Kasūr District, which has an area of 1,543 sq mi (3,996 sq km). It comprises the flat alluvial plain bordered by the Rāvi River to the northwest and the Sutlej River to the southeast. Five canals, used for irrigation, flow through the district. Agriculture is the principal occupation; wheat, rice, sugarcane, cotton, fruits, and vegetables are grown in the region. A forestry plantation was started at Chhānga Mānga in 1864 and now produces silk, honey and beeswax, and turmeric, as well as seasoned timber. Pop. (1981) city, 155,523; district, 1,528,002.

Kataastaasan Kagalang-Galang Na Katipunan Nang Manga Anak Nang Bayan (Philippine organization): *see* Katipunan.

katabatic wind, also called DOWNSLOPE WIND, or GRAVITY WIND, wind that blows down a slope because of gravity. It occurs at night, when the highlands radiate heat and are cooled. The air in contact with these highlands is thus also cooled, and it becomes denser than the air at the same elevation but away from the slope; it therefore begins to flow downhill. This process is most pronounced in calm air because winds mix the air and prevent cold pockets from forming.

When a katabatic wind is warmed by compression during its descent into denser air, it is called a foehn. A large-scale katabatic wind that descends too rapidly to warm up is called a fall wind. In areas where fall winds occur, homes and orchards are situated on hillslopes above the lowlands where the cold air accumulates.

Kataev, Valentin (Petrovich) (Russian writer): *see* Katayev, Valentin (Petrovich).

Katagum, town and traditional emirate, Bauchi State, northern Nigeria, on the north bank of the Jamaare River (a tributary of the Hadejia). It was the seat of an emirate founded *c.* 1809 by Ibrahim Zakiyul Kalbi (also known as Malam [Scholar] Zaki), a warrior in the Fulani jihad (holy war) who in 1812 besieged and destroyed Ngazargamu (115 mi [185 km] east-northeast), the capital of the Bornu kingdom. After his victory, Malam Zaki (who was named *sarkin* ["king of"] *Bornu* by Usman dan Fodio, the jihad leader) returned to the territory he had conquered earlier (including the Hausa kingdom of Shira) and founded the town of Katagum in 1814. By 1824, when the Scottish explorers Hugh Clapperton and Walter Oudney visited Katagum, it had two surrounding walls (20 ft [6 m] in height, a 10-ft base with four gates), a central mosque, and considerable trade, using cowrie shells for currency. Oudney died in Katagum and was buried at Murmur, a settlement just beyond the southern gate.

Bornu reconquered much of its territory (including Katagum emirate) from the Fulani in the 1820s and, by aiding the local Hausa population, forced the evacuation of Katagum town in 1826; its Kanuri tribesmen forces, however, were defeated (1826) at Fake (90 mi west-southwest) by a joint expedition led by Dan Kauwa, Katagum's amir, and by Yakubu, king of Bauchi, an emirate to the south. Katagum emirate, thus restored to Fulani rule, prospered until greatly weakened by the wars with Amīr Buhari of nearby Hadejia in the 1850s.

After the fall of Kano city (130 mi west) to the British in 1903, the emirate became part of Katagum Province (made a division of Kano Province in 1905). In 1916 the seat of the emirate was transferred to Azare (43 mi south-southwest). The emirate became part of Bauchi Province in 1926. Most of the area's inhabitants are Muslims and members of the Fulani, Kanuri, Hausa, Mangawa, Bede, Karekare, Ngizim, Shirawa, or Teshenawa tribes. They cultivate peanuts (groundnuts), sorghum, millet, rice (especially in the riverine *fadama*s ["floodplains"]), cowpeas, cotton, indigo, and gum arabic and keep cattle, goats, sheep, and donkeys.

Katagum town has a government health office and a dispensary. It is now the headquarters of a local government council. Pop. (1972 est.) town, 4,740.

Katahdin, Mount, highest point (5,268 ft [1,606 m]) in Maine, U.S., lying in Baxter State Park, 20 mi (30 km) northwest of Millinocket, in Piscataquis County, in the east central part of the state. The rugged mountain actually consists of a group of summits of which the highest is Baxter Peak. Except during the winter months, hiking and camping are allowed. The mountain is the northern terminus of the Appalachian Trail, which extends southwestward to Georgia. Katahdin is from an Algonkian (Abnaki) Indian word meaning "main mountain."

Katanga (Zaire): *see* Shaba.

Katangan Complex, major division of Late Precambrian rocks (the Precambrian era began about 4,600,000,000 years ago and ended 570,000,000 years ago) in central Africa, especially in Katanga Province (now Shaba Region), Zaire. The Kantangan Complex is a complicated array of diverse sedimentary and metamorphic rocks; Katangan rocks consist of shales, quartzites, limestones, sandstones, dolomites, and slates more than 7,000 metres (23,000 feet) thick. The Katangan has been radiometrically dated at more than 620,000,000 years in age. Katangan rocks are of tremendous economic importance; copper, cobalt, uranium, zinc, and other valuable minerals are abundant.

Katanning, town, southwestern Western Australia. Laid out in 1898, it probably derives its name from the Aboriginal term *kartannin* ("meeting place"). A market and service centre for the grain and sheep (merino stud and wool) raised on the surrounding Wheat Belt (*q.v.*), it has flour mills, oatmeal mills, and a large meat-packing industry. Its yards for selling livestock are Western Australia's largest outside metropolitan Perth. Katanning lies on the Great Southern Highway and a rail line to Perth (155 mi [250 km] northwest). Pop. (1981) 4,413.

Katarina (Swedish personal name): *see under* Catherine.

Katay Don Sasorith, byname WILLIAM RABBIT (b. July 12, 1904—d. Dec. 29, 1959, Vientiane, Laos), Lao nationalist and author of eloquent resistance pamphlets in his youth, who later held many government posts, among them that of premier in 1954–56.

Katay's 33 years of government service began with a civil service post in the French administration of Laos from 1926 to 1945. Of part Vietnamese descent, he was the chief spokesman of the national resistance movement during World War II, joining with others to form the Lao Issara, or Free Laos, movement, which fought first against the Japanese and then against the French, who tried to reoccupy Laos after the fall of the Tojo government in Japan in 1945. A provisional government was formed, and Katay was named minister of finance; but its triumph was short-lived, and in 1946 he was forced to flee to Thailand, where the government maintained itself in exile. He published a newspaper in which he exhorted the overthrow of the French, and he wrote *Contribution à l'histoire du mouvement d'indépendance national Lao* (1948; "Contribution to the History of the Lao National Independence Movement"), under his pen name, William Rabbit, adapted from his own name, Katay, which means "rabbit" in Lao.

In 1949 Katay returned to Vientiane and in 1951 he won election to the National Assembly. From then on his rise to power was rapid; when Laos finally achieved independence from France in 1954, Katay was named premier. Always suspicious of the Pathet Lao, the Communist-dominated but overwhelmingly nationalist military organization, he was able to secure U.S. financial support to combat what he termed "foreign Communist aggression." Claiming that the Viet Minh (North Vietnamese Communist forces) were invading Laos through the Pathet Lao, Katay was able to obtain aid from the U.S. government to resist them. In 1955 Katay lost parliamentary support and was forced to give Prince Souvanna Phouma the premiership. The Prince continued an intricate balancing act in domestic politics; both he and the government of Phoui Sananikone came under attack by Katay whenever they proposed compromises with the Pathet Lao.

Katayev, Valentin (Petrovich), Katayev also spelled KATAEV (b. Jan. 28 [Jan. 16, old style], 1897, Odessa, Ukraine, Russian Empire—d. April 12, 1986, Moscow), Soviet novelist and playwright whose lighthearted, satirical treatment of postrevolutionary social conditions rose above the generally uninspired official Soviet style.

Katayev began writing short stories in 1916. He served in the Red Army until 1920, when he became a journalist in Odessa. In 1922 Katayev moved to Moscow, working on the staff of *Gudok* ("The Whistle").

His novel *Rastratchiki* (1926; *The Embezzlers*) is a picaresque tale of two adventurers in the tradition of Gogol. His comic play *Kvadratura kruga* (1928; *Squaring the Circle*) portrays the effect of the housing shortage on two married couples who share a room. *Beleyet parus odinoky* (1936; *Lonely White Sail,* or *A White Sail Gleams*), another novel, treats the 1905 revolution from the viewpoint of two Odessa schoolboys; it was the basis of a classic Soviet film. Katayev's *Vremya, vperyod!* (1932; *Time, Forward!*), concerning workers' attempts to build a huge steel plant in record time, is considered among the most readable of Soviet five-year-plan novels. Some critics have noted the influence of John Dos Passos in this work.

During the 1950s and '60s Katayev edited the magazine *Yunost* ("Youth") and opened its pages to the most promising literary talent of the young generation, including Yevgeny Yevtushenko and Bella Akhmadulina. The long list of his own works continued to grow, and in 1966 the literary magazine *Novy mir* ("New World") printed his *Svyatoy kolodets* (1967; *The Holy Well*), a remarkable lyrical-philosophical account of dreams experienced while the author is under anaesthesia

for surgery. Clearly reflecting the influence of Marcel Proust, James Joyce, and Franz Kafka, Katayev weaves scenes of his family, friends, and lovers, events of Soviet history, and his travels in America into a kind of stream-of-consciousness autobiography. It is considered by some critics to be the summary work of his career. Katayev's relentless imagination, sensitivity, and originality made him one of the most distinguished Soviet writers.

Katayev, Yevgeny Petrovich: *see* Ilf, Ilya; and Petrov, Yevgeny.

Katchli rug: *see* Hatchlu rug.

Kateb Yacine (b. Aug. 6, 1929, Constantine, Alg.—d. Oct. 28, 1989, Grenoble, Fr.), Algerian poet, novelist, and playwright, one of North Africa's most respected literary figures.

His first novel, *Nedjma* (1956), is undoubtedly the one work that has most influenced the course of Francophone North African literature. *Nedjma* recounts a tale of intra-clan conflict against the background of violence and disunity characteristic of Algerian society under French-colonial rule. It incorporates local legends and popular religious beliefs, treats the quest for a restored Algeria in a mythic manner, and makes a radical stylistic break with the realistic, straightforward, sequential approach to storytelling on which the North African novel had relied up to that point. The discontinuous chronology and multiple narrative voice found in *Nedjma* greatly influenced a younger generation of Moroccan writers.

Kateb was educated in French-colonial schools until 1945, when the bloody suppression of a popular uprising at Sétif both ended his education and provided him with material that would figure prominently in *Nedjma* as well as other works. He traveled widely throughout Algeria, Europe, and the Far East, making his living at a variety of occupations.

Another novel (*Le Polygone étoilé,* 1966; "The Starry Polygon"), a collection of plays (*Le Cercle des représailles,* 1959; "The Circle of Reprisals"), and many of his poems take up the same themes and characters as *Nedjma.* Later plays, however, turned to different concerns. Among these works is *L'Homme aux sandales de caoutchouc* (1970; "The Man in the Rubber Sandals"), the hero of which is Ho Chi Minh. A major theme of his later works is the struggle of the working class against capitalism. Several of his plays were produced in France and in Algeria, where he led a popular theatre group.

Katerini, town and capital of the *nomós* (department) of Pieria, Greek Macedonia. It is an agricultural and tobacco centre on the plain of Pieria. Its port, Paralía, is one of the few landing places along a shore of dunes and salt pans, the latter the largest in Greece. The town, which has flour mills and processes railway ties, expanded in population with the influx of Greek refugees from Turkey in the 1920s. It is linked by railway to Lárisa and Thessaloníki. Pop. (1981) 38,404.

kathak, one of the five forms of classical dance-drama of India, the others being bharata-natya, kathakali, Manipuri, and Orissi. Kathak is indigenous to northern India, where it developed under the influence of both Hindu and Muslim cultures. Kathak is characterized by intricate footwork and precise rhythmic patterns that the dancer articulates by controlling about 100 ankle bells. It takes its movements from life, stylizes them, and adds the complex rhythmic patterns. Kathak is danced by both males and females; many of the dances convey moods of love.

kathakali, one of the five forms of classical dance-drama of India, the others being bharata-natya, kathak, Manipuri, and Orissi. It is indigenous to southwestern India (Kerala) and is a dance-drama based on subject matter from the *Rāmāyaṇa,* the *Mahābhārata,* and stories from Śaiva literature. Enacted outdoors, the presentation is an all-night function. During the action, voices chant the story as mimed by dancers; incidental dances, accompanied by ear-splitting drumbeats, enrich the performance. Traditionally, kathakali is performed exclusively by men and young boys who play the parts of both males and females. The dancers are dedicated to its practice throughout their lives.

The movement is vigorous and florid. Stylized gestures and facial expressions follow the rules of bharata-natya. Gestures are wide and strong, the pointing of a finger being preceded by a sweep of the body and a great circling of the arms. Faces are made up to look like painted masks. The costume consists of a full skirt, a heavy jacket, numerous garlands and necklaces, and a towering headdress.

Katharevusa Greek language, Greek KATHAREVOUSA, a "purist" language of modern Greece, which until 1976 was the official written language of Greece and was used in public documents, Parliament, the courts, and most newspapers and technical publications. In that year it was replaced by Demotic Greek as the official language, and its use is now mostly restricted to technical publications.

Katharevusa originated in the 19th century as a result of the efforts to "purify" the local dialects of foreign elements and to systematize their morphology by using ancient Greek roots and much classical inflection. Although its syntax differs only slightly from that of Demotic, the spoken language, it is much more resistant to loanwords. Many Katharevusa elements appear in Demotic. After the liberation of Greece from the Turks (1828), Katharevusa flourished in the Romantic literary school of Athens; it is exemplified in the classical odes, hymns, ballads, narrative poems, tragedies, and comedies of Aléxandros Rízos Rangavís and in the verses of Akhillévs Paráskhos, which are characterized by rhetorical profuseness and mock-heroic patriotism. By the 1880s Katharevusa had been superseded by Demotic as the most popular mode of literary expression. *Compare* Demotic Greek language.

Katherine, town, north-central Northern Territory, Australia, on the Katherine River. The river was explored in 1862 by John McDouall Stuart and named by him after the daughter of an acquaintance. It rises in southwestern Arnhem Land and flows intermittently southwest for 150 miles (240 km) to join the Daly River. Some gold is found in its upper reaches, and the colourful Katherine Gorge with walls of red and brown quartzite, 22 miles (35 km) northeast of the town, is a national park and a noted tourist attraction. The town is located at the point where the Stuart Highway, the North Australia Railway, and the Overland Telegraph Line to Darwin (165 miles [266 km] northwest) cross.

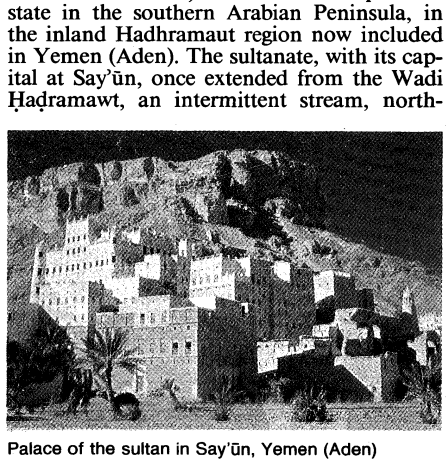
Katherine serves many cattle stations and farms growing sorghum and hay and receives produce from as far away as Wyndham, 300 miles (483 km) west in Western Australia, to which it is connected by road. Beef is processed there for export. During World War II, Katherine was a military base. At that time vegetables were grown along the river for troop supplies. The wartime exigency formed the basis for the present intensive experimentation in cropping along the riverbanks. Pop. (1986) 5,691.

Kāthiāwār Peninsula, peninsula in southwestern Gujarāt state, west-central India. It is bounded by the Little Rann (marsh) of Kutch (north), the Gulf of Kutch (northwest), the Arabian Sea (southwest), and the Gulf of Cambay (east). From the northeast an ancient sandstone formation extends into the peninsula, which has an area of 23,000 square miles (60,000 square km). Most of the sandstone, however, is masked by lavas. The coastal regions are flanked west and east by clays and limestones and south by alluvium and miliolite, a wind-deposited sand concretion known as Porbandar stone and widely used for building. The area flanking the Gulf of Cambay is largely alluvial.

Much of the peninsula is less than 600 feet (180 m) above sea level, but the Gīrnār Hills and the isolated Gīr Hills reach heights of 3,666 feet (1,117 m) and 2,124 feet (647 m), respectively. The natural vegetation of the dry, hot region is mainly thorn forest, but mangrove stands are common in low-lying areas near the sea. The Gīr forests contain the last wild Indian lions, and other wildlife abounds. Agriculture is the chief occupation on the peninsula; the principal crops raised include wheat, millet, and cotton. Bhavnagar is the principal port and city.

The settlement of Kāthiāwār dates to the 3rd millennium BC. Archaeological remains of the Harappan civilization occur at Lothal and Prabhasa Patan (Patan Somnāth). In the 3rd century BC the peninsula came under Mauryan influence, but it was later dominated by the Śakas. In the early centuries AD it was ruled by Kṣatrapa dynasties, and, on the decline of the Gupta empire, Kāthiāwār was seized by the Valabhīs in the 5th century AD. It suffered from early Muslim attacks, culminating in the campaigns of Maḥmūd of Ghazna and the sack of Somnāth in 1024. The area later passed under Mughal rule, and British paramountcy was recognized by the many small princely states after 1820.

Kathiri sultanate, former semi-independent state in the southern Arabian Peninsula, in the inland Hadhramaut region now included in Yemen (Aden). The sultanate, with its capital at Say'ūn, once extended from the Wadi Ḥaḍramawt, an intermittent stream, northward to the Rub' al-Khali, the vast southern Arabian desert. The Kathīrī tribe dominated the Hadhramaut from about 1500 until the early 19th century, when the rising Qu'aiti sultanate challenged it. The British intervened on behalf of the latter, and the Kathīrī people were cut off from the seacoast under a treaty signed in 1918. The sultanate was incorporated into independent Yemen (Aden) in 1967. The main occupations of the Kathīrī people are agriculture, stock raising, and handicrafts.

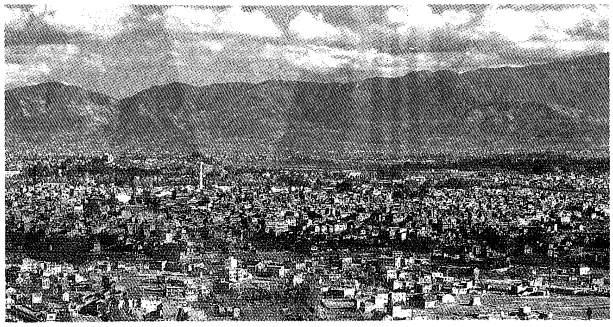


Palace of the sultan in Say'ūn, Yemen (Aden)
Katrina Thomas—Photo Researchers/EB Inc.

Kāthmāndu, also spelled KĀTMĀNDU, or KANTIPUR, capital, Nepal, near the confluence of the Bāghmati and Vishnumati rivers, at an elevation of 4,344 feet (1,324 m) above sea level. It was founded in 723 by Rājā Gunakamadeva. Its early name was Manju-Patan; the present name refers to a wooden temple (*kāṭh,* "wood"; *mandir,* "temple," or "edifice") said to have been built from the wood of a single tree by Rājā Lachmina Singh in 1596. A building, supposedly the original, still stands in the central square and is used for the accommodation of *sādhu*s (holy men).

Kāthmāndu has served as the seat of the ruling Shah family of the Gurkha people since 1768.

The city has become the country's most important business and commercial centre through the efforts of its Newār merchant families. In the 1970s the construction of new



Kāthmāndu, lying in the Kāthmāndu Valley, Nepal, with the Bairavkund Range (Lesser Himalayas) in the background

©Brian A. Vikander/West Light

roads and the expansion of air service were centred upon Kāthmāndu, making it the hub of the national transportation system, which for centuries was limited to footpaths. Many of the townspeople are engaged in agriculture, the Newār preferring to live in the city. Tribhuvan University was chartered in 1959.

Kāthmāndu's two main streets contrast strongly to the older sectors of narrow streets and brick houses adorned with carved doors and windows. Destruction during the 1934 earthquake resulted in the construction of many modern-style buildings. The city's most notable building is the old palace of the Malla kings, which includes Taleju temple (1549), built by Rājā Mahindra Malla. The palace's main gate is guarded by a figure of the god Hanumān; in a small, adjoining square are several pagoda-style temples.

To the east is Tundi Khel, the parade ground, in the centre of which is a stone platform surrounding a tree, from which important government pronouncements were formerly made first to the army. Between it and the city is a tall watchtower built by Bhim Sen Thapa, a former prime minister. On the outskirts of Kāthmāndu are many palaces built by the Rana family, the most imposing of which is the Singha Palace, once the official residence of the hereditary prime ministers and now housing the government secretariat. About 3 miles (5 km) northeast is the great white dome of Bodhnath, a Buddhist shrine revered by Tibetan Buddhists.

Festivals in Kāthmāndu include, in spring, the Shivaratri and the Machendra Jatra with its procession bearing the image of the god Machendra; in late summer, the Gai Jatra (festival of the cow); and, in early autumn, the Indra Jatra, during which the goddess Devī, represented by a young girl, is carried in procession. Pop. (1981) 235,160.

Katif (Saudi Arabia): *see* Qaṭīf, al-.

Katihār, formerly SAIFGANJ, town, northeastern Bihār state, northeastern India. Katihār is situated east of the Saura River, a tributary of the Ganges. It is a major road and rail junction with railway workshops and is engaged in agricultural trade. Industries include rice, jute, oilseed, and flour milling. The town has several hospitals.

The surrounding region extends over the extreme eastern part of the North Bihār Plains. It is drained by the Kamala and Saura rivers. Its economy is predominately agricultural; wheat, jowar (sorghum), corn (maize), and oilseeds are grown. Pop. (1981) town, 104,781.

Katiola, town, central Côte D'Ivoire (Ivory Coast). Katiola is situated along the road and railroad running from Abidjan, the national capital, to Ouagadougou, Burkina Faso (formerly Upper Volta). A traditional trade centre (yams, tobacco, cattle, and sheep) among the Baule (Baoule), Senufo (Senoufo), and Diula (Dioula) peoples, it is also the seat of a Roman Catholic bishop and the site of several schools. Women of the local Mangoro ethnic group are noted potters, and Katiola has a modern school of ceramics and sends pottery to Abidjan for sale. Pop. (1975) town, 18,625.

Kâtip Çelebi, byname HACI HALIFE, Arabic KHAṬĪB SHALABĪ, or ḤAJJĪ KHALĪFA, original name MUṢṬAFA IBN ʿABD ALLĀH (b. February 1609, Constantinople—d. 1657, Constantinople), Turkish historian, geographer, and bibliographer.

Kâtip became an army clerk and took part in many campaigns in the east, meanwhile collecting material for his historical works. As a child he was taught the Qur'ān and Arabic grammar and calligraphy, but his later education was irregular; he attended lectures between military campaigns. An inheritance allowed him to settle permanently in Constantinople, where, except for his duties as government clerk, he was able to devote all his time to collecting books, studying, and writing.

He was an avid bibliophile, an industrious scholar, and a prolific and straightforward writer. Among his chief works is: *Kashf al-ẓunūn ʿan asāmi al-kutub wa al-funūn* ("The Removal of Doubt from the Names of Books and the Sciences"). This work is his masterpiece; it is a bibliographical encyclopaedia in Arabic giving information on 15,000 Arabic, Persian, and Turkish books published up to his time. His *Jihannuma* ("View of the World") is a geographical work that makes the first use, in Turkey, of European atlases and other sources. *Tuhfat al-Kibar fi Asfar il-Bahar* (Eng. trans. of chapters I-IV, *The Maritime Wars of the Turks*) is a history of the Ottoman navy; *Dustūr al-amal li islah al-khalal* ("Instructions for the Reform of Abuses") is a treatise suggesting remedies for the economic crisis in the Ottoman Empire of his day; and *Mizan al-ḥaqq fi ikhtijārī al-ahaqq* (*The Balance of Truth*) defends positive sciences and Islāmic doctrine and criticizes fanaticism.

Katipunan, in full KATAASTAASAN KAGALANG-GALANG NA KATIPUNAN NANG MANGA ANAK NANG BAYAN ("Supreme Worshipful Association of the Sons of the People"), Filipino nationalist organization founded in 1892 to oppose Spanish rule. The organization numbered anywhere from 100,000 to 400,000 members. The Filipino nationalist Emilio Aguinaldo was the leader of this group, which successfully fought the Spanish. Most of the members were Tagalogs.

Katkov, Mikhail Nikiforovich (b. Nov. 13 [Nov. 1, Old Style], 1818, Moscow—d. Aug. 1 [July 20], 1887, Znamenskoye, near Moscow), Russian journalist who exercised a high degree of influence in government circles during the reigns of Alexander II (reigned 1855–81) and Alexander III (reigned 1881–94).

After study at the Moscow University (graduated 1838) and the University of Berlin (1840–41), Katkov was an assistant professor of philosophy at Moscow (1845–50). In 1851 he became editor of the daily *Moskovskiye Vedomosti* ("Moscow News"), and in 1856 he also became editor of the journal *Russky Vestnik* ("Russian Courier"). During his early journalistic career, he supported the liberal reforms of Alexander II (*e.g.*, the emancipation of the serfs and the establishment of an independent judiciary) and generally hoped to bring about the transformation of the Russian autocracy into a constitutional monarchy. After the Polish uprising of 1863, however, he became a staunch chauvinist and not only wrote articles favouring reactionary domestic policies and aggressive Pan-Slav foreign policies but also encouraged Alexander III, who regarded Katkov as one of his closest advisers, to restrict the entry of students from low social classes into secondary schools and unsuccessfully urged him to commit Russia to an anti-German foreign policy.

Katmai National Park and Preserve, formerly KATMAI NATIONAL MONUMENT, national park and preserve in southwestern Alaska, U.S., at the head of the Alaska Peninsula, on Shelikof Strait. Katmai was proclaimed a national monument in 1918 after the violent eruption there in 1912 of Novarupta. The park's boundaries were changed in 1931, 1942, 1969, 1978, and in 1980, when the name was altered. Its area covers 4,090,000 acres (1,655,000 hectares).

The 1912 eruption converted a green valley into a wasteland known as the Valley of Ten Thousand Smokes, and the volcanic crater later became a lake. The park's lakes, wild rivers, forests, mountains, and marshlands abound in wildlife, including large numbers of brown and grizzly bears. Its scenic coastline includes fjords, cliffs, bays, and waterfalls. *See also* Ten Thousand Smokes, Valley of.

Kātmāndu (Nepal): *see* Kāthmāndu.

Katna, also spelled QATNA, modern AL-MASHRAFAH, ancient Syrian city, Syria. It prospered especially during the 2nd millennium BC and was frequently named as Qatanum in the royal archives of Mari on the Euphrates. Excavations there in 1924–29 revealed a temple dedicated to the Sumerian goddess Nin-E-Gal. Foreign trade and influence were illustrated by the presence of a stone sphinx dedicated by Ita, daughter of Amenemhet II (1929–1895 BC) of Egypt, as well as several Mycenaean vases manufactured prior to 1375 BC, when the city was destroyed by the Hittite king Suppiluliumas.

Katō Hiroyuki, DANSHAKU (Baron) (b. Aug. 5, 1836, Izushi, Tajima province, Japan—d. Feb. 9, 1916, Tokyo), Japanese writer, educator, and political theorist who was influential in introducing Western ideas into 19th-century Japan. After the fall of the shogunate in 1868, he served as one of the primary formulators of Japan's administrative policy.

Katō's interest in Western studies developed at a time when Japan was still isolated from the outside world—in the late 1850s and early 1860s, when Katō worked in the government office for the study of foreign books. In 1864, when that office was made into a school for the study of Western learning, Katō became a professor of foreign affairs. After the 1868 Meiji Restoration abolished the old Japanese feudal regime of the shogunate, he became a private tutor to the emperor and was appointed to many high government posts in education and foreign affairs. Meanwhile, through such books as *Shinsei taii* (1870; "General Theory

of True Government Policy") and *Kokutai shinron* (1874; "New Theory of the National Structure"), he introduced the Japanese public to European theories of government, democracy, and human rights.

In about 1880, however, when the movement for democracy began to gain momentum, Katō altered his earlier views, arguing that it was too early for a national assembly and that, as Prussia demonstrated, democracy was not necessary for national strength. The constitution that was finally promulgated in 1889 was based on the Prussian, not the British or French, model. The Meiji constitution also held that human rights were not inalienable but a privilege granted by the state, a position taken by Katō in his *Jinken shinsetsu* (1882; "New Theory on Human Rights").

With the founding of Tokyo Imperial University in 1890, Katō became its first president. In 1900 he was created a baron and in 1906 was made a member of the Privy Council, a position that heightened his influence on state policy. By that time he had gained international scholarly recognition from the 1893 German publication of his *Der Kampf ums Recht des Stärkeren und seine Entwickelung* (1893; "War, Right of the Strongest, and Evolution").

Katō Kiyomasa (b. 1562, Nakamura, Owari province, Japan—d. Aug. 2, 1611, Kumamoto, Higo province), great Japanese military leader who helped both Toyotomi Hideyoshi and Tokugawa Ieyasu in their attempts to unify Japan; as an ardent Buddhist, he also led the struggle to ban Christianity from Japan.

A relative of Hideyoshi, Katō entered his service upon reaching manhood and soon distinguished himself in battle. When Hideyoshi invaded Korea in 1592, Katō spearheaded the campaign and fought so ferociously that the Koreans nicknamed him "Devil Kiyomasa." Upon Hideyoshi's death in 1598, Katō returned to Japan and aided Tokugawa Ieyasu, who as chief regent to Hideyoshi's young son was attempting to maintain his position against a coalition of feudal lords.

For his services Katō was made the hereditary lord of the large Kumamoto fief in southeastern Japan. In Kumamoto he was noted for the effort he put into his riparian projects and the construction of his castle. Upon his death his fief was transferred to the Hosokawa family by the Tokugawa.

Katō Takaaki, also called KATŌ KŌMEI (b. Jan. 25, 1860, Nagoya, Japan—d. Jan. 28, 1926, Tokyo), Japanese prime minister in the mid-1920s whose government and policies were considered the most democratic in Japan before World War II.

Katō's first job was with the great Japanese cartel of Mitsubishi, which backed him throughout his political career; he, in turn, watched over its interests. In 1887 he became the private secretary to the minister of foreign affairs, Ōkuma Shigenobu, and subsequently served as director of a bureau in the finance department. After acting as Japanese ambassador to England (1894–99), Katō served as minister of foreign affairs for a few months in 1900 and again in 1906. He resigned in opposition to the nationalization of the railways, which hurt the Mitsubishi interests, and remained out of office until 1908, when he was reappointed ambassador to London. Recalled in 1913, he became foreign minister for the third time, in the short-lived Cabinet of the unpopular new prime minister, Katsura Tarō. Katō then reorganized the Rikken Dōshi-kai, created by Katsura, and renamed the party the Kenseikai, or Constitutionalist Party, of which he became chairman in 1913. Under Katō's leadership, the Kenseikai became the major opposition to the more conservative Rikken Seiyūkai.

In April 1914 Katō again took over the foreign ministry under his old patron Ōkuma. During his incumbency, on Jan. 18, 1915, Japan sent the so-called 21 demands to China, resulting in greatly increased privileges and industrial rights there for Japan. After the March election, Katō resigned in protest of Ōkuma's corrupt tactics at the polls.

The following decade proved a quiet period for Katō, but in June 1924 he became prime minister of a new coalition government. His party won a majority in the Diet the following year, and Katō was able to name his own Cabinet. A new period of democratic government began: universal male suffrage was enacted, the army was greatly reduced in size and influence, the power of the House of Peers was lessened, and moderate social legislation was introduced. Other legislation enacted by Katō's government included an antisubversive measure that provided prison terms of up to 10 years for membership in any group advocating a change in the Japanese "national polity" or proposing the abolition of private property. Military training was introduced in middle and higher schools, and the army was modernized. Katō died before the end of his term.

Katona, József (b. Nov. 11, 1791, Kecskemét, Hung.—d. April 16, 1830, Kecskemét), Hungarian lawyer and playwright, author of the historical tragedy *Bánk bán.*

Educated in law, Katona was also interested in the stage and wrote several plays of little literary merit. In 1815 he wrote *Bánk bán* (performed 1821), reckoned among the best Hungarian dramas, but it remained unnoticed until after his death. (An opera based on it has remained popular in Hungary.) Disappointed by his failure to achieve literary success, Katona turned to law and spent his last years as attorney general of his native town.

Katoomba, town, east-central New South Wales, Australia, in the Blue Mountains at an elevation of 3,337 feet (1,017 m). First known as The Crushers, after a local stone quarry, it was renamed Katoomba, from an Aboriginal word for "waterfalls," because of the nearby 800-foot- (245-metre-) high falls. The town was formerly a coal-mining centre, but mining has given way to tourist development based on the scenic mountain locale. The nearby Scenic Railway, once used to carry coalminers down the cliff face, now carries tourists into the Jamieson Valley. Declared a municipality in 1889 and a city in 1946, Katoomba was incorporated within the City of Blue Mountains in 1947; it now serves as the city's administrative headquarters and is the regional business centre. It is on the Great Western Highway and has an electric rail link to Sydney (55 miles [88 km] southeast). The locality yields apples and timber; clothing, leather goods, and furniture are manufactured in the town. Pop. (1981), including Wentworth Falls, 13,942.

Katowice, *województwo* (province), south-central Poland, established 1975, comprising an area of 2,568 square miles (6,650 square km). Located in the Górny Śląsk (Upper Silesia) coalfields, it is bordered by the provinces of Opole on the west, Częstochowa on the north, Kielce and Kraków on the east, and Bielsko-Biała on the southeast and by Czechoslovakia on the southwest. The province has coal deposits that are the largest in Poland and among the largest in Europe. The deposits extend over 2,084 square miles (5,397 square km); reserves reach a depth of 3,280 feet (1,000 m). Coal mining dominates the provincial economy. Katowice province also has the country's largest concentration of zinc and lead foundries. In addition there are plants producing machine tools, mining equipment, and chemicals. Textile mills, synthetic-fibre factories, breweries, stone quarries, plastics factories, and food-processing plants are economically important. Most of the inhabitants reside in urban centres. Katowice province is the most densely populated province in the Upper Silesian industrial agglomeration of Poland. Pop. (1987 est.) 3,946,100.

Katowice, German KATTOWITZ, town and capital, Katowice *województwo* (province), south-central Poland, in the heart of the Górny Śląsk (Upper Silesia) coalfields. The settlement was first recorded in 1598, and it remained a small village until 1865, when it was granted municipal rights as Kattowitz. The town grew rapidly as coal mining began in the area during the 1860s. It became part of Poland in 1922 and has since incorporated surrounding villages. Its economy is dependent upon coal mining and heavy industry, and it is an important rail junction and has an airport. The local "Jan" coal mine was the first fully automated mine in the world. The Huta-Katowice metal complex was one of Poland's major development projects in the 1970s. Katowice is also a cultural centre. Pop. (1987 est.) 367,300.

Katsina, state, north-central Nigeria. Part of its area composes the historic kingdom and emirate of Katsina.

According to tradition, the kingdom, one of the Hausa Bakwai ("Seven True Hausa States"), was founded in the 10th or 11th century, when Kumayo (Kamaiyu), a grandson of Bayajida (Abuyazidu), the legendary progenitor of the Hausa people, overthrew Janzama, *sarkin Durbawa* ("chief of Durbawa"), who ruled at nearby Durbi ta Kusheyi. Alternating rulers of the Kumayo and Durbawa houses governed Katsina until the victory of Korau over Durbawa, in the early 14th century. Islām was introduced in the 1450s, and Muhammad Korau (reigned late 15th century) was Katsina's first Muslim king. During his reign camel caravans crossed the Sahara from Ghudāmis (Ghadames), Tripoli, and Tunis to Katsina and brought such prosperity to the state that it became caught in the rivalry between the great West African empires of Songhai (Gao) and Bornu. In 1513 Katsina was conquered by the Songhai; the devastation was described in 1526 by Leo Africanus, the Arab traveler.

The original walls around Katsina town, the kingdom's capital, were built in the mid-16th century; in 1554 the ruler of Katsina defeated the forces of Songhai and, in 1570, those of Kano, its principal rival in the trans-Saharan trade. After Moroccan armies had vanquished Songhai in 1591, Katsina was (until the end of the 18th century) a tributary state of Bornu. Trade rivalry with Kano brought intermittent Kano–Katsina warfare from the late 15th century until 1650, when the two states signed a peace treaty, effected by the threat of the Jukun (Kwararfa) kingdom of the south-southeast. Although Katsina was almost destroyed by the Jukun in 1671, it survived and entered its greatest period of prosperity in the early 18th century. Besides being the leading Hausa commercial state (extending across the borders of present-day Nigeria and Niger), Katsina replaced Timbuktu (Tombouctou; 740 miles [1,191 km] west-northwest) as the chief West African centre of Islāmic studies. Later in the century, wars with Gobir, a Hausa state to the northwest, marked the beginning of Katsina's decline.

Fulani herdsmen settled in Katsina by the 15th century, and in 1804 the Fulani jihad (holy war) leader, Usman dan Fodio, led a revolt (beginning in Gobir) against the Hausa overlords. Umaru Dallaji, a Fulani leader from near Bindawa, 30 miles (48 km) south, captured Katsina town in 1806 and was named the first Katsina emir with Katsina as his seat. The emirate was governed by the representative of the sultan of Sokoto (a town 160 miles [258 km] west) as well as the local emir.

Many of the Hausa nobility and people fled to Dankama (25 miles [40 km] northeast) and to Tassawa (Tessaoua) and Maradi in Niger, where they proclaimed a Hausa Katsina chiefdom. Their raids throughout the 19th century weakened the Fulani emir and Katsina town (which was surpassed by Kano).

In 1903 Katsina's emir pledged allegiance to the British rulers of Northern Nigeria. When the British and French set the present Niger–Nigeria boundary in 1904, Katsina emirate was reduced to 8,313 square miles (21,531 square km) in Nigeria and made a part of Kano province.

Katsina province was formed from Kano and Zaria provinces in 1931, and it became an administrative division of North-Central state in 1967 (in 1975–76 renamed Kaduna state). Kaduna state was divided in 1987, and Katsina state was formed; it has an area of approximately 9,500 square miles (24,600 square km). The state is mainly inhabited by Muslim Hausa (the Katsena [Katsenawa], Kano [Kanawa], and Bugaje branches) and Fulani peoples and by a few Maguzawas (animistic Hausas). Katsina town is the state capital and the largest settlement in Katsina state. Farming is the chief occupation; peanuts (groundnuts) are the main cash crop, but cotton is important in the south. Millet and sorghum are grown as staple foods, and there is vegetable gardening in riverine floodplains. Most of its peoples own cattle, sheep, or goats, and hides and skins are sold for profit. The area is now served by the main highway between Kano and Maradi (Niger). Pop. (1988 est.) state, 4,874,600.

Katsina, town, Katsina state, northern Nigeria, near the Niger border. Probably founded about 1100 near Ambuttai, which was the residence of Katsina's Hausa kings and the annual meeting place for the rulers of nearby Durbi, the town was named for Kacinna (Katsena, Katsina), the wife of Janzama (a Durbawa king of the time) and a princess of Daura (the legendary home of the Hausa people, 49 miles [79 km] east). After a period (*c.* 1513–54) under the Songhai *askias* ("emperors"), Katsina became the intellectual and trans-Saharan caravan centre of the Hausa states from the late 16th to the late 18th century (and remained so until *c.* 1815, when it was surpassed by Kano and bypassed by the new trade routes to the Gulf of Guinea coast).

Fulani emirs retain traditional and advisory roles and reside in Katsina's palace of the Kangiwa ("Elephant's Head"); among the royal treasures of the palace is Gajere, a sword with a 13th-century Arabic inscription that was used in the overthrow of the Kumayo-Durbawa dynasty in the early 14th century. Associated with the town's large central mosque is the Gobarau Minaret, a 50-foot (15-metre) tower made of mud and palm branches and probably dating from the 18th century. Most of the town's old 13.5-mile-(22-kilometre-) long wall is in ruins. There is a small government residential area outside the wall.

Modern Katsina, the state capital, is a major collecting point for peanuts (groundnuts) and for hides and skins that are sent to Kano (92 miles [148 km] southeast) for export by road and rail. In Katsina's central market, sorghum, millet, onions, *fadama-* ("floodplain-") grown vegetables, peanuts, indigo, goats, poultry, sheep, cattle, and cotton are traded. Traditional crafts of the town's predominantly Hausa population include weaving and dyeing of cotton, working in leather and metal, and designing of pottery, embroidery, and calabashes. Modern industries were introduced in the 1970s and include vegetable-oil mills and a steel-rolling plant.

Also in the 1970s Katsina was developed as a regional education centre. It is the site of a campus of the Katsina College of Arts, Science, and Technology (1974), the Kaduna State College of Legal Studies, and federal and Islāmic teacher-training colleges; it is also served by a hospital. The town is located on the highway between Kano and Maradi (Niger), and it is a junction for local roads. Pop. (1988 est.) 169,100.

Katsu Kaishū, HAKUSHAKU (Count), also called KATSU YOSHIKUNI, or KATSU AWA (b. March 12, 1823, Edo [now Tokyo], Japan—d. Jan. 21, 1899, Tokyo), Japanese naval officer who reformed his country's navy and played a mediatory role in the Meiji Restoration—the overthrow in 1868 of the shogun (hereditary military dictator of Japan) and restoration of power to the emperor. He was one of the few high officials of the shogunate to be employed by the new imperial government.

Trained as a naval officer, Katsu was appointed to command the *Kanrin Maru,* the first Japanese ship to sail to the West (1860). The voyage took him to the United States, and after his return to Japan he worked to modernize the Japanese navy and develop the country's coastal defenses. He also became the leader of the moderate faction within the Tokugawa shogunate, but his effort to reduce the growing friction between supporters of the emperor and those of the shogun were unsuccessful. He remained on good terms with the imperialists, however, and in May 1868, with the imperial troops outside the city of Edo, Katsu surrendered peacefully and persuaded the imperialists to treat the former shogun leniently. In 1872 Katsu himself was invited to join the new government as minister of the navy. He soon became one of the most influential officials in the new administration.

Katsura Imperial Villa, Japanese KATSURA RIKYŪ, group of buildings located in the southwest suburbs of Kyōto, originally built as a princely estate during the early 17th century on the bank of the Katsura River, which supplies the water for its ponds and streams. The estate covers an area of about 16 acres (6.5 hectares). In 1590 it was given to Prince Toshihito, the younger brother of the emperor, who developed the estate until his death in 1629. In the following years it was completed in substantially its present form by his son, Prince Toshitada, who built an addition to the main section, two more tea pavilions, and much of the garden's stonework.

The estate is completely enclosed by bamboo fences and high bamboo hedges. The main buildings, set into a landscape created for them, include three attached structures, the *ko-shoin, chu-shoin,* and *shin-shoin*—old, middle, and new halls, respectively. They form the typical *shoin*-style building in echelon, intersecting roofs, and freely organized interior spaces. Because of the sloping site, the high wooden posts supporting the *chu-shoin* and *shin-shoin* are necessary to maintain the floor level throughout.

Because both princes were devotees of the tea ceremony, the estate has four teahouses, one for each season. They are constructed in highly sophisticated combinations and arrangements of the simplest materials.

Katsura Tarō, KŌSHAKU (Duke, or Prince) (b. Jan. 4, 1848, Hagi, Nagato province, Japan—d. Oct. 10, 1913, Tokyo), Japanese army officer and statesman who served three times as prime minister of Japan.

Katsura fought for the imperial cause in the Meiji Restoration, which in 1868 wrested power from the feudal Tokugawa family and restored it to the emperor, and later was sent to Germany to study military strategy and tactics. He was appointed deputy army minister in 1886 and served in the Sino-Japanese War (1894–95). As a protégé of Yamagata Aritomo—military leader, prime minister, and special adviser to the emperor—he became army minister in 1898 and prime minister in 1901 for the first of three successive terms. During his first premiership (1901–06) an alliance with Great Britain was concluded (1902) and the Russo-Japanese War (1904–05) successfully fought. Katsura, however, became increasingly the antagonist of Itō Hirobumi (the first prime minister of Japan and founder of the Rikken Seiyūkai political party) on policy toward Korea, then a Japanese protectorate. While Itō strove to set up a moderate rule in Korea, Katsura favoured outright annexation, a goal he achieved in 1910, during his second term as prime minister. He was in Europe in the summer of 1911 when he received word of the emperor Meiji's illness. He hurried home and after Meiji's death in 1912 entered the service of the new emperor, Taishō. Katsura was named lord keeper of the privy seal and grand chamberlain and was elevated to princely rank.

Although he had previously opposed the idea of political parties, during his third premiership (December 1912 to February 1913) he tried to counter Seiyūkai control of the Diet (parliament) by forming his own party. His Rikken Dōshikai was at first unsuccessful but eventually became one of the two major political groups in pre-World War II Japan. Katsura's third premiership lasted only seven weeks and ended amidst riots against his oligarchic methods and his program for greater armaments. He died a few months later.

katsura tree (*Cercidiphyllum japonicum*), upright gracefully branching tree native to China and Japan, and the only remaining member of the family Cercidiphyllaceae. It is a handsome ornamental tree planted widely for its broadly oval form; it grows up to 15 m (50 feet) tall in cultivation. The somewhat heart-shaped leaves are reddish purple when they emerge, turn green as they mature, and become yellow to scarlet before they fall. The species tends to branch at the base, but the variety *C. japonicum sinense* has a single trunk for several feet before branching. The katsura tree makes a good landscape specimen not only for its form and foliage but also for its relative freedom from insects and disease. Its wood is valued in Japan for lumber and general construction.

Katsushika Hokusai (Japanese artist): *see* Hokusai.

Katsuta, city, Ibaraki *ken* (prefecture), Honshu, Japan, on the Naka River, northeast of Mito, the prefectural capital. The city developed rapidly as an industrial site for the Hitachi Company, Ltd., after 1940, mainly producing electric locomotives and other electric machinery. Pop. (1987 est.) 105,914.

Kattakurgan, city, Samarkand *oblast* (province), Uzbek Soviet Socialist Republic, in a thickly populated oasis in the Zeravshan Valley. It began in the 18th century as a centre of trade and handicrafts; it now has various light-industrial plants for processing local agricultural produce. The Kattakurgan Reservoir on the nearby Zeravshan River is used for irrigation and recreation, and there is an Uzbek theatre of musical drama. Pop. (1987 est.) 63,000.

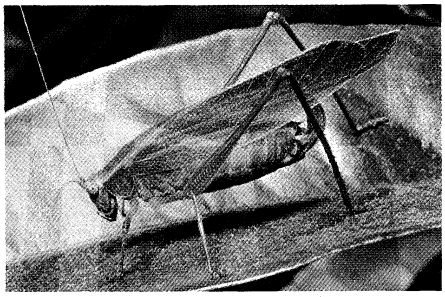
Kattegat (Danish), Swedish KATTEGATT ("Cat's Throat"), strait trending north and south between the Jutland (Jylland) peninsula and Sjælland (Zealand) island of Denmark (west and south) and Sweden (east); it connects through the Skagerrak (north) with the North Sea and through The Sound and the Great and Little Belts (south) with the Baltic Sea. Covering an area of 9,840 square miles (25,485 square km), the strait is 137 miles (220 km) long, varies in width from 37 to 88 miles (about 60 to 142 km), and has a mean

depth of 84 feet (26 m). A surface flow of fresh water from the Baltic Sea lowers the strait's salinity to 30 parts per 1,000. The Danish islands of Læsø, Anholt, and Samsø are within the strait; the chief ports are Gothenburg (Göteborg) and Halmstad in Sweden and Århus in Denmark. The Kattegat is an important commercial navigation passage and a popular summer vacation area.

Kattowitz (Poland): *see* Katowice.

Katwijk, *gemeente* (commune), comprising Katwijk aan Zee and Katwijk aan den Rijn, Zuidholland *provincie,* western Netherlands. The *gemeente* lies along the North Sea at the mouth of the Old Rhine River. The Old Rhine was canalized there (1804–07) with huge locks. Katwijk aan Zee has been a seaside resort since 1848 and has a wide beach and promenade. Herring fishing and related activities augment the tourist trade. Katwijk aan Zee has a 17th-century lighthouse and the church of St. Andrew (1574). Remnants of Roman and Frankish settlements of the 1st and 7th centuries have been excavated. Katwijk aan den Rijn has a 15th-century church with a monument by Rombout Verhulst, the 17th-century Dutch master of Baroque sculpture. Pop. (1987 est.) 39,034.

katydid, any of numerous species of insects in several subfamilies of the long-horned grasshopper family Tettigoniidae. Katydids are generally green and have long wings; they live on trees, bushes, or grasses, and many species resemble leaves. Katydids are powerful jumpers; in fact, many species do not fly and



Fork-tailed bush katydid (*Scudderia furcata*)
E.S. Ross

only flutter their wings during leaps. Katydids can be recognized by their long, threadlike antennae. The female has a swordlike ovipositor for laying eggs. The eggs, usually large and flattened in appearance, are deposited in bark, on twigs, or in leaves. Katydids feed chiefly on plant matter, though some also eat other insects.

The true katydids make up the subfamily Pseudophyllinae. Those in the genus *Pterophylla,* the true katydids of eastern North America, are considered great insect singers; their repetitive song, "katydid, katy-didn't," is produced only at night as the insect rubs its left forewing against a ridge on the right one. Each species has its own song.

The subfamily Phaneropterinae, whose members sometimes are called the false katydids, includes the bush katydid, the round-headed katydid, and the angular-winged katydid. The songs of these katydids are a series of high-pitched ticks or lisps. The fork-tailed bush katydid (*Scudderia furcata*) has long, narrow tegmina (hardened leathery forewings) and often licks its feet to clean the adhesive pads found there. The round-headed katydid (*Amblycorypha*) has oval wings that are wider than those of the bush katydid. The angular-winged katydid (*Microcentrum*) has a flattened, humped back; its wings resemble large leaves. Eggs are deposited in overlapping rows along a twig. In flight *Microcentrum* holds its wings in a gliderlike position.

Katyk (Ukraine, U.S.S.R.): *see* Shakhtyorsk.

Katyn Massacre, mass execution of Polish military officers by the Soviet Union during World War II. The discovery of the massacre precipitated the severance of diplomatic relations between the Soviet Union and the Polish government-in-exile in London.

After Nazi Germany and the Soviet Union concluded their Nonaggression Pact of 1939 and Germany invaded Poland from the west, Soviet forces occupied the eastern half of Poland. As a consequence of this occupation, tens of thousands of Polish military personnel fell into Soviet hands and were interned in prison camps inside the Soviet Union. But after the Germans invaded the Soviet Union (June 1941), the Polish government-in-exile (located in London) and the Soviet government agreed to cooperate against Germany, and a Polish army on Soviet territory was to be formed. The Polish general Władysław Anders began organizing this army, but when he requested that 15,000 Polish prisoners of war whom the Soviets had once held at camps near Smolensk be transferred to his command, the Soviet government informed him in December 1941 that most of those prisoners had escaped to Manchuria and could not be located.

The fate of the missing prisoners remained a mystery. Then on April 13, 1943, the Germans announced that they had discovered mass graves of Polish officers in the Katyn forest near Smolensk, in western Russian S.F.S.R. A total of 4,443 corpses were recovered that had apparently been shot from behind and then piled in stacks and buried. Investigators identified the corpses as the Polish officers who had been interned at a Soviet prison camp near Smolensk and accused the Soviet authorities of having executed the prisoners in May 1940. In response to these charges, the Soviet government claimed that the Poles had been engaged in construction work west of Smolensk in 1941 and the invading German army had killed them after overrunning that area in August 1941. But both German and Red Cross investigations of the Katyn corpses then produced firm physical evidence that the massacre took place in early 1940, at a time when the area was still under Soviet control.

The Polish government-in-exile in London requested that the International Committee of the Red Cross examine the graves and also asked the Soviet government to provide official reports on the fates of the remaining missing prisoners. The Soviet government refused these demands, and on April 25, 1943, the Soviets broke diplomatic relations with the Polish government in London. The Soviets then set about establishing a Polish government-in-exile composed of Polish communists.

The Katyn Massacre left a deep scar in Polish–Soviet relations during the remainder of the war and afterward. The Soviet Union for decades insisted that the Polish officers found at Katyn had been killed by the invading Germans in 1941. This explanation was accepted without protest by successive Polish communist governments until the late 1980s, when the Soviet Union allowed a noncommunist coalition government to come to power in Poland. In March 1989 this government officially shifted the blame for the Katyn Massacre from the Germans to the Soviet secret police, the NKVD. Subsequent investigation confirmed that the Soviet security authorities did indeed execute the Poles in the spring of 1940.

Katz, Sir Bernard (b. March 26, 1911, Leipzig, Ger.), German-born British physiologist who investigated the functioning of nerves and muscles; his studies on the release of the neurotransmitter acetylcholine, which carries impulses from nerve fibre to muscle fibre, won him a share (with Julius Axelrod and Ulf von Euler) of the 1970 Nobel Prize for Physiology or Medicine.

After receiving a medical degree from the University of Leipzig in 1934, Katz emigrated to England where he pursued advanced studies at University College, London, taking a Ph.D. in 1938. Upon receiving a Carnegie fellowship, he studied in Australia (1939–42) and then served in the Royal Australian Air Force during World War II. He returned to University College in 1946 and from 1952 to 1978 was professor and head of the biophysics department; he became emeritus in 1978. Katz was knighted in 1969.

Katz wrote *Electric Excitation of Nerve* (1939), *Nerve, Muscle and Synapse* (1966), and *The Release of Neural Transmitter Substances* (1969). He and his associates made numerous discoveries concerning the chemistry of nerve transmission, including the role of calcium ions in promoting the release of neurotransmitter substances and the fact that quanta of these substances are being released constantly at random intervals.

Kauai, volcanic island, Kauai county, Hawaii, U.S. It lies 95 miles (150 km) northwest of Oahu Island across the Kauai Channel. The northernmost and geologically the oldest of the major Hawaiian Islands, it is also the most verdant and is known as the Garden Isle. The first Polynesians to reach the Hawaiian Islands are said to have landed there a millennium ago and settled at the mouth of the Wailua River. With an area of 553 square miles (1,433 square km), the nearly circular isle, whose place-name is of uncertain meaning, consists mainly of Mount Waialeale and marginal lowlands dissected by fertile valleys and deep fissures. Principal towns are Lihue (the county seat), Kapaa, and Hanapepe. Sugar is the major agricultural product, and there is diversified manufacturing, especially of tourist-oriented goods. Kauai county embraces nearby Niihau Island (73 square miles) and the tiny uninhabited islets of Kaula and Lehua. Pop. (1986 est.) Kauai county, 46,300.

Kaufbeuren, city, Bavaria *Land* (state), southern Germany. It lies along the Wertach River, in the eastern Allgäu region of Schwaben (Swabia). Founded about 800 and chartered about 1220, it was a free imperial city from 1286 to 1803, when it passed to Bavaria. Parts of its medieval walls, towers, and fortifications remain. Notable landmarks are the Gothic St. Blasius Chapel with a famous carved altar (1518), St. Martin's Church (1443), and a Franciscan convent with the tomb of Mutter Kreszentia Höss (a place of pilgrimage). The city's annual Tänzelfest (children's festival) dates from the 16th century. The city's industries include breweries and the manufacture of textiles, Gablonz glassware, and jewelry. Kaufbeuren is also a market centre for dairy products of the Allgäu region. Pop. (1989 est.) 39,192.

Kauffmann, (Maria Anna Catharina) Angelica (b. Oct. 30, 1741, Chur, Switz.—d. Nov. 5, 1807, Rome, Papal States [Italy]), painter in the early Neoclassical style who is best known for her decorative wall paintings for residences designed by Robert Adam.

The daughter of Johann Joseph Kauffmann, a painter, Angelica was a precocious child and a talented musician and painter by her 12th year. Her early paintings were influenced by the French Rococo works of Henri Gravelot and François Boucher. In 1754 and 1763 she visited Italy, and while in Rome she was influenced by the Neoclassicism of Anton Raphael Mengs.

She was induced by Lady Wentworth, wife of the English ambassador, to accompany her to London in 1766. She was well received and was particularly favoured by the royal family. Sir Joshua Reynolds became a close friend,

and most of the numerous portraits and self-portraits done in her English period were influenced by his style of portrait painting. Her name is found among the signatories to the petition for the establishment of the Royal



Self-portrait, painting on canvas by Angelica Kauffmann; in the Staatliche Museen Preussischer Kulturbesitz, Berlin

By courtesy of the Staatliche Museen Preussischer Kulturbesitz Gemaldegalerie, Berlin—Art Resource/EB Inc.

Academy, and in its first catalogue of 1769 she is listed as a member. During the 1770s Kauffmann was one of a team of artists who supplied the painted decorations for Adam-designed interiors (*e.g.*, the house at 20 Portman Square, London; now the Courtauld Institute Galleries). Kauffmann retired to Rome in the early 1780s with her second husband, the Venetian painter Antonio Zucchi.

Kauffmann's pastoral and mythological compositions portray gods and goddesses in a delicate and graceful if somewhat insipid fashion. Her paintings are Rococo in tone and approach, though her figures are given Neoclassical poses and draperies. Kauffmann's portraits of female sitters are among her finest works.

Kaufman, Denis Arkadyevich: *see* Vertov, Dziga.

Kaufman, George S(imon) (b. Nov. 16, 1889, Pittsburgh, Pa., U.S.—d. June 2, 1961, New York, N.Y.), American playwright and journalist, who became the stage director of most of his plays and musical comedies after the mid-1920s. He was the most successful craftsman of the American theatre in the era between World Wars I and II, and many of his plays were Broadway hits.

After attending public school in Pittsburgh and Paterson, N.J., Kaufman found himself miscast as a salesman. He contributed to the satirical column run by Franklin P. Adams ("F.P.A.") in the New York *Evening Mail* and, in 1912, on Adams' recommendation, was given a column of his own in the *Washington Times*. He was a drama critic for *The New York Times* from 1917 to 1930.



George S. Kaufman, 1942

Pictorial Parade—EB Inc.

His first successful play, written in collaboration with Marc Connelly, was *Dulcy* (first performed 1921), a comedy based on a central character of Adams' column. *The Butter and Egg Man* (1925), a satire on theatrical production, was the only play that Kaufman wrote alone. His plays with Connelly included *Beggar on Horseback* (1924), an Expressionist satire on the inefficiency of efficiency, and *Merton of the Movies* (1922), one of the first satires on Hollywood. Among his other collaborations were *Of Thee I Sing* (1931), a musical-comedy satire on politics with Morrie Ryskind and Ira Gershwin (with music by George Gershwin); *Dinner at Eight* (1932) and *The Land Is Bright* (1941) with Edna Ferber; *The Solid Gold Cadillac* (1953) with Howard Teichmann; and a number of memorable successes with Moss Hart that included *Once in a Lifetime* (1930), *You Can't Take It with You* (1936), and *The Man Who Came to Dinner* (1939).

Kaufman was twice winner of the Pulitzer Prize for plays of which he was coauthor. His range was wide, varying in tone with his collaborators, but brilliant satire and caustic wit were his forte. He was often called in to revise other authors' plays in last-minute efforts to get them in shape for production.

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Kaufmann, Konstantin Petrovich (b. March 2 [Feb. 19, Old Style], 1818, Majdany, near Deblin, Pol.—d. May 16 [May 4], 1882, Tashkent, Russian Empire [now in Uzbek S.S.R.]), general who conquered vast territories in Central Asia for the Russian Empire and ruled Russian Turkistan for two decades.



Kaufmann, detail of an engraving

Novosti Press Agency

Having been trained as an engineer, Kaufmann served in the Caucasus in the early years of his military career (1840s), commanded a sappers' battalion during the Crimean War (1853–56), and then became attached to the war ministry. In 1865 he was appointed governor-general of Lithuania. He was transferred in 1867 to Turkistan, where Russia was conducting an active policy of expansion.

As the first governor-general of Turkistan, Kaufmann assumed command of the military campaigns against neighbouring lands. He captured the city of Samarkand in 1868 and made the khanate of Bukhara (located to the north of Afghanistan) a Russian protectorate that same year. In 1873 he occupied the khanate of Khiva (located between Bukhara and the Caspian Sea), and Russia gained all of that khanate's territory north of the Amu Darya. In 1875 Kaufman occupied the khanate of Kokand (northeast of Bukhara), allowing Russia to annex it in 1876. Kaufmann's military successes, however, brought protests from the British government, which considered that its interests in Afghanistan were threatened by Russian expansion, and Alexander II, emperor of Russia, refused to support further advances planned by Kaufmann. Although Kaufmann continued to engage in less spectacular expansionist activities, he concentrated on developing his skills as an administrator. Instituting far-reaching reforms, including land reform, he capably governed Turkistan until his death.

Kauikeaouli (Hawaiian king): *see* Kamehameha III.

Kaukauveld, westward extension of the Kalahari (desert) in Namibia and extreme northwestern Botswana, locally called the *omaheke* (sandveld). It has an area of about 32,000 square miles (83,000 square km), lies east of the town of Grootfontein, and is bordered on the north and south by two intermittent shallow watercourses (*omurambas*), the Kaudom and the Epukiro, both of which drain generally eastward. On the west the Kaukauveld merges into the hardveld (rocky plain) of the Central Highland, and on the east it borders the Okavango Swamp. The Kaukauveld's sandy surface is generally flat, though occasionally the sand is swept by winds into 300-foot- (90-metre-) high dunes. Rainfall in most of the region is scanty and irregular and allows only random patches of dry grass, interspersed with bush and acacia scrub, to develop. In the north, rainfall is greater, and here baobab, fan palm, and the mopane (turpentine tree) are found. The Kaukauveld is inhabited chiefly by groups of San (Bushmen), some of whom are wandering hunters and gatherers, although most have now taken to herding cattle and goats at remote ranches. The settlement of Tsumkwe in Namibia was established to teach the San the principles of agriculture and animal husbandry.

Kaulbach, Wilhelm von (b. Oct. 15, 1805, Arolsen bei Kassel, Hesse-Kassel [Germany]—d. April 7, 1874, Munich, Ger.), painter, illustrator, and muralist associated with the German Romantic movement.

From 1822 he studied under Peter von Cornelius at the Düsseldorf Academy. When Cornelius became director of the Academy in Munich in 1824, he brought Kaulbach to Munich; and in 1849 Kaulbach succeeded Cornelius in the academy's directorship—a position he held for 25 years. His prodigious output included melodramatic illustrations for *Reynard the Fox* (1841) and for the poetry of Friedrich Gottlieb Klopstock, Johann Wolfgang von Goethe, and William Shakespeare. As a muralist, he covered acres of walls in Munich and Berlin in a style derived from that of late Raphael and Albrecht Dürer. His vast historical paintings, such as the "Destruction of Jerusalem," the "Battle of the Huns," the "Crusaders," and the "Reformation," make up in heroic pose what they lack in artistic imagination. Kaulbach was one of the most renowned artists of his day, though his reputation has since declined.

Kaulun Peninsula, also spelled KAULUNG (Hong Kong): *see* Kowloon Peninsula.

Kaunas, formerly KOVNO, town, Lithuania, U.S.S.R. It lies at the head of navigation on the Neman (Lithuanian Nemunas) River, there joined by the tributary Viliya (Lithuanian Neris) River.

Founded as a fortress in 1030, Kaunas became a town in 1317 and received its charter of self-government in 1408. It was frequently attacked by the Teutonic Knights and changed hands several times before the defeat of the Knights in 1410. Thereafter its trade grew and the town flourished. In 1795 it passed to Russia by the Third Partition of Poland (with which Lithuania had merged in 1569), and it was devastated by Napoleon's advance in 1812. The town recovered and in 1842 became a provincial centre. With the coming of the railways later in the 19th century, the trade of the town increased and industries began to develop. From 1920 to 1940 Kau-

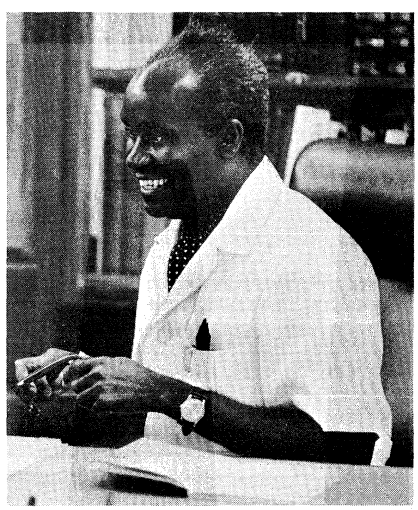
nas was the capital of independent Lithuania. Annexed by the U.S.S.R. in 1940, Kaunas suffered heavy damage during World War II and lost many citizens by deportation before and after the war. Under Soviet rule, Kaunas continued to have a high proportion of ethnic Lithuanians in its population (84 percent in 1970, compared to 43 percent in Vilnius and 61 percent in Klaipėda) and remained a centre of Lithuanian national sentiment. In 1972 it was the scene of nationalist riots following the funeral of a student who had set himself on fire as an expression of protest against the Soviet regime.

Many historic buildings survive, including the ruins of the castle at the confluence of the rivers. Beside the castle are narrow, winding streets and alleys of Old Town, which contains the Vytautas Church (built 1400), the Holy Trinity Church (1634), and the Jesuit Church (1666). Funiculars and stairways link the Old Town to the higher, newer parts of Kaunas.

Modern Kaunas is an important industrial centre, producing metal castings, machine tools, radios, furniture, and wool, silk, and rayon textiles. Road, rail, and water transportation lines converge there. Power is supplied by a hydroelectric station on the Neman. Kaunas is also a major educational and cultural centre, with polytechnic, medical, agricultural, veterinary, and physical-culture institutes, as well as theatres and museums. Pop. (1983 est.) 395,000.

Kaunda, Kenneth (David) (b. April 28, 1924, Lubwa, near Chinsali, Northern Rhodesia), first president of Zambia (from 1964) and leading figure in the country's independence movement.

Kaunda's father, who was from Nyasaland (now Malawi), was a schoolteacher; his mother, also a teacher, was the first African



Kaunda
Camera Press

woman to teach in colonial Zambia. Both taught among the Bemba tribe in northern Zambia, where young Kaunda received his early education, completing secondary school in the early 1940s. Like the majority of Africans in colonial Zambia who achieved some measure of middle-class status, he also began to teach, first in colonial Zambia and in the middle 1940s in Tanganyika (now Tanzania). He returned to Zambia in 1949.

In that year he became interpreter and adviser on African affairs to Sir Stewart Gore-Browne, a liberal white settler and a member of the Northern Rhodesian Legislative Council. Kaunda acquired knowledge of the colonial government as well as political skills, both of which served him well when later that year he joined the African National Congress (ANC), the first major anticolonial organization in Northern Rhodesia. The ANC had its origin in the Federation of African Welfare Societies, a group that had sought to extend African political influence; the group organized into a federation of welfare societies in 1946, two years later transformed itself into an explicitly political agency, the Northern Rhodesia Congress, and in 1951 was renamed the ANC. In the early 1950s Kenneth Kaunda became the ANC's secretary general, functioning as its chief organizing officer, a role that brought him into close contact with the movement's rank and file. Thus, when the leadership of the ANC clashed over strategy in 1958–59, Kaunda carried a major part of the ANC operating structure into a new organization, the Zambia African National Congress.

Kaunda became president of the new organization and skillfully used it to forge a militant policy against the British plan for a federation of the three central African colonies—Southern Rhodesia, Northern Rhodesia, and Nyasaland. African leaders opposed and feared any such federation because it would tend to place ultimate power in the hands of a white minority of settlers. Kaunda employed the Zambia congress as an instrument for executing what he called "positive nonviolent action," a form of civil disobedience against the federation policy. His campaign had two major results: first, the British government modified the federation policy and eventually agreed to discard it; second, the imprisonment of Kaunda and other militant leaders elevated them to the status of national heroes in the eyes of the people. Thus, from 1960 on, the nationwide support of Zambia's independence movement was secured, as was too the dominant status of Kenneth Kaunda in that movement.

Kaunda was released from prison by the colonial government on Jan. 8, 1960. At the end of that month he was elected president of the United National Independence Party (UNIP), which had been formed in October 1959 by Mainza Chona, a militant nationalist who was disenchanted with the older ANC. The UNIP enjoyed a spectacular growth, claiming 300,000 members by June 1960. This strength, however, did not prevent severe harassment by the government and especially by the local chiefs who owed their status to their colonial rulers. Yet the government also was quick to recognize the legitimacy of the UNIP leaders among the Zambian populace. Thus in December 1960 it invited Kaunda and several other UNIP leaders to participate in discussions on the status of the three colonies at the Federal Review Conference in London. Early in the following year the British government announced that formal decolonization of Zambia would commence.

The procedures through which Zambia moved toward independence were complicated, however, by the presence of the European settler community of some 77,000 and also an Asian community of 11,000. Both groups sought to delay decolonization, hoping to strengthen their positions. The British government proved indecisive in its handling of this conflict. Kaunda's leadership was largely able to allay the deeply felt grievances among black Zambians toward these groups, although there was widespread anti-white rioting in urban areas in 1961. The first major elections leading to final decolonization were held in October 1962. The constitutional proposals upon which the election was based provided the European settlers with a disproportionate share of the votes. Yet the two major African parties—the UNIP and ANC—gained a majority of the votes. The UNIP was the winner, gaining 15 of the 37 seats in the new Legislative Council.

The UNIP success was attributed overwhelmingly to the leadership of Kaunda. He had been astute both in allaying European fears that an African regime would unfairly disregard their interests and in quelling the factionalism prevalent in large sections of the country's African population. It was this same skill that enabled Kaunda to negotiate further constitutional advances, and in 1964 Zambia was granted independence.

Like other African leaders, Kenneth Kaunda faced many complex post-independence problems, especially the issue of tribalism. He succeeded in continuing to negotiate on this issue, saving Zambia the trauma of tribal civil war. Nonetheless political violence began to occur, and this, together with pressures on his borders, led him in 1973 to impose single-party rule on his country. In 1976, with a declining economy at home and civil war in Angola, just to the east, he assumed emergency powers. In December 1978—despite security troubles due to the Rhodesian conflict spreading into Zambia, economic collapse, disruption of communication routes to the sea, and political rivalries—he won, unopposed, a new five-year term in the presidential election, with about 80 percent of the votes cast. Several attempted coups were successfully defeated in the following years. In 1983 Kaunda won reelection to another five-year term in office. (M.Ki.)

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Kaunitz, Wenzel Anton von, in full WENZEL ANTON, FÜRST (prince) VON KAUNITZ-RIETBERG (b. Feb. 2, 1711, Vienna—d. June 27, 1794, Vienna), Austrian state chancellor during the eventful decades from the Seven Years' War (1756–63) to the beginning of the



Kaunitz, Wedgwood medallion portrait; in Gripsholm Castle, Sweden
By courtesy of the Svenska Portrattarkivet, Stockholm

coalition wars against revolutionary France (1792); he was responsible for the foreign policy of the Habsburg monarchy and served as principal adviser on foreign affairs to the empress Maria Theresa and her successors.

Destined for the church, Kaunitz studied law instead. After a tour of Europe he entered the Austrian foreign service in 1740, advancing to minister to the Sardinian court in 1742. In Turin, Italy, he learned diplomacy from the unscrupulous king of Sardinia, Charles Emmanuel III. He rapidly became known to Empress Maria Theresa, who sent him to the Netherlands as chief minister to Charles of Lorraine and her sister Maria Anna. Kaunitz governed these northern provinces virtually unaided but, nevertheless, proved unable to defend them against France.

A lifelong enemy of Prussia, Kaunitz represented Austria at the Aachen (now in Germany) peace congress in 1748, where he began to formulate the policy that was to reverse Europe's traditional alliance system a few years later. He wished to break Austria's alliances with England and the United Provinces, which were friendly toward Prussia, and bring France and Russia into the Habsburg orbit, an ambition he failed to realize as ambassador to Paris (from 1750). In 1753, however, he was made head of the Austrian State Chancery, and his efforts were rewarded in 1756, when Austria and France signed the defensive treaty of Versailles. Russia acceded the next year. This reversal of alliances was his greatest diplomatic coup, resulting in the isolation of Prussia on the Continent. The allies proved unable to subdue Frederick the Great during the ensuing Seven Years' War, however, and Kaunitz finally negotiated the peace of Paris in 1763. In 1764 he was created Fürst von Kaunitz-Rietberg.

After the death of Maria Theresa's husband, the Holy Roman emperor Francis I, Kaunitz' influence increased. He participated in the first partition of Poland (1772) and worked toward a détente with Prussia. Nevertheless, Austria once again became involved in a war with that state over the Bavarian succession (1778–79). Having extended his influence to domestic affairs, he organized the state council to run the country (1760) and favoured reorganizing and centralizing the administration of many of the Habsburg domains.

Kaunitz' relations with Maria Theresa's coregent and successor, her son Joseph, were much less cordial, and he often served as mediator between the Empress and her more active and aggressive son. With the son's accession as Joseph II (1780), the foreign minister's powers were cut drastically, and the vain, eccentric Kaunitz was increasingly pushed into the background.

The French Revolution terminated the system of alliances for which Kaunitz had stood. The new emperor Leopold II drew closer to Prussia again (Reichenbach convention of 1790), and the aged minister resigned under the emperor Francis II on Aug. 19, 1792.

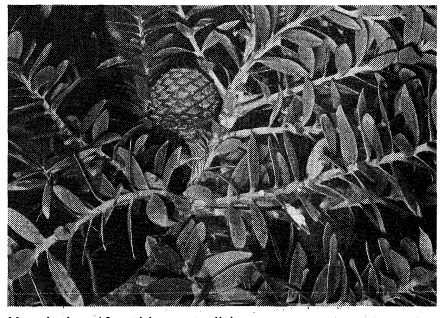
Kaur (The Gambia): *see* Kau-ur.

Kaura Namoda, town, northeastern Sokoto State, northern Nigeria, on the Gagere River (a tributary of the Rima). Originally a small settlement of Maguzawas (an animistic Hausa people), it was ruled by the kings of Zamfara, one of the *banza bakwai* ("the seven illegitimate states" of the Hausa people), whose capital was moved from Birnin Zamfara (43 mi [69 km] north-northwest) to Kiyawa (20 mi east-southeast) *c.* 1756. After Kiyawa was captured *c.* 1806 in the Fulani *jihād* ("holy war") led by Usman dan Fodio, a Fulani warrior named Namoda was installed as *sarkin* ("king of") *Zamfara*, and many of the Kiyawa peoples, the Zamfarawa, fled to the town later designated Kaura (war lord) Namoda. The town's traditional Fulani chief continues to hold the title of *sarkin Kiyawa,* while the leader of Zurmi, 18 mi northeast, is known as the *sarkin Zamfara.*

Most of the town's growth, however, is due to the arrival of the railway from Zaria (132 mi southeast) in 1929; and Kaura Namoda is now a major collecting point for peanuts (groundnuts) and cotton. Besides these export crops, local trade is primarily in millet, sorghum, cowpeas, rice, sugarcane, and tobacco. Goats are the main source of meat and skins; but the local Hausa and Fulani also keep cattle, sheep, donkeys, horses, and camels. A government dispensary serves the town; and it is the headquarters of a local government council. Kaura Namoda is the northwestern terminus of the trunk railway from Lagos and Port Harcourt, and it is located on the highway between Gusau and Jibiya (on the main highway between Katsina and Maradi [Niger]). Pop. (1983 est.) 47,880.

kauri pine, also called DAMMAR PINE (*Agathis australis*), a resinous timber conifer of the family Araucariaceae, native to the North Island of New Zealand. The tree sometimes reaches 45 metres (150 feet) in height, with a diameter up to 7 m (23 ft).

Kauri resin, obtained from this and other *Agathis* species, is an amber-like deposit dug



Kauri pine (*Agathis australis*)
G.R. Roberts

from the sites of previous forests; the hard, durable resin, called kauri copal, kauri gum, or dammar, is used in making varnishes, lacquers, and linoleum.

Kauriālā (central Asia): *see* Ghāghara River.

Kā'ūsīyeh DYNASTY (AD 665–*c.* 1006), branch of the Bāvand dynasty, which ruled in Ṭabaristān (now Māzandarān, northern Iran).

The origins and early history of the Kā'ūsīyeh branch are obscure. Its founder and the founder of the main dynasty was a certain Bāv (ruled 665–680). The dynasty was centred at Ferīm, in the mountainous country southwest of Sārī. Its geographical isolation and the difficult nature of the terrain enabled it to survive. In *c.* 854 Qāren I (ruled 837–867) converted to Islām. During the 10th century the Bāvands maintained their independence through various marriage alliances with the Būyid and Zeyārid dynasties. Rostam III (ruled 1006–57) became a vassal of the Zeyārid king Qābūs, but with weakening of Zeyārid power, Rostam and his successor Qāren II (ruled 1057–74) reigned as petty rulers in the mountainous area near Sārī.

The Kā'ūsīyeh branch was succeeded *c.* 1074 by another branch of the Bāvand dynasty known as Espahbadīyeh, which ruled in Māzandarān and Gīlān until 1210.

Kauṭilya, also called CĀṆAKYA, or VIṢṆUGUPTA, Cānakya also spelled CHANAKYA (fl. 300 BC), Hindu statesman and philosopher who wrote a classic treatise on polity, *Arthaśāstra* (Eng. trans., 3rd ed., 1929), a compilation of almost everything that had been written in India up to his time on *artha* (property, economics, or material success).

He was born into the Brahmin caste and received his education at Taxila (now in Pakistan). He is known to have had a knowledge of medicine and astrology, and it is believed he was familiar with elements of Greek and Persian learning introduced into India by Zoroastrians. Some authorities believe he was a Zoroastrian or at least was strongly influenced by that religion.

Kauṭilya became a counsellor and adviser to King Candragupta (reigned *c.* 321–*c.* 297) of the Mauryan Empire of northern India but lived simply himself. He was instrumental in helping Candragupta overthrow the powerful Nanda dynasty at Pāṭaliputra, Magadha.

Kauṭilya's book came to be Candragupta's guide. Each of its 15 sections deals with a phase of government, which Kauṭilya sums up as "the science of punishment." He openly advises the development of an elaborate spy system reaching into all levels of society and encourages political and secret assassination. Lost for centuries, the book was discovered in 1905.

Compared by many to Machiavelli and by others to Aristotle and Plato, Kauṭilya is alternately condemned for his ruthlessness and trickery and praised for his sound political wisdom and knowledge of human nature. All authorities agree, however, that it was mainly because of Kauṭilya that the Mauryan Empire under Candragupta and later under Aśoka (reigned *c.* 265–*c.* 238) became a model of efficient government.

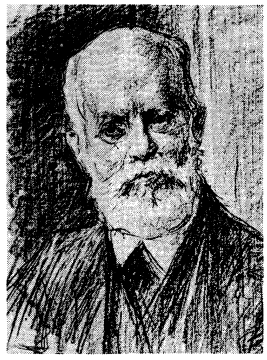
Käutner, Helmut (b. March 25, 1908, Düsseldorf, Ger.—d. April 20, 1980, Castellina, Italy), German actor, theatre and film director, and playwright who was acclaimed as one of the most intelligent and humanistic motion-picture directors in postwar West Germany. Although the quality of his work was uneven, attributed partially to poor working conditions, he remains a leading figure in German cinema.

Käutner was educated at the University of Munich and the Academy of Arts in Cologne. He was a cabaret singer before becoming an actor and film scriptwriter. He directed his first film in 1939 and managed to evade pressure from the Ministry of Propaganda during the war years. His success was partly due to his noncollaboration with the Nazi regime and Joseph Goebbels' criticism of Käutner's first major feature film, *Romanze in Moll* (1943; *Romance in a Minor Key*), as decadent and "defeatist." It and other early works were praised elsewhere, however, as unusual and highly innovative, even when not entirely successful.

Allowed to resume work by the British authorities after the war, Käutner made *In jenen Tagen* (1947; *In Former Days*) and other films on the Nazi era, including *Die letzte Brücke* (1953; *The Last Bridge*) and *Des Teufels General* (1955; *The Devil's General*), which established his international reputation. During a brief period in Hollywood (1957) he produced two mediocre films, *The Wonderful Years* and *A Stranger in My Arms.* His later work in Germany failed to revive his reputation, though *Der Reste ist Schweigen* (1959; *The Rest Is Silence*), a version of *Hamlet* set in contemporary Germany, was perhaps unjustly neglected. During the last decade of his life Käutner directed for the stage instead of the screen.

Kautsky, Karl (b. Oct. 16, 1854, Prague—d. Oct. 17, 1938, Amsterdam), Marxist theorist and a leader of the German Social Democratic Party.

Having joined the Austrian Social Democrats while a student at the University of Vienna, Kautsky became a Marxist when he went to Zürich (1880) and was influenced by the political theorist Eduard Bernstein (1850–1932). In London he made the acquaintance of Friedrich Engels, with whom he maintained a close friendship until the latter's death in 1895. In 1883 he founded and edited the Marxist review *Neue Zeit*, publishing it in Zürich, London, Berlin, and Vienna until 1917. He was the author of the Erfurt Program adopted by the



Kautsky, lithograph by Max Liebermann

By courtesy of the Staatsbibliothek Preussischer Kulturbesitz Bildarchiv, Berlin

Social Democrats in 1891, which committed the party to an evolutionary form of Marxism that rejected both the radicalism of Rosa Luxemburg and the evolutionary socialist doctrines of Eduard Bernstein. The German Social Democrats accepted Kautsky as their authority on Marxism until World War I, when he joined the minority Independent Social Democrats in their opposition to the war. After the October Revolution in Russia (1917), Kautsky became increasingly isolated from the Independents by his opposition to violent revolution and to minority socialist dictatorships. After many Independents had joined the Communist Party, however, the remaining Independents and the majority branch of the German Social Democratic Party reunited, a result for which Kautsky had laboured.

After 1918 he edited the German Foreign Office's archives, publishing secret documents regarding the origins of the war. He engaged in literary activities in Vienna from 1924 until 1938, when the German occupation forced him to flee. His other works include *Marx' ökonomische Lehren* (1887; *The Economic Doctrines of Karl Marx*), *Thomas More und seine Utopie* (1888; *Thomas More and His Utopia*), and many articles in *Neue Zeit*.

kava, also spelled CAVA, or AVA, nonalcoholic, euphoria-producing beverage made from the root of the pepper plant, principally *Piper methysticum,* in most of the South Pacific islands. It is yellow-green in colour and somewhat bitter, and the active ingredient is apparently alkaloidal in nature.

Consumption of the beverage takes place in the kava ceremony, which is rigidly prescribed and includes the ritual making and drinking of kava and the consuming of a ceremonial feast. Occasions for the kava ceremony can be social, such as a gathering of chiefs, a visit of a chief from a neighbouring island, or a gathering before battle, or it can be ceremonial, such as the conclusion of a public assembly presided over by a chief or king, the inauguration of a new chief, or a meeting with a god or gods for divination.

Kavadh I, also spelled QOBĀD (d. Sept. 13, 531), king of the Sāsānian empire (reigned 488–496 and 498/499–531). He was a son of Fīrūz and succeeded Fīrūz' brother Balāsh as ruler.

Time spent in youth as a hostage in the hands of the Hephthalites after their first defeat of his father gave Kavadh valuable military experience and connections, which he later turned to good use. After the deposition of his uncle Balāsh in AD 488, he was called to the throne. At first largely dependent on the feudal chief Zarmihr (elsewhere called Sokhra), he contrived to eliminate this over-powerful protector, but the consequent hostility of the nobles, with tribal unrest in Armenia and western Iran, led to his deposition in favour of a brother, Jamasp.

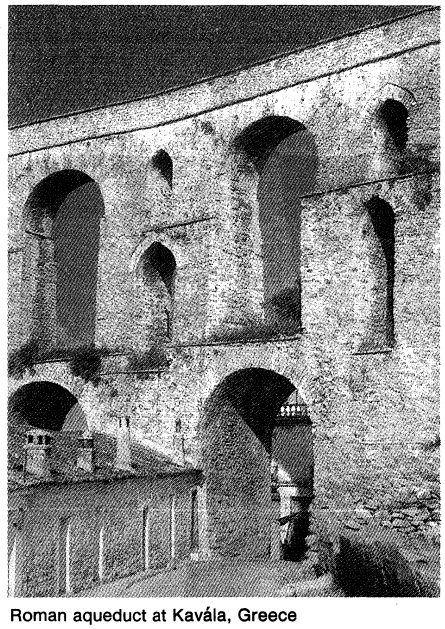
Kavadh was incarcerated in the "Castle of Oblivion" in Susiana but escaped (in a romantic version his wife takes his place in the dungeon) and, helped by a nobleman, Siyavush (Seoses), fled to the Hephthalites. Their king arranged a marriage between Kavadh and the Hephthalite king's daughter, who was a granddaughter of Fīrūz. He also gave Kavadh a powerful army with which to recover the Persian throne, which Kavadh did without opposition in AD 498 or 499. Kavadh next applied to the Byzantine emperor Anastasius I for subsidies with which to placate his auxiliaries. Payment being refused, he led his troops against Anatolia and seized the cities of Theodosiopolis (Erzurum) and Amida (Diyarbakır). He later returned Amida in return for a heavy indemnity.

When Justin I succeeded to the Byzantine throne in 518, Kavadh's main concern was to ensure the succession of his favourite son, Khosrow (later Anūshīrvan), by a peace under which Khosrow would be adopted and sponsored by the Byzantine emperor. Justin rebuffed the proposal, and a new breach resulted.

About the same time, Kavadh was deeply influenced by the Mazdakites, a heterodox religious sect. Finally persuaded of the danger of the Mazdakites, he had them assemble as if for a meeting and then massacred them.

Kaváfis, Konstantínos Pétrou: *see* Cavafy, Constantine.

Kavála, also spelled KAVÁLLA, ancient NEAPOLIS, commercial town and modern seaport of Greek Macedonia and capital of the *nomós* (department) of Kavála. It lies along the Gulf of Kaválas in the northern Aegean Sea. Since 1924 it has been the seat of the metropolitan bishop of Fīlippoi (ancient Philippi), Neapolis, and the island of Thasos and also the headquarters of a Greek army division. The town is built on a promontory stretching south into the gulf, and opposite the island of Thasos. The town's Turkish quarter is surrounded by Byzantine walls and occupies the small promontory, which is crowned by a Byzantine castle. The new town spreads out north of the main harbour, which was formed by the construction of two long moles after World War II.



Roman aqueduct at Kavála, Greece

© Mairani—CLICK/Chicago

Kavála has been identified with Neapolis, where Brutus stationed his fleet before the Battle of Philippi (42 BC) and where the apostle Paul landed on his way from Samothrace to Philippi. It was known as Christopolis in the Byzantine era. In 1387 it fell to the Turks, who held it until 1912, when it joined the kingdom of Greece. Bulgaria, which coveted Kavála as a maritime outlet, occupied the town three times: 1912–13, 1916–18, and 1942–44.

Kavála is now a major warehousing and export centre for the tobacco-growing districts of northern Greece. East of the town, drained marshland supports rice and melon cultivation; beekeeping is also important. There are also vineyards producing table grapes. A Roman aqueduct stands by the old town, and numerous other Roman and Byzantine artifacts remain, many of them housed in the archaeological museum opened in 1965. Pop. (1981) 56,375; *nomós,* 135,218.

Kavanagh, Patrick (b. 1905, near Inniskeen, County Monaghan, Ire.—d. Nov. 30, 1967, Dublin), poet whose long poem *The Great Hunger* put him in the front rank of modern Irish poets.

Kavanagh was self-educated and worked for a while on a farm in his home county, which provided the setting for a novel, *Tarry Flynn* (1948), which later was dramatized and presented at the Abbey Theatre, Dublin. After moving to Dublin, where he spent most of his life as a journalist, Kavanagh wrote *The Great Hunger* (1942), an epic about an Irish farm boy, containing impassioned satirical passages that recall D.H. Lawrence. Two volumes of verse followed—*A Soul for Sale* (1947) and *Come Dance with Kitty Stobling* (1960). His *Collected Poems* appeared in 1964 and *Collected Prose* in 1967. An early work of autobiography was *A Green Fool* (1939).

Kavanagh achieved a reputation in Ireland and abroad not only for his poetry but also for his criticism of his contemporaries and of the church.

Kavango, also spelled OKAVANGO, geographic region, northeastern Namibia. It is separated mostly by the Okavango River from Angola on the north, includes the western part of the Caprivi Strip to the northeast, and is bounded by Botswana on the southeast and by the Owambo (Ovamboland) region on the west.

Kavango covers an area of 16,100 square miles (41,700 square km). A generally flat area, it lies at an elevation of about 3,600 feet (1,100 m) above sea level and usually receives about 20 to 24 inches (500 to 600 mm) of annual rainfall. Patches of tall grass interspersed with bush scrub and trees develop into forests of Rhodesian teak, mahogany, and mopane in the east. Big-game species are abundant and include the elephant, buffalo, roan antelope, and impala, and there are crocodiles and tigerfish in the Okavango River. Nearly all of the region's settlements are located along the Okavango, which is subject to frequent flooding, but some are on the banks of the numerous *omurambas* (intermittent watercourses) that flow into the river.

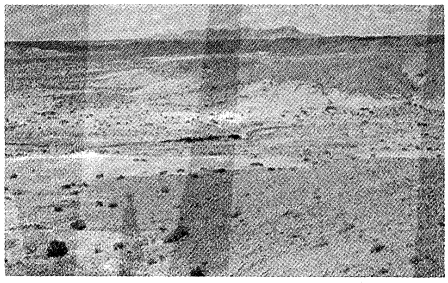
The Bantu-speaking Kavango people, who are the main inhabitants of the area, comprise six different tribes. They practice dryland cultivation of cereals, as the irrigation potential of the river has not been utilized. Some cattle are also raised. The western part of the Caprivi Strip is inhabited by bands of San (Bushmen).

Lutheran (Finnish) and Roman Catholic (Dutch and German) missions maintain several educational, medical, and religious institutions within the Okavango River settlements. Wood carving has become an important local handicraft in the Okavango settlements, and a sawmill and joinery operate at Rundu, the main settlement in the region, located on the Okavango. A road connects Rundu with the town of Grootfontein, 150 miles (240 km) southwest.

Kāverī (India): *see* Cauvery River.

Kavieng, chief port of New Ireland, Papua New Guinea, on Balgai Bay at the island's northern tip. It is a port of call for interisland and Australian shipping and handles copra, cocoa, and trochus and green snail shells (for buttons). The coral-surfaced 120-mile (193-kilometre) East Coast Road, which was constructed during the German period (1880–1914), was extended to link plantations and villages. There are air facilities to other parts of the country. Occupied by the Japanese during World War II, Kavieng was frequently bombed by Allied aircraft (1943–44). Pop. (1980) 4,633.

Kavīr Desert, Persian DASHT-E KAVĪR, also spelled DASHT-I KAVĪR, great salt desert of central Iran. Located in a basin southeast of the Elburz Mountains, it is approximately 240 miles (390 km) wide. A salt crust, caused by the almost rainless climate and intense surface evaporation, lies over a salt marsh. The



Kavīr (Salt) Desert, Iran
Harrison Forman

treacherous quicksandlike marshes are almost uninhabited. Settlements are found only in the surrounding mountain ranges.

Kavirondo (people): *see* Luo.

Kavkazsky Nature Reserve, natural area set aside for research in the natural sciences, at the western end of the Caucasus Mountains, including the upper reaches of the Malaya Laba, Bolshaya Laba, Mzymta, and Shakhe rivers, southwestern Russian Soviet Federated Socialist Republic. The reserve was established in 1924 and has an area of 648,650 acres (262,500 hectares). It is within a folded-mountain region subjected to the action of glaciers and snow; the rocks are mostly crystalline granites and gneisses. At low elevations forests of beech and oak prevail, and at higher elevations extensive forests of fir are found; higher still is rhododendron, and above this, alpine meadows. Wildlife includes brown bear, wild pig, lynx, red deer, Caucasian tur (a type of wild goat), chamois, wolf, and the European bison, which has been reintroduced. Bird species include the Caucasian blackcock, Caucasian snowcock, and alpine chough. The reserve is used for scientific research concentrating on reacclimatization studies of the European bison and on the preservation of Caucasian flora and fauna.

kavvanah, also spelled KAWWANAH (Hebrew: "intention," or "devotion"), plural KAVVANOT, KAVVANOTH, KAWWANOT, or KAWWANOTH, in Judaism, the attitude or frame of mind that is appropriate when one performs religious duties, especially prayer. The 12th-century philosopher Moses Maimonides recommended that to attain kavvanah when praying, a person should mentally place himself in the presence of God and totally divest himself of all worldly concerns. To perform religious duties without kavvanah has been viewed by some as equivalent to nonfulfillment of spiritual obligations.

In Kabbala (esoteric Jewish mysticism), kavvanah implied a concentration upon the secret meanings of the words and letters of the various prayers. Prayer recited without true kavvanah was compared to a body without a soul. The 16th-century mystic Isaac ben Solomon Luria strongly accented the importance of kavvanah in his Kabbalistic speculations, for, theoretically, correct kavvanah can influence the upper worlds and bring about cosmic restoration (*tiqqun*).

In Ḥasidism, a social and religious movement that emphasizes piety, kavvanah plays more an emotional than an intellectual role in religious life. There is consequently greater preoccupation with the spiritual well-being of the individual Hasid and less concern for the upper worlds.

kavya, highly artificial Sanskrit literary style employed in the court epic of India from the early centuries AD. It remains influential in modern Indian languages and literatures. With its subjects derived from early popular epics, it is characterized by elaborate and ornate metre and diction and by hyperbole. Rhetorical prose kavya also exist, notable for their use of compound nouns.

Kaw (North American Indians): *see* Kansa.

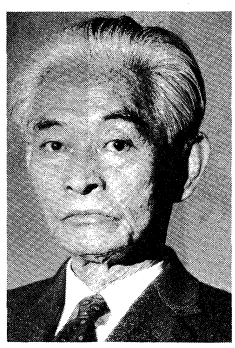
Kawa (people): *see* Wa.

Kawa, ancient Egyptian colony in Cush (Kush; modern Sudan) on the east bank of the Nile, 4 to 5 miles (6 to 8 km) north of Dunqulah. It was excavated (1930–36) by Francis L. Griffith and Laurence Kirwan for the University of Oxford. Founded by the Karmah culture (identified as Cush by the Middle Kingdom Egyptians), it became the second most important city (after Karmah) in the area because of its fertile farmlands. Amenhotep I (1514–1493 BC) conquered it when he destroyed the Cushite state.

Amenhotep III (*c.* 1390–53 BC) built there the first temple to Amon; this temple, however, was destroyed by his successor, Akhenaton (who probably renamed the city Gem-aten), but it was later restored by Tutankhamen (reigned 1333–23 BC). Taharqa (690–664 BC) renovated and enlarged the temple, leaving important stelae there. The city was sacked by the Roman Petronius Arbiter in 23 BC, and, though it was occupied for two centuries thereafter, it did not regain its former wealth and importance.

Kawabata Yasunari (b. June 11, 1899, Ōsaka—d. April 16, 1972, Zushi, Japan), Japanese novelist who won the Nobel Prize for Literature in 1968. His melancholic lyricism echoes an ancient Japanese literary tradition in the modern idiom. The sense of loneliness and preoccupation with death that permeates much of his mature writing possibly derives from the loneliness of his childhood (he was orphaned early and lost all near relatives while still in his youth).

Kawabata graduated from Tokyo Imperial University in 1924 and made his entrance into the literary world with the semiautobiographical *Izu no odoriko* (1926; *The Izu Dancer*). It appeared in the journal *Bungei jidai* ("The Artistic Age"), which he founded with the writer Yokomitsu Riichi; this journal became the organ of the Neosensualist group with which Kawabata was early associated.



Kawabata Yasunari
Harold Strauss

This school is said to have derived much of its aesthetic from such post-World War I French literary currents as Dadaism, Expressionism, and Cubism. Their influence on Kawabata's work may be seen in the abrupt transitions, in imagery that is frequently startling in its mixture of incongruous impressions, and in his juxtaposition of the beautiful and the ugly. The same qualities, however, are present in Japanese prose of the 17th century and in the *renga* (linked verse) of the 15th century. It is to the latter that Kawabata's fiction seemed to draw nearer in later years.

There is a formlessness about much of Kawabata's writing, reminiscent of the fluid composition of *renga*. His best-known novel, *Yukiguni* (1948; *Snow Country*), was begun in 1935; after several different endings were discarded, it was completed 12 years later, although the final version did not appear until 1948. *Sembazuru* (*Thousand Cranes*), intended as a semisequel to *Yukiguni,* was begun in 1949 and never completed. These and *Yama no oto* (1949–54; *The Sound of the Mountain*) are considered to be his best novels.

When Kawabata accepted the Nobel Prize, he said that in his work he tried to beautify death and to seek harmony among man, nature, and emptiness and that he had been striving for beauty all his life. He committed suicide shortly after the death of his friend Mishima Yukio.

Kawagoe, city, Saitama *ken* (prefecture), Honshu, Japan, on the northern Musashino plateau. It developed around a castle built by the Ōta family in the 15th century and prospered as a post town on the road to Edo (now Tokyo) and as a port on the Shingashi River. During the Tokugawa period (1603–1867) it was known for the manufacture of castings and fine furniture. A railway to Tokyo, 23 miles (37 km) southeast, was opened in 1895, and Kawagoe rapidly became a commercial centre. Industries now include textile manufacture and food processing. The city also serves as a residential suburb of the Tokyo–Yokohama Metropolitan Area. Pop. (1987 est.) 294,658.

Kawaguchi, city, Saitama *ken* (prefecture), Honshu, Japan, on the alluvial plain of the Ara River, just north of Tokyo. During the Tokugawa period (1603–1867) it was a post town and marketplace, with few industries. The manufacture of metal castings grew rapidly during the early 20th century, and since World War II other industries, such as the manufacture of textiles and precision instruments and brewing, have been introduced. Pop. (1987 est.) 416,808.

Kawai Gyokudō, original name KAWAI YOSHISABURŌ (b. Nov. 24, 1873, Aichi prefecture, Japan—d. June 30, 1957, Tokyo), artist who contributed to the rejuvenation of traditional Japanese painting.

He went to Kyōto in 1887 to study painting under Kōno Bairyū (1844–95), a master of the Shijō school of painting (known for its realism based on sketching). On his teacher's death he proceeded to Tokyo and studied under Hashimoto Gahō (1835–1908), who belonged to the Kanō school (stressing Chinese subjects and technique). He also studied Western-style painting and developed a highly personal style, especially in the field of landscape painting. Among his representative works are "Futsuka zuki" ("The New Moon"), "Yuku haru" ("The Departing Spring"), "Mine-no-yū" ("Evening at the Mountain Top"), and "Bosetsu" ("Snow in the Evening").

Kawai Kanjirō (b. Aug. 24, 1890, Yasugi, Japan—d. Nov. 18, 1963, Kyōto), potter who

sought to combine modern methods of manufacture with traditional Japanese and English designs.

Kanjirō was graduated from the Tokyo Higher Polytechnical School in 1914 and worked briefly at the Kyōto Research Institute for Ceramics. In 1920 he built his own kiln in Kyōto and began to give exhibitions. His first works demonstrated his interest in Chinese and Korean techniques.

In 1925, in association with Yanagi Sōetsu and Hamada Shōji, he started the folk-art movement, developing ceramic ware for daily use employing styles from the old folk arts of Japan and England. After World War II he extended his efforts to the mass production of pottery with handicraft characteristics, employing techniques such as *doro hakeme* (literally, "brush-traits on the mud"), a method of simulating brush strokes on the clay.

Kanjirō's most notable individual works include a celadon porcelain flower vase with blood-red figure (1924), a pot with grass and flowers coloured in copper-red and iron-black (1937), and a flat pot with *uchi-gusuri* glazing (1962).

Kawaíb, also spelled CAWAHÍB, South American Indian peoples of the Brazilian Mato Grosso. In the 18th and early 19th centuries they were driven out of their original home along the upper Tapajós River by the warlike Mundurukú and split into six isolated groups between the Teles Pires and the Madeira rivers. The Parintintin of the Madeira River and the Tupí-Kawaíb of the upper Jiparaná River are the best-known remnant populations of the Kawaíb. All groups speak Tupian languages.

The Parintintin economy was typical of the tropical forest, combining agriculture with hunting, gathering, and especially fishing. The Parintintin were, however, continually at war with all outsiders; they were cannibals as well as headhunters. They fought with the Mundurukú, Brazilian colonists, and the Piraháa until they made peace in 1922, when their numbers were estimated at 250. Many subsequently died of European diseases. The few remaining Parintintin live on the Igarapé Ipixuna, a tributary of Lake Uruapiára, or have become rubber workers on the Madeira River.

The Tupí-Kawaíb economy and culture were similar to those of the Parintintin. The Tupí-Kawaíb had a complex social organization with more than 20 clans. They were first encountered in 1913–14 by the Brazilian military. The effect of European diseases on native populations is tragically demonstrated by statistics of the Tupí-Kawaíb's Takwatip clan. From a population of 300 individuals in 1915, only 59 persons were alive in 1928, and by 1938 there were only 7 survivors.

Kawaihae, deepwater port on Kawaihae Bay, northwestern coast of Hawaii Island, Hawaii, U.S. It marks the northern point of a 40-mile (64-kilometre) stretch known as the "Gold Coast," a resort-beach development area that follows the Queen Kaahumanu Highway around Anaehoomalu and Kiholo bays. Kawaihae was a busy port in the 19th century for whalers and traders but declined with the advent of steamships. By the late 20th century, however, harbour improvements including piers and terminals for shipping, mostly bulk sugar and cattle on the hoof (from the huge Parker Ranch and smaller ranches inland), had made Kawaihae the island's second port after Hilo. Just south of the harbour is Puukohula, one of the best-preserved Hawaiian *heiaus* (temples), dedicated in 1791 by Kamehameha I with human sacrifices to the war god, Kukailimoku. Nearby, around Puako, are vast fields of shallow rock carvings of early Polynesian life. The name Kawaihae, meaning "water of wrath," recalls a story of people fighting for water from a pool in the locally arid area.

Kawakami Hajime (b. Oct. 20, 1879, Iwakuni, Japan—d. Jan. 30, 1946, Tokyo), journalist, poet, and university professor who was one of Japan's first Marxist theoreticians.

While working as a journalist after his graduation from Tokyo University in 1902, he translated from the English E.R.A. Seligman's *Economic Interpretation of History,* the first analysis of dialectical materialism to appear in Japanese. In 1913 he went to Europe for further study. Upon his return in 1915 he became professor of economics at Kyōto Imperial University, where he remained until 1928, when his political activities forced his resignation. While in Kyōto he began publishing his own magazine, *Shakai mondai kenkyū* ("Studies on Social Problems"), which he used as a vehicle to educate students and workers in Marxist economics. His *Keizagaku taikō* ("Outline of Economics"), published in 1928, and his introduction to the Japanese edition of *Das Kapital* played a crucial role in the development of theoretical economics in Japan during the 1920s and 1930s.

During the 1920s Kawakami gradually became more directly involved in politics; he ran unsuccessfully for the national Diet (parliament) as a candidate of the Proletarian Party. He also engaged in the activities of the outlawed Japan Communist Party, his arrest for illegal political activities ending his active political involvement. Upon his release from jail in 1937, he began writing his *Autobiography,* which discusses the gradual evolution of his thought from the Tolstoyan nationalism he espoused as a youth to Marxism. During the winter of 1945–46, in the days after World War II, Kawakami, a broken old man, died of malnutrition. Four volumes of his poetry were published posthumously in 1946.

Kawanabe Gyōsai, also called SHŌJŌ GYŌSAI (b. May 18, 1831, Koga, Japan—d. April 25, 1889, Tokyo), Japanese painter and caricaturist.

After working briefly with Utagawa Kuniyoshi, the last great master of the Japanese colour print, he received most of his artistic training in the studio of Kanō Tōhaku. He soon abandoned the formal traditions of this master for the greater freedom of the popular school. The great painter Hokusai influenced his work, and, like that artist, Gyōsai delighted in sketching figures, conveying in a few masterly strokes the impression of living energy and momentary action.

During and after the political revolution of 1867, Gyōsai attained a considerable reputation as a caricaturist. Often imprisoned, he continued to express his opinions in caricature with great popular success. His sketchbooks and a five-volume work on hawks were also published. Originality and humour are obvious in his sketches of goblins and animal life, especially birds, fish, and reptiles.

Gyōsai was fond of sake and is said to have done his best work under its influence. Many of his books, prints, and sketches are signed Shōjō ("Drunken") Gyōsai.

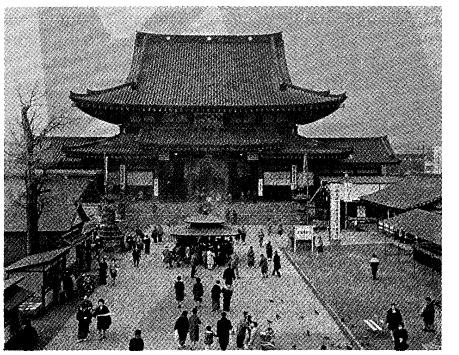
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Kawanishi, city, Hyōgo *ken* (prefecture), Honshu, Japan, on the west bank of the Ina River. Using the river water, the city produces dyed cloth and bleached and tanned leather. Fruit, flowers, and garden plants are cultivated on the river terrace to the south.

The railway to Ōsaka and Kōbe reached Kawanishi in 1910. Since then the city has increasingly become a suburb of the metropolitan area. The nearby prefectural natural park attracts many tourists. Pop. (1987 est.) 140,-147.

Kawartha Lakes, chain of 14 lakes in southeastern Ontario, Canada, stretching across Peterborough and Victoria counties, just north and west of Peterborough and 30–70 miles (50–115 km) northeast of Toronto. Ranging in size from 2 to 18 square miles (5 to 47 square km), the lakes form a major link in the Trent Canal (a waterway connecting Georgian Bay in Lake Huron with Lake Ontario). Once the centre of a lumbering region, the lakes (Scugog, Sturgeon, Cameron, Balsam, Pigeon, Bald, Sandy, Buckhorn, Chemong, Deer, Lovesick, Stony, Clear, and Katchewanooka) now constitute a popular summer-resort region noted for canoeing, boating, fishing, and scenery that resembles the Thousand Islands of the St. Lawrence River. Kawartha is a Huron Indian word meaning "bright waters and happy lands."

Kawasaki, city and port, Kanagawa *ken* (prefecture), Honshu, Japan, on Tokyo Bay, between Tokyo and Yokohama. Kawasaki is included in the Keihin Industrial Zone. Almost completely destroyed in World War II, the city has since been rebuilt. There are three industrial sections—heavy industry along the reclaimed coast, the automobile, machine, and tool industries in the city centre, and light chemical industries in the northwest. After a 1976 fire in Kawasaki, the city was rebuilt using extensive fire-prevention techniques, including provision of fire breaks, parks, and roads. The city houses the Buddhist Heigen Temple. Pop. (1987 est.) 1,126,485.



Heigen Temple, Kawasaki, Japan, dedicated to Kūkai, founder of the Shingon sect of Buddhism
Photos Pack—EB Inc.

Kawasaki Heavy Industries, Ltd., Japanese KAWASAKI JŪKŌGYŌ KK, major Japanese manufacturer of transportation equipment and machinery and an important member of the Kawasaki group of industries. It is headquartered in Kōbe.

The original enterprise was a shipyard established by Kawasaki Shōzō in 1878. In 1886 Kawasaki established another shipyard in Kōbe and, upon the merger of the two in 1896, formed the Kawasaki Shipyard Company. Its present name was adopted in 1939, after it had expanded into the manufacture of railroad equipment, steel plates, aircraft, and machinery. After World War II the company was broken up by the occupation authorities, but, after its merger with two of its previous subsidiaries in 1969, it again became a major corporation.

The company produces a wide range of products, including ships, locomotives and railway cars, and aircraft and missiles. The Kawasaki motorcycle, sold throughout the world, is its best-known consumer product and represents a significant portion of total sales.

Kawasaki Steel Corporation, Japanese KAWASAKI SEITETSU KK, major Japanese steel manufacturer and leading member of the Kawasaki group of industries. Headquarters are in Kōbe.

The company, originally a subsidiary of

Kawasaki Heavy Industries, Ltd., was incorporated in 1950 as a separate company. Its new post-World War II plant and advanced technology made it an important factor in Japan's postwar industrial recovery.

Kawasaki engages primarily in the manufacture of iron and steel products, including steel plates and sheets, structural steel, tubular products, castings and forgings, and welding electrodes. It has manufacturing plants in a number of countries.

Kawasaki syndrome, also called KAWASAKI DISEASE, or MUCOCUTANEOUS LYMPH NODE SYNDROME, rare disease of unknown cause. It is one of the leading causes of acquired heart disease in children.

Kawasaki syndrome, which usually occurs in children less than 5 years of age, was first described in Japan in 1967. It is characterized by prolonged fever, congestion of the ocular conjunctiva, changes in the lips and oral cavity, swelling of the cervical lymph nodes, skin rash, reddening of the palms of the hands and soles of the feet (with some swelling of extremities), and damage to the coronary arteries. Mites, bacteria, rickettsia, and chemicals have been suggested as agents of Kawasaki syndrome. In the late 1980s some researchers suggested that a virus produces the syndrome, but no conclusive proof has been reported.

The symptoms of the disease are usually treated with high doses of aspirin. Although virtually all children who are afflicted with Kawasaki syndrome eventually conquer the symptomatic fever and rash, about one-fifth of those afflicted have weakened hearts because of structural changes in the blood vessels of the heart.

Kawatake Mokuami, original name YOSHIMURA SHINSHICHI, also called KAWATAKE SHINSHICHI II, or FURUKAWA MOKUAMI (b. Feb. 3, 1816, Edo, Japan—d. Jan. 22, 1893, Tokyo), versatile and prolific Japanese Kabuki playwright whose work is valued for its poetic quality and inventive plotting.

Working for the Ichimura Theatre in Edo, he wrote many kinds of plays during a long apprenticeship. During his 40s, Kawatake established his reputation writing domestic plays (*sewamono*) and picaresque plays (*shiranami mono*) for the actor Ichikawa Kodanji IV. Following the Meiji Restoration (1868), Kawatake began producing modified versions of traditional history plays, emphasizing factual accuracy in his works. He also pioneered in producing a new kind of domestic play that explicitly described the modernization and Westernization of early Meiji society. He decided to retire in 1881 at the age of 65 and write a play, *Shimachidori tsuki no shiranami,* that would sum up all his work.

From 1882 until 1893, Kawatake staged the plays of Chikamatsu Monzaemon and wrote dance dramas for Ichikawa Danjūrō IX and plays for Onoe Kikugorō V. Of his more than 360 plays, some of the best remembered are *Aotozōshi hana no nishikie, Keian taiheiki, Sannin Kichiza kuruwa no hatsugai, Tsuta momiji utsunoya tōge, Kumo ni magō ueno no hatsuhana, Renjishi, Tsuchigumo,* and *Momijigari.*

Kawkaw (Mali): *see* Gao.

Kawm al-Aḥmar (Egypt): *see* Hierakonpolis.

Kawm Umbū, also spelled KUM OMBU, or KÔM OMBO, town and valley·of Upper Egypt, situated about 30 miles (48 km) north of the Aswān High Dam in Aswān *muḥāfaẓah* (governorate). The town, an agricultural marketplace and a sugarcane-processing and cotton-ginning centre, lies on the east bank of the Nile between the main valley highway and the Cairo–Aswān Railway.

Just to the east, the Nile gorge opens up into a valley up to 10 miles (16 km) wide and 20 miles (32 km) long from north to south. With the construction of the Aswān High Dam (1959–1970) and the creation of Lake Nasser, more than 60,000 Nubian Egyptians were resettled from their flooded homes in villages and model towns around the valley on lands reclaimed from the desert. They now raise sugarcane and other cash crops irrigated by the dam to supplement their traditional wheat and corn (maize) subsistence farming. Historically the Nile River valley south of Kawm Umbū was populated largely by ethnic Nubians or mixed Egypto-Nubians, who also live in the northern Sudan.

A short distance south-southwest of modern Kawm Umbū (Arabic: "Hill of Umbū") lies ancient Ombos. It is known for its unique double temple of the Ptolemaic and Roman periods, which is dedicated to Sebek (Suchos), the crocodile god, and to Horus, the falcon-headed god. Parts of the temple's pylon and court have been eroded away by the river. Excavations by Egypt's Antiquities Department began on the ancient town's mound in the early 1980s. Kawm Umbū probably owed its foundation to the site's strategic location, commanding both the Nile and the routes from Nubia to the Nile valley, and was especially prosperous under the Hellenistic Ptolemaic dynasty (304–30 BC), when it was the capital of the separate nome (province) of Ombos. Pop. (1986 prelim.) 52,131.

Kawoela, also spelled KAWULA (Indonesia): *see* Lomblen Island.

Kay, John: (English humanist and physician): *see* Caius, John.

Kay, John (b. July 16, 1704, near Bury, Lancashire, Eng.—d. 1764?, France), English machinist and engineer, inventor of the flying shuttle, an important step toward automatic weaving.

Son of a woolen manufacturer, he was placed in charge of his father's mill while still a youth. He made many improvements in dressing, batting, and carding machinery.

On May 26, 1733, he received a patent for a "New Engine or Machine for Opening and Dressing Wool" that incorporated his famous flying shuttle. Using the flying shuttle, one weaver could weave fabrics of any width more quickly than two could before.



John Kay, detail of a lithograph by Madeley

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

The weavers were quick to adopt the new invention but organized a protective club to avoid paying Kay a royalty. After he lost most of his money in litigation to protect his patent, Kay moved to France, where he is said to have died in obscurity and want.

Kay, Ulysses (Simpson) (b. Jan. 7, 1917, Tucson, Ariz., U.S.), American composer, a prominent representative of the Neoclassical school.

A nephew of the New Orleans jazz trumpeter Joe ("King") Oliver, Kay played jazz saxophone as a boy; later, he turned to piano, violin, and composition. After taking his B.A. at the University of Arizona (1938), he studied at the Eastman School of Music (M.A., 1940), the Berkshire Music Center, Yale University (with the composer Paul Hindemith), and Columbia University.

After naval service (1942–46) during World War II as a performer, composer, and arranger for dance bands, Kay settled in New York and produced works for chamber ensemble (*Suite for Strings,* 1947), orchestra (*Concerto,* 1948), and film (*The Quiet One,* 1949). He worked in Rome from 1949 to 1952; in 1958 he was a member of the first delegation of American composers to visit the Soviet Union. From 1968 he was a professor of music at City University of New York.

Kay's music is characterized by melodic lyricism and tonal orientation (*i.e.,* organized around a given tone as a focal point) supplemented by chromaticism (use of all tones of the chromatic scale, whether or not they belong to a particular key). In his later works he also uses quartal harmony, or chords built of tones a fourth apart, rather than the usual third. His works include many film and television scores, among them his notable *Essay on Death* (1964), a tribute to President John F. Kennedy. Besides large orchestral works, including the *Symphony* (1967) and *Southern Harmony* (1975), Kay wrote chamber music, choral works such as the cantata *Song of Jeremiah* (1945), organ and piano music, short band pieces, and two one-act operas: *The Boor* (1955) and *The Juggler of Our Lady* (1956).

Kay-Shuttleworth, Sir James (Phillips), 1ST BARONET, original surname KAY (b. July 20, 1804, Rochdale, Lancashire, Eng.—d. May 26, 1877, London), physician, public-health reformer, and chief founder of the English system of publicly financed elementary education. The special training of teachers and the inspection of schools by government officials were among the reforms he advocated, and he introduced pupil-teachers—intellectually promising youths (aged 13–18) who simultaneously taught in elementary schools and received secondary education from the heads of those schools. In 1839–40 he and E. Carleton Tufnell founded St. John's College, Battersea, London, one of the first normal schools (teachers' colleges) in England.

Kaya, also called KARAK, Japanese MIMANA, tribal league formed sometime before the 3rd century AD in the area west of the Naktong River in southern Korea. The traditional date for the founding of this confederation is given as AD 42, but this is considered highly unreliable. The confederation was sometimes known as Karak after its largest single unit.

Because the area was isolated from the rest of the peninsula by Mount Chii in the west and Mount Kaya in the north, the Kaya confederation developed trade largely by sea with the Chinese capital at Lo-lang and with Wae (Japan). The people of Kaya are thought to be closely related to the tribes that crossed over from Korea to Japan a century or two before this period, and Kaya frequently sought aid from the Japanese in its feuds with its larger Korean neighbours.

Archaeological finds suggest that Kaya developed a culture not much behind that of the neighbouring Silla kingdom. Various earthenwares with patterns quite different from those of Silla have been excavated from the region. The Kaya people invented a unique musical instrument, the *kayagum,* and produced a well-known player of the instrument named U Ruk.

Because of its unfavourable conditions—it was surrounded on the Korean peninsula by the two greater powers of Silla and Paekche—the political and social development of Kaya was arrested, and it did not mature into a centralized kingdom. Silla subjugated the eastern

half of the kingdom in 532 and the western half in 562.

kaya (tree): *see* Japanese torreya.

kayak, one of the two common types of canoe used for recreation and sport. It originated with the Eskimos of Greenland and was later also used by Alaskan Eskimos. It has a pointed bow and stern and no keel and is covered except for a cockpit in which the paddler or paddlers sit, facing forward and using a double-bladed paddle. The kayak was commonly built for one occupant but could be designed for two or three. The Eskimos built kayaks by stretching seal or other animal skins over a driftwood or whalebone frame and rubbing them with animal fat to waterproof the covering. The paddler wore an overlapping shield to permit the kayak to be righted without shipping (*i.e.,* taking on) water after rolling over. The kayak was used by Eskimo men for fishing and hunting. In the 20th century the Eskimos gradually abandoned the kayak in favour of motorboats. For the use and construction of the kayak in modern recreation and sport, *see* canoeing. *See also* umiak.



International slalom kayak
Ted Heidenreich Jr.

For winners of kayak championships in singles, pairs, and fours competition, *see* Sporting Record: *Canoeing;* Olympic Games.

kayakeum, also spelled KAYAGUM, or KAYA KUM, musical instrument, a Korean board zither with 12 silk strings, movable bridges, and a convex upper surface. It is a rectangle about 5 feet (1.5 m) in length. Although related to similar Chinese and Japanese instruments, such as the *cheng, ch'in, koto,* and *wagon,* it is played in a distinctive Korean manner. The *djunadjan* is a similar, slightly smaller instrument, with 10 pairs of strings.

kayāl, also spelled KHAYAL, in Hindustani music (*q.v.*), a musical form based on a Hindi song in two parts that recur between expanding cycles of melodic and rhythmic improvisation. In a standard performance a slow (*vilambit*) *kayāl* is followed by a shorter, fast (*drut*) *kayāl* in the same raga.

The *kayāl* is related to the longer melodic form known as the *dhrupad* but has fewer restrictions. It is usually accompanied by *tabla* (drums) and *tamburā* (lutes) in a variety of *tālas* (metric cycles).

Kayan, indigenous people of central Borneo, grouped with the Kenyah and several lesser groups under the general name Bahau. Numbering about 27,000 in the late 20th century, the Kayan are settled mainly along the middle reaches of the Baram, Bintulu, and Rajang rivers in Sarawak. In Indonesian Borneo the Kayan live mainly near the headwaters of the Kayan River and along the middle reaches of the Mahakam and Kapuas rivers.

The Kayan live on the banks of rivers—navigable by canoes—in long houses that individually may contain 50 or more family apartments. The extensive quarters of the chief are often decorated with carvings and murals and are in the centre of the house. Several houses may be grouped to form a village. The Kayan have a subsistence economy based on shifting cultivation, hill rice being grown on clearings in the rain forest. Sago is a subsidiary crop; fishing, hunting, and the collection of forest produce are other important economic activities. Many of the Kayan are skilled blacksmiths, and they are noted for their fine craftsmanship and traditional art. Kayan society has a class system, class endogamy being marked among the aristocrats. Formerly the Kayan practiced head-hunting and were in frequent conflict with the Iban and other Dyak tribes. The Kayan have an elaborate traditional religion with a pantheon of gods, a wide range of animistic beliefs, and such ritual institutions as shamanism and augury. Many Kayan of Sarawak are Christians.

Kaye, Danny, original name DAVID DANIEL KOMINSKI (b. Jan. 18, 1913, New York City—d. March 3, 1987, Los Angeles), American actor and comedian in motion pictures, television, and on the stage.

The son of Ukrainian immigrants, he worked as a comic entertainer in hotels in the Catskill Mountains in New York state and spent the rest of the 1930sdoing comedy and dance routines in nightclubs across the United States. During this time he adopted the name Danny Kaye and originated the pantomimes, rapid-fire scat singing, and physical antics that were to become his trademark. Kaye achieved a rapid success on the Broadway stage beginning with *The Straw Hat Revue* (1939) and *Lady in the Dark* (1940) and performed for American servicemen during World War II. His first motion-picture appearance was in *Up in Arms* (1944), and this was followed by starring roles in *The Kid from Brooklyn* (1946), *The Secret Life of Walter Mitty* (1947), *The Inspector General* (1949), *On the Riviera* (1950), *Hans Christian Andersen* (1952), *White Christmas* (1954), and *Me and the Colonel* (1958). Kaye played multiple roles in several of these films, but his basic screen persona was that of a meek and clumsily incompetent man who nevertheless emerges triumphant in the end.

Kaye had a weekly variety program on television during the 1960s. Throughout his later career he traveled developing countries giving comic appearances before children.

Kaye, Nora, original name NORA KOREFF (b. Jan. 17, 1920, New York City—d. Feb. 28, 1987, Los Angeles), American dramatic ballerina, called the "Duse of the Dance."

She studied at the Metropolitan Opera Ballet school and danced in the opera ensemble. After further training under Michel Fokine and George Balanchine, she joined the Ballet (now American Ballet) Theatre at its formation in 1939. Her first major success, the creation of the role of Hagar in Antony Tudor's *Pillar of Fire* (1942), was followed by penetrating performances in Tudor's *Lilac Garden,* Agnes deMille's *Fall River Legend,* and Jerome Robbins' *Cage.* She danced with the New York City Ballet from 1951 to 1954, then rejoined the Ballet Theatre (1954–60).



Nora Kaye
Maurice Seymour/Ronald Seymour

After retiring from performing in 1961, she assisted her husband, Herbert Ross, in choreographing musicals. In 1965 she was appointed assistant to the directors, and she served as associate director of the American Ballet Theatre from 1977 to 1983. She was executive producer of *The Turning Point* (1977) and coproducer of *Nijinsky* (1980), both films directed by her husband.

Kayes, town, western Mali, western Africa. It lies along the Sénégal River. Kayes is both the terminus of Sénégal River traffic and an important stop on the Mali Railway (Regie des Chemins de Fer du Mali; in Senegal, Regie des Chemins de Fer du Senegal). Southeast of Kayes is the French fort of Medine, constructed in 1855 and the site of an unsuccessful siege in 1857 against the French by al-Hājj 'Umar (founder of the Tukulor Empire). The area in which Kayes is situated has an economy based on subsistence agriculture. The most important crop is peanuts (groundnuts), and some livestock is raised. Pop. (1976) town, 49,431.

Käyri (ancient Finnish feast day): *see* Kekri.

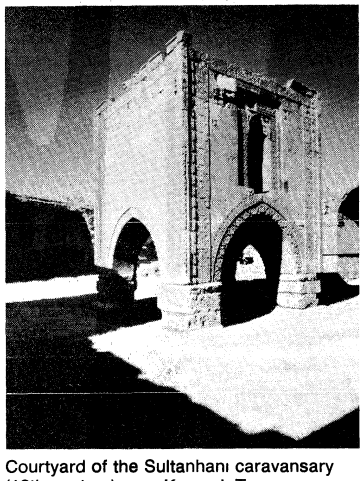
Kayser, Heinrich (Gustav Johannes) (b. March 16, 1853, Bingen, Hesse [Germany]—d. Oct. 14, 1940, Bonn, Ger.), German physicist who discovered the presence of helium in the Earth's atmosphere.

Kayser's early research work was on the properties of sound. In collaboration with the physicist and mathematician Carl D.T. Runge, Kayser carefully mapped the spectra of a large number of elements and discovered the existence of series, or closely grouped spectral lines, the spacing and intensity of which vary in a regular manner. In 1883 they developed a mathematical formula that showed the relationship between these lines. About the same time, the Swedish physicist Johannes R. Rydberg used the data of other researchers and developed a similar formula. In 1895, utilizing newly developed techniques for spectral analysis, Kayser found helium in the Earth's atmosphere—previously it was known to exist only in the Sun and in certain minerals.

Kayseri, Roman CAESAREA CAPPADOCIAE, city, central Turkey. It lies at an elevation of 3,422 feet (1,043 m) on a flat plain below the foothills of the extinct volcano Mount Ereiyes (ancient Mount Argaeus, 12,852 feet [3,917 m]). The city is situated 165 miles (265 km) east-southeast of Ankara. Originally known as Mazaca, the town was later called Eusebia by Argaeus, after King Ariarathes V Eusebes. It was the residence of the Cappadocian kings and was sacked by Tigranes I, king of Armenia, in the 1st century BC. Renamed Caesarea Cappadociae early in the 1st century AD, it served as the capital and imperial mint of the Roman province of Cappadocia. It was a nucleus of Christianity in the 4th century, when St. Basil the Great reputedly established an ecclesiastical centre just northeast of the city. Captured *c.* 1080 by the Seljuq Turks, who renamed it Kayseri, it later formed a part of the Dānishmend principality. It fell to the Mongols in 1243 and in the 14th century functioned as the chief city of the Turkmen Ertanid principality before passing to the Ottomans in 1397. After the Ottomans were defeated by Timur (Tamerlane) in 1402, Kayseri was annexed by the Karamanid Turkmens and later by the Mamlūks of Egypt and Syria until it was recaptured by the Ottoman sultan Selim I in 1515.

The present city shows many signs of its

Roman and medieval heritage. Kayseri has a well-preserved citadel originally built by the emperor Justinian and subsequently rebuilt by the Seljuqs and the Ottomans. Several outstanding examples of 13th-century Seljuq art, including several circular and octagonal *türbes* (mausoleums), are located there. The best known is the Döner Kümbet (Turning Mausoleum), noted for its delicate decorative work. Chief among the city's numerous mosques and *medreses* (religious schools) are the Ulu Cami (Great Mosque), the Kurşunlu Cami (16th century; attributed to the noted architect Sinan), and the Sahibiye Medresesi, which serves as a Seljuq museum. The 13th-century Huand Medresesi now houses the provincial museum. Kayseri is also the site of one of the earliest Turkish schools of medicine, the Giyasiye Şifahiye (early 13th century), and contains a colourful covered bazaar. The more modern sections of the city are grouped around an avenue leading to the railway station north of the Citadel. Nearby on the road from Kayseri to Sivas is the Sultanhanı caravansary, one of the finest in the Middle East.



Courtyard of the Sultanhanı caravansary (13th century) near Kayseri, Tur.
Josephine Powell, Rome

An important agricultural market for its large hinterland, Kayseri has undergone rapid industrialization and specializes in the manufacture of sugar, cement, textiles, home appliances, and aircraft spare parts. It is also a centre for goldsmiths and carpet manufacturers and the site of Erciyes University, founded in 1978. Because of its location, Kayseri serves as a communications centre and is linked by air with Istanbul. It also has railway and road connections with the major towns of Anatolia.

A few miles northeast of Kayseri, on the Sivas Road at Kültepe, archaeological excavations have unearthed the ancient Hittite–Assyrian city of Kanesh, dating from the 3rd millennium BC. The excavations recovered tens of thousands of clay tablets, inscribed in cuneiform writing, from the business archives of an Assyrian commercial colony outside the city of Kanesh. They are among the earliest written records found in Turkey and give a detailed picture of the economic life of the period.

The surrounding area lies on the Central Anatolian Plateau and is drained by the Kızıl and Yenice rivers. Its agricultural products include rye, millet, raisins, and fruits. Stock raising is significant. Pop. (1985 prelim.) city, 378,458.

Kayseri rug, floor covering handwoven in or around the city of Kayseri in central Turkey. The best-known rugs from this district are



Kayseri prayer rug with an imitated Persian design, from Anatolia, 20th century; in a private collection in New York state
In a New York state private collection; photograph, Otto E. Nelson—EB Inc.

those produced in the 20th century, largely for sale to tourists and undiscriminating collectors.

Free imitations of Ghiordes, Persian, or Cairene designs, they are carried out in wool, silk, mercerized cotton, or, more recently, rayon. Inscriptions appearing in these rugs are usually unreadable.

Kaz Dağı (mountain range, Asia Minor): *see* Ida.

Kazachskij Melkosopočnik (Kazakh S.S.R.): *see* Kazakh Uplands.

Kazakh, also spelled KAZAK, people inhabiting mainly the Kazakh Soviet Socialist Republic and the adjacent parts of the Uighur Autonomous Region of Sinkiang in China. The Kazakh speak a Turkic language but are Mongoloid in physical type. In the late 20th century there were about 7,200,000 Kazakh in the Soviet Union (mostly in Kazakhstan), 930,000 in China (mainly in Sinkiang), and 96,000 in Mongolia.

The Kazakh were traditionally pastoral nomads, dwelling the year round in portable, dome-shaped tents (called *gers*, or yurts) constructed of dismountable wooden frames covered with felt. The Kazakh migrated seasonally to find pasturage for their livestock, including horses, sheep, goats, cattle, and a few camels. The diet consisted largely of milk products supplemented by mutton. Fermented mare's milk (koumiss) and horseflesh were highly esteemed but usually available only to the prosperous.



Kazakh wrestlers
Sovfoto

The Kazakh believed themselves to be descended from a progenitor who had three sons from whom sprang the main divisions of the Kazakh: the Great, Middle, and Little hordes (*ordas*) that occupied the eastern, central, and western parts, respectively, of what became the Kazakh Khanate and is now the Kazakh S.S.R. (or Kazakhstan). These hordes were subdivided into smaller groups; the basic unit was the extended family embracing not only parents and unmarried children but married sons and their families, who camped together. Groups at various levels in the tribal hierarchy had chiefs, but only rarely was the Kazakh nation, or even one of the hordes, united under a single chief.

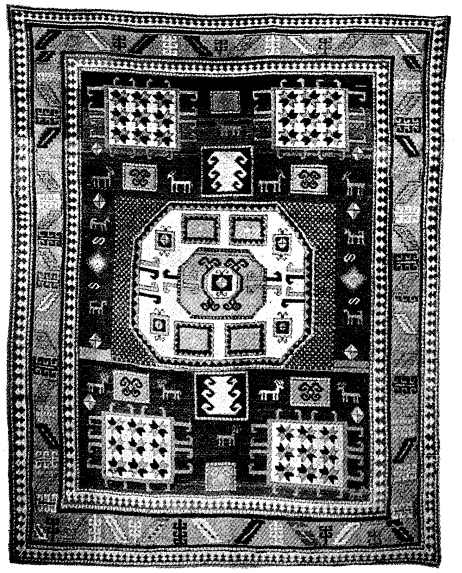
Their nomadic life was gradually curtailed by the encroachment of settled agriculture on the pasturelands. In the 19th century an increasing number of Kazakh along the borders began to plant some crops. After the Russian Revolution, many wealthy Kazakh fled with their herds to Sinkiang in China or to Afghanistan, and the remaining nomads were eventually settled on cattle-breeding collective farms. By 1934 only one nomadic group remained in the Soviet Union. In Sinkiang, however, many nomadic groups remain; a separate political division, the Kazakh Autonomous Prefecture of Ili, with its capital at Kuldja, was set aside for them, as well as two *tzu-chih-hsien* (autonomous counties).

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Kazakh khanate, former state of Turkistan, in the area of the present Kazakh Soviet Socialist Republic. Founded by the Kazakh in the late 15th century, it declined in the 17th and was gradually absorbed into the Russian Empire in the period between the early 18th and the mid-19th century.

Kazakh language, also spelled KAZAK, one of the Turkic language group (a subfamily of the Altaic languages), belonging to the northwestern, or Kipchak, subgroup. The Kazakh language is spoken primarily in the Kazakh S.S.R. and the Uighur Autonomous Region of Sinkiang in China but is also found in Mongolia and Afghanistan. The so-called Kipchak-Uzbek dialect is closely related to Kazakh and is considered by some to be a Kazakh dialect (its speakers, however, use the Uzbek literary language). The Kazakh people make up the second largest Turkic-speaking people in the Soviet Union, ranking after the Uzbeks. *See also* Turkic languages.

Kazakh rug, floor covering handmade by seminomadic people of Turkic stock living in the Kirovabad district of the Caucasus in the Azerbaijan S.S.R. These handsome rugs in bold designs and colour contrasts continue the spirit of Dragon rugs. The field patterns differ, however, offering triple-medallion schemes and centralized layouts, such as an octagon surrounded by four star-filled squares, which are reminiscent of much earlier arrangements native to other districts. Some rugs have diaper patterns of abstract forms or are exercises in the employment of latch-hooked shapes borrowed from the Yürüks. Small prayer rugs, with relatively simple



Kazakh rug from the Caucasus, late 19th century; in the Alfred E. Farah Collection

Collection of Alfred E. Farah; photograph, Otto E. Nelson—EB Inc.

designs, often have a square intrusion into the base of the prayer-niche pattern.

Kazakh rugs normally are all wool and made, as are almost all other Caucasian rugs, in the Turkish, or Ghiordes, knot. They have the longest and most recumbent pile among the Caucasian rugs and are comparatively coarse; but, to compensate, they are lustrous.

Kazakh Uplands, Russian KAZAKHSKY MELKOSOPOCHNIK, also spelled KAZACHSKIJ MELKOSOPOČNIK, hilly upland in central and eastern Kazakh Soviet Socialist Republic, occupying about one-fifth of the republic. It is a peneplain, the mountainous Paleozoic foundation of which had already been worn down into an undulating plain by the beginning of the Mesozoic era, beginning about 245 million years ago. Low hills are characteristic, and there are extensive depressions occupied by Lake Tengiz and other lakes. Isolated mountain massifs, the result of more recent earth movements, rise in the centrally located Karkaraly Mountains (4,455 feet [1,358 m]) and Ulutau Mountains (3,717 feet [1,133 m]). The climate is continental, and precipitation averages only 4–12 inches (100–300 mm) a year. The river network is therefore scant, with many streams flowing only in spring. The upland is called Sary-Arka ("Yellow Range") because of the colour of the sun-scorched vegetation, which is mainly fescue and feather-grass steppe in the north and of the semidesert variety in the south. There are pine forests on the mountain slopes and important mineral deposits at many sites.

Kazakhstan, officially KAZAKH SOVIET SOCIALIST REPUBLIC, Russian KAZAKHSKAYA SOVETSKAYA SOTSIALISTICHESKAYA RESPUBLIKA, Akademiya Nauk romanization KAZAKHSKAJA SOVETSKAJA SOCIALISTIČESKAJA RESPUBLIKA, historic region and one of the union republics of the Soviet Union.

A brief treatment of Kazakhstan follows. For full treatment, *see* MACROPAEDIA: Union of Soviet Socialist Republics.

Physical and human geography. Kazakhstan is a vast tableland containing the Kara-Kum Desert and rising to high mountains in the south along the border with the Kirgiz S.S.R. Its capital is Alma-Ata. It is bounded by the People's Republic of China on the east; the Kirgiz and Uzbek S.S.R.'s on the south; the Caspian Sea and a small section of Turkmenistan on the west; and by the Russian S.F.S.R. on the north.

Lowlands account for more than a third of the total area, hilly plains and plateaus for nearly half; the rest is mountainous. The climate is sharply continental (marked by extremes), especially in the plains and valleys, with hot summers and cold winters. Steppes and deserts dominate the landscape, the vegetation of the latter including wormwood and tamarisk. There is hardly any forest.

There are numerous mammal species in Kazakhstan, including antelope and elk; in the mountains there are wolf, bear, and snow leopard. Ermine and sable have commercial importance.

Traditional nomadic life-styles no longer predominate. Industry, particularly mining and quarrying, now plays a major role; Kazakhstan is a supplier of raw materials for the entire Soviet Union. A large number of different minerals have been discovered there, including copper, lead, zinc, silver, tungsten, tin, chromium, nickel, cobalt, vanadium, gold, iron ore, and coal. There are also phosphates, borates, and other salts. Building is an important industry, and there is much prefabricated construction. Manufacturing was stimulated during World War II by the withdrawal of manufacturing capacity from the western U.S.S.R. and thus beyond the reach of war damage; modern plants in Kazakhstan produce goods ranging from automatic presses to X-ray equipment.

Three-quarters of the farmland is used for pasture, and about a fifth of the agricultural land is arable, with the rest in hay fields and orchards or vineyards. Farming is important, and the grain-producing areas in the north produce up to a third of all the wheat grown in the Soviet Union. In the south, fruits, vegetables, melons, sugar beets, rice, and grapes predominate.

The constitution of the Kazakh S.S.R. (1937) provides for state ownership of the means of production. The highest legislative body is the Supreme Soviet of the Kazakh S.S.R. Its members are chosen by the Communist Party of Kazakhstan and are ratified every four years in a general election with a single list of candidates. It meets briefly semiannually; it elects a Presidium to function between sessions and a Council of Ministers (cabinet).

Education is provided tuition-free at all levels and is compulsory between the ages of 7 and 17. The languages of instruction are mainly Kazakh and Russian. There is a state university, a teachers college, and a variety of polytechnical, agricultural, vocational, veterinary, and medical schools.

Despite the official Soviet policy of opposing religion, in its Central Asian republics the strong Islāmic tradition is tolerated; parallel to the secular educational system is a wide network of Muslim educational institutions. Soviet Muslims can complete their education at al-Azhar University in Egypt. Graduates from al-Azhar serve as deputies on the Muslim Board of Central Asia and Kazakhstan.

Health standards are high. As industry developed, antipollution measures were introduced. Growth rates of the population in the late 20th century were so high that the rates became a political problem with respect to the older, slower-growing populations of the European U.S.S.R.

The work of Kazakh scholars on the history of the Kazakh language and literature, on the history and ethnography of the Kazakh people, and in industrial and agricultural research under the auspices of the Academy of Sciences of the Kazakh S.S.R. has continued a centuries-long intellectual tradition.

Historic Kazakh literary figures include Abū Naṣr al-Fārābī, a 10th-century author of numerous treatises on philosophy, science, and mathematics, and Abay Ibragim Kunanbayev (d. 1904), who helped develop Kazakh as a literary language. Important modern writers include the poet Jambul Jabayev and the playwright Mukhtar Auezov. The tradition of reciting epic folk poems and lyrics is still continued. There are many art and drama schools. Alma-Ata has a national picture gallery.

History. In the late 15th and early 16th centuries, the Kazakhs consolidated a nomadic empire. From 1488 to 1518 they controlled virtually the entire steppe region. This confederacy was weakened by the tendency of the khanate to separate into smaller groups, known as hordes, led by tribal chieftains and heads of clans. During the 17th century the Kazakh khanate was further weakened by Oyrat raids. Russian advances from the north, at first believed to be an aid against the Oyrats, eventually resulted in domination by the Russians and the abolition of the khanate (complete in 1848). A Kazakh nationalist movement arose in the early 20th century. It fostered an unsuccessful and bloody revolt in 1916. In 1917 a nationalist government was formed, but in 1919–20 the Red Army occupied Kazakhstan. After 1927 the Soviet government worked to settle the nomadic population of Kazakhstan and to dilute the nationalism in the region by establishing there large groups of Russians and Ukrainians. Area 1,049,200 square miles (2,717,300 square km). Pop. (1988 est.) 16,470,000.

Kazakov, Yury Pavlovich (b. Aug. 8, 1927, Moscow), Soviet short-story writer who worked in the classic Russian lyrical style of Anton Chekhov and Ivan Bunin.

Kazakov was initially a jazz musician, but he began to publish short stories in 1952. He graduated from the Gorky Institute of World Literature in 1958 and traveled extensively in the northern regions of the Soviet Union during the 1950s and '60s. Kazakov's early short stories marked a notable departure from the tenets of Socialist Realism in their rejection of heroic types and the morally didactic presentation of character. The stories in such collections as *Man'ka* (1958), *Na polustanke* (1959; "At the Station"), *Po doroge* (1961; "Along the Road"), and *Goluboe i zelyonoe* (1963; "The Blue and the Green") focus on the subtle and complex emotional reactions of rural characters during moments of inspiration, communion, betrayal, or loss. Kazakov treats questions of conscience and emphasizes the importance of the individual's harmonious coexistence with nature.

Kazan, capital city, Tatar Autonomous Soviet Socialist Republic, western Russian S.F.S.R., on the eastern shore of the upper part of the Kuybyshev Reservoir on the Volga River, where it is joined by the Kazanka. The city stretches for about 15 miles (25 km) along hills, which are much dissected by ravines. Formerly a low, wide, and often inundated floodplain separated Kazan from the Volga, but the waters of the reservoir now reach the city itself, the lower parts of which are protected by dikes.

Ancient Kazan (Iske Kazan), founded in the late 13th century by the Mongols (Tatars) of the Golden Horde after their overthrow of the Bulgar kingdom on the middle Volga, was located about 28 miles (45 km) upstream on the Kazanka; it was transferred to the mouth of the river at the end of the 14th century. After the disintegration of the Golden Horde in the 15th century, Kazan became the capital of an independent khanate. It developed as an important trading centre; annual fairs were held on an island in the Volga. In 1469 Ivan III captured Kazan, but his puppet khan organized a massacre of all Russians in the town in 1504. Finally in 1552 Ivan IV the Terrible captured Kazan after a long siege and subjugated the khanate. The old Tatar fortress was rebuilt as a Russian kremlin, the white walls and towers of which survive as a feature of the modern skyline. Kazan was seized in a revolt of 1773–74, and much of the city was

burned to the ground; Catherine II the Great rebuilt it on a gridiron pattern. The Cathedral of St. Peter and St. Paul dates from the 18th century.

As Siberia was opened up, Kazan's trading importance greatly increased, and industry developed in the 18th century; by 1900 it was one of the chief manufacturing cities of Russia. In its wide range of industries, some long-established ones still flourish on a large scale: soapmaking, leatherworking, shoemaking, and fur preparation. New industries include oil refining, electrical and precision engineering, and chemical production. Linen and foodstuffs are also produced. In 1920 Kazan became capital of the Tatar A.S.S.R.

Kazan is a major cultural and educational centre. The Kazan State University was founded in 1804. The mathematician N.I. Lobachevsky was its rector in 1827–46, and among those who studied there were Leo Tolstoy, the composer M.A. Balakirev, and V.I. Lenin. There is also a branch of the Academy of Sciences of the U.S.S.R., a conservatory, and other institutions of higher education. Kazan has a theatre of Tatar opera and ballet, theatres of Tatar and Russian drama, a philharmonic society, and a noted Tatar museum. Pop. (1987 est.) 1,068,000.

Kazan, Elia, original name ELIA KAZANJOGLOUS (b. Sept. 7, 1909, Constantinople, Tur.), American director and author, noted for his successes on the stage, especially with plays by Tennessee Williams and Arthur Miller, and for his critically acclaimed films.

Kazan was brought to the United States at four with his immigrant Greek family. He attended Williams College, Williamstown, Mass., and years later he wrote that the lonesome, unhappy years there provoked in him a deep antagonism toward privilege. He attended the Drama School at Yale, and from 1932 to 1939 he was an actor with the Group Theatre in New York City led by Lee Strasberg and Harold Clurman.

Kazan directed his first play in New York City in 1934. He won national notice as a Broadway director with such plays as Thornton Wilder's *The Skin of Our Teeth* (1942), Arthur Miller's *Death of a Salesman* (1949), and Tennessee Williams' *A Streetcar Named Desire* (1949). Kazan was cofounder (with Robert Lewis and Cheryl Crawford) of the Actors Studio in 1947.

In 1944 he began to direct films. His films, many of which incorporate liberal or socially critical themes, include *A Tree Grows in Brooklyn* (1945), *Gentlemen's Agreement* (1947), on anti-Semitism, *Pinky* (1949), on racism, *A Streetcar Named Desire* (1951), *Viva Zapata!* (1952), and *On the Waterfront* (1954); the last three starred Marlon Brando. Both *Gentlemen's Agreement* and *On the Waterfront* won him Academy Awards. Other films included *East of Eden* (1955), starring James Dean, *Baby Doll* (1956), and *Splendour in the Grass* (1960). Kazan was also codirector of the Repertory Theatre of Lincoln Center in New York City from 1960 to 1964.

The film *America, America* (1964) was adapted from his own autobiographical novel of 1962. He also wrote *The Arrangement* (1967; film, 1969), about the experiences of a Greek immigrant to the United States, *The Assassins* (1972), and *The Understudy* (1974).

His autobiography, *Elia Kazan: A Life,* was published in 1988. In it, among other things, he defended his decision to comply with the House Committee on Un-American Activities' request that he give the names of other Group Theatre members who had been secret members of the Communist Party.

Kazanlŭk, Greek SEUTHOPOLIS, town, central Bulgaria, in the Kazanlŭk Basin, 2 miles (3 km) north of the Tundzha River. The area is famous for its roses, which are made into attar of roses for the perfume industry. This industry, which developed in the 17th century, now uses approximately 20,000 acres (8,000 hectares) and includes the growing of lavender, peppermint, and pyrethrum. The town is an ancient craft centre; modern industries include textiles, food processing, and the manufacture of household appliances and musical instruments.

The Kazanlŭk Tomb, discovered in 1944 on the outskirts of town, is a Thracian burial tomb of an unknown ruler from the 4th or 3rd century BC. The fine murals that decorate the entire tomb distinguish it from 13 similar known examples. The town also has a museum, theatre, opera house, and art gallery. Kazanlŭk was ceded to Bulgaria in 1877 after the Russians captured it from Turkey. Pop. (1986 est.) 61,155.

Kazantzákis, Níkos (b. Dec. 2, 1885, Iráklion, Crete—d. Oct. 26, 1957, Freiburg im Breisgau, W.Ger.), Greek writer whose prolific output and wide variety of work represent a major contribution to modern Greek literature.

He was born during the period of revolt of Crete against rule by the Ottoman Turks, and his family fled for a short time to the Greek island of Náxos. Kazantzákis studied law at the University of Athens (1902–06) and philosophy under Henri Bergson in Paris (1907–09). He then traveled widely in Spain, England, Russia, Egypt, Palestine, and Japan, settling before World War II on the island of Aegina. He served as a minister in the Greek government (1945) and worked for the United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris (1947–48). He then moved to Antibes, Fr.

Kazantzákis' works cover a vast range, including philosophic essays, travel books, tragedies, and translations into modern Greek of such classics as Dante's *Divine Comedy* and Goethe's *Faust.* He produced lyric poetry and the epic *Odíssa* (1938; *Odyssey*), a 33,333-line sequel to the Homeric epic that expresses the full range of Kazantzákis' philosophy.

Kazantzákis is perhaps best known for his widely translated novels. They include *Víos kai politía tou Aléxi Zormpá* (1946; *Zorba the Greek*), a portrayal of a passionate lover of life and poor-man's philosopher, *O Kapetán Mikhális* (1950; *Freedom or Death*), a depiction of Cretan Greeks' struggle against their Turkish overlords in the 19th century, *O Khristós Xanastavrónetai* (1954; *The Greek Passion*), and *O televtaíos pirasmós* (1955; *The Last Temptation of Christ*), a revisionist psychological study of Jesus Christ. Published after his death was the autobiographical *Anaforá stóv Gréko* (1961; *Report to Greco*). Motion pictures based on his works include *Celui qui doit mourir* (1958; "He Who Must Die," from *The Greek Passion*), *Zorba the Greek* (1964), and *The Last Temptation of Christ* (1988). His second wife, Helen Kazantzákis, wrote a biography, *Nikos Kazantzakis* (1968).

Kazaure, town and traditional emirate in northwestern Kano state, northern Nigeria. The town has been the emirate's headquarters since 1819. It was founded by Dan Tunku, a Fulani warrior who was one of the 14 flag bearers for the Fulani jihad ("holy war") leader Usman dan Fodio. Dan Tunku arrived from the nearby town of Dambatta (Dambarta) at the stockaded village that he named Kazaure, for a local hunter, and established an emirate (officially subject to Kano) that was carved from the adjoining Kano, Katsina, and Daura emirates.

Troubles with the emir of Kano led to a series of Kano–Kazaure battles until the Fulani sultan at Sokoto (a town 216 miles [348 km] west-northwest) granted independence to the Kazaure emirate in 1824.

During the reign (1824–57) of Emir Dambo, Dan Tunku's son and successor, the emirate was enlarged (partially at the expense of the adjacent state of Damagaram), and Kazaure town's surrounding wall and palace were constructed. Wars with Damagaram continued until the Kazaure victory in 1889. Kazaure town was occupied by the British in 1906, and the emirate's area of 500 square miles (1,300 square km) was incorporated into Kano Province. In 1968 it became part of Kano State.

The town is now a collecting point for peanuts (groundnuts), which are transshipped to Kano city, 45 miles (72 km) south-southeast, for export. It is also the area's chief market centre for millet, sorghum, onions, peanuts, cotton, cattle, goats, sheep, guinea fowl, donkeys, hides, and skins. It is served by an agricultural-training institute and a dispensary and a health office. Pop. (latest census) town, 4,361.

Kazeh (Tanzania): *see* Tabora.

Kazembe, also spelled CAZEMBE, the largest and most highly organized of the Lunda nations (*see* Luba-Lunda states) in Central Africa, and the title of all its rulers. At the height of its power (*c.* 1800), the Kazembe nation occupied almost all of the territory now included in Shaba Region (in Zaire) and northern Zambia. Apparently created about 1740 by an exploring party from western Lunda, the kingdom rapidly increased in size and influence through the conquest and annexation of neighbouring nations. After 1850, however, disputed succession led to civil war, and the kingdom was finally destroyed about 1890 by attacks from eastern tribes.

During the existence of the nation of Kazembe there were nine kings with the name Kazembe. The greatest of these was Kazembe II, known as Kaniembo (reigned *c.* 1740–60), who conquered most of the territory that the nation eventually occupied, extending citizenship to those he conquered and establishing the complicated network of tribute and trade that held the vast kingdom together. His grandson, Kazembe IV, known as Kibangu Keleka (reigned 1805–50), encouraged contacts with Portuguese traders from Angola, and Kazembe became an important centre of trade between the nations in the centre of Africa and the Portuguese and Arabs on the eastern coast.

Kāzerūn, town, southwestern Iran. It is situated on a plain among high limestone ridges on the north–south trunk road. The town is extensive, with well-built houses. It is surrounded by date palms, citrus orchards, and wheat and tobacco fields; rice, cotton, and vines also are grown.

The ruins of the ancient city of Bishāpūr (or Shāhpūr), 12 miles (19 km) north, have Sāsānid (*c.* AD 224–651) bas-reliefs and, in a lofty cave, a statue of Shāpūr I (AD 241–272). Southeast of Kāzerūn on a high mound are the ruins of Qal'eh-ye Gabri ("Castle of the Ghebars [Zoroastrians]"). Pop. (1985 est.) 66,500.



Citrus orchards outside Kāzerūn, Iran

J.P. Vuillomenet—Rapho/Photo Researchers

kaziasker (from Arabic *qāḍī*, "judge," and *'askar*, "army"), the second highest officer in the judicial hierarchy of the Ottoman Empire; he ranked immediately after the *shaykh al-Islām*, the head of the *'ulamā'* (men of religious learning).

The title was created by Sultan Murad I (reigned 1360–89), who appointed Çandarli Kara Halil as the first *kaziasker*. In that office he accompanied the army in campaigns and dispensed justice in camp. After the conquest of Istanbul (1453), Sultan Mehmed II (reigned 1444–46, 1451–81) duplicated the office on advice of the grand vizier Karamani Mehmed Paşa, who was envious of the powers of the incumbent *kaziasker*. Thenceforth there were two *kaziasker*s, one of Rumelia (Ottoman territories in the Balkans) and the other of Anatolia.

Both *kaziasker*s had the authority to appoint the judges and professors at theological schools in their respective areas, except those of Istanbul, Bursa, and Edirne. They dealt with matters of inheritance and marriage and had seats in the state council. During the 17th century, however, the *kaziasker* of Rumelia deprived his Anatolian counterpart of most of his authority and came to deal with all cases of inheritance concerning the Muslims and extended his authority to estates, to debts of the state, and to interests of the treasury. His authority extended to the three Barbary states, and his jurisdiction over the judges of the Crimea was recognized by the Treaty of Küçük Kaynarca (1774).

Kazimierz (Polish personal name): *see under* Casimir.

Kazimir (Czech, Polish, Russian personal name): *see under* Casimir.

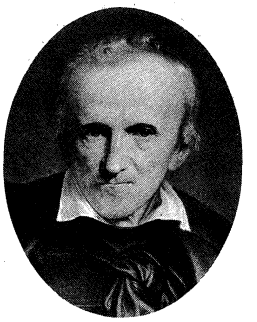
Kazin, Alfred (b. June 5, 1915, Brooklyn, N.Y., U.S.), U.S. teacher, editor, and critic of literature.

Kazin, whose parents were Russian immigrants, attended the City College of New York during the Great Depression and then worked as a free-lance book reviewer for various periodicals. At age 27 he wrote a sweeping historical study of modern American literature, *On Native Grounds* (1942), which won him instant recognition as a perceptive critic with a distinct point of view. The book traced the social and political movements that inspired successive stages of literary development in America.

Many of Kazin's later works dealt with the forces that drive an individual to write. Kazin felt that with increasing technological domination of society, literature had diminished in importance as a vehicle of personal growth and political definition. His criticism, both severe and generous, revealed writers as imperfect individuals struggling with difficult times. Kazin's sketches of literary personalities revealed much about both the writers and their eras. His critical and political sensibilities were inextricably intertwined. Among the books Kazin edited are *The Portable Blake* (1946), *The Stature of Theodore Dreiser* (1955), and *The Works of Anne Frank* (1959). His other writings include *Starting Out in the Thirties* (1965), *Bright Book of Life* (1973), *New York Jew* (1978), and *An American Procession* (1984).

Kazinczy, Ferenc (b. Oct. 27, 1759, Érsemlyén, Hung.—d. August 1831, Széphalom), Hungarian man of letters whose reform of the Hungarian language and attempts to improve literary style had great influence.

Born of a well-to-do family of the nobility, Kazinczy learned German and French as a child and entered a famous Protestant college at Sárospatak in 1769. While there, he published his first book, a small geography of Hungary (1775). Later he studied law and became a civil servant. Imbued with the ideas of the Enlightenment, he was at home in the



Kazinczy, lithograph after a painting by T. Heinrich, 1859

By courtesy of the Petofi Irodalmi Muzeum, Budapest

progressive administration introduced by the emperor Joseph II, but during the reactionary period under Francis II he joined the opposition. He was arrested for participating in a political conspiracy (December 1794) and condemned to death, even though his role was minor. His sentence was commuted to imprisonment, and he was released in June 1801, a middle-aged man standing on the threshold of a new life, which he intended to devote entirely to the improvement of Hungarian literature.

The task was difficult, since political and social conditions were not such as to encourage the development of a viable culture, and the tastes of even the small reading public were unrefined. Living with his wife and seven children on the small income from his estate, he tried, through a voluminous correspondence with other writers and his own writings—biting epigrams published in *Tövisek és virágok* (1811) and many sonnets, a poetical form that he introduced into Hungary—to banish from literature everything he considered vulgar and uncouth.

His position as self-styled censor involved Kazinczy in endless controversies. His most famous battle was fought to improve the language: he initiated reforms of grammar, spelling, and style that made Hungarian a more flexible medium for literary expression. After serving on the committee that founded the Hungarian Academy in 1828, he was elected a member of the academy in 1830.

Kāziranga National Park, national park in Sibsāgar district, Assam state, northeastern India, situated on the southern bank of the Brahmaputra River, 60 mi (97 km) west of Jorhāt on the main road to Gauhāti. Established in 1908 as a game reserve, it became a national park in 1974. It has an area of 165 sq mi (430 sq km) and lies between the Brahmaputra River and the Mīkīr Hills. Much of the park is marshland interspersed with large pools fringed with reeds, patches of elephant grass, scattered trees, and thickets. Wildlife includes, in particular, the great Indian one-horned rhinoceros, tiger, leopard, elephant, wild pig, hog deer, swamp deer, buffalo, and pelican, stork, and other waterfowl. Guest houses perched above the main road at Kohra near the southern boundary give a panoramic view of the Himalayas on the rare occasions when the sky is clear. There are several low watchtowers, and elephant rides are available for viewing wildlife in the swampland.

kazoku, in Japan, the unified, crown-appointed aristocracy of the period 1869–1947, which replaced the feudal lords. The *kazoku* ("flower family") class was created in 1869 as part of the Westernizing reforms of the Meiji Restoration. In this class the old feudal lords (daimyo) and court nobles (*kuge*) were merged into one group and deprived of territorial privileges. In 1884 the *kazoku* was reorganized into a European-style peerage, with the ranks of prince, marquis, count, viscount, and baron. Membership was opened to those who performed distinguished public service. After 1889 this class composed the upper house of the Japanese legislature. The *kazoku* was abolished by the constitution of 1947.

Kazvin, also spelled QAZVĪN, city, Markazī (Tehrān) *ostān* (province), north central Iran, in a wide, fertile plain at the southern foot of the Elburz Mountains. Originally called Shad Shāhpūr, it was founded by the Sāsānian king Shāpūr I *c.* AD 250. It flourished in early Muslim times (7th century), serving as a base for Islāmization, and was surrounded by strong fortifications by Hārūn ar-Rashīd. Genghis Khan laid waste the city; however, it revived under the Ṣafavids when Shāh Ṭahmāsp I (ruled 1524–1576) moved the capital from Tabriz to Kazvin. The city lost its eminence once again when 'Abbās I the Great (ruled 1588–1629) transferred the government to Isfahan in 1598. Nāder Shāh assumed the crown in Kazvin shortly after his return from invading India in 1739 and before returning to Meshed, then capital of Iran. Āghā Moḥammed Khān of the Qājār dynasty reestablished Kazvin about 1796 as a major base for foreign trade with the Caspian Sea, Persian Gulf, and Asia Minor. Interference by Russia and Britain in the internal politics of Iran in the 19th century and the autocratic rule of the country resulted in unrest and the growth of a nationalist movement. The city fell to a nationalist force from Rasht in 1909. The British established a military headquarters in Kazvin in the 1920s; a coup d'état was launched from Kazvin in 1921 that led to Iran's consolidation under Reza Shah Pahlavi. There were riots and fighting between the local people and the Iranian Army during the Iranian Revolution in 1978–79.



The courtyard of the Jāme' Masjed (mosque), Kazvin, Iran

By courtesy of the Iran National Tourist Organization

Kazvin is a regional communications centre, connected by road and rail with Tehrān and Tabriz and by road with the Caspian Sea and Hamadan. Industries include cloth weaving, cotton ginning, wool carding, flour milling, food processing, and electrical equipment manufacturing. There is also a thermoelectric plant, and a modern poultry-raising complex was developed with the help of the former Agricultural Development Bank of Iran. Buildings dating from the time of the Seljuq sultans include the Masjid-e Jom'eh (Friday Mosque); the Madrasah Haidariye, a square hall surmounted by a cupola; the tomb of Mostowfi, the Persian traveller; and the mosque of the Shāh. In the mountains about 37 mi (60 km) northeast of Kazvin are the remains of a castle of the Assassins. Pop. (1976) 138,527.

K.B.E., knight commander of the British Empire, member of the second highest class

of a British order of knighthood. *See* British Empire, The Most Excellent Order of the.

K.C.B., knight commander of the Bath, member of the second highest rank of knightly class in a British order of knighthood. *See* Bath, The Most Honourable Order of the.

K.C.M.G., knight commander of St. Michael and St. George, member of the second highest rank of a British order of knighthood. *See* Saint Michael and Saint George, The Most Distinguished Order of.

K.C.V.O., knight commander of the Royal Victorian Order, member of the second highest rank of a British order of knighthood. *See* Royal Victorian Order.

Ke Ga, Point, Vietnamese MUI KE GA, formerly CAP VARELLA, or CAPE VARELLA, the southeasternmost point of Vietnam, on the South China Sea, on the coast of southern Phu Khanh *tinh* (province). The promontory, rising to 2,316 ft (706 m) above the sea, is a continuation of a massive southwest–northeast-trending granite spur of the Chaîne Annamitique (Annamite Chain; Vietnamese Truong Son), which rises to 6,663 ft in Nui (peak) Vong Phu (French, La Mère et l'Enfant; English, Mother and Child). In 1936 the last remaining section of the coastal railroad linking Saigon (now Ho Chi Minh City) with Hanoi penetrated the coastal barrier by a series of tunnels, one of which is ¾ mi (1.2 km) long.

ke-yi, Pinyin GEYI (Chinese: "matching the meaning"), practice by Chinese Buddhists of borrowing from Taoist and other philosophical texts phrases with which to explain their own ideas. According to tradition, *ke-yi* was first used by Chu Fa-ya, a student of many religions of the 4th-century AD, as he came to understand Buddhism. The technique reached its height of development among translators of the *Prajña sutras*, who sought to make Buddhist thought more accessible to Chinese readers.

After Kumārajīva began his missionary work in China around 401, *ke-yi* was no longer needed; the ideas could be explained directly by an Indian authority.

Kéa, also spelled KÉOS, also called TZIÁ, westernmost of the Cyclades (*q.v.*) group of Greek islands in the Aegean Sea, east of the southern tip of Attica. With an area of 50.4 sq mi (130.6 sq km), it rises gradually toward the



Uppermost dwellings on a hill on Kéa, Greece
Henri Cartier-Bresson—Magnum

centre, to the peak of Profítis Ilías (1,841 ft [561 m]). The principal town, Kéa, on the site of ancient Ioulis, is located near the northwestern coast.

Inhabited since early Helladic times, Kéa fought on the Greek side in the naval battles of Artemisium and Salamis (both 480 BC); it joined the Delian League and the Athenian alliance. Revolting in 363–362, the populace was reduced by Athens, which established a monopoly of their ruddle (red-earth dye), a principal product. Called Tzia in the Middle Ages, it was divided in AD 1207 among four Italian adventurers. In 1537 it formed a part of the duchy of Náxos, and in 1566 it came under Turkish rule, under which it continued until in 1912 it joined the kingdom of Greece. Agricultural products include grapes, citrus, and honey, while a plant manufactures aluminum kitchenware for the Greek mainland. Some valonia oak is also exported. At ancient Karthaia are the remains of a Doric temple and other buildings. Pop. (1981) 1,648.

kea, New Zealand parrot species of the subfamily Nestorinae. *See* parrot.

Kean, Charles (John) (b. Jan. 18, 1811, Waterford, County Waterford, Ire.—d. Jan. 22, 1868, London), English actor-manager best known for his revivals of Shakespearean plays.

He was the son of the famed actor Edmund Kean; he was educated at Eton and made his debut as Young Norval in *Douglas* in London in 1827. He toured the provinces extensively but first won general acceptance during a U.S. tour in 1830. Returning to England, he steadily gained in reputation with well-honed performances, most notably as Sir Giles Overreach in *A New Way to Pay Old Debts,* in *Hamlet* and *Richard III,* and as the melancholy Jaques in *As You Like It.*

Although handicapped by poor vocal projection and an unprepossessing physical appearance, Kean compensated by perfecting the details of each performance. As manager of the Princess Theatre (1850–59) in London, he staged a series of successful revivals notable for their historical accuracy. His 1856 production of *A Midsummer Night's Dream* was especially well received. He first appeared with his father, who originally had discouraged his theatrical ambition, in Payne's *Brutus* in Glasgow in 1828. He was playing Iago to his father's Othello in 1833 when the elder Kean collapsed on stage in his final performance. He frequently appeared opposite Ellen Tree (1805–80), whom he married in 1842. Their adoptive daughter, the actress Agnes Robertson (1833–1916), made her debut at the Princess in 1851.

Articles are alphabetized word by word, not letter by letter

Kean, Edmund (b. March 17?, 1789, London—d. May 15, 1833, London), one of the greatest of English tragic actors, especially associated with the title role of Shakespeare's *Othello.* He became an innovative artist, reintroducing a naturalistic style of acting that relied on agility rather than the static posing then in vogue.

Though no official record of his birth exists, it has been well established that he was the bastard son of Ann Carey, who described herself as an itinerant actress and street hawker, and Edmund Kean, a mentally unbalanced youth who committed suicide at the age of 22. The story of Kean's upbringing is overladen with legend, much of it the product of his own later fantasies, but during his formative years he was in the charge of Charlotte Tidswell, mistress of his father's eldest brother, Moses. Tidswell, then a small-part member of the Drury Lane Theatre Company, had been born to a higher station in life and had accepted her position at Drury Lane as the cast-off mistress of Charles Howard, the 11th duke of Norfolk. Extremely ambitious for her adopted child, she gave him both an early stage training and the rudiments of a general education. Her efforts to provide a disciplined home background were defeated, however, by his willfulness and vagrancy, and for much of his childhood he lived as a waif and stray. At times he was with his mother, who exploited his precocious talents for singing, dancing, reciting, and acrobatics. For a while he was adopted by a wealthy middle-class couple, from whom he fled when he discovered that they considered him their social inferior. This behaviour was typical of the boy Kean, who displayed in miniature the character of the man he was later to become. He was as sensitive to slight as he was obsessively anxious for applause, and as self-destructive as he was determined to fulfill his destiny.

At the age of 15 he was his own master and set out to conquer the stage, the only world he knew. Joining the company of one Samuel Jerrold at Sheerness, Kent, for 15 shillings a week, he engaged to "play the whole round of tragedy, comedy, opera, farce, interlude and pantomime." The ensuing 10-year struggle was especially hard for him to endure, not only because of the privations of a strolling player's existence but also because it prolonged the agony of his frustrated ambition.

In 1808 Kean married Mary Chambers, a fellow member of his theatrical company, a woman of lower middle-class background who had little understanding of his ferocious ego. She bore him two sons, whom he called Howard and Charles, presumably in recognition of Tidswell's relationship with the Duke of Norfolk and his own latent fantasy that he was its offspring. The elder son, his favourite, died a few days after he had at last received the offer of a London engagement.

Kean's long apprenticeship left scars, particularly an addiction to alcohol, which he had come to rely on as a substitute for recognition. But the experience of adversity may well have been essential to his artistic achievement. By the standards of the time, he was unsuited to the great tragic roles. The style then in vogue was artificial, declamatory, and statuesque, and its leading exponent, John Philip Kemble, was an actor of classic good looks, imposing figure, and vocal eloquence. Though Kean had handsome features, notably unusually expressive eyes, he was small, with a voice forceful and commanding rather than melodious. He could never have hoped to compete with Kemble on Kemble's terms, so he had to school himself to become an innovator as well as a virtuoso. On Jan. 26, 1814, when, as Shylock, he made his Drury Lane debut, the measure of his triumph was not to outshine Kemble but to outmode him.

Kean reintroduced a so-called naturalistic style of acting; by rejecting static poses in



Edmund Kean, detail of a pencil drawing by Samuel Cousins, 1814; in the National Portrait Gallery, London
By courtesy of the National Portrait Gallery, London

favour of agility of movement, and beautiful recitation in favour of unleashed passion, he gave the illusion of *being,* rather than *playing,* a character. There was nothing improvised about his performances, however. Technically they were carefully planned, and it was said of his portrayal of Othello that, with its unvarying tones and semitones, rests and breaks, forte and piano, crescendo and diminuendo,

it might have been read from a musical score. He permitted himself melodramatic tricks now long regarded as unnatural; his range, moreover, was limited. The poet Samuel Taylor Coleridge said that Kean revealed Shakespeare by "flashes of lightning," but he failed in parts which left no opportunity for the thunder to roll as well as for the lightning to flash. As a grim archvillain in Philip Massinger's *New Way to Pay Old Debts,* Kean was so convincing as a rapacious extortioner that he was reputed to have sent the poet Lord Byron into convulsions; as Romeo he was almost laughably unpersuasive. Nevertheless, he had a profound and lasting influence on the art of acting. In magnetic power and domination of the stage he has, possibly, never been equalled.

Though Kean remained a passionately admired actor, as a public figure he became increasingly unpopular. Haunted by his fear of losing his position as head of the British stage, he was betrayed into displays of jealousy against potential rivals. At the same time, his fame and fortune (he earned, on the average, £10,000 a year) were insufficient to satisfy his ambitions. Rebelling against his low social status as an actor, he surrounded himself with tavern riffraff and founded quasi-political secret societies dedicated to the "damnation of all lords and gentlemen." The climax came in 1825, when he was successfully sued for adultery with the wife of a city alderman. This provided the pretext for a virulent press campaign, in which he was subjected to hostile demonstrations in England and during his second, and last, tour of the United States. Though he courageously withstood this persecution and eventually quelled it, Kean never recovered from the blow it dealt to his pride. The last eight years of his life were a story of slow suicide by drink and other excesses.

At Covent Garden on March 25, 1833, playing Othello to his son Charles's Iago, he collapsed during the performance—his last. A few weeks later he died at his house at Richmond, Surrey, leaving his son only his name. The name proved to be a valuable asset, however, for Charles John Kean (1811–68), who established a reputation as the pioneer of representational realism and who in this sense is considered the forerunner of Sir Henry Irving.

(G.W.P.)

BIBLIOGRAPHY. Early accounts of Kean's life, though inaccurate, are of interest for his contemporary reputation. See especially "Barry Cornwall" (B.W. Procter), *Life of Edmund Kean* (1835; reprinted 1969); and F.W. Hawkins, *The Life of Edmund Kean* (1869; reprinted 1969). H.N. Hillebrand, *Edmund Kean* (1933; reprinted 1966), provides the first scholarly examination of the evidence on Kean's parentage, birth, and upbringing. For a fuller documentation, see G.W. Playfair, *Kean* (1939, reprinted 1973); and the *Letters of Mr. and Mrs. Charles Kean Relating to Their American Tours,* ed. by W.G.B. Carson (1945). Later works include M.W. Disher, *Mad Genius* (1950); and Raymund Fitzsimons, *Edmund Kean, Fire from Heaven* (1973).

Kean, Ellen, *née* ELLEN TREE (b. December 1805, Ireland—d. Aug. 20, 1880, London), one of the finest English actresses of her day and the wife of the actor Charles Kean, with whom she performed.

She was born of English parents and first appeared at Covent Garden, London, in 1823 as Olivia in Shakespeare's *Twelfth Night.* She then performed at Bath (1824–26); at Drury Lane Theatre, London (1826–29); and at Covent Garden (1829–36), where she played Romeo to Juliet as portrayed by the famous English actress Fanny Kemble.

From 1836 to 1839 Tree travelled in the United States. From 1839 to 1842 she played again at Covent Garden. In 1842 she married Charles Kean, after which they were closely associated for the remainder of his life. In 1845 they toured the United States with an extensive repertory. In 1850 Charles co-leased



Ellen Kean, engraving by J.C. Armytage after W.C. Ross, 1844

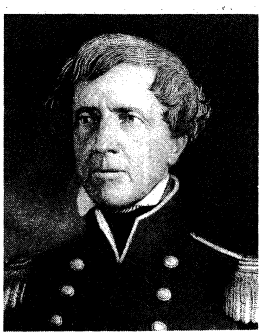
By courtesy of the Mander and Mitchenson Theatre Collection, London

(until 1859) the Princess Theatre, London, where he and Ellen filled most of their subsequent engagements and where their fame reached its peak. They established a lasting reputation as pioneers of representational realism in the production of Shakespeare, whose characters Gertrude (in *Hamlet*) and Viola (in *Twelfth Night*) were among Ellen's finest performances. When Charles died in 1868, Ellen retired. W.G.B. Carson's edition of the *Letters of Mr. and Mrs. Charles Kean* appeared in 1945.

Kearney, city, seat of Buffalo County, south central Nebraska, U.S., on the north bank of the Platte River. The first settlers were Swedish immigrants who came there in 1865. The city was founded in 1871 at the junction of the Burlington and Union Pacific railroads. It was named for nearby Ft. Kearny, a U.S. Army post (established in 1848 [abandoned in 1871] to protect travellers on the Oregon Trail), which had been named to honour Gen. Stephen Watts Kearny. After a boom period in the 1890s as a cow town (livestock centre and shipping point), it developed as an agricultural centre with light industry. Corn, alfalfa, potatoes, soybeans, and sugar beets are the chief crops. The manufacture of automotive valves and filters is important. Kearney State College was founded there in 1905. Fort Kearny State Historical Park is 8 mi (13 km) southeast. Inc. 1873. Pop. (1980) 21,158.

Kearny, Stephen Watts (b. Aug. 30, 1794, Newark, N.J., U.S.—d. Oct. 31, 1848, St. Louis, Mo.), U.S. Army officer who conquered New Mexico and helped win California during the Mexican War (1846–48).

After serving in the War of 1812, Kearny spent most of the next 30 years on frontier duty. At the beginning of the Mexican War,



Stephen Watts Kearny, engraving by T.B. Welch

By courtesy of the Library of Congress, Washington, D.C.

Kearny was ordered to lead an expedition from Ft. Leavenworth, Kan., to seize New Mexico and California for the United States. Lacking seasoned troops, he used diplomacy rather than arms to defeat the 3,000 Mexicans lying in wait en route to Santa Fe. Persuading them to withdraw, he marched unopposed into Santa Fe on Aug. 18, 1846. He promptly proclaimed a civil government for the entire province and won popular support by his promise of a democratic administration.

Heading toward California, Kearny was informed that the conquest had already been completed by Commo. Robert F. Stockton and Lt. Col. John C. Frémont. With a force reduced to only 120 dragoons, Kearny arrived in early December to discover that rebellious Mexican-Californians had retaken most of the province. Stockton had proclaimed himself governor of California and refused to accept Kearny's authority. To preserve harmony, and because Stockton's men constituted the bulk of available U.S. forces, Kearny accepted the situation and led the combined army–navy command to Los Angeles, defeating the Mexicans at San Gabriel (Jan. 8, 1847) and the Mesa (January 9), thus ending the resistance.

Kearny's position was complicated by the insubordination of Frémont, who had persuaded Stockton to appoint him governor. With the arrival of reinforcements, Kearny was finally able to impose his will on Frémont without bloodshed. At the same time he pacified California, establishing a stable and efficient civil government. He then returned to Ft. Leavenworth (August 22) accompanied by a reluctant Frémont, whom he placed under arrest and sent to Washington for court-martial.

Kearny was next ordered to Mexico, where he served as military commander at Veracruz and later at Mexico City until an attack of yellow fever ended his career.

Keaton, Buster, original name JOSEPH FRANCIS KEATON (b. Oct. 4, 1895, Piqua, Kan., U.S.—d. Feb. 1, 1966, Woodland Hills, Calif.), U.S. silent-film actor and director of pantomimed comedy who created the classic deadpan character in conflict with mechanical monsters.



Keaton

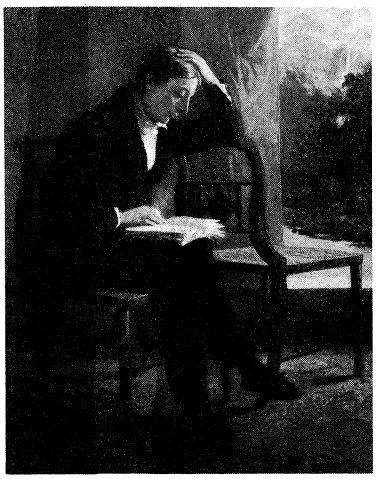
Steve Schapiro, *Life* © Time Inc.

Keaton was the son of parents whose vaudeville act, the Three Keatons, was a zany combination of acrobatics and miming. As a child he mastered subtle timing and comic falls and acquired as a lifelong trademark the never-smiling face. Keaton's first film was *The Butcher Boy* (1917); it was followed by dozens of shorts made with comedy star Roscoe ("Fatty") Arbuckle. From 1920 to 1928, as writer-director-star, he made 19 short films and 10 features, including such silent masterpieces as *The Navigator* (1924), *Seven Chances* (1925), *The General* (1926), *Steamboat Bill, Jr.* (1928), and *The Cameraman* (1928).

Keaton's career declined when spoken dialogue displaced pantomime. Hampered by personal problems, he nevertheless gradually

rebuilt his career, appearing in films such as *San Diego, I Love You* (1944), *Sunset Boulevard* (1950), *Limelight* (1952), and *It's a Mad, Mad, Mad, Mad World* (1963). Keaton regained some of his former popularity from the late 1940s onward, as his silent-film comedies were revived.

Keats, John (b. Oct. 31, 1795, London—d. Feb. 23, 1821, Rome), English Romantic lyric poet who devoted his short life to the perfection of a poetry marked by vivid imagery, great sensuous appeal, and an attempt to express a philosophy through classical legend. His best-known poems are *Endymion,* "La Belle Dame sans Merci," "Ode on Melancholy," "Ode to a Nightingale," "Ode on a Grecian Urn," "Ode to Psyche," "The Eve of St. Agnes," and *Hyperion.* At age 25 he died of tuberculosis while seeking treatment in Rome.



Keats, detail of an oil painting by Joseph Severn, 1821; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

Youth. The son of a livery-stable manager, John Keats received relatively little formal education. His father died in 1804, and his mother remarried almost immediately. Throughout his short life Keats had close emotional ties to his sister, Fanny, and his two brothers, George and Tom. After the breakup of their mother's second marriage, the Keats children lived with their widowed grandmother at Edmonton, Middlesex. John attended a school at Enfield, two miles away, that was run by John Clarke, whose son Charles Cowden Clarke did much to encourage Keats's literary aspirations. At school Keats was noted as a pugnacious lad and was decidedly "not literary," but in 1809 he began to read voraciously. After the death of the Keats children's mother in 1810, their grandmother put the children's affairs into the hands of a guardian, Richard Abbey. At Abbey's instigation John Keats was apprenticed to a surgeon at Edmonton in 1811. He broke off his apprenticeship in 1814 and went to live in London, where he worked as a dresser, or junior house surgeon, at Guy's and St. Thomas' hospitals. His literary interests had crystallized by this time, and after 1817 he devoted himself entirely to poetry. From then on until his early death the story of his life is largely the story of the poetry he wrote.

Early works. Cowden Clarke had introduced the young Keats to the poetry of Edmund Spenser and the Elizabethans, and these were his earliest models. His first mature poem is the sonnet "On First Looking Into Chapman's Homer" (1815), which was inspired by his excited reading of George Chapman's classic 17th-century translation of the *Iliad* and *Odyssey.* Clarke also introduced Keats to the journalist and contemporary poet Leigh Hunt, and Keats made friends in Hunt's circle with the young poet John Hamilton Reynolds and with the painter Benjamin Haydon. His first book, *Poems,* was published in March 1817 and was written largely under "Huntian" influence. This is evident in the relaxed and rambling sentiments evinced and in Keats's use of a loose form of the heroic couplet and light rhymes. The most interesting poem in this volume is "Sleep and Poetry," the middle section of which contains a prophetic view of Keats's own poetical progress. He sees himself as at present plunged in the delighted contemplation of sensuous natural beauty but realizes that he must leave this for an understanding of "the agony and strife of human hearts." Otherwise the volume is remarkable only for some delicate natural observation and some obvious Spenserian influences.

In 1817 Keats left London briefly for a trip to the Isle of Wight and Canterbury and began work on *Endymion,* his first long poem. On his return to London he moved into lodgings in Hampstead with his brothers. *Endymion* appeared in 1818. This work is divided into four 1,000-line sections, and its verse is composed in loose rhymed couplets. The poem narrates a version of the Greek legend of the moon goddess Diana's (or Cynthia's) love for Endymion, a mortal shepherd, but Keats puts the emphasis on Endymion's love for Diana rather than on hers for him. Keats transformed the tale to express the widespread Romantic theme of the attempt to find in actuality an ideal love that has been glimpsed heretofore only in imaginative longings. This theme is realized through fantastic and discursive adventures and through sensuous and luxuriant description. In his wanderings in quest of Diana, Endymion is guilty of an apparent infidelity to his visionary moon goddess and falls in love with an earthly maiden to whom he is attracted by human sympathy. But in the end Diana and the earthly maiden turn out to be one and the same. The poem equates Endymion's original romantic ardour with a more universal quest for a self-destroying transcendence in which he might achieve a blissful personal unity with all creation. Keats was dissatisfied with the poem as soon as it was finished.

Personal crisis. In the summer of 1818 Keats went on a walking tour in the Lake district and Scotland with his friend Charles Brown, and his exposure and overexertions on that trip brought on the first symptoms of the tuberculosis of which he was to die. On his return to London a brutal criticism of his early poems appeared in *Blackwood's Magazine,* followed by a similar attack on *Endymion* in the *Quarterly Review.* Contrary to later assertions, Keats met these reviews with a calm assertion of his own talents, and he went on steadily writing poetry. But there were family troubles. Keats's brother Tom had been suffering from tuberculosis for some time, and in the autumn of 1818 the poet nursed him through his last illness. About the same time, he met Fanny Brawne, a near neighbour in Hampstead, with whom he soon fell hopelessly and tragically in love. The relation with Fanny had a decisive effect on Keats's development. She seems to have been an unexceptional young woman, of firm and generous character, and kindly disposed toward Keats. But he expected more, perhaps more than anyone could give, as is evident from his overwrought letters. Both his uncertain material situation and his failing health in any case made it impossible for their relationship to run a normal course. After Tom's death (George had already gone to America), Keats moved into Wentworth place with Brown; and in April 1819 Fanny Brawne and her mother became his next-door neighbours. In about October 1819 Keats became engaged to Fanny.

The year 1819. Keats had written "Isabella," an adaptation of the story of the "Pot of Basil" in Boccaccio's *Decameron,* in 1817–18, soon after the completion of *Endymion,* and again he was dissatisfied with his work. It was during the year 1819 that all his greatest poetry was written—"Lamia," "The Eve of St. Agnes," the great odes ("On Indolence," "On a Grecian Urn," "To Psyche," "To a Nightingale," "On Melancholy," and "To Autumn"), and the two verisons of *Hyperion.* This poetry was composed under the strain of illness and his growing love for Fanny Brawne; and it is an astonishing body of work, marked by careful and considered development, technical, emotional, and intellectual. "Isabella," which Keats himself called "a weak-sided poem," contains some of the emotional weaknesses of *Endymion;* but "The Eve of St. Agnes" may be considered the perfect culmination of Keats's earlier poetic style. Written in the first flush of his meeting with Fanny Brawne, it conveys an atmosphere of passion and excitement in its description of the elopement of a pair of youthful lovers. Written in Spenserian stanzas, the poem presents its theme with unrivaled delicacy but displays no marked intellectual advance over Keats's earlier efforts. "Lamia" is another narrative poem, and a deliberate attempt to reform some of the technical weaknesses of *Endymion.* Keats makes use in this poem of a far tighter and more disciplined couplet, a firmer tone, and more controlled description.

The odes are Keats' most distinctive poetical achievement. They are essentially lyrical meditations on some object or quality which prompts the poet to confront the conflicting impulses of his inner being, and to reflect upon his own longings and their relations to the wider world around him. All the odes were composed between March and June 1819 except "To Autumn," which is from September. The internal debates in the odes centre on the dichotomy of eternal, transcendent ideals and the transience and change of the physical world. This subject was forced upon Keats by the painful death of his brother and his own failing health, and the odes highlight his own struggle for self-awareness and certainty through the liberating powers of his imagination. In the "Ode to a Nightingale" a visionary happiness in communing with the nightingale and its song is contrasted with the dead weight of human grief and sickness, and the transience of youth and beauty—strongly brought home to Keats in recent months by his brother's death. The song of the nightingale is seen as a symbol of art that outlasts the individual's mortal life. This theme is taken up more distinctly in the "Ode on a Grecian Urn." The figures of the lovers depicted on the Greek urn become for him the symbol of an enduring but unconsummated passion that subtly belies the poem's celebrated conclusion, "Beauty is truth, truth beauty,—that is all ye know on earth, and all ye need to know." The "Ode on Melancholy" recognizes that sadness is the inevitable concomitant of human passion and happiness; the transience of joy and desire is an inevitable aspect of the natural process. But the rich, slow movement of this and the other odes suggests an enjoyment of such intensity and depth that it makes the moment eternal. The "Ode to Autumn" is essentially the record of such an experience. Autumn is seen not as a time of decay but as a season of complete ripeness and fulfillment, a pause in time when everything has reached fruition, and the question of transience is hardly raised. These poems, with their rich and exquisitely sensuous detail and their meditative depth, are among the greatest achievements of Romantic poetry. With them should be mentioned the ballad "La Belle Dame Sans Merci," of about the same time, which reveals the obverse and destructive side of the idyllic love seen in "The Eve of St. Agnes."

Keats's fragmentary poetic epic, *Hyperion,* exists in two versions, the second being a revision of the first with the addition of a long prologue in a new style, which makes it into a different poem. *Hyperion* was begun in the autumn of 1818, and all that there is of the first version was finished by April 1819. In September Keats wrote to Reynolds that he had given up *Hyperion,* but he appears to have continued working on the revised edition, *The Fall of Hyperion,* during the autumn of 1819. The two versions of *Hyperion* cover the period of Keats's most intense experience, both poetical and personal. The poem is his last attempt, in the face of increasing illness and frustrated love, to come to terms with the conflict between absolute value and mortal decay that appears in other forms in his earlier poetry. The epic's subject is the supersession of the earlier Greek gods, the Titans, by the later Olympian gods. Keats's desire to write something unlike the luxuriant wandering of *Endymion* is clear, and he thus consciously attempts to emulate the epic loftiness of Milton's *Paradise Lost.* The poem opens with the Titans already fallen, like Milton's fallen angels, and Hyperion, the sun god, is their one hope of further resistance, like Milton's Satan. There are numerous Miltonisms of style, but these are subdued in the revised version, as Keats felt unhappy with them; and the basis of the writing is revealed after all as a more austere and disciplined version of Keats's own manner. There is not enough of the narrative to make its ultimate direction clear; but it seems that the poem's hero was to be the young Apollo, the god of poetry. So, as *Endymion* was an allegory of the fate of the lover of beauty in the world, *Hyperion* was perhaps to be an allegory of the poet as creator. Certainly this theme is taken up explicitly in the new prologue to the second version.

The second version of *Hyperion* is one of the most remarkable pieces of writing in Keats's work; the blank verse has a new energy and rapidity, and the vision is presented with a spare grandeur, rising to its height in the epiphany of the goddess Moneta, who reveals to the dreamer the function of the poet in the world. It is his duty to separate himself from the mere dreamer, and to share in the sufferings of humankind. The theme is not new to Keats—it appears in his earliest poetry—but it is here realized far more intensely. Yet with the threat of approaching death upon him, Keats could not advance any further in the direction that he foresaw as the right one, and the poem remains a fragment.

Last years. There is no more to record of Keats's poetical career. The poems "Isabella," "Lamia," "The Eve of St. Agnes," *Hyperion,* and the odes were all published in the famous 1820 volume, the one that gives the true measure of his powers. It appeared in July, by which time Keats was evidently doomed. He had been increasingly ill throughout 1819, and by the beginning of 1820 the evidence of tuberculosis was clear. He realized that it was his death warrant, and from that time sustained work became impossible. His friends Brown, the Hunts, and Fanny Brawne and her mother nursed him assiduously through the year. Percy Bysshe Shelley, hearing of his condition, wrote offering him hospitality in Pisa; but Keats did not accept. When Keats was ordered south for the winter, Joseph Severn undertook to accompany him to Rome. They sailed in September 1820, and from Naples they went to Rome, where in early December Keats had a relapse. Faithfully tended by Severn to the last, he died in Rome.

Letters. The prime authority both for Keats's life and for his poetical development is to be found in his letters. This correspondence with his brothers and sister, Fanny, with his close friends, and with Fanny Brawne gives the most intimate picture of the admirable integrity of Keats's personal character, and enables the reader to follow closely the development of his thought about poetry—his own and that of others.

His letters evince a profound thoughtfulness combined with a quick, sensitive, undidactic critical response. Spontaneous, informal, deeply thought, and deeply felt, these are among the best letters written by any English poet. Apart from their interest as a commentary on his work, they have the right to independent literary status.

Reputation. It is impossible to say how much has been lost by Keats's early death. His reputation grew steadily throughout the 19th century, though as late as the 1840s the Pre-Raphaelite painter William Holman could refer to him as "this little-known poet." His influence is found everywhere in the decorative romantic verse of the Victorian age, from the early work of Alfred Tennyson onward. His general emotional temper and the minute delicacy of his natural observation were greatly admired by the Pre-Raphaelites, who both echoed his poetry in their own and illustrated it in their paintings. Keats's 19th-century followers on the whole attached their affections to the more superficial aspects of his work; and it has been largely left for the 20th century to realize the full range of his technical and intellectual achievement.

MAJOR WORKS. *Poems* (1817); *Endymion: A Poetic Romance* (1818); *Lamia, Isabella, The Eve of St. Agnes, and Other Poems* (1820). Some individual poems in the above volumes were first published in periodicals; for example, the sonnets "O Solitude" and "On First Looking into Chapman's Homer" both appeared in *The Examiner* in 1816, "Ode to a Nightingale" and "Ode on a Grecian Urn" in *Annals of the Fine Arts* in 1819, and "La Belle Dame sans Merci" in *The Indicator* in 1820. Other poems of Keats were not collected or published until after his death. The standard edition of the poetry is *John Keats: Complete Poems,* ed. by Jack Stillinger (1982). *The Letters of John Keats, 1814–1821,* 2 vol. (1958, reprinted 1976), are edited by Hyder Edward Rollins. The most comprehensive selection is Robert Gittings (ed.), *Letters of John Keats* (1970).

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Keb (Egyptian god): *see* Geb.

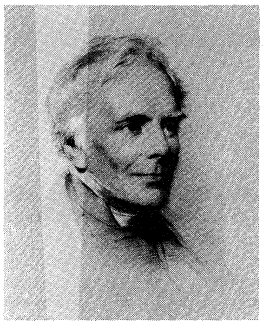
Kêb, also called KEP-SUR-MER, town and port, southern Kampuchea (Cambodia). It lies 12 miles (19 km) southeast of Kâmpôt along the Gulf of Thailand and 15 miles (24 km) west of the Vietnamese border. Commercial fishing is an important economic activity. Kêb was formerly a seaside resort. In 1969 it was linked to Phnom Penh, the national capital, and to Kâmpông Saôm by railway. Pop. (1971 est.) 9,400.

Kebbi River (Nigeria): *see* Sokoto River.

Kebiishi, body of police commissioners who constituted the only effective military force during Japan's Late Heian period (AD 857–1160). The Kebiishi was the backbone of the administration during this time, and its decline around 1000 marked the beginning of the disintegration of central control over the outlying areas of the country.

Originally created around 810 to deal with the disturbances resulting from the conspiratorial plots of the former emperor Heizei, the Kebiishi proved its effectiveness and grew larger. In 816 the Kebiishi was given official status and regular patrol functions, eventually replacing the palace guards and the draft army as the only effective body for law enforcement. It was supervised by a chief, normally drawn from high official ranks, who was assisted by men selected from both civil and military positions. As the power of the Kebiishi was extended to the provinces, it began to acquire judicial responsibilities and recruited men with training in jurisprudence.

Keble, John (b. April 25, 1792, Fairford, Gloucestershire, Eng.—d. March 29, 1866, Bournemouth, Hampshire), Anglican priest, theologian, and poet who originated and helped lead the Oxford Movement (*q.v.*), which sought to revive in Anglicanism the High Church ideals of the later 17th-century church.



Keble, chalk drawing by George Richmond, 1863; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

Ordained in 1816, Keble was educated at the University of Oxford and served as a tutor there from 1818 to 1823, when he left to assist in his father's parish. In 1827 he published *The Christian Year,* a volume of poems for Sundays and festivals of the church year. Widely circulated, the book did more than any other to promulgate the ideas of the High Church movement in Anglicanism.

The affinity of Keble's thought with the naturalism of the Romantic poets was evident from his lectures, which were published in the last year of his term as professor of poetry at Oxford (1831–41). By 1833, however, he had become known as a leader of the Oxford Movement, which was generally considered to have been initiated by his sermon "National Apostasy," given that year on July 14 at the university chapel. Centred at the University of Oxford, the movement sought at first to respond to government efforts to appropriate church funds and property but gradually expanded its activities to a more general theological and pastoral agenda. Keble wrote 9 of the Oxford Movement's 90 *Tracts for the Times,* which were intended to rouse the Anglican clergy against the theory of a state-controlled church and which caused the movement's advocates to be known as Tractarians. The Tractarians encouraged study of the early Church Fathers, edited their works, and arranged for their translation. In 1836 Keble produced an edition of the works of the Anglican divine Richard Hooker and in 1838 shared in the inauguration of *A Library of the Fathers* by translating the works of Irenaeus (*c.* 120/140–*c.* 200/203), a theologian and bishop of the early church. When John Henry Newman's conversion to Roman Catholicism in 1845 threatened the continuation of the movement, Keble and Edward Bouverie Pusey (1800–82), a prestigious Oxford professor of Hebrew and a clergyman, managed by their persistence to keep the movement alive.

Keble, who served as a country vicar at Hursley from 1836 until his death, is remembered as much for his lyrics as for his Tractarian role. Among his books of verse are *The Psalter or Psalms of David* (1839) and the poems for childhood, *Lyra Innocentium* (1846); he also wrote numerous hymn lyrics, including "O God of mercy, God of might." In 1869 Keble College, Oxford, was founded in his honour.

Kebnekaise, mountain range in the *län* (county) of Norrbotten, northern Sweden, 25 mi (40 km) from the Norwegian border and about 103 mi north of the Arctic Circle. The name is a Lapp word meaning "kettle top." One of its peaks, Kebnekaise Sydtopp (6,926 ft [2,111 m]), is the highest in Sweden. The roughly triangular area of the mountain range covers about 18 sq mi (47 sq km); it is uninhabited and, except for a tract of stunted birch forest, completely desolate. It consists of steep, winding crests, interspersed with narrow, sharp-crested ridges and peaks. Besides Kebnekaise Sydtopp, the highest peaks are Kaskasatjåkko (6,811 ft) and Kaskasapakte (6,693 ft). The best known summit in the range, however, is the volcano-like Tuolpagorni (5,545 ft). Because of the extremely high latitude, the glacier scenery is especially fine. Among the many glaciers, the largest are Björlings Glaciär, Storglaciären, Isfallsglaciären, Kebnepakteglaciären, and Rabots Glaciär, named for Charles Rabot, the Parisian geographer who, in 1883, first climbed Kebnekaise Sydtopp. A notable feature of the range is Tarfalasjön, a small lake, one shore of which is formed by the 60-ft ice wall of Kebnepakteglaciären.

Kebun Binatang Ragunan: *see* Jakarta Zoological and Botanical Gardens.

Kebun Raya Indonesia: *see* Botanical Garden of Indonesia.

Kecskemét, town and seat, Bács-Kiskun *megye* (county), central Hungary. Long established as a centre for handicrafts and cattle rearing, it has also grown in importance for its viticulture, vegetables, and fruit. It is surrounded by flat sandy farmland, often referred to as "the orchard of Hungary," providing about 25 percent of the country's fruit, notably apricots, and producing preserves, syrups, and



Threshing grain near Kecskemét, Hung.
E. Henriksson—Ostman Agency

liqueurs in large quantity, notably Kecskemét apricot brandy (*barackpálinka*).

The town dates back to the Árpád dynasty (10th century) and in the 14th century was one of the privileged towns. It survived the Turkish occupation relatively unscathed as a *khas*, a possession of the Sultan under his protection. A polygonal main square is surrounded by public buildings and by a great Catholic church and a Franciscan monastery. The ancient Reform church was built between 1680 and 1684 by special permission of Sultan Mehmed IV. The synagogue (1862) has in its courtyard the remains of an older synagogue (1818). There are many churches, museums, and buildings of architectural and historical significance. The great Hungarian dramatist József Katona (1791–1830) was born in Kecskemét, as was the composer Zoltán Kodály (1882–1967). There is an artists' colony, founded 1909, which is of contemporary importance in Hungarian art.

The agricultural district covers 230,000 ac (93,000 ha). The old custom, dating from the Turkish era, of the peasant farmers travelling daily from the town to the farms has declined, and the post-1945 policy has been to develop farmland centres, each with a complete range of services. Working conditions have improved and yields of grain and industrial crops have risen. In the Bugac *puszta*, or wasteland (totalling 50,000 ac), approximately 19 mi (30 km) south of Kecskemét, the sandy saline soils have been reclaimed. Expert animal husbandry has replaced inefficient sheep-rearing practices. Planting of trees, the introduction of mechanized agriculture, and soil conservation have revitalized farming in the area.

Kecskemét's principal industries, in addition to food (fruit) processing, are textiles and the manufacture of agricultural machinery and consumer goods. The town, 50 mi southeast of Budapest, is on the rail and road arteries to Szeged. Pop. (1983 est.) 96,000.

Kedah, state (*negeri*) in northwestern West Malaysia (Malaya), bordered by Pinang state (southwest), the Strait of Malacca (west), and Perlis state (northwest). Its area of 3,639 sq mi (9,425 sq km) includes the steep, heavily forested Western and Bintang ranges to the east, which virtually isolate it from Perak state and Thailand. The sultanate at one time included Penang and was under Thai suzerainty until 1909, when it accepted a British adviser and became one of the unfederated Malay states. Temporarily annexed by Thailand during World War II, it subsequently joined the Federation of Malaya.

A well-farmed lowland stretching for about 10 mi (16 km) between the ranges and the west coast is crossed by two short rivers (the Kedah and Muda). The Muda irrigation project was completed in 1970. The alluvial Kedah plain, with tall freshwater swamp forest and a few limestone outcroppings, is one of the nation's chief rice-producing areas. A large swamp reclamation project has been undertaken at Kubang Pasu.

Rubber estates were developed early in the 20th century in the hillier lowland sector around the Muda, attracting many Tamil Indians who now live in and around Sungai Patani. Coconuts are grown for domestic use. Tin and tungsten are mined at Kampung Karangan, and iron ore is found at Semiling and Tupah. Kedah's longtime isolation was ended by a series of main-road and rail connections south into the tin and rubber belt. There is an airport at Alor Setar (*q.v.*), the state capital and seat of the sultan. The chief exports are rubber, rice, tapioca, and tin. Processing rice is the main industry, and small Chinese rice mills are scattered along the highways.

While the state is predominantly Malay, Chinese are prominent in the market towns of Jitra, Baling, and Kulim. The Pengkalan Bujang area is rich in archaeological finds. The Langkawi Islands to the northwest are a popular tourist attraction. Pop. (1982 est.) 1,122,-164.

Kediri, ancient KAḌIRI, *kotamadya* (city) and *kabupaten* (regency), Jawa Timur *propinsi* (East Java province), Java, Indonesia, on the Kali (river) Brantas. From the 11th to the early 13th century, Kediri was the dominant kingdom in eastern Java, renowned for its naval and commercial strength and for its achievements in literature. It was absorbed into the later kingdoms of Singasari and Majapahit and then by the central Java kingdom of Mataram. When the latter split in the middle of the 18th century, both the Susuhunan of Surakarta and the Sultan of Yogyakarta exercised authority over lands that had once made up Kediri. After the Java War (1825–30) these lands were ceded to the Dutch, and Kediri became a residency under Dutch administration. It contained high mountains, Gunung (mount) Liman (8,409 ft [2,563 m]) and Gunung Kelud (5,680 ft); teak was obtained from its forests; and its fertile plains produced rice, sugarcane, cotton, cassava, corn, peanuts, coconuts, soybeans, and—from estates—coffee, cocoa, quinine, tobacco, and indigo.

Kediri city is a centre of the sugar industry; it is linked to other towns by roads and a railway. The neighbourhood has numerous Hindu ruins. Pop. (1980) city, 221,830; regency, 1,235,265.

Keeler, James (Edward) (b. Sept. 10, 1857, LaSalle, Ill., U.S.—d. Aug. 12, 1900, San Francisco), U.S. astronomer who confirmed that Saturn's ring system is not a solid unit but is composed of a vast swarm of tiny particles.

Interested in astronomy from an early age, Keeler became assistant to the noted astronomer Samuel P. Langley at the Allegheny Observatory, Pittsburgh, in 1881. From 1886



James Keeler
By courtesy of the Lick Observatory Archives, Santa Cruz, Calif.

to 1891 he was on the staff of the Lick Observatory, Mt. Hamilton, California, where he headed the spectroscopic program. Among the outstanding results he achieved was the measurement of the rate of expansion of the Orion Nebula together with proof that it is located within the Galaxy.

In 1891 Keeler became director of the Allegheny Observatory, where he performed his studies of Saturn's rings. Returning to the Lick Observatory as director in 1898, he undertook photographic observations of 120,000 galaxies with the recently acquired Crossley 36-inch (91-centimetre) reflecting telescope. This work established the reflecting telescope as the supreme instrument for photographing faint celestial objects and demonstrated that a spiral galaxy is the most common type of galaxy in the observable universe.

Keeler, Wee Willie, byname of WILLIAM HENRY KEELER (b. March 3, 1872, Brooklyn, N.Y., U.S.—d. Jan. 1, 1923, Brooklyn), U.S. professional baseball player, nicknamed for his height of 5 feet 4½ inches, whose place-hitting ability ("Hit 'em where they ain't") made up for his lack of power.

An outfielder who batted and threw left-handed, Keeler played in the major leagues from 1892 to 1910 and achieved a career batting average of .341 or .345. (Many early baseball records are in dispute.) He reached his peak with the Baltimore Orioles (1894–98) of the National League. His highest average for a single season was .424 or .432 in 1897; he won the league batting championship that year and in 1898 with .379 or .385. He was elected to the Baseball Hall of Fame in 1939.

Keeling Islands (Indian Ocean): *see* Cocos Islands.

Keelung (Taiwan): *see* Chi-lung.

Keely, John E(rnst) W(orrell) (b. Sept. 3, 1827—d. Nov. 18, 1898, Philadelphia, Pa., U.S.), fraudulent American inventor.

Keely was orphaned in early childhood. He is said to have been an orchestra leader, a circus performer, and a carpenter. In 1873 he announced that he had discovered a new physical force, one that, if harnessed, would produce unheard-of power. He claimed, for example, to be able to produce from a quart of water enough fuel to move a 30-car train from Philadelphia to New York City. He began construction of an engine to perform this feat and by 1874 was able to give preliminary demonstrations of his machine. He made a great show of guarding the secret of the motor he was developing to obtain power "from intermolecular vibrations of ether," and scientists and engineers scoffed at his unverified claims. Organizing the Keely Motor Company, Philadelphia, he sold stock to some 3,000 trusting shareholders and was also supported for a time by a wealthy Philadelphia patroness.

After his death, an investigation was carried out, and examination of his apparatus showed that, rather than a new force, tubes of compressed air or a form of hydraulic power activated the machinery.

Keen, William Williams (b. Jan. 19, 1837, Philadelphia, Pa., U.S.—d. June 7, 1932, Philadelphia), doctor who was the United States' first brain surgeon.

After graduating (M.D., 1862) from Jefferson Medical College, Philadelphia, Keen was a surgeon for the U.S. Army during the American Civil War (1862–64). The next two years he did postgraduate work in Paris and Berlin. On his return to the United States, he became a lecturer in surgical pathology (1866–75) at his alma mater, concurrently teaching at the Philadelphia School of Anatomy. He also taught at the Women's Medical College of Philadelphia (1884–89) and was a professor of surgery (1889–1907; emeritus thereafter) at Jefferson Medical College.

Keen was one of the first surgeons to successfully remove a brain tumour (1888). He also assisted the American surgeon Joseph Bryant in removing the left upper jaw of U.S. president Grover Cleveland (1893) for a malignant tumour. The operation was performed in total secrecy on a yacht in Long Island Sound and was a complete success. Keen's account of the event was published in the *Saturday Evening Post* (Sept. 22, 1917). In addition to his teaching and medical work, Keen served as president of the American Medical Association (1900) and edited *Surgery: Its Principles and Practice,* 8 vol. (1906–13).

Keene, city, seat of Cheshire county, southwest New Hampshire, U.S., on the Ashuelot River. The original site (Upper Ashuelot), one of the Massachusetts grants of 1733, was abandoned (1746–50) because of hostile Indians. Resettled and named after Sir Benjamin Keene (1697–1757), English minister to Spain, it was incorporated as a town in 1753 and chartered as a city in 1874. Industries developed after the arrival of the Boston and Maine Railroad in 1840, and manufactures now include small engineering products, optical instruments, furniture, textiles, and shoes. The city is also a winter sports resort and the commercial centre of the Monadnock region. Keene State College was established in 1909. Pop. (1988 est.) 23,633.

Keene, Charles Samuel (b. Aug. 10, 1823, Hornsey, Middlesex, Eng.—d. Jan. 4, 1891, London), British artist and illustrator who was associated with the English periodical *Punch* from 1851 until 1890. His brief and uncluttered illustrations feature gently satirized characters drawn from lower- and middle-class life, shown against backgrounds that accurately evoke the spirit of the times.

Apprenticed to a wood engraver from 1842 to 1847, Keene made his first appearance in *Punch* in 1851 and, after nine years of steady work, joined the permanent staff. His services were requisitioned for launching *Once a Week* in 1859; his most notable work in this periodical was a series of illustrations to Charles Reade's *A Good Fight* (afterward rechristened *The Cloister and the Hearth*) and to George Meredith's *Evan Harrington.* In 1872 Keene met Joseph Crawhall, who had been in the habit for years of jotting down any humorous incidents he might hear of or observe and illustrating them for his own amusement. These were placed at Keene's disposal and inspired at least 250 successful drawings in the last 20 years of his connection with *Punch.* In 1881 a volume of his *Punch* drawings was published as *Our People.*

Keene, Laura, original name MARY MOSS (b. *c.* 1826, London, Eng.—d. Nov. 4, 1873, Montclair, N.J., U.S.), actress and first notable female theatre manager in the United States.

Keene served her apprenticeship with Mme Vestris, the singer-actress-manager. The actor-manager James William Wallack saw her at London's Olympic Theatre in 1851 and engaged her for his New York City company. She made a successful debut at Wallack's in 1852 but soon left to manage a Baltimore theatre and then to tour as far as San Francisco and Australia. She returned to New York City in 1855 and in 1856 began eight years of management in her own theatre. She was admired for her portrayals of elegant ladies in classical English comedy and of pathetic heroines in contemporary melodrama.

One of her company's successes was Tom Taylor's comedy *Our American Cousin* (1859), in which E.A. Sothern and Joseph Jefferson made their first great hits. Her company was performing this play at Ford's Theatre, Washington, D.C., the night that President Abraham Lincoln was assassinated there. In 1872 she helped found and edit a monthly magazine, the *Fine Arts.*

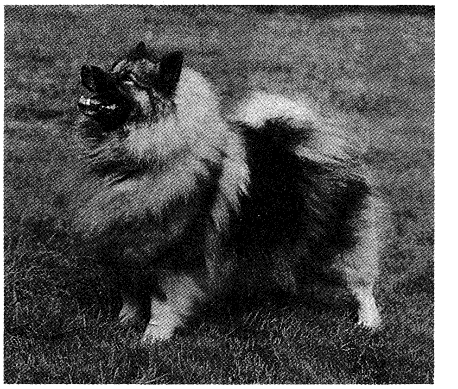


Laura Keene, lithograph

By courtesy of the Theatre Collection, the New York Public Library, Astor, Lenox and Tilden Foundations

Kees, John: *see* Caius, John.

Keeshond, also called DUTCH BARGE DOG, breed of dog long kept on Dutch barges as a guard and companion. Originally a dog kept by working-class people, the Keeshond was the symbol of the 18th-century Dutch Patriots Party. It derived its present name from a dog, Kees, belonging to Kees de Glyselaer, the leader of the Patriots. Descended from the same ancestors as the Samoyed, Norwegian elkhound, spitz, and Pomeranian, the Keeshond has a foxlike face and a plumed tail carried high over its back. Its long, thick, gray coat consists of a pale undercoat overlaid by black-tipped hairs. The mature Keeshond stands 17 to 18 inches (43 to 46 cm) and weighs 32 to 40 pounds (14.5 to 18 kg).



Keeshond

Sally Anne Thompson—EB Inc.

Keesom, Willem Hendrik (b. June 21, 1876, Texel, Neth.—d. March 24, 1956, Oegstgeest), Dutch physicist who specialized in cryogenics and was the first to solidify helium.

Having taken his doctorate from Amsterdam University in 1904, Keesom worked under Kamerlingh Onnes at the University of Leiden and then in 1917 joined the faculty of the Utrecht veterinary school. Six years later he returned to Leiden as professor of experimental physics. At the Onnes laboratory there in 1926, he successfully solidified helium. In 1932 he achieved the temperature of −457.6° F (−272° C), just two degrees Fahrenheit above absolute zero. His book *Helium* appeared in 1942.

Keetmanshoop, town, southeastern Namibia. The town lies about 285 miles (460 km) south of Windhoek, the national capital, with which it is connected by road. Keetmanshoop was established in 1866 as a Rhenish (German Lutheran) mission station for the local Nama group of Khoikhoin (Hottentot) people, and it was named for Johann Keetman, a prominent member of the missionary society. It became a town after a German garrison was stationed there in 1894. The chief industries in Keetmanshoop produce Karakul sheepskins, processed foods, and leather goods. The Naute Dam is located on the Löwen River south of the town. Pop. (1988 est.) 14,000.

Keewatin, region, south-central Northwest Territories, Canada. Keewatin region, formerly part of Keewatin and eastern Mackenzie districts, was created in the early 1970s by the territorial government. The region extends northward from the border of eastern Saskatchewan and Manitoba to just above the Arctic Circle. It consists of the northwest coast of Hudson Bay; Southampton, Coats, and several other islands in the northwestern part of Hudson Bay; and territory stretching inland as far west as the Thelon River. The region, named from the Cree Indian word for "the north wind," is almost entirely within the Canadian Shield—a physiographic area of rocky, ice-smoothed hills and irregular basins mostly filled by lakes and swamps—and is almost completely within the permafrost zone with its Arctic tundra vegetation. The major settlements, Eskimo Point, Baker Lake, and Rankin Inlet (the regional headquarters), are economically dependent upon fur trapping, sealing, and handicrafts. The population is mostly Inuit (Eskimo). Pop. (1986) 4,986.

Kef, el-, also spelled LE KEF (Tunisia): *see* Kāf, al-.

Kefallinía (Greece): *see* Cephalonia.

Kefar Naḥum (Israel): *see* Capernaum.

Kefar Sava, city, west-central Israel, in the southern Plain of Sharon. The locality is not mentioned in the Bible but is referred to in the Talmud. Although the name is mentioned in the *Antiquities* of the Roman-Jewish historian Flavius Josephus (written between AD 90–100), scholars now believe the reference there is to another place in the vicinity.

Modern Kefar Sava, the first Jewish settlement of the southern Sharon, was founded in 1903 (six years before Tel Aviv), next to the Arab village of Kafr Sābā, which had retained the ancient name. The early colonizers planted almonds, olives, and some eucalyptus trees for swamp drainage. Many obstacles were placed in the settlers' path by the Ottoman Turkish authorities. During the later stages of World War I, the western section of the front between the advancing British armies and the Turkish-German forces passed through Kefar Sava, but in September 1918 the Australian cavalry that was attached to Field Marshal Allenby's command broke the front of the Turkish 8th Army, and Kefar Sava passed behind the British lines. The settlement, which had suffered severely during the war and again during the Arab riots of 1921, was reestablished in 1922. The modern economy is based on citrus, mixed farming, dairying, and light industry; citrus canning and aluminum processing are among the chief industrial undertakings. The city has a large hospital specializing in the treatment of lung diseases. Inc. local council, 1939; city, 1962. Pop. (1985 est.) 47,500.

Keffi, town, western Plateau State, central Nigeria. It was founded in *c.* 1800 by Abdu Zanga (Abdullahi), a Fulani warrior from the north who made it the seat of a vassal emirate subject to the emir of Zaria (a town 153 miles [246 km] north). Although Keffi paid tribute to Zaria throughout the 19th century, it was constantly raided for slaves; its war in the reign of Sidi Umaru (1877–94) with the nearby town of Nasarawa resulted in a further payment of slaves to Zaria.

In 1902 the British transferred the headquarters of Nasarawa Province to Keffi in order to protect the trade caravans going from the Benue River to the north. The killing of a British administrator in Keffi by the Zaria *magaji* ("representative"), who subsequently fled to Kano (220 miles north-northeast), the most powerful of the Fulani emirates, resulted in the British attack and defeat of Kano in 1903.

Most of the inhabitants of the traditional emirate are Gwandara people, engaged in tin and columbite mining and in farming; the chief crops are millet, sorghum, yams, and cotton. Keffi town has a teacher-training college, and it is served by a mosque and a hospital. The emir's palace stands next to the main square, and the town is now the headquarters of a local government council. Keffi is located just to the west of a junction of local roads that give it access to Abuja, Nasarawa, the trunk highway at Akwanga, and the main railway at Lafia. Pop. (1983 est.) 52,290.

Keflavík, town, southwestern Iceland, on Reykja Peninsula, overlooking Faxa Bay. A fishing port and local market centre, it is the site of an international airport as well as of a U.S. air base, built during World War II and later established as a North Atlantic Treaty Organization base (1951); some 3,000 American servicemen were stationed there in the 1970s. A paved road 30 miles (48 km) long connects the airfield to Reykjavík. Pop. (1983 est.) 6,886.

Kegalle, also spelled KEGALLA, town, west-central Sri Lanka (Ceylon). The surrounding region produces graphite, precious stones, rubber, and agricultural products. This region is one of the few farming areas in Sri Lanka where traditional transplanting, which leads to greater yields (as opposed to sowing the paddy seed broadcast), has taken hold. The town contains a junior technical college. Pop. (1982 est.) 17,000.

Kegon (Japanese: "Flower Ornament"), Chinese HUA-YEN, Buddhist philosophical tradition introduced into Japan from China during the Nara period (710–784). Although the Kegon school can no longer be considered an active faith teaching a separate doctrine, it continues to administer the famous Tōdai-ji monastery at Nara.

The name Kegon is a translation of the Sanskrit *avataṃsaka* ("garland," or "wreath"), after the school's chief text, the *Avataṃsaka-sūtra.* This text, preserved in both Tibetan and Chinese versions, deals with the Buddha Vairocana (Japanese Birushana, or Roshana). The Kegon school held as its ideal the recognition of a harmonious whole of all beings, all interrelated and interdependent, with the Buddha Vairocana at the centre, permeating everything. It believed that no element has a separate and independent existence apart from the whole but rather that each reflects all the others. According to it, the universe is self-creating.

The school was founded in China in the late 6th–7th century by Fa-shun (also called Tu-shun) and further systematized in the 7th–8th century by Fa-tsang. It continued in China until the 10th century, after which it began to decline. The doctrine first reached Japan about 740, carried by two of Fa-tsang's pupils, Chen-hsiang (Japanese Shinshō) and Tao-hsüan (Japanese Dōsen), and by a southern Indian, Bodhisena.

The totalistic principle of the Kegon school caught the attention of the reigning emperor, Shōmu, who considered it a possible approach to governing his people. Shōmu is credited with founding the great monastery Tōdai-ji, an honour shared by the Indian priest Bodhisena, the Japanese saint Gyōki (Gyōgi), and the abbot of the monastery, Rōben. In 752 the emperor Shōmu dedicated the Daibutsu, the colossal bronze image of Vairocana at Tōdai-ji, and many of the ritual objects used in the consecration ceremony are still preserved in the monastery treasury, the Shōsō-in.

Kei, Great: *see* Great Kei River.

Kei Islands (Indonesia): *see* Kai Islands.

Keidanren, abbreviation of KEIZAI DANTAI RENGŌKAI, English FEDERATION OF ECONOMIC ORGANIZATIONS, Japanese association of business organizations that was established in 1946 for the purpose of mediating differences between member industries and advising the government on economic policy and related matters. It is considered one of the most powerful organizations in Japan.

Created as part of a postwar effort to reorganize the business sector of Japanese society, Keidanren initially had little influence. It subsumed the functions of the Japanese Industrial Council in 1952, a measure that both expanded its ranks and increased its influence. Keidanren was an important force in the creation of Japan's Liberal-Democratic Party in 1955, and it has effected a number of other changes in Japanese society. Since 1975, however, the association's influence has suffered from the stricter regulation of political contributions, as well as from the increasingly multinational character of many Japanese businesses.

The association represents some 800 corporations and includes among its membership a diversified group of industries such as mining, finance, and transportation. It has a complex internal structure composed of several consulting agencies and permanent committees that advise the government on such matters as trade policies and space exploration. The organization also conducts unofficial international economic conferences.

Keien (Japanese poet): *see* Kagawa Kageki.

Keighley, locality, Bradford district, county of West Yorkshire, England. Situated in a deep valley, Keighley lies on the River Worth, near its confluence with the Aire, below gritstone Pennine moors that supply an abundance of soft water. Keighley grew rapidly in the 19th century when its woolen industries and manufacture of textile machinery benefited from access to the Leeds and Liverpool Canal. Pop. (1981) urban area, 49,267.

Keigwin, Richard (d. June 21, 1690, St. Kitts), British naval officer and officer of the East India Company, prominent as the leader of "Keigwin's Rebellion" against the company in Bombay in 1683.

On May 4, 1673, as a lieutenant aboard HMS *Assistance,* he led the assault on the Dutch-held island of St. Helena in the South Atlantic. His landing place is still known as Keigwin's Rock. In 1676 he went to Bombay as a free merchant but soon entered the East India Company's service. He became a commandant, and in 1679 he distinguished himself in battle against the Marāṭhā navy, but his refusal to reduce the Bombay regiment and disband the cavalry, despite orders from the company's headquarters in London, led to his recall.

Keigwin returned to Bombay as a captain-lieutenant and a member of the company's governing council. Continuing bad relations with the company, however, resulted in his eventual exclusion from the council, and in December 1683 he headed a revolt against company rule. For nearly a year he ruled Bombay vigorously in the king's name, but finally, in November 1684, after obtaining a free pardon for himself and his followers, he surrendered the island-city to the company on the king's orders. He returned to England in 1685. As commanding officer of the HMS *Assistance,* he was killed while leading the assault on Basseterre, St. Kitts, in the Leeward Islands.

Keihanshin Industrial Zone, Japanese KEIHANSHIN KŌGYŌ CHITAI, also called KYŌTO–ŌSAKA–KŌBE REGION, industrial region, south-central Japan, centring on the Ōsaka–Kōbe Metropolitan Area.

Bordered by Ōsaka Bay to the southwest and bisected by the Yodo River, the area consists of a floodplain interspersed with hills. Other rivers draining the area include the Muko, Yamato, and Ina. The highest hill is Rokkō at 3,123 feet (952 m). Keihanshin is the oldest industrial region of Japan and includes the smaller Hanshin (Ōsaka–Kōbe) Industrial Zone. Keihanshin, neither an administrative nor a political entity, encompasses Ōsaka Urban Prefecture and portions of Kyōto Urban Prefecture and the prefectures (*ken*) of Hyōgo and Shiga.

Kyōto (the former capital of Japan) and Ōsaka were ancient centres of politics, agriculture, industry, and culture. Traditional industries included textiles (*e.g.,* Nishijin brocade) and porcelain. These industries were first mechanized during the Meiji period (1868–1912). Cement, steel, glass, and rubber industries were also established at Kōbe during this period. Originally financed by the government, these factories eventually were transferred to private ownership. Export of manufactured goods from the region to the Asian mainland began after the Sino-Japanese War (1894–95).

In the Shōwa period (from 1926), heavy industries began producing metals, steam lo-

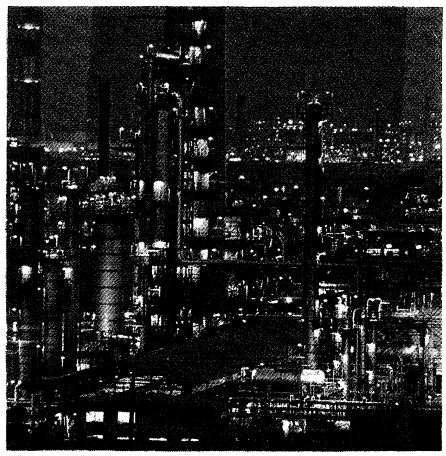
comotives, and rolling stock; lighter industry produced electrical equipment, bicycles, and chemical products. Munitions industries developed in preparation for World War II, while other industries dispersed to Ōsaka's periphery. Small industries, subcontracting for larger ones, produced such items as artificial pearls, eyeglass lenses, and fountain pens. Until the end of World War II, the Keihanshin was the dominant economic zone of Japan.

After the war military industries were converted to produce iron and steel, machinery, transport equipment, and electrical appliances. Since the 1960s, however, the limited space for the expansion of industry and for the construction of new factories has been a major problem in the region. The sinking of land, resulting from the overuse of groundwater, and the decentralization of the city of Ōsaka have created other problems. Although large-scale reclamation projects have been undertaken to provide more space, Keihanshin has lost its leading economic position to the Keihin Industrial Zone (*q.v.*) in the Tokyo–Yokohama Metropolitan Area.

Smaller districts that may be defined within Keihanshin include the Sakai-Senhoku District (the New Coastal Area), the East District, and the North District that specializes in electrical equipment. Parts of the Nara District have been developed as residential and recreational areas, and the Kyōto–Biwa District, which includes Lake Biwa, has been used as a source of industrial water.

Keihin Industrial Zone, Japanese KEIHIN KŌGYŌ CHITAI, also called TOKYO–YOKOHAMA REGION, industrial region, centring on the Tokyo–Yokohama Metropolitan Area (*q.v.*).

Keihin, neither an administrative nor a political entity, extends inland from northwestern and northeastern shores of Tōkyō-wan (Tokyo Bay). It encompasses the metropolis (*to*) of Tokyo and includes parts of the prefectures (*ken*) of Kanagawa, Saitama, and Chiba. The heart of the zone is Keihin-kō (Keihin Harbours), a large industrial belt along the northwestern shore of Tōkyō-wan between Kawasaki and Yokohama.



Petroleum plant, Keihin Industrial Zone, Japan
Imperial Press—FPG/EB Inc.

The Tokyo area began to grow only during the Tokugawa period (1603–1867), when Edo (as Tokyo was then called) became the seat of the Tokugawa shogunate, or military government. There was a considerable degree of economic development then, but the region was mostly a consumer of goods made elsewhere. At that time most commercial and industrial activity was based in the ancient cities of Kyōto and Ōsaka, an area that later became known as the Keihanshin Industrial Zone (*q.v.*). With the tremendous growth of economic activity that occurred in Japan after the Meiji Restoration (1868), the Keihin region began to rival the older Keihanshin; but it was not until after World War II that the Tokyo area became the dominant economic region in Japan.

In the postwar period the Keihin region has been at the centre of Japan's economic and industrial resurgence. The core of this growth has been the heavy industry concentrated at Keihin-kō, which includes steel mills, oil refineries, petrochemical complexes, and shipyards. Major land-reclamation projects have been undertaken to create room for industrial expansion. Further inland plants have been built for the manufacture of such goods as automobiles, machinery, electrical equipment, textiles, and processed foods. Tokyo has become the centre of the publishing industry. Most of Japan's major banks and corporations are based in the city, making it the financial capital of the country as well.

The tremendous and rapid growth of the region, however, has created numerous problems, one of the most serious being overcrowding. Although many new industrial areas have been created by landfill, there has been a constant shortage of land for industrial growth at the centre of the Keihin zone. Transportation inadequacies and environmental pollution have also become major concerns. A consequence of these problems has been the relocation of plants outside of Keihin to the coastal areas of Chiba and Ibaraki prefectures and to other areas of Japan.

Keiō University, Japanese KEIŌ DAIGAKU, private institution of higher learning located in Tokyo. It was founded as a private school in 1858 by the liberal educator Fukuzawa Yukichi and began to function as a university in 1900. Fukuzawa's original purpose was to create an alternative to the nationalistic and authoritarian government-controlled universities, which were at that time devoted to serving the national interests and training future government leaders rather than to fostering free inquiry. Keiō was not officially recognized by the Ministry of Education as a university until 1919. This allowed it to avoid state supervision and thus to provide a freer academic environment, with greater emphasis on individual development than prevailed at government schools such as Tokyo University. Because opportunities in government service have since the late 19th century been largely confined to graduates of government universities, Keiō has concentrated on studies directed toward work in the private sector, such as business and law, and has produced many leaders in banking and industry. In the late 1970s the university included the five faculties of business and commerce, economics, engineering, law, and letters, and schools of medicine and business administration. Associated with the university is the Keiō Institute of Cultural and Linguistic Studies.

Keiser, Reinhard (b. Jan. 9, 1674, Teuchern, near Weissenfels, Saxony—d. Sept. 12, 1739, Hamburg), leading composer of German opera, bridging the Baroque style of the late 17th century and the Rococo style galant of the early 18th century.

Keiser attended the Thomasschule in Leipzig and about 1697 settled in Hamburg. His more than 120 operas include *Octavia* (1705); *Der angenehme Betrug*, with arias by Graupner (1707, revived 1931); *Croesus* (*c.* 1711; revised 1730); and the comic opera *Der lächerliche Printz Jodelet* (1726; revived 1930).

With his colleagues Johann Mattheson and G.P. Telemann, Keiser attempted to establish a distinctively German form of Baroque opera. His early stage works were entirely in German, but Italian arias crept into his later operas under the influence of the increasingly popular Neapolitan school. In his last, *Circe* (1734), there were 21 German arias and 23 Italian arias, some written by Leonardo Leo, Johann Adolf Hasse, and Handel. Keiser's works show French influence in their ballet scenes. Unlike the Neapolitan operas, but like those of the earlier Venetian style, they show much flexibility in the treatment of the aria. He had a fine melodic gift, and many of his arias compete with Italian arias in florid vocal passages.

Keiser held his dominant position until the onslaught of the more stereotyped Neapolitan opera was too strong. He became cantor and canon of the Hamburg cathedral in 1728 and saw, in 1738, the closing of the Hamburg opera. In his later years he turned to church music written in a more severe style, including motets, cantatas, and operatic oratorios. His style influenced both Bach and Handel.

Keita, Modibo (b. May 1915, Bamako, French Sudan—d. May 17, 1977, Bamako, Mali), nationalist politician and first president of Mali (formerly the French Sudan).

Trained as a teacher, Keita was active in the formation of the first urban cultural societies formed by Western-educated youth in the 1930s, when political parties were still banned by the French. After World War II he was cofounder and secretary general of what became the leading Sudanese party, the Union Soudanaise, as well as a leader in the multinational Rassemblement Démocratique Africain, in which he became a friend of another future president, Félix Houphouët-Boigny of the Ivory Coast. Considered a dangerous anticolonialist by the French, Keita was briefly imprisoned in 1946. Two years later, however, he won a seat in the territorial assembly and in the mid-1950s served as a deputy in the French National Assembly, becoming its first African vice president and holding a Cabinet post in two French governments.

Meanwhile, Keita had become president of the Union Soudanaise and also mayor of Bamako (the capital). In the crucial elections of 1957 his party won an overwhelming victory, but Keita remained engaged in external relations. In the referendum of 1958, in which the West African territories had to choose between internal autonomy within the French Community and immediate isolated independence, Keita successfully campaigned for the community. Eager for a West African federation of former French territories, he could not combat the strong centrifugal forces at work among the soon-to-be-independent nations, especially in wealthy Ivory Coast. He finally settled for a Mali Federation made up only of Senegal and his own Sudan. Keita became prime minister of the short-lived federation, which could not even agree on a unitary or federal structure and which was also plagued with personality conflicts. When the two territories separated in 1960, Keita remained as president of the Sudan, which then took the name of Mali, and began to follow the austere Socialist path that characterized Mali's first eight years of independence. His government, though repressive, seemed firmly established; by 1967, however, there was internal party discontent and criticism from both left and right, added to growing financial and economic problems and (in 1968) bad harvests. On Nov. 19, 1968, Keita was overthrown in a bloodless coup led by junior army officers. He spent the remainder of his life in detention.

Keitel, Wilhelm (b. Sept. 22, 1882, Helmscherode, Ger.—d. Oct. 16, 1946, Nürnberg), field marshal and head of the German armed forces high command during World War II. One of Adolf Hitler's most loyal and trusted lieutenants, he became chief of the Führer's personal military staff and helped direct most of the Third Reich's World War II campaigns.

Serving mainly as a staff officer in World War I and in administrative posts under the Weimar Republic (1918–33), Keitel became

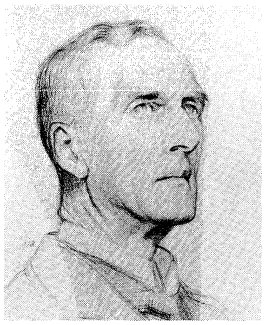
chief of staff of the armed forces office, equivalent to minister of war, in 1935, and in 1938 advanced to head of the armed forces high command, which Hitler had created as a central control agency for Germany's military effort. In June 1940 Keitel dictated the terms



Keitel
Ullstein, Berlin

of the French surrender. After the war he was convicted at the International Military Tribunal at Nürnberg of authorizing the shooting of hostages and other acts and was executed. He was generally regarded as a weak officer who had little tactical military experience and served chiefly as Hitler's lackey.

Keith, Sir Arthur (b. Feb. 5, 1866, Aberdeen, Aberdeen, Scot.—d. Jan. 7, 1955, Downe, Kent, Eng.), Scottish anatomist and physical anthropologist who specialized in the study of fossil man and reconstructed early hominid forms, notably fossils from Europe and North



Sir Arthur Keith, detail of a pencil drawing by William Rothenstein, 1928; in the National Portrait Gallery, London
By courtesy of the National Portrait Gallery, London

Africa and important skeletal groups from Mt. Carmel in present Israel.

A doctor of medicine, science, and law, Keith became a professor at the Royal College of Surgeons of England, London (1908), was professor of physiology at the Royal Institution, London (1918–23), and was rector of the University of Aberdeen (1930–33). His major works include *The Antiquity of Man* (1915), *Concerning Man's Origin* (1927), and *A New Theory of Human Evolution* (1948). In his writings on evolution, Keith tended to emphasize the competitive factor and interpreted racial and national prejudice as inborn. He was knighted in 1921.

Keith, Benjamin Franklin (b. Jan. 26, 1846, Hillsboro, N.H., U.S.—d. March 26, 1914, Palm Beach, Fla.), American impresario who founded the most powerful circuit of theatres in vaudeville history.

Keith was a circus concessionaire before 1883, when he opened a curio museum in Boston. Two years later he joined Edward Franklin Albee, a seller of circus tickets, in establishing and operating the Boston Bijou Theatre, the home of a continuous variety show playing from 10:00 AM until 11:00 PM. The pair then opened a great many theatres across the East and Midwest, absorbing most of the smaller chains.

Keith, James (Francis Edward) (b. June 11, 1696, Inverugie, near Peterhead, Aberdeen, Scot.—d. Oct. 14, 1758, Hochkirch, Saxony), Scottish Jacobite who was a military commander under Frederick II of Prussia.

Forced into exile for his activities in behalf of the Stuart pretender to the English throne (1715 and 1719), Keith served for a time in the Spanish army and in 1728 went to Russia, where he distinguished himself in the War of the Polish Succession and in campaigns against the Ottoman Turks and Sweden. In 1747 he entered the Prussian service and was made a field marshal by Frederick the Great. During the Seven Years' War, he commanded Prussian forces at the siege of Prague (1757) and successfully defended Leipzig against the Austrians. He was killed in the Battle of Hochkirch. In 1868 a monument donated by William I of Prussia was erected to Keith's memory at Peterhead in Scotland.

Keith, William (b. Nov. 21, 1839, Old Meldrum, Aberdeen, Scot.—d. April 13, 1911, Berkeley, Calif., U.S.), Scottish-born American painter known for his California landscapes.

Settling in California in 1859, Keith was encouraged by critical approval and sales of his first landscapes to study abroad in 1869–70. For 40 years thereafter, from his studios in San Francisco, he produced thousands of woodland and mountain landscapes from his field sketches of the Sierra Nevada, of California live oaks, and of the Yosemite. The influence of John Constable, Camille Corot, and George Inness on his work is evident. His landscapes are represented at two Keith galleries in California (at St. Mary's College, Moraga, and at the Oakland Museum of Art) and in the Metropolitan Museum of Art (New York City), the Corcoran Gallery (Washington, D.C.), and the Cleveland Museum of Art.

Keiyō Industrial Zone, Japanese KEIYŌ KŌGYŌ CHITAI, industrial region, east-central Japan, part of the Keihin (Tokyo–Yokohama) Industrial Zone. Keiyō is neither an administrative nor a political entity. Occupying a portion of Chiba prefecture (*ken*) on the Bōsō Peninsula, the region lies just east of Tokyo; it is bordered to the west by Tokyo Bay and to the east by the Pacific Ocean. The coast of Tokyo Bay was formerly used for seaweed collection, fishing, and resorts. Development of heavier industry began with construction of a steel plant in Chiba city in 1952. Subsequently, other iron and steel, chemical (including petrochemical), and shipbuilding industries migrated to Keiyō as a result of industrial decentralization in Keihin. Deepwater ports and thermal power generators were built, and 70 percent of the land reclaimed from the bay went to the Keiyō region. Further development in Keiyō took place during the 1960s, and the region became part of Keihin in the late 1960s. By the mid-1970s, production of heavy metals and chemicals in Keiyō was the highest among Japan's industrial regions. Cities in Keiyō include Chiba, Funabashi, Kisarazu, and Kimitsu. Rail, highway, and domestic airline connections are extensive.

Keizan Jōkin, also called KEIZAN, posthumous name JŌSAI DAISHI (b. Nov. 13, 1268, Echizen Province, Japan—d. Sept. 22, 1325, Noto Province), Buddhist priest of the Sōtō sect, who founded the Sōji Temple (Sōji-ji; now in Yokohama), one of the two head temples of the sect.

At the age of 12 Keizan entered the priesthood under Koun Ejō, the second head priest of the Eihei Temple (in modern Fukui Prefecture), the headquarters of the sect. After the death of Koun Ejō, Keizan studied under Tettsū Gikai of the Daijō Temple and finally received the law of Buddha from him. After studying under Kohō Kakumyō, he returned to the Daijō Temple and there propagated the teachings of the Sōtō sect for 10 years, until he became the head priest of the Shogaku Temple in modern Ishikawa Prefecture.

Keizan gave the temple a new name, Shogaku-zan Sōji-ji, and affiliated it with the Sōtō sect in 1321. Later, when he preached to the emperor Go-Daigo on the Ten Questions on Buddhism, Sōji Temple became an Imperial temple. It was destroyed by fire in 1898 and was rebuilt on the present site in Yokohama. Keizan devoted himself to establishing many temples, renewing the religious traditions of his sect, and popularizing the teachings of its founder, Dōgen. Under him the Sōtō sect developed rapidly and expanded to all corners of Japan. Now called Taiso (Great Master), he is worshiped as the restorer of the Sōtō sect. The main literary works of Keizan are explanations of Sōtō methods of meditation and daily monastic life.

Kekchí, Mayan Indians of central Guatemala, living in damp highlands and lowlands of irregular terrain. The Kekchí are agricultural, raising corn and beans as staple crops. These are planted together in plots burned off and worked with digging sticks. Sexual taboos and fertility rituals are associated with the planting. Houses are built of thatch and poles, without windows. Hammocks are used for beds. In some places women still weave, using the backstrap loom, but pottery and weaving are on the decline. Commercially made cloth predominates.

Nominally Roman Catholic, the Kekchí have the *cofradía,* or laymen's religious society, whose duties include the celebration of the community's patron saint's day and the protection of the saint's image. Worship of pre-Christian deities is well preserved, however; the most important of these is Tzultacaj (Tzultaq'ah), god of the mountains and valleys.

Kekkonen, Urho K(aleva) (b. Sept. 3, 1900, Pielavesi, Fin.—d. Aug. 31, 1986, Helsinki), Finnish prime minister (1950–53, 1954–56) and president (1956–81), noted for his Soviet-oriented neutrality.

A northern lumberman's son, Kekkonen studied at the University of Helsinki, receiving the degrees of Bachelor of Civil Law in 1928 and Doctor of Civil Law in 1936. While working as an attorney, he became increasingly involved, from the 1920s, in the agrarian movement and was a civil servant in the Ministry of Agriculture, 1927–32. He was a member of Parliament (1936–56) as a representative of the Agrarian Party (later renamed the Centre Party). Originally, he took a hard line against the Soviet Union and, in 1940, was one of only two members of Parliament to vote against ceding any Finnish territory to the U.S.S.R. By 1943, however, recognizing that Germany would lose the war, he concluded that Finland must adopt a policy of friendly neutrality toward the Soviet Union if it wanted to retain its independence.

Holding various ministerial and legislative posts, Kekkonen became prime minister in 1950, during the presidency of Juho Kusti Paasikivi, and secured the presidency upon Paasikivi's death in 1956. The careful, but friendly foreign policy vis-à-vis the Soviet Union came to be called the Paasikivi-Kekkonen line. Kekkonen continued to be reelected (1962, 1968, 1978). In 1973 parliament extended his third six-year term in office an extra four years. He resigned in 1981 because of failing health.

Kekri, also spelled KEYRI, or KÄYRI, in ancient Finnish religion, a feast day marking the end of the agricultural season that also coin-

cided with the time when the cattle were taken in from pasture and settled for a winter's stay in the barn. Kekri originally fell on Michaelmas, September 29, but was later shifted to November 1, All Saints' Day. In the old system of reckoning time, Kekri was a critical period between the old and new years when the ancestor spirits came to visit their former homes. The living accordingly held feasts honouring the dead. Food and drink were left for the spirits, the sauna was heated, and the dead were referred to as "holy men." The feast was generally restricted to the members of the family, but in some areas the occasion was also marked by the common sacrifice of a sheep by the men of the entire village.

Kekule von Stradonitz, (Friedrich) August, original name FRIEDRICH AUGUST KEKULÉ (b. Sept. 7, 1829, Darmstadt, Hesse—d. July 13, 1896, Bonn), chemist who laid the groundwork for the modern structural theory in organic chemistry. Intending to be an architect, he entered the University of Giessen but came under the influence of Justus von Liebig and switched to chemistry.



Kekule
Historia-Photo

After receiving his doctorate (1852) he studied at Paris, where he met Charles-Frédéric Gerhardt, from whose type theory of organic structure Kekule developed his own ideas. He became a lecturer at the University of Heidelberg (1856) and professor of chemistry at Ghent, Belg. (1858). He moved to Bonn in 1865.

His early training in architecture may have helped him conceive his structural theories. In 1858 he showed that carbon is tetravalent and that its atoms can link together to form long chains. This idea, which opened the way to an understanding of aliphatic compounds, was announced almost simultaneously, but independently, by Archibald Scott Couper.

One night in 1865 Kekule dreamed of the benzene molecule as a snake biting its tail while in whirling motion. From that vision his concept of the six-carbon benzene ring was born, and the facts of organic chemistry known up to that time fell into place.

He also carried out valuable work on mercury fulminate, unsaturated acids, and thio acids and wrote a four-volume textbook of organic chemistry. When he was ennobled he added "von Stradonitz" to his name.

Kelaa des Srarhna, el-, also spelled EL-KELAA DES SRAGHNA, town, provincial capital, and province (established 1973), Tensift region, western Morocco. The town, located about 47 mi (75 km) northeast of Marrakech, is a local market centre in the eastern part of the province; its name means the "Citadel of the Srarhna," referring to its earlier function as the ancient capital of the local Berber-Arab Srarhna tribe. It is picturesque, surrounded by ramparts and adorned by scattered gardens and olive groves.

El-Kelaa des Srarhna province is bounded by the provinces of Settat (north), Beni Mellal (northeast), Azilal (southeast), Marrakech (south), Safi (southwest), and el-Jadida (northwest). It embraces an area of 3,888 sq mi (10,070 sq km) and comprises the most arid area of Morocco west of the Atlas Mountains. The western part of the province is a relatively barren quartz and shale plateau (receiving about 8 in. [200 mm] of rainfall annually) whose limited natural vegetation includes fruit-bearing jujube trees. The local seminomads grow subsistence cereals and graze sheep and goats. The Oued (stream) Tessaout valley in the eastern part of the province contains fertile mounds of silt (*dirs*) washed down from the Haut (High) Atlas mountains. The Tessaont valley has had regulated irrigation since the completion of the Aït Adel dam (in nearly Azilal province) in 1971; crops such as olives, citrus fruits, and cereals (including wheat and barley) are intensively cultivated. Extensive phosphate deposits are located near the town of Benguerir in the western part of the province. Pop. (1971) town, 17,163; (1981 est.) province, 587,100.

Kelang, formerly KLANG, town, west central Selangor state, West Malaysia (Malaya), on the Sungai (River) Kelang and the 40-mi (64-km) Kuala Lumpur–Port Kelang railway. The state capital until 1880, it is now the administrative centre of a rubber- and fruit-growing district. During the 19th-century tin rush, Klang served as a port of entry to the central region. Formerly noted for its coffee, it began intensive production of rubber in the 1890s, when the price of coffee fell, and rubber was planted on cleared local estates.

Industries include pineapple canning and the manufacture of rubber footwear and herbicides. Nearby Connaught Bridge is a large thermal-electric power station. The Istana ("palace") Alam Shah is the residence of the sultan of Selangor. Pop. (1980) 192,080.

Kelantan, state (*negeri*), northeastern West Malaysia (Malaya); mountainous jungles form its boundaries with Thailand (northwest) and the states of Perak (west), Pahang (south), and Terengganu (east). Its 5,765-sq-mi (14,931-sq-km) area is almost entirely formed by the valley of the Sungai (River) Kelantan. The river, navigable by launch for 80 mi (130 km), rises in several branches (Galas, Nenggiri, Lebir) in the hilly south and flows more than 150 mi north to the South China Sea at Tumpat, the state's chief port. Kelantan's agricultural economy centres on the densely populated river delta and coastal plain (coconuts, rice, and rubber). The interior, rising to 7,175 ft (2,187 m) at Gunung Tahan on the Pahang border, has several rubber and oil-palm estates.

The area was colonized by Javanese in the 14th century, and the sultanate has been traced to the Melakan sultan Mansur Shah (1459–77). Although the state was under Thai suzerainty from 1780 to 1909, its people are Malay by race and Muslim by religion, more homogeneous than other Malayan groups. Kelantan retains a dialect and traditions differing from those in surrounding states because of its Javanese heritage and long geographical isolation. Temporarily annexed by Thailand during World War II, it subsequently joined the Federation of Malaya.

Along the coastal sandspits and lagoons coconuts are grown, and there is inshore fishing despite the shallow seaward approaches that oblige even small coastal steamers to anchor half a mile offshore. The northeast monsoon prevents almost all seaborne activity from October to January. In November and December heavy rainfall causes flooding of the delta distributaries.

Industry is concentrated around the state capital, Kota Baharu (*q.v.*), and includes boatbuilding, sawmilling, plywood manufacture, rice milling, and various cottage industries (batik textiles, silverware). Iron, tin, and manganese are mined. Small quantities of gold are obtained as a by-product of tin mining. In addition to the dense road network in the coastal plain, the state is served by a rail connection with Thailand (via Rantau Panjang) and the east coast railway, which follows the Sungai Kelantan Valley. There is an airport at Kota Baharu. Other important towns are Pasir Mas, Kuala Kerai, and Machang. Pop. (1982 est.) 903,695.

Kell, Joseph: *see* Burgess, Anthony.

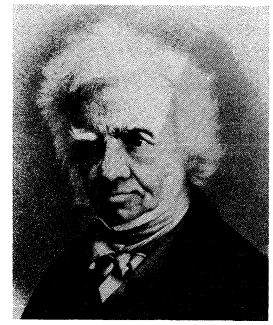
Kellar, Harry, Kellar also spelled KELLER (b. July 11, 1849, Erie, Pa., U.S.—d. March 10, 1922, Los Angeles), first great magician native to the United States. Called the "dean of magic" and "the most beloved magician in history," he was the most popular magician from 1896 until 1908.

From age 12 to 18 Kellar learned magic while travelling as an assistant to I.H. Hughes. Kellar opened his full evening show in the United States in 1884. Known as a perfectionist, he carefully planned every word and movement of his act. He soon rivalled the popularity of Alexander Herrmann, whose position as the leading magician in the United States he assumed when Herrmann died in 1896. In 1908 Kellar publicly turned his show over to his successor, Howard Thurston.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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Keller, Ferdinand (b. Dec. 24, 1800, Marthalen, Switz.—d. June 21, 1881, Zürich), Swiss archaeologist and prehistorian who conducted the first systematic excavation of prehistoric Alpine lake dwellings, at Obermeilen on Lake Zürich. He thus initiated the study of similar remains elsewhere in Switzerland and Europe, from which much was learned about Late Stone Age and Bronze Age life.



Ferdinand Keller, detail of a lithograph by Wilhelm Suter
By courtesy of the Bibliotheque Nationale Suisse, Bern

After becoming a professor of English in Zürich (1831), Keller tried excavating prehistoric burial mounds. In 1832, with other amateur enthusiasts, he founded the Zürich Antiquarian Society and over the next 15 years became absorbed in the young science of European prehistoric archaeology. Excavating widely around Zürich, he gathered a sizable collection of flints, bronzes, and pottery and published papers that earned him an honorary doctorate in archaeology and a reputation as one of Switzerland's foremost archaeologists.

In 1854, at Obermeilen, farmers dredging a broad expanse of mud, in which many wooden pilings were submerged, found flints, bones, and bronze jewelry. They were brought to Keller, who immediately organized a party to examine the site. The results were extraordinary. In addition to more enduring artifacts, pieces of basketry, cloth, and netting were found. Bones included those of domestic animals. Keller theorized that Stone Age or Bronze Age villages had been built on the

pilings submerged in the lake bed. Publication of his first findings created a sensation, and the rush was on to find other sites to excavate. His papers appeared in English as *The Lake Dwellings of Switzerland and Other Parts of Europe* (1866). Other excavators submitted their reports to him, and he devoted much of his time to theorizing on the subject of lake dwellings. At the time of publication of his eighth report (1879), 161 sites had been authenticated in Switzerland, and work was under way on sites in Austria, France, and Italy.

Keller, Gottfried (b. July 19, 1819, Zürich—d. July 16, 1890, Zürich), the greatest German-Swiss narrative writer of the late 19th-century realistic school.

His father, a lathe artisan, died in Keller's early childhood, but his strong-willed, devoted mother struggled to provide him with an education. After being expelled from secondary



Gottfried Keller, drawing by R. Leemann, 1842; in the Zentralbibliothek, Zürich

By courtesy of the Zentralbibliothek, Zurich

school for a prank, he took up landscape painting. Two years' study in Munich (1840–42) brought little success, so he returned to Zürich, where he published his first poems in 1846. From 1848 to 1850 the Zürich government sponsored his studies at Heidelberg, where he was deeply influenced by the philosopher Ludwig Feuerbach. From 1850 to 1855 he lived in Berlin.

Intending to write for the theatre, he wrote instead the long autobiographical novel *Der grüne Heinrich* (1854–55; *Green Henry*), on which his reputation rests. It was completely revised 25 years later (1879–80), and in this version, which is standard, the personal story of a young man's development becomes a classic Bildungsroman (educational novel) in the tradition of Goethe's *Wilhelm Meister*. Green Henry (so called because his frugal mother made all his clothes from a single bolt of green cloth) sets out to become an artist. After some success and many disappointments, he returns to his native city and wins some respect and contentment in a modest post as a civil servant. Keller returned to Zürich in 1855 and became clerk to the canton (1861–76). These 15 years allowed him almost no time for writing. He resumed his literary career late in life.

Keller is also well known for his short stories, some of which are collected as *Die Leute von Seldwyla* (1856–74; *The People of Seldwyla*) and *Sieben Legenden* (1872; *Seven Legends*). His last novel, *Martin Salander* (1886), deals with political life in Switzerland in his time.

Keller, Helen (Adams) (b. June 27, 1880, Tuscumbia, Ala., U.S.—d. June 1, 1968, Westport, Conn.), American author and educator who was blind and deaf. Her education and training represent an extraordinary accomplishment in the education of persons so handicapped.

By severe illness, at the age of 19 months,



Helen Keller at 66

By courtesy of the American Foundation for the Blind

she was deprived of sight and hearing and soon became mute. When she was about six years old her parents appealed to Alexander Graham Bell for counsel regarding her education, and, as a result, Anne Mansfield Sullivan (later Mrs. John A. Macy) began on March 2, 1887, to instruct the child. Sullivan, then 20 years old, formerly blind but partially cured of blindness, was a graduate of the Perkins School for the Blind at Boston. Within a month she had begun to teach Helen the names of objects by pressing the manual alphabet into her palm; later Helen learned to speak by placing her fingers on Sullivan's larynx to "hear" the vibrations. Under Sullivan's constant teaching and with instruction at the Horace Mann School for the Deaf, Boston, and the Wright-Humason Oral School, New York City, Keller learned to read and write in Braille and became exceptionally proficient in the ordinary educational curriculum. She graduated *cum laude* (1904) from Radcliffe College, Cambridge, Mass., where Sullivan had "spelled" the lectures into her hand.

Helen Keller devoted her life to publicly aiding the deaf and blind. With the aid of a translator (needed because her voice was not generally intelligible), she toured the world to promote the education of persons similarly afflicted. She wrote many books, including *The Story of My Life* (1902) and *Helen Keller's Journal* (1938). Helen Keller's childhood training with Anne Sullivan was depicted in William Gibson's play *The Miracle Worker* (New York opening, Oct. 19, 1959), which won the Pulitzer Prize in 1960 and was subsequently made into a motion picture (1962).

Kellermann, Bernhard (b. March 4, 1879, Fürth, Ger.—d. Oct. 17, 1951, Potsdam, E.Ger.), German journalist and writer best known for his novel *Der Tunnel* (1913; *The Tunnel,* 1915), a sensational technical-utopian work.

Kellermann was a painter before he turned to writing. His early novels, *Yester und Li* (1904), *Ingeborg* (1906), and *Der Tor* (1909; *The Fool,* 1925), were written in the Neo-Romantic Impressionist manner. The renowned *Tunnel* was followed by *Der 9. November* (1921; *The Ninth of November*, 1925), inspired by the German revolution of 1918; *Das blaue Band* (1938; "The Blue Band"), based on the sinking of the ocean liner "Titanic"; and *Totentanz* (1948; "Dance of Death").

As a foreign correspondent for the *Berliner Tageblatt* during World War I, Kellermann wrote two journalistic novels, *Der Krieg im Westen* (1915; "The War in the West") and *Der Krieg im Argonnerwald* (1916; "War in the Argonne Forest"), as well as a number of travel books.

Kellermann, François-Christophe, DUC (duke) DE VALMY (b. May 28, 1735, Strasbourg, Fr.—d. Sept. 23, 1820, Paris), French general whose defeat of a Prussian army at Valmy in September 1792 halted an invasion that threatened the Revolutionary regime in France.

Born into a family of the judicial nobility, Kellermann became an officer in the French Army in 1752. He fought with distinction against the Prussians and British during the Seven Years' War (1756–63) and was subsequently sent on diplomatic missions to eastern Europe. Promoted to the rank of field marshal in 1788, Kellermann welcomed the outbreak of the Revolution in the following year. In March 1792 he was made a lieutenant general. He joined Charles-François du Périer Dumouriez, commander of the northern front, at Valmy on September 19; on the following day Kellermann defeated an invading Prussian army in an artillery duel. The Austrian and Prussian forces then retreated from French soil.

In November 1792 Kellermann was appointed commander of the Army of the Alps. He recaptured Savoy from the Sardinians in the autumn of 1793, but in November the Jacobin regime in Paris imprisoned him on suspicion of disloyalty. He was released shortly after the Jacobins fell from power in July 1794, and from 1795 to 1797 he again commanded the Army of the Alps. When Napoleon came to power in 1799, Kellermann was made a senator. He proved to be so able a military administrator that he was made marshal of France in 1804 and duc de Valmy four years later. Meanwhile, his son François-Étienne



François-Christophe Kellermann, portrait drawing by Jacques-Louis David; in the Musée de Besançon, France

Giraudon—Art Resource/EB Inc.

Kellermann (1770–1835) had become one of the finest cavalry officers in Napoleon's army. After the Second Restoration of King Louis XVIII (1815), Kellermann sat in the Chamber of Peers.

Kelley, Florence (b. Sept. 12, 1859, Philadelphia—d. Feb. 17, 1932, Philadelphia), social reformer who contributed to the development of state and federal labour and social welfare legislation in the United States.

Kelley earned a B.A. from Cornell University in 1882. While studying at the University of Zurich, she became an ardent socialist and there translated into English Friedrich Engels' *The Conditions of the Working-class in England in 1844* (1887). In 1891 she joined the residents of Chicago's Hull House, the social settlement directed by Jane Addams. Her investigative work there contributed to an Illinois act in 1893 that regulated tenement sweat shops, hours of work for women, and child labour. That year, too, she was named the first chief factory inspector of Illinois.

In 1899 Kelley became secretary of the National Consumer's League, which promoted the use of consumer boycotts to support proper working conditions. She travelled across the United States publicizing the league and organizing state affiliates. Her work has been credited with contributing to the passage of minimum wage, child labour, and working hours laws in the United States.

Kelley, a suffragist, was also a founder of the

National Association for the Advancement of Colored People (1909) and an organizer of the Women's International League for Peace and Freedom (1919).

Kellgren, Johan Henrik (b. Dec. 1, 1751, Floby, Swed.—d. April 20, 1795, Stockholm), poet considered the greatest literary figure of the Swedish Enlightenment and once called Sweden's "national good sense."



Kellgren, portrait by J.T. Sergel, 1785
By courtesy of the Svenska Portrattarkivet, Stockholm

A talented young man, Kellgren soon found his way to the court of Gustav III. For some time he acted as private secretary to the king, who appointed him one of the first members of the Swedish Academy when it was founded in 1786. Kellgren's earliest works, erotic poems, appeared in 1773, but he won fame with the satiric poem *Mina löjen* (1778; "My Laughter"). In the 1780s he wrote a number of verse dramas on themes suggested by Gustav. This collaboration culminated in *Gustaf Wasa* (1786), a successful patriotic opera. The following year he wrote what is considered his greatest poem, *Den Nya Skapelsen, eller inbillningensvärld* (1790; "The New Creation, or the World of the Imagination"), in which he exalts the power of the imagination while describing a rich experience of romantic love.

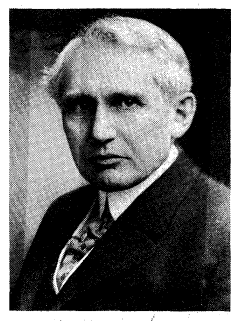
From 1778 until the time of his death, Kellgren was associated with the influential literary journal *Stockholmsposten,* which he edited in the years 1780–84 and 1788–95. He used his literary skills to attack superstition and criticize a broad array of social vices.

Kellogg, city, Shoshone county, northern Idaho, U.S. It is situated in the Coeur d'Alene mining district of the Bitterroot Range. Established as a prospecting camp in 1893 and originally called Milo, it was renamed (1894) to honour Noah S. Kellogg, discoverer of the Bunker Hill Mine. The community developed as a mining and smelting centre for lead, zinc, and silver. Bunker Hill (combined with the Sullivan) is one of the world's largest lead mines. The Sunshine Mine, a few miles east of Kellogg, is one of the largest single-lode producers of silver in the United States; in 1972 it was the scene of a disastrous fire that killed 91 miners. The Cataldo Old Mission of the Sacred Heart (1848; restored within a state park) is 11 miles (18 km) west. Inc. town, 1897; city, 1913. Pop. (1986 est.) 2,650.

Kellogg, Frank B(illings) (b. Dec. 22, 1856, Potsdam, N.Y., U.S.—d. Dec. 21, 1937, St. Paul, Minn.), U.S. secretary of state (1925–29) whose most important achievement was the Kellogg–Briand Pact of 1928, a multilateral agreement designed to prohibit war as an instrument of national policy. He was awarded the Nobel Prize for Peace in 1929.

Kellogg studied law and was admitted to the bar in 1877. He achieved prominence as a lawyer representing the U.S. government in antitrust cases and served in the U.S. Senate (1917–23) and as U.S. ambassador to Great Britain (1923–25).

As secretary of state under President Calvin Coolidge (1925–29), Kellogg generally followed an isolationist policy regarding European affairs, but he helped arrange an international conference at Geneva (1927) that sought unsuccessfully to limit naval armaments.



Frank B. Kellogg
By courtesy of the Library of Congress, Washington, D.C.

In 1928 the French foreign minister, Aristide Briand, had evolved a plan for a bilateral pact outlawing war as a tool of national diplomacy. Kellogg delayed for months, partly fearful of a two-nation entanglement. Prodded into action by vocal American proponents of the "outlawry of war" movement, he succeeded in broadening the agreement to include 62 nations, among them all the major powers. Although widely heralded and recognized with the Nobel Prize, the Kellogg–Briand Pact was nevertheless full of loopholes and devoid of means for effective enforcement.

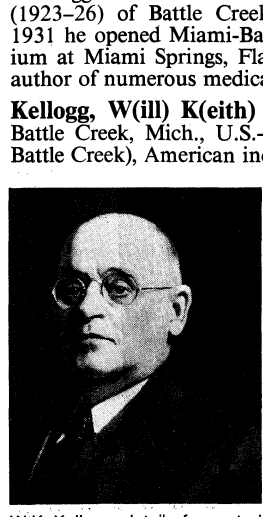
Kellogg later (1930–35) served on the Permanent Court of International Justice.

Kellogg, John Harvey (b. Feb. 26, 1852, Tyrone, Mich., U.S.—d. Dec. 14, 1943, Battle Creek, Mich.), American physician and health-food pioneer whose development of dry breakfast cereals was largely responsible for the creation of the flaked-cereal industry.

Kellogg received his M.D. from Bellevue Hospital Medical College, New York City, in 1875. A Seventh-day Adventist and vegetarian, Kellogg became superintendent in 1876 of the Seventh-day Adventist Western Health Reform Institute, which then became the Battle Creek Sanitarium. (In 1959 it was renamed the Battle Creek Health Center.) Kellogg developed numerous nut and vegetable products to vary the diet of the patients, including a flaked-wheat cereal called Granose and cornflakes. Although cornflakes were not new, they had never before been presented as a breakfast food. Kellogg's brother W.K. Kellogg formed his own cereal company, and one of the sanitarium patients, C.W. Post, also founded a cereal company that became well known.

Kellogg was founder and first president (1923–26) of Battle Creek College, and in 1931 he opened Miami-Battle Creek Sanitarium at Miami Springs, Fla. He was also the author of numerous medical books.

Kellogg, W(ill) K(eith) (b. April 7, 1860, Battle Creek, Mich., U.S.—d. Oct. 6, 1951, Battle Creek), American industrialist and philanthropist who founded (1906) the W.K. Kellogg Company to manufacture cereal products as breakfast foods. His cereals have found widespread use throughout the United States.



W.K. Kellogg, detail of a portrait by Frank O. Salisbury, 1938; in a private collection
By courtesy of Kellogg Co.

Kellogg established the firm after working with his brother John Harvey Kellogg, a physician who directed the Battle Creek Sanitarium, where cereal products were advocated as health foods. The company originally made only toasted cornflakes but later added other products. In 1930 Kellogg established the W.K. Kellogg Foundation, which has donated large sums of money in support of efforts at social improvement, particularly programs of child welfare.

Kellogg–Briand Pact, also called PACT OF PARIS (Aug. 27, 1928), multilateral agreement attempting to eliminate war as an instrument of national policy. It was the most grandiose of a series of peacekeeping efforts after World War I.

Hoping to tie the United States into a system of protective alliances directed against a possible resurgence of German aggression, the French foreign minister, Aristide Briand, first suggested a bilateral nonaggression pact in the spring of 1927. The U.S. secretary of state, Frank B. Kellogg, prodded by the American "outlawry of war" movement and supported by those who were disappointed at the failure of the United States to join the League of Nations, proposed that the pact be converted into a general multilateral treaty, which the French accepted.

As a result of Kellogg's proposal, nearly all the nations of the world eventually subscribed to the Kellogg–Briand Pact, agreeing to renounce war as an instrument of national policy and to settle all international disputes by peaceful means. The signatories allowed themselves a great variety of qualifications and interpretations, however, so that the pact would not prohibit, for example, wars of self-defense or certain military obligations arising from the League Covenant, the Monroe Doctrine, or postwar treaties of alliance. These conditions, in addition to the treaty's failure to establish a means of enforcement, rendered the agreement completely ineffective.

Kellogg Company, leading American producer of ready-to-eat cereals and other food products. Kellogg's Corn Flakes was one of the earliest and remains one of the most popular breakfast cereals in the United States. Headquarters are in Battle Creek, Mich.

The company was founded as the Sanitas Food Company in 1900 by W.K. Kellogg and his brother Dr. John H. Kellogg, who together had developed a method of producing crunchy, flavourful flakes of processed grain that proved a popular breakfast food among the patients at Dr. Kellogg's Battle Creek Sanitarium. W.K. Kellogg eventually bought out his brother and in 1906 established the Kellogg Toasted Corn Flakes Company. Through innovative advertising techniques and improvements in the quality of the cereals, the company prospered. The present name was adopted in 1922 after the company began making cereals other than cornflakes.

In 1969 the company began to diversify. The acquisition of Salada Foods that year introduced tea and desserts to its product line. It purchased Fearn International, makers of soups, sauces, and other foods, in 1970; Mrs. Smith's Pie Company in 1976; and Pure Packed Foods, makers of nondairy frozen foods, in 1977.

Kells (Ireland): *see* Ceanannus Mór.

Kells, Book of, illuminated gospel book (MS. A.I. 6; Trinity College Library, Dublin) that is a masterpiece of the ornate Hiberno-Saxon

style. It is probable that the illumination was begun in the late 8th century at the Irish monastery of Iona and that after a Viking raid the book was taken to the monastery of Kells in County Meath, where it may have been completed in the early 9th century. A facsimile of the manuscript was published in 1974.

Kelly, Ellsworth (b. May 31, 1923, Newburgh, N.Y., U.S.), American painter and sculptor, a leading exponent of the hard-edge style, in which abstract contours are sharply and precisely defined.

Kelly studied at the Boston Museum of Fine Arts School (1946–48) and at the Académie des Beaux-Arts (1948–49) in Paris. He presented his first one-man show in Paris in 1951. Since then his works have been exhibited in shows around the world and are represented in numerous museums. He was commissioned to do sculpture for the Transportation Building in Philadelphia (1957) and the New York State Pavilion at the New York World's Fair (1964–65).

Kelly used the clean, geometric lines of his paintings (*e.g.*, "Red Blue Green," 1963) in his painted, cut-out metal sheet sculpture (*e.g.*, "Gate," 1959). Many of his geometric sculptures were manufactured industrially.

BIBLIOGRAPHY. E.C. Goossen, *Ellsworth Kelly* (1973), is the catalog from a retrospective exhibition of his work at the Museum of Modern Art in New York City. John Coplans, *Ellsworth Kelly* (1972), contains excellent colour plates.

Kelly, Emmett (Lee) (b. Dec. 9, 1898, Sedan, Kan., U.S.—d. March 28, 1979, Sarasota, Fla.), American circus clown, best known for his role as "Weary Willie," a mournful tramp dressed in tattered clothes and made up with a growth of beard and a bulbous nose.

Kelly as a young man studied to become a cartoonist, and he originally created the Weary Willie character as a cartoon figure. Later,



Emmett Kelly, c. 1937

By courtesy of the Circus World Museum, Baraboo, Wisconsin

he joined Howe's Great London Circus as a trapeze artist, and in 1923 he brought his cartoon character to life as a clown. He worked for the Sells–Floto and Hagenbeck–Wallace circuses until 1931 and then for the Cole Bros. After appearing in England with the Bertram Mills Circus in the late 1930s, Kelly joined the Ringling Bros. and Barnum & Bailey Combined Circus in 1942 and played with them until the late 1950s. Weary Willie made his motion-picture debut in *The Greatest Show on Earth* (1952). Kelly's autobiography, *Clown,* was published in 1954. He was a mascot in spring training for the Brooklyn Dodgers in 1957 and worked sporadically thereafter until the year of his death. He died in 1979 on an opening day of the Ringling Bros. and Barnum & Bailey Combined Circus.

Kelly, Gene, original name EUGENE CURRAN KELLY (b. Aug. 23, 1912, Pittsburgh, Pa., U.S.), American dancer, actor, choreographer, and motion-picture director whose athletic style of dancing, combined with classical ballet technique, transformed the movie musical and did much to change the American public's conception of male dancers.

Prior to his first Broadway roles as a member of the chorus, Kelly took a degree in economics from the University of Pittsburgh (A.B., 1933) and held a variety of jobs, including that of dance instructor. In 1941 he starred in *Pal Joey* on Broadway, and he made his film debut with Judy Garland in *For Me and My Gal* (1942).

Kelly's carefree acting manner and spontaneous, masculine dancing style made him one of the most popular stars of movie musicals in the 1940s and '50s. Among his more notable movies, in which he often worked as choreographer and codirector, are *Cover Girl* (1944, also choreographer); *Anchors Aweigh* (1945, choreographer), for which he was nominated for a best actor Oscar; *The Pirate* (1948, cochoreographer); *On the Town* (1949, choreographer and codirector); *Brigadoon* (1954, choreographer); and *Invitation to the Dance* (1956, director and choreographer). Kelly starred in perhaps two of the most popular musicals ever made—*An American in Paris* (1951, choreographer) and *Singin' in the Rain* (1952, codirector and cochoreographer); the American Film Institute named the latter the best film musical of all time. Kelly directed such films as *Gigot* (1962) and *Hello, Dolly!* (1969) and narrated the popular *That's Entertainment* films in 1974 and 1976.

In 1951 Kelly was awarded a special Oscar from the Academy of Motion Picture Arts and Sciences for his "versatility as actor, singer, director and dancer, and especially for his brilliant achievements in the art of choreography on film."

Kelly, George (Edward) (b. Jan. 16, 1887, Philadelphia, Pa., U.S.—d. June 18, 1974, Bryn Mawr, Pa.), playwright, actor, and director whose dramas of the 1920s reflect the foibles of the American middle class with a telling accuracy.

Educated privately, Kelly followed his elder brother Walter into vaudeville as an actor, writing his first sketches for his own performance. His first success on Broadway was *The Torchbearers* (performed 1922), a satire on the social and aesthetic pretensions of the Little Theatre movement then flourishing in the United States. His next play, *The Show-Off* (1924), became an American comedy classic, made three times as a film (1926, 1934, 1946) and often revived on the stage. In *Craig's Wife* (1925), Kelly shifted his vision to the upper middle class and abandoned comedy to write a savage drama of a woman who sacrifices her husband to her possessions, ultimately losing both.

He wrote several other plays, but none was a popular success. He wrote film scripts, among them those for the motion-picture versions of his plays, including *Craig's Wife* (1936), remade as *Harriet Craig* (1950).

Kelly, Grace, also called (from 1956) PRINCESS GRACE OF MONACO, French PRINCESSE GRACE DE MONACO (b. Nov. 12, 1929, Philadelphia, Pa., U.S.—d. Sept. 14, 1982, Monte Carlo, Monaco), American actress of films and television, known as a leading lady of stately beauty and reserve. She starred in 11 motion pictures before abandoning a Hollywood career to marry Prince Rainier of Monaco in 1956.

She was born into a rich Irish Catholic family in Philadelphia (her uncle was the playwright George Kelly) and attended private schools before enrolling in the American Academy of Dramatic Art in New York City in 1947. She made her professional debut in summer stock in July 1949 and her Broadway debut in November 1949. She also appeared frequently on television.

During her six-year (1951–56) heyday in Hollywood, she appeared in such films as *Fourteen Hours* (1951), in which she made her screen debut; *High Noon* (1952), as Gary Cooper's Quaker wife; *Mogambo* (1953), opposite Clark Gable; and *The Country Girl* (1954), for which she won an Academy Award for best actress as Bing Crosby's dowdy wife. But perhaps her most memorable roles were in such Alfred Hitchcock films as *Dial M for Murder* (1954), *Rear Window* (1954), and *To Catch a Thief* (1955). Kelly was the perfect Hitchcock heroine and had what he described as "sexual elegance." After making *The Swan* (1956) and *High Society* (1956), she married Prince Rainier and became princess of Monaco. The couple had three children—Princess Caroline, Prince Albert, and Princess Stephanie—and remained devoted to each other and their family.

Princess Grace died of injuries sustained in an automobile accident. She and her daughter Stephanie were driving on a winding road at Cap-d'Ail in the Côte d'Azur region of France when Princess Grace suffered a stroke and lost control of the car, which plunged down a 45-foot (13.7-metre) embankment.

Kelly, Hugh (b. 1739, Dublin?, Ire.—d. Feb. 3, 1777, London, Eng.), British dramatist, critic, and journalist who was, for a time, a serious rival of the playwright Oliver Goldsmith in the London theatre, after his play *False Delicacy* (staged in 1768) scored a triumph in opposition to Goldsmith's *Good-Natur'd Man.*

Kelly immigrated to London in 1760 and began contributing essays to several magazines there. He edited *The Court Magazine* from



Hugh Kelly, engraving after a portrait by Hugh Hamilton (c. 1734–1806)

By courtesy of the National Library of Ireland

1761 to 1765 and published a short epistolary novel called *Memoirs of a Magdalen . . .* (1767). His *Thespis,* 2 vol. (1766–67), confirmed his reputation as a controversial critic.

The resounding success of Kelly's first play, *False Delicacy,* staged with the patronage of David Garrick, cost him Goldsmith's friendship and earned the enduring resentment of Samuel Johnson, who had written the prologue for Goldsmith's play. Another comedy by Kelly, *The School for Wives* (1773), and an afterpiece, *The Romance of an Hour* (1774), proved successful. But a final comedy, *The Man of Reason* (1776), was a failure, and Kelly, having been called to the bar in 1774, retired from the theatre to practice law. Kelly's formula for success as a playwright was to blend comic and satiric scenes with earnestly sentimental material.

Kelly, John B. (b. Oct. 4, 1889, Philadelphia, Pa., U.S.—d. June 20, 1960, Philadelphia), American oarsman who won 126 consecutive races in single sculls in 1919 and 1920, a record that included the 1920 Olympic Games championship. Kelly also won the double sculls event (with his cousin Paul Costello) at the 1920 and 1924 Games.

Kelly started work in 1907 in his brother's construction company and formed his own

bricklaying firm in 1919. Because of his trade he was barred from competing in the 1920 Diamond Sculls event at the Henley Regatta in England. Kelly's son, Jack, won the Diamond Sculls event in 1947 and 1949.

Kelly was the brother of Walter Kelly, the vaudevillian, and George Kelly, the playwright. His daughter, Grace, was an actress and later princess of Monaco.

Kelly, Ned, byname of EDWARD KELLY (b. June 1855, Beveridge, Victoria, Australia—d. Nov. 11, 1880, Melbourne), most famous of the bushrangers, Australian rural outlaws of the 19th century. The Kelly gang's perpetration of a series of daring robberies in the Victoria–New South Wales borderland (1878–80) captured the imagination of the public. Some viewed Ned Kelly as a personification of the plight of workers set against large landowners in an economically depressed period.

In 1877 Kelly shot and injured a policeman who was trying to arrest his brother, Dan Kelly, for horse theft. The brothers fled to the bush, where two other men joined them to form the Kelly gang. In June 1880, after several police shootings and robberies, the gang took possession of Glenrowan township, where they were besieged by police. Kelly was wounded and captured in the ensuing fray; his fellow gang members were killed. Later that year he was taken to Melbourne jail, where he was hanged.

Kelly, Walt, byname of WALTER CRAWFORD KELLY (b. Aug. 25, 1913, Philadelphia—d. Oct. 18, 1973, Los Angeles), American creator of the comic strip "Pogo," which was noted for its sophisticated humour, gentle whimsy, and occasional pointed political satire.

Kelly spent his boyhood in Bridgeport, Conn., where he was a cartoonist for his high school paper, having been taught to draw by his father, a painter of theatrical scenery. In 1935 he went to Hollywood, where he did animation drawings for Walt Disney Productions. During the 1940s he was active as a commercial artist in New York City, one of his projects being a comic book in which the character Pogo appeared in about 1943. His great opportunity came in 1948 with the publication of the short-lived New York *Star,* for which he did, among other duties, the daily comic strip "Pogo," based on the character he had created earlier. After the *Star* ceased publication in January 1949, "Pogo" was carried by the New York *Post* and, before long, by many other papers.

The characters in "Pogo" are animals who live in Okefenokee Swamp, in Georgia. Pogo himself is a self-effacing possum. Other characters were Howland Owl, Albert the Alligator, and Churchy LaFemme, a turtle. The strip was exceptionally well-drawn, and the text material was witty and highly literate. Kelly frequently included animal characters that closely resembled prominent political figures of the day.

Beginning with *Pogo* (1951) there have been many collections of Kelly's strips, compiled both from newspapers and from original creations.

Kelly, William (b. Aug. 21, 1811, Pittsburgh—d. Feb. 11, 1888, Louisville, Ky., U.S.), American ironmaster who invented the pneumatic process of steelmaking, in which air is blown through molten pig iron to oxidize and remove unwanted impurities. Also patented by Sir Henry Bessemer of Great Britain, this process produced the first inexpensive steel, which became the major construction material in the burgeoning industrial age.

In the early 1840s, while on a buying trip for McShane & Kelly, a Pittsburgh dry-goods and shipping company in which he was a partner, Kelly became interested in the iron industry around Eddyville, Ky., and later persuaded his brother to join him in forming an ironworks. They bought an iron furnace and 14,000 acres of timberland and ore deposits; the Eddyville Iron Works prospered.

With the gradual depletion of the timberland and the dwindling of carbon-free iron deposits, Kelly began searching for a more efficient means of refining pig iron. Aware that air drafts cause molten iron to glow white hot, he became convinced that air blown through molten iron not only would remove the carbon but also would cause the temperature of the molten mass to rise, making further heating unnecessary.

Those around Kelly believed that his scheme was insane, and his father-in-law even had him examined by a doctor. The physician's knowledge of basic science enabled him to see the value of his patient's scheme, however, and he became one of Kelly's strongest supporters.

About 1850, after several failures, Kelly succeeded in producing iron and steel with his process, although the quality of the steel was still largely a matter of chance. He did not patent the process immediately but continued working on it.

In 1855 Bessemer obtained an English patent, and the following year several American patents, on the pneumatic process. When Kelly heard of Bessemer's patents, he filed a priority claim and in 1857 received a U.S. patent superseding Bessemer's patents.

Further innovations in steelmaking, notably by Robert Mushet of England and Goran Goransson of Sweden, made the pneumatic process practical. Before he went bankrupt during the panic of 1857, Kelly sold his patent to his father. In 1859 he renewed his experiments at the Cambria Iron Works, Johnstown, Pa., and by 1862 managed to find enough financial aid to enable him to build a steel plant in Wyandotte, Mich. Within two years he produced the first commercial steel using the Kelly process. In 1863 the Kelly Pneumatic Process Company was organized, and the following year a company using Bessemer's patents was organized in Troy, N.Y. Unable to achieve more than minimal success with their respective patents and processes, the companies pooled their resources in 1866, and thereafter steel production expanded rapidly.

Although he received some money from the Kelly Company, it was only after his patent was extended in 1871 that Kelly received significant remuneration for his invention.

keloid, fibrous tissue overgrowth occurring in scars. Usually only the skin layers are affected in this manner; scars of the mucous membranes or deeper tissues do not form keloids. Keloids are sometimes equated with fibrous tumours, but most pathologists do not consider them to be neoplasms (new growths of physiologically nonfunctional tissue). Negroid and Mongoloid peoples are most likely to develop keloids from scars or traumatic irritation; the tendency seems to be inherited.

Kelowna, city, southern British Columbia, Canada. It lies 80 miles (129 km) north of the U.S. (Washington) border, on the east shore of Okanagan Lake (there bridged), 284 miles (457 km) east-northeast of Vancouver. Kelowna originated around a mission established in about 1859 by Father Charles Pandosy, of the Oblates of Mary Immaculate, who planted trees and formed the basis for an apple industry.

The city is now the focal point for one of Canada's largest fruit-growing districts. Lumbering, fruit packing and canning, tree nurseries, wine making, and machine-shop working are the economic mainstays. An international regatta has been held each summer since 1906, and tourism is becoming increasingly important as a source of income. *Kelowna* is a corruption of an Indian word for "grizzly bear." Inc. city, 1905. Pop. (1981) 59,196.

kelp, any of numerous large seaweeds found in colder seas and belonging to the order Laminariales (about 30 genera) of brown algae. The term applies also to the ash produced by the incineration of various seaweeds. Until early in the 19th century this ash was an important source of potash (derived from the plant's stemlike stipe) and iodine (extracted from its leaflike blades). Giant kelp, of the genus *Macrocystis,* is rich in minerals and produces algin, a complex carbohydrate (polysaccharide) that is useful in various industrial processes, including tire manufacture. Algin is added to ice cream before freezing to prevent crystallization and is also used as a suspending and emulsifying agent.

Several genera of brown algae are known as kelp. *Laminaria,* a large brown seaweed (1 to 3 m [3.3 to 9.8 feet] long) abundant along the Pacific coasts and the British Isles, is a source of commercial iodine and produces acetic acid when allowed to ferment. It has a stipe that superficially resembles the stem of land plants and lives several years, but the blade dies each year. Growth occurs, as in all kelp, at the meristematic region between the stipe and the blade.



Oarweed (*Laminaria*)
Douglas P. Wilson

Macrocystis, the largest known kelp, up to 65 m (215 feet) long, is limited in distribution because it reproduces only at temperatures below 18–20° C. The complicated plant body, similar in appearance to that of higher plants, has a large rootlike holdfast for attachment to the ocean floor, a hollow stemlike stipe for the internal transport of organic material, and a long branching stalk with blades that stay afloat by means of hollow gas bladders.

Nereocystis, or sea otter's cabbage, an annual kelp that grows primarily in deep waters and rapid tideways, can attain lengths up to 40 m (130 feet). Internally the plant structure is similar to *Macrocystis;* externally the stalk is tough and whiplike, terminating in a large bladder. The long leafy outgrowths from the stalk carry out photosynthesis and reproduction.

kelp crab, Pacific species of spider crab (*q.v.*).

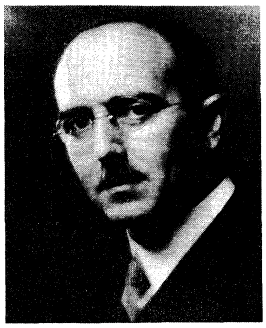
Kelsen, Hans (b. Oct. 11, 1881, Prague—d. April 20, 1973, Berkeley, Calif., U.S.) Austrian–American legal philosopher, teacher of law, jurist, and writer on international law, who formulated a kind of positivism known as the "pure theory" of law.

Kelsen was a professor at Vienna, Cologne, Geneva, and the German university in Prague; he wrote the Austrian constitution adopted in 1920 and served as a judge of the Austrian Supreme Constitutional Court (1920–30). After immigrating to the United States in 1940, he taught at Harvard, the University of California at Berkeley, and the Naval War College, Newport, R.I.

Kelsen's "pure theory" was first presented in *Hauptprobleme der Staatsrechtslehre* (1911; "Chief Problems of the Doctrine of International Law"). He considered that a theory of law should validate and give order to law it-

self. By "pure" he meant that a theory of law should be logically self-supporting and should not depend on extralegal values. Fundamental to a system of law is some assumption (*Grundnorm*) that is accepted by a substantial proportion of the community. Kelsen nevertheless admitted the relevance of sociology and ethics to the lawmaking process and to the content of laws.

Among Kelsen's later books are *General Theory of Law and State* (1945) and *The Law of the United Nations* (1950–51). In such works as *Principles of International Law* (1952) he envisioned a world unity under law superimposed on the legal order within each nation.



Kelsen
By courtesy of the Bild-Archiv, Osterreichische Nationalbibliothek, Vienna

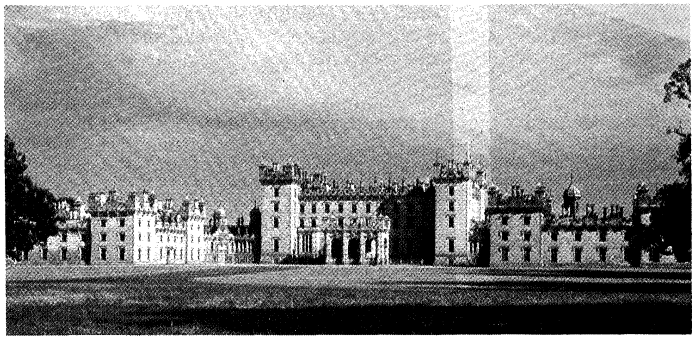
Kelsey, Henry (b. *c.* 1667, East Greenwich, near London—buried Nov. 2, 1724, East Greenwich), British mariner and explorer of the Canadian plains who played a significant role in the establishment of the Hudson's Bay Company.

Kelsey was apprenticed to the Hudson's Bay Company (chartered 1670) by 1684, and in a trip to the region begun that year he conducted some exploration along the west shore of Hudson Bay. In 1689 he journeyed with a small party to the Churchill River area. Kelsey became proficient in Indian languages, and in 1690 he headed a company venturing ever farther westward to promote trade with the Indians and got to the Saskatchewan River and beyond. That two-year venture is believed to have made him the first white man to explore Canada's central plains. Twice, incursions by the French led to the capture of the western British outpost York Fort (now York Factory, Man.) while he was in the fort, and both times it was he who negotiated the surrender. For several years he was master of a frigate plying Hudson Bay in trade with the Indians. Kelsey was overseas governor of the Hudson's Bay Company from 1718 to 1722. He wrote portions of many of his reports in rhyme.

Kelso, small burgh and market centre in the district of Roxburgh, Borders region, Scotland. It lies on the left bank of the River Tweed, at the head of the Merse, a rich agricultural plain south of the Lammermuir Hills. The town has an important market and is noted for its spring lamb sales.

Like many of its neighbours, medieval Kelso suffered from border warfare with the English. The abbey was founded by King David I of Scotland (reigned 1124–53). Completed in the mid-13th century, it became one of the most powerful in Scotland, but it suffered damage in English raids and was reduced to ruins in 1545. The transept functioned as the parish church until 1771, and one vault was used as the town jail. The abbey was presented to the nation in 1919 by the Duke of Roxburgh and restoration was undertaken.

Medieval Kelso was overshadowed by the nearby castle and flourishing royal burgh of Roxburgh, a favourite royal residence and



Floors (Fleurs) Castle, near Kelso, Roxburgh
A.F. Kersting

prosperous town. After its final destruction in 1460, Roxburgh was abandoned in favour of the rising burgh of Kelso, which had its status confirmed in 1634. After the erection of a bridge over the River Tweed in 1754, Kelso became a stop on the important London-to-Edinburgh coach route. John Rennie's new five-arched bridge over the Tweed in 1803 was his model for the famous London Bridge (1811). Pop. (1981 prelim.) 5,609.

Keltic languages: *see* Celtic languages.

kelvin, base unit of thermodynamic temperature measurement in the International System (SI) of measurement. It is defined as 1/273.16 of the triple point (equilibrium among the solid, liquid, and gaseous phases) of pure water. The kelvin (symbol K without the degree sign [°]) is also the fundamental unit of the Kelvin scale, an absolute temperature scale named for the British physicist William Thomson, Baron Kelvin. Such a scale has as its zero point absolute zero, the theoretical temperature at which the molecules of a substance have the lowest energy. Many physical laws and formulas can be expressed more simply when an absolute temperature scale is used; accordingly, the Kelvin scale has been adopted as the international standard for scientific temperature measurement. The Kelvin scale is related to the Celsius scale. The difference between the freezing and boiling points of water is 100 degrees in each, so that the kelvin has the same magnitude as the degree Celsius.

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Kelvin (of Largs), William Thomson, Baron, also called (1866–92) SIR WILLIAM THOMSON (b. June 26, 1824, Belfast, County Antrim, Ire. [now in Northern Ireland]—d. Dec. 17, 1907, Netherhall, near Largs, Ayrshire, Scot.), Scottish engineer, mathematician, and physicist, who profoundly influenced the scientific thought of his generation.

A brief account of the life and works of Lord Kelvin follows; for a full biography, *see* MACROPAEDIA: Kelvin.

William Thomson entered the University of Glasgow, where his father taught mathematics, at the age of 10. He published two mathematical papers at 16 and 17 and graduated from the University of Cambridge at 21. The following year he was awarded the chair of natural philosophy at Glasgow and remained there for the rest of his career. Thomson later became involved in the laying of the first Atlantic cable. He grew wealthy through his invention of a receiver for the submarine telegraph, and Queen Victoria knighted him. In 1892 he became Lord Kelvin.

Thomson's scientific contributions include a major role in the development of the conservation law of energy; the absolute temperature scale (which is cited in kelvins); the dynamical theory of heat; the mathematical analysis of electricity and magnetism, including basic ideas for the electromagnetic theory of light; the geophysical determination of the Earth's age; and fundamental work in hydrodynamics. He published more than 600 scientific papers, received dozens of honorary degrees, was granted many patents, and served as president of the Royal Society. He died without issue (of two marriages), and his peerage became extinct.

Kemal, Mustafa (Turkish statesman): *see* Atatürk, Kemal.

Kemal, (Mehmed) Namık (b. Dec. 2, 1840, Tekirdağ, Ottoman Empire—d. Dec. 2, 1888, Sakız [now Chios, Greece]), Turkish prose writer and poet who greatly influenced the Young Turk and Turkish nationalist movements and contributed to the westernization of Turkish literature.

An aristocrat by birth, he was educated privately, learning Persian, Arabic, and French, which resulted in his working for the Ottoman government translation bureaus in 1857–58. Kemal became acquainted with the leading poets of the day and began to write poetry in the classical Ottoman style. Later he was influenced by the writer and editor of the newspaper *Tasvir-i Efkâr*, İbrahim Şinasi, who had spent much time in Europe and was greatly enamoured of Western ways and ideas. Kemal became editor of the *Tasvir-i Efkâr* in 1865, when Şinasi fled to France. By 1857, however, the highly political nature of the publication caused trouble with the Ottoman government, and he, together with other Young Ottomans, as this group of reforming young writers came to be known, fled to London, and then to Paris and Vienna. Kemal spent his time studying and translating works of such great French authors as Victor Hugo, Jean-Jacques Rousseau, and Charles-Louis Montesquieu into Turkish. He also published the newspaper *Hürriyet* ("Liberty"). When the Young Ottomans returned to Constantinople in 1871, Kemal continued his revolutionary writings as editor of the newspaper *İbret* and also wrote his most famous play, *Vatan yahnut Silistre* ("Fatherland; or, Silistria"), a drama evolving around the siege of Silistria in 1854, in which he expounded on the ideas of patriotism and liberalism. The play was denounced by the Ottoman government and led to his imprisonment on Cyprus (1873–76). After his release and another period of virtual exile, he became governor of Sakız (Chios) in 1888.

Namık Kemal, the social reformer, is best-known as the propagator of two basic ideas: *vatan* ("fatherland") and *hürriyet* ("freedom"), ideas modeled after European concepts that he virtually introduced into the Turkish language. Although a liberal thinker, Kemal never rejected Islām in his plan of reform. He believed that the religion was compatible with a thoroughly modernized Turkey having a constitutional government modeled after that of the English. His best-known novels include *İntibah yahut Ali Beyin sergüzeşiti* (1874; "Awakening; or, Ali Bey's Experiences") and *Cezmi* (1887/88), a novel based on the life of the 16th-century khan of the Crimean Tatars, 'Ādil Giray. A widely read social work

is *Rüya* ("The Dream"), expressing his desire for a Turkey free from oppression.

Kemalpaşazâde, also called IBN KEMAL, IBN KEMAL PAŞA, or ŞEMSEDDIN AHMET IBN SÜLEYMAN IBN KEMAL PAŞA (b. *c.* 1468, Edirne, Ottoman Empire—d. April 16, 1534, Constantinople), historian, poet, and scholar who is considered one of the greatest Ottoman historians.

Born into an illustrious military family, as a young man he served in the army of İbrahim Paşa, *vezir* (minister) to Sultan Bayezid II. He later studied under several famous religious scholars and soon began teaching at religious colleges. A highly respected scholar, he was commissioned by Sultan Bayezid II to write an Ottoman history in Turkish, *Tevarih-i Al-i Osman* ("The Chronicles of the House of Osman"), which covers the events between the accession of Sultan Bayezid II in 1481 and the Battle of Mohács in 1526 during the reign of Sultan Süleyman Kanuni, known in the West as the Magnificent. The style of the history is highly ornate, abounding in complex literary devices. Around 1516, Kemalpaşazâde was appointed military judge of Anatolia and accompanied Selim I (1512–20) on a military campaign to Egypt, during which he translated the works of the Egyptian historian Abu al-Mahāsin ibn Taghribirdi from Arabic. Falling from court favour, however, he returned to his native Edirne to teach until he was recalled during the reign of Süleyman, who named him supreme head of the religious institution, a post he held until his death.

Although best known as a historian, Kemalpaşazâde was also a great scholar and a talented poet. He wrote numerous scholarly commentaries on the Qur'ān, treatises on jurisprudence and Muslim theology and philosophy, and, in Arabic, a philological work entitled *Daqa'iq al-Haqa'iq* ("The Subtleties of Verities"). His best poetical works include the *Nigaristan* ("The Picture Gallery"), written in Persian and modelled upon the *Būstān* and the *Golestān* of Sa'dī; a poem, *Yusuf ü Züleyha,* in rhymed couplets retelling the story of Joseph and Potiphar's wife; and *Divān* ("Collected Poems"), consisting mainly of lyrics.

Kemble, Adelaide (b. 1814?, London—d. Aug. 4, 1879, Warsash House, Hampshire, Eng.), celebrated singer and member of the famous theatrical family Kemble.

Born to Charles and Maria Theresa Kemble, Adelaide turned her interests to music instead of acting and sang professionally from 1835 to 1842. She studied in Italy and was a brilliant success in her operatic debut as Norma in Venice. She toured the Continent and appeared in England in concert and opera to consistently great acclaim. She withdrew from the stage with a brief speech after a concert in 1842, married John Sartoris, and never again appeared in public. Her fame lingered, reinforced by private performances she gave from time to time for friends.

Kemble, Charles (b. Nov. 25, 1775, Brecknock, Brecknockshire, Wales—d. Nov. 12, 1854, London), theatrical manager, the first to use appropriately detailed historical sets and costumes on the English stage, and an actor noted for his supporting roles in several Shakespeare plays, but at his best in comedy.

Kemble, the youngest member of a theatrical family, made his first recorded appearance in 1792 or 1793 at Sheffield as Orlando in Shakespeare's *As You Like It.* His London debut took place on April 21, 1794: in Shakespeare's *Macbeth* he acted Malcolm to the Macbeth of his brother, the tragedian and theatrical manager John Philip Kemble. In comedy he was frequently supported by his wife, Maria Theresa de Camp. He became manager of Covent Garden Theatre, London, but nearly went bankrupt until his daughter, Fanny Kemble, made her debut there in 1829



Charles Kemble as Romeo, engraving by P. Thomson, *c.* 1819

By courtesy of the R. Mander and J. Mitchenson Theatre Collection

and became a success. Visits to the United States with his daughter in 1832 and 1834 also brought acclaim. Because of increasing deafness, he retired from the stage in December 1836 but gave readings of Shakespeare until 1840. After his retirement he was given the post of examiner of plays, a government position he resigned in 1840 to his son John Mitchell, a distinguished philologist.

Jane Williamson's *Charles Kemble: Man of the Theatre* was published in 1970.

Kemble, Elizabeth (actress): *see* Whitlock, Elizabeth.

Kemble, Elizabeth, *née* SATCHELL (b. 1763?, London—d. Jan. 20, 1841, near Durham, Durham, Eng.), English actress of great ability whose career was subordinated to that of her husband, George Stephen Kemble. Elizabeth Satchell was a talented performer when she married Kemble in 1783, and for several years they acted together, with critics consistently noting her superiority. When engagements took her husband out of town she accompanied him to the detriment of her own career. She outlived him by 19 years.

Kemble, Fanny, in full FRANCES ANN KEMBLE (b. Nov. 27, 1809, London—d. Jan. 15, 1893, London), English author of plays, poems, and reminiscences, the latter containing much information about the stage and social history of the 19th century; she was also a popular actress of both comedy and tragedy. She disliked both acting and the theatrical



Fanny Kemble, detail from an engraving by A. Chappel after a painting by Sir Thomas Lawrence, 1830

By courtesy of the R. Mander and J. Mitchenson Theatre Collection

profession, taking to the stage only when she needed money.

The eldest daughter of the actor-manager Charles Kemble and the actress-playwright Maria Theresa de Camp, Fanny Kemble began acting to help her father, who was facing bankruptcy as manager of the Covent Garden Theatre in London; she made her debut there on Oct. 25, 1829, as Juliet in Shakespeare's *Romeo and Juliet.* An immediate popular success, she brought prosperity to Covent Garden for the next three years, notably as Lady Teazle in *The School for Scandal,* Portia in *The Merchant of Venice,* and Beatrice in *Much Ado About Nothing.* She also created the role of Julia in *The Hunchback,* which James Sheridan Knowles wrote especially for her. In 1832 and 1834 she successfully toured the United States with her father; on her second trip she married a Southern planter, retiring from the stage until a year before her divorce in 1848, when she returned successfully to the English stage. She subsequently made a series of successful readings of Shakespeare in England and the United States, her last appearance being in New York City in October 1868. Her valuable *Journal* appeared in 1835 followed by a second in 1863. She also wrote autobiographical works: *Record of a Girlhood* (1878), *Records of Later Life* (1882), and *Further Records, 1848–1883* (1890).

Kemble, George Stephen, original name STEPHEN KEMBLE (b. April 21, 1758, Kingston, Herefordshire, Eng.—d. June 5, 1822, near Durham, Durham), English actor and theatrical manager.

Kemble's mother, the actress Sarah Kemble, acted the role of [the pregnant] Anne Boleyn in *King Henry VIII* on the night of his birth, then was rushed off to deliver him. His parents hoped he would be a chemist, but young Kemble rejected his apprenticeship and joined a travelling company of actors. The fame of his great sister Sarah Siddons aided him in finding engagements. In 1783 Kemble married Elizabeth Satchell, an actress who clearly outshone him. They played together, she billed as Mrs. Elizabeth Kemble. For a time he virtually abandoned acting in favour of theatre management. He was stage manager at the Drury Lane when his son Henry Stephen Kemble made his debut as Romeo. A daughter was a successful actress until she left the stage for marriage.

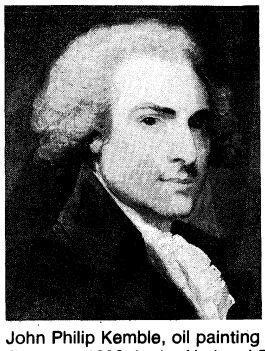
Kemble, Henry Stephen (b. Sept. 15, 1789, London—d. June 22, 1836), English actor of popularity but modest attainments, a member of the famous Kemble theatrical family.

The only child of George Stephen and Mrs. Elizabeth Kemble, Henry Stephen was born after his mother completed a stage performance as Queen Margaret, a circumstance similar to that of his father's birth. His parents hoped he would not pursue a theatrical career, but he abandoned Cambridge after two years to try his wings in his father's acting company at Whitehaven. Henry's talent was meagre, although he joined a touring company to develop it. While his father was stage manager at the Drury Lane he gave Henry parts that were beyond his ability. He became something of a whipping boy for critics, although he enjoyed personal popularity. He enjoyed modest success as a comic character actor.

Kemble, John Philip (b. Feb. 1, 1757, Prescot, Lancashire, Eng.—d. Feb. 26, 1823, Lausanne, Switz.), popular English actor and manager of the Drury Lane and Covent Garden theatres in London, where his reforms improved the status of the theatrical profession. He played heavy dramatic roles in the artificial and statuesque style then in vogue. His most famous roles were Shakespeare's Brutus in *Julius Caesar* and the title roles in *Hamlet* and, above all, *Coriolanus.* He excelled in declamation but could not express strong or subtle emotions.

Eldest son in an acting family, he spent his childhood on the stage. Later he trained for the priesthood in France, where he acquired

a certain severity and asceticism that influenced his acting style. Finding that he had no vocation for the priesthood, he returned to England and the theatre, making his first adult appearance on the stage in 1776. After several years in the provinces, he played Hamlet in Dublin on Nov. 2, 1781, and made his London debut in the same role at Drury Lane on Sept. 30, 1783, with mixed results. It was, however, his performance in *Macbeth* on March 31, 1785, opposite his sister, the great tragedian Sarah Siddons, that established him as a popular favourite.



John Philip Kemble, oil painting by G. Stuart, *c.* 1800; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

Appointed manager of the Drury Lane Theatre in 1788, Kemble made important reforms in costumes, scenery, and management, introducing live animals and aquatic effects to the stage for the first time. As an actor, Kemble's tall and imposing figure, impressive countenance, and grave and solemn demeanour made him uniquely suited for the Roman characters in Shakespeare's plays. Because of conflicts with Richard Brinsley Sheridan, a dramatist and the proprietor of Drury Lane, Kemble resigned that position, and, though he resumed his duties temporarily at the beginning of the 1800–01 season, the connection between the two was permanently severed at the end of 1802. In 1803 he became manager of the Covent Garden, in which he had acquired a sixth share; when the playhouse burned down on Sept. 20, 1808, he suffered financially. The increase in prices after the opening of the new theatre in 1809 led to riots that practically suspended performances for three months. Kemble was saved from ruin by a large loan, afterward converted into a gift, from the Duke of Northumberland and by the sale of Kemble's fine library. Troubled by gout and by the rising popularity of the great Romantic actor Edmund Kean, he retired to the European continent after his last performance as Coriolanus on June 23, 1817.

Kemble, Maria Theresa, also called MARIE-THÉRÈSE KEMBLE, *née* DE CAMP (b. Jan. 17, 1774, Vienna, Austria—d. Sept. 3, 1838, Chertsey, Surrey, Eng.), English singer, dancer, and actress who married the actor-theatrical manager Charles Kemble.

The daughter of a French family of musicians, Maria Theresa was taken to England as a small child. In 1786 she found an acting part at the Drury Lane Theatre. She continued to play a wide variety of minor parts, some of them singing. In 1806 she married Charles Kemble and appeared with him for years in supporting parts at the Covent Garden. Their two daughters also won fame; they were the author and actress Fanny Kemble and the opera and concert singer Adelaide Kemble.

Kemble, Priscilla, *née* HOPKINS (b. 1756, London, Eng.—d. May 1845, Leamington, Warwickshire), noted English actress and wife of the actor and theatrical manager John Philip Kemble.

Born into a theatrical family, Priscilla Hopkins made her acting debut in 1772 with David Garrick's company at the Drury Lane. After a few years, Priscilla married another of Garrick's actors, William Brereton. He died in 1787, and later that year she married John Philip Kemble shortly before he became manager of the Drury Lane. Priscilla continued acting, mainly in supporting roles, until she retired from the stage in 1796.

Kemble, Roger (b. March 1, 1721, Hereford, Eng.—d. Dec. 6, 1802), English actor and theatre manager and founder of the famous Kemble family.

Kemble's fancy was taken by a theatrical company that he encountered at Canterbury in 1752. He was able to join it, but he was not at first a successful actor. Later he turned up at Birmingham, where he managed to be taken on by the theatre manager John Ward, and he improved his acting at least modestly.

Kemble married Ward's daughter Sarah, to the distress of her father, who did not want his child to marry an actor but consoled himself, it is said, with the thought that Kemble was no actor. Kemble did succeed as a theatrical manager. The marriage was fruitful: of his and Sarah's 12 children, 8 lived to adulthood and 5 of those went into the theatre; the children often played in productions of a traveling company Kemble established and managed.

Kemble, Sarah (English actress): *see* Siddons, Sarah.

Kemeny, Zoltan (b. March 21, 1907, Banica, Austria-Hungary [now in Hungary]—d. June 14, 1965, Zürich, Switz.), Hungarian-born Swiss sculptor of dramatic metal reliefs.

Kemeny was trained in cabinetmaking and architecture and worked for a time in fashion design. In his early reliefs, the coarseness of the materials, frequently scrap metal, wire, nails, and springs, contrasts sharply with Kemeny's fluent sculptural style; images seem to grow and float on the surfaces. After experimenting with lead, zinc, tin, iron, and aluminum, Kemeny settled upon copper and brass as his major materials. Kemeny would structure each relief around a single constituent shape, which he then repeated in the work in many different sizes and variants. "Will Energy Tension Creation" (1958) is a major work, as is "Metallo Magic" (1963), a 360-foot-long brass panel suspended in the foyer of the Frankfurt Municipal Theatre. Kemeny lived in Paris (1930–40) and then in Zürich from 1942. His reputation flowered after World War II, and he had numerous one-man exhibitions in major European cities. He was awarded first prize in sculpture at the Venice Biennale (1964), and a retrospective of his work was held in Paris in 1966 at the National Museum of Modern Art.

Kemény, Zsigmond, Báró (Baron) (b. June 12?, 1814, Alvinc, Hung.—d. Dec. 22, 1875, Pusztakamarás), Hungarian novelist especially noted for his minute psychological analysis.

Kemény's private means and title smoothed the way toward his career. His achievements in politics came through journalism, first in his native Transylvania, then in Pest, where from 1847 to 1855 he served on the staff of the liberal daily newspaper *Pesti Hirlap.* In 1855 he became editor of the *Pesti Napló,* making it the most influential newspaper in Hungarian politics. A partisan of the statesman Ferenc Deák, Kemény prepared the way for the compromise (1867) between Hungary and the Austrian Habsburgs by a journalistic campaign. Always eccentric, he became unbalanced and in 1868 had to abandon his editorship.

Kemény wrote a number of historical novels: *Gyulai Pál* (1847), *Özvegy és leánya* (1855; "The Widow and Her Daughter"), *A rajongók* (1858–59; "The Fanatics"), and *Zord idő* (1862; "Grim Times"). They make heavy reading: there is more description than action, the atmosphere is depressing, and the style is difficult. His heroes, entangled in personal and historical conflicts, move inexorably toward destruction. His novels of contemporary life, such as *Férj és nő* (1852; "Husband and Wife"), are pervaded by the same atmosphere of tragedy. Kemény's masterful grasp of motivation and his fine evocation of the historical background were praised by critics and a select group of readers, but his novels were never popular.

Kemerovo, *oblast* (province), south-central Russian S.F.S.R. It occupies an area of 36,875 square miles (95,500 square km), in the Tom River basin. The north–south valley of the basin is flanked by the Kuznetsk Alatau Mountains on the east and by the lower Salair Ridge on the west. In the south are the low Gornaya Shoriya uplands, on which the headstreams of the Tom rise. The north has steppe vegetation, but most of the *oblast* is thickly forested with conifers that give way to meadows at higher elevations. The *oblast* encompasses the rich Kuznetsk Coal Basin, which underlies the entire area between the two flanking ranges, and the heavy industrial region that has developed on the coalfields since the 1930s. Almost nine-tenths of the *oblast*'s population is urban and is engaged in coal mining; the manufacture of iron, steel, and nonferrous metals (principally at Novokuznetsk); heavy engineering and machine building; and the chemical industry. Some iron ore is mined near Temirtau and Tashtagol in the south, as are small quantities of lead, zinc, barites, arsenic, and gold. Timber working is highly developed, especially the production of pit props. Agriculture is significant only in the north. Kemerovo city is the provincial centre. Pop. (1989 prelim.) 3,175,000.

Kemerovo, city and administrative centre of Kemerovo *oblast* (province), south-central Russian S.F.S.R. It lies along the Tom River near the foothills of the Kuznetsk Alatau Mountains. The small village of Kemerovo was founded in the 1830s and merged with the village of Shcheglovo in 1918 to form the city of Shcheglovsk. The city began to grow rapidly with the development of the Kuznetsk Coal Basin, and in 1932 it reverted to the name Kemerovo. Today it is a major coal-mining centre, with pits in and around the city, and it is one of the most important chemical-producing cities in the Soviet Union. Its products include nitrogenous fertilizers, plastics, material for synthetic fibres, aniline dyes and paints, caustic soda, ammonia, and pharmaceutical goods. The city's engineering industries manufacture coal-mining equipment and agricultural machinery, and sawmilling and timber working are important. There are mining and teacher-training institutes. Pop. (1989 prelim.) 520,000.

Kemi, city, Lapin *lääni* (province), northwestern Finland. It lies along the Gulf of Bothnia at the mouth of the Kemi River, north-northeast of Oulu. It was chartered in 1869, although the site had been inhabited for three centuries. The largest bridge and viaduct in Finland formerly stood just north of Kemi, but both were destroyed by the Germans in World War II. A major centre for the pulp and timber industries, Kemi is also a seaport handling most of the export trade on the Gulf of Bothnia. The nearby Isohaara hydroelectric station provides power for the northern two-thirds of Finland. The city is on the rail line between Tornio and Oulu (completed 1903) and has an airport 4 miles (6.5 km) northwest. Pop. (1987 est.) mun., 26,218.

Kemi River, Finnish KEMIJOKI, river in Lapin *lääni* (province), northern Finland. The country's longest river, it rises near the So-

viet border and flows generally southwest for about 340 miles (550 km) to the Gulf of Bothnia at Kemi town. The river system is harnessed for hydroelectric power and is important for salmon fishing and for transporting logs.

Kemmuna (Malta): *see* Comino.

Kemnitz, Martin: *see* Chemnitz, Martin.

Kempe, John (b. *c.* 1380, near Ashford, Kent, Eng.—d. March 22, 1454, London), English ecclesiastical statesman prominent in the party struggles of the reign of King Henry VI (1422–61, 1470–71).

He began his career as an ecclesiastical lawyer and was soon employed on diplomatic missions for King Henry V (reigned 1413–22). Upon the accession of the infant Henry VI, Kempe played a leading role in the Council of Regency as a supporter of Henry Beaufort, bishop of Winchester, who was engaged in a power struggle with Humphrey, Duke of Gloucester. In 1426 Kempe was appointed archbishop of York and chancellor of England. During Beaufort's prolonged absences from England, he kept Gloucester in check until, in 1432, Gloucester gained the upper hand and forced Kempe to resign.

Created a cardinal in 1439, Kempe again became chancellor in 1450. He quickly suppressed Jack Cade's Kentish rebellion, and, as a leader of the Lancastrian party of Henry VI, he maintained the king's authority against powerful Yorkist rivals. The Lancastrians obtained his appointment as archbishop of Canterbury and cardinal bishop of Santa Rufina in 1452, but he died shortly before the Lancastrian-Yorkist rivalry erupted in civil war (Wars of the Roses, 1455–85).

Kempe, Margery (b. *c.* 1373—d. *c.* 1440), English religious mystic whose autobiography is one of the earliest in English literature.

The daughter of a mayor of Lynn, she married John Kempe in 1393 and bore 14 children before beginning a series of pilgrimages to Jerusalem, Rome, Germany, and Spain in 1414. Her descriptions of her travels and her religious ecstasies, which often included "boystous" crying spells, are narrated in an unaffected prose style that uses such contemporary expressions as "thou wost no more what thou blaberest than Balamis asse." Apparently illiterate, she dictated her *Book of Margery Kempe* to two clerks from about 1432 to about 1436. It was first published (modernized) in 1936 and in Middle English in 1940.

Kempeneer, Pieter de, also called PEDRO CAMPAÑA (b. 1503, Brussels—d. 1580), Flemish religious painter and designer of tapestries, chiefly active in Seville, where he was called Pedro Campaña. By 1537 he had settled in Seville and apparently remained there until shortly before 1563, when he was appointed director of the tapestry factory in Brussels. His most important works are in Seville cathedral—the "Descent from the Cross" (1547) and the "Purification of the Virgin," an altarpiece with portraits of the donor and his family (1555).

Kempenland, also called KEMPEN, French LA CAMPINE, historically TAXANDRIA, plateau region of northeastern Belgium occupying most of Antwerp province and northern Limburg province. It is a rather dry, infertile region of sandy soil and gravel, with pine woods interspersed among meadows of thin grass and heather. Poor drainage, especially in the lower, western part, has produced marshes where reeds and alder trees shelter abundant waterfowl. Although market towns and abbeys date from the Middle Ages, settlement was moderate until the 19th century, when, under population pressure from neighbouring regions, much wasteland was drained and cultivated. Wilderness remains, however, in large parks and designated walking districts. Bokrijk, a national park and nature reserve (founded in 1958) north of Hasselt, has an outdoor museum representing an old Kempenland village and farm, complete with water mills, windmills, brewery, pillory, and gallows.

Coal was discovered in eastern Kempenland, around Genk, in the late 19th century. Exploitation began after World War I, and the coalfield—part of a larger field that extends eastward to Aachen, Ger.—superseded the older south Belgian field as the country's chief coal-producing area. Chemical plants and other coal-based industries followed, encouraged by the construction in 1939 of the Albert ship canal across the region from Antwerp to the Meuse River. Major Kempenland towns include Turnhout, Herentals, Geel, Mol, and Genk. The region is evoked in the novels and poems of Marie Gevers (1883–1975).

Kempff, Wilhelm (b. Nov. 25, 1895, Jüterbog, Ger.), German pianist who specialized in the 19th-century German Classical and Romantic repertoire—especially the sonatas of Ludwig van Beethoven—and in the music of Frédéric Chopin.

He began his piano studies with his father, one of a distinguished family of church musicians. From the age of nine Wilhelm Kempff studied piano and composition at the Berlin Hochschule für Musik. He later also studied philosophy and music history. In 1916 he launched his career as a performer by touring as a pianist with the Berlin Cathedral Choir, and in 1918 gave his first performance as a soloist with the Berlin Philharmonic Orchestra. Tours to Europe, South America, and Japan followed. He directed the Stuttgart Musikhochschule from 1924 to 1929, and from 1931 to 1941 taught summer piano classes at the Marmorpalais in Potsdam. He first performed in London in 1951 and made his debut in the United States in 1964. His playing was marked by intimacy, refinement, and tonal beauty. In addition to musical compositions in a variety of genres, he wrote an autobiography (1951).

Kempsey, town, northeastern New South Wales, Australia, 25 miles (40 km) above the coastal mouth of the Macleay River. Established in 1836, it was at first accessible only by sea via the harbour at Trial Bay. Proclaimed a municipality in 1886, it was named after the Valley of Kempsey on the Severn River in Worcestershire, England. Principal town of the Macleay valley, Kempsey has suffered from floods caused partly by deforestation of the nearby highlands. Located on the Pacific Highway, 145 miles (233 km) northnortheast of Newcastle, and on the Sydney–Brisbane railway, Kempsey serves a district of dairy, corn (maize), and fodder farming and lumbering. Industries include dairy and bacon processing and furniture, plywood, veneer, plaster, brick, and pipe manufacture. A spring festival and rodeo are held in October and a district agricultural show in April. Pop. (1981) 9,037.

Kempten, city, Bavaria *Land* (state), southern Germany, situated on the Iller River in the heart of the Allgäuer Alps. It was known in Celtic and Roman times as Cambodunum. A residence of the Alemannic dukes and the Frankish kings, the town was the site of a Benedictine abbey founded (752) and endowed by Hildegard, wife of Charlemagne. The abbey, which was raised to the status of a principality in 1348, was in constant conflict with the town, which was a free imperial city from 1289 and solidly Protestant from 1525. A new town grew up around the abbey in the 17th century, after the Thirty Years' War, and was chartered in 1712. The two towns were united in 1818, after having been absorbed by Bavaria in 1803.

Historic landmarks include the abbey church of St. Lorenz (1652), the residence of the prince-abbots (1651–74), the stone town hall (1474), and the Church of St. Mang (Evangelical, 1426, restored). The 18th-century Corn Exchange (Kornhaus) now houses the Allgäu Provincial Museum, with a notable Roman collection. The economic, cultural, and communications centre of the Allgäu region and the market for its dairy products (especially cheeses), Kempten has breweries and engineering, textile, and paper industries. Pop. (1989 est.) 60,052.

Ken, Thomas (b. July 1637, Berkhampsted, Hertfordshire, Eng.—d. March 19, 1711, near Warminster, Wiltshire), Anglican bishop, hymn writer, royal chaplain to Charles II of England, and one of seven bishops who in 1688 opposed James II's Declaration of Indulgence, designed to promote Roman Catholicism.

Ordained about 1661, Ken held several ecclesiastical positions until 1669, when he became a prebendary of Winchester Cathedral. In 1679 Ken was appointed chaplain to Princess Mary of York, wife of Prince William of Orange and daughter of James, the Duke of York, who later became King James II. The following year Ken became royal chaplain to Charles II and soon after made his refusal to vacate his house in Winchester to the actress Nell Gwyn, Charles II's mistress. In 1685 he became bishop of Bath and Wells and the same year attended Charles on his deathbed.

In 1688 James reissued his Declaration of Indulgence for the second consecutive year. Though it seemed to promise toleration for Protestant dissenters, it was actually intended to win them to Roman Catholicism. Ken and six other bishops not only refused to publish it in their dioceses but published instead a petition against the order. Imprisoned in the Tower of London and tried for sedition, the bishops were subsequently acquitted. Despite this dispute, Ken remained loyal to James during the Revolution of 1688, when William of Orange sailed from Holland to England with an army to aid the Protestants. James fled the country, and William was crowned king in 1689. For his refusal to swear allegiance to the new regime, Ken was deprived of his office in 1691 and spent the remaining 20 years of his life in retirement. His familiar hymns, "Awake, My Soul, and With the Sun" and "Glory to Thee, My God, This Night" were added to the seventh edition of his *Manual of Prayers* (1674) in 1700.

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Kenadsa, also spelled KENADZA, town and bituminous coalfields, northwestern Algeria, in a hammada (stony desert region) situated at the northwestern edge of the Sahara. The Kenadsa coalfields were discovered in 1907 but not mined until 1917. The maximum output of the Kenadsa (and nearby Ksiksou) coalfields occurred in the 1940s (particularly during World War II) and 1950s. Production has gradually declined to the point where mining is negligible. Transportation costs in comparison to the eastern Algeria natural-gas and petroleum fields (first exploited in the late 1950s) were the principal cause for the demise. Nearby lead, manganese, and iron-ore deposits are also minimally exploited. The coalfields and town are 15 miles (24 km) west of Béchar. Pop. (1987 prelim.) mun., 9,822.

kenaf (*Hibiscus cannabinus*), fast-growing plant of the mallow family Malvaceae and its fibre, one of the bast fibre (*g.v.*) group. It is used mainly as a jute substitute. The plant grows wild in Africa, where the fibre is sometimes known as Guinea hemp, and has been

cultivated on the Indian subcontinent, where it is usually known as mesta, or ambari, since prehistoric times.

Kenaf was unknown in the West until late in the 18th century, when cordage and sacking made from the fibre were brought to Europe. It remained one of the less important bagging materials until World War II, when shortages of jute and other bagging fibres led to a new interest that continued after the war, as supplies of established materials remained insufficient and prices increased. In Cuba, the United States, and similarly affected countries, governments encouraged cultivation of kenaf, and production became increasingly mechanized.

The plant is a herbaceous annual with stalks growing to about 18 feet (5.5 m) in height and fibre concentrated mainly in the lower portion. The leaves are composed of five lance-shaped lobes occurring mainly near the stalk top; the flowers, pale yellow with purple centres, are borne on short stalks growing from the upper angles between leaf stalks and stems.

Kenaf, although adaptable to various soils, grows best in well-drained, sandy loam and requires a warm, moist climate, tropical or subtropical, without excessively heavy rains or strong winds. Some varieties need at least 12 hours of light each day throughout the growing season. Kenaf is less demanding on the soil than jute and may be grown in rotation with other crops. Dense sowing is common, except when cultivation is for seed production. Crops are hand-harvested, yielding the best fibre at the flowering stage. Fibres are usually separated from the stalks mechanically, although in some areas retting, followed by hand stripping, is still practiced. The fibre strands, about 3 feet (0.9 m) long, are pale in colour and lustrous, with strength comparable to that of jute. Leading producers include India, Thailand, and China.

Kenaf, still fairly new to international trade, is used mainly for cordage, canvas, and sacking but is receiving increased consideration for other products, such as newsprint and carpet-backing yarn. Studies begun in the 1950s demonstrated that kenaf, which reaches its mature height in less than six months is easier to process, greater in yield, and stronger of fibre than wood chips.

Kenai Fjords National Park, formerly KENAI FJORDS NATIONAL MONUMENT, national park in southern Alaska, U.S., on the south coast of the Kenai Peninsula within 20 miles (32 km) of Seward. Proclaimed a national monument in 1978, it underwent boundary and title changes in 1980. The area includes the Harding Icefield, its outflowing glaciers, and coastal fjords and islands, which are remnants of drowned mountains. A rich and varied forest is home to sea lions, sea otters, seals, and tens of thousands of breeding birds, including puffins, murres, and auklets. The park's total area is 670,000 acres (271,100 hectares).

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Kendal, town ("parish"), South Lakeland district, county of Cumbria, England, the largest town and the administrative centre of the county. It is close to the main route from London to Scotland via Carlisle and is on one of the principal tourist routes to the Lake District.

A weekly market was granted by the English king Richard I (reigned 1189–99), and fairs were recorded as early as the 14th century. Woolen manufacture was important from 1331, when a Flemish weaver settled in the community. The town's motto is "*Pannus mihi panis,*" commonly translated "Wool Is My Bread." The cloth known as Kendal Green is no longer made, but carpets and woolen mills are still important. Other industries include shoe and snuff manufacture.

The outline of a Roman fort is traceable, and parts of the large parish Church of the Holy Trinity date from 1200. Castle How is an artificial mound, of pre-Norman origin, on which stands an obelisk commemorating the Glorious Revolution of 1688. The Elizabethan Levens Hall, with ornamental gardens, is 5 miles (8 km) south, and 3 miles south is Sizergh Castle with a 14th-century tower and a Tudor hall. Pop. (1981) 23,550.

Kendal, Ehrengarde Melusina, Duchess of, DUCHESS OF MUNSTER, COUNTESS AND MARCHIONESS OF DUNGANNON, COUNTESS OF FEVERSHAM, BARONESS OF DUNDALK, BARONESS OF GLASTONBURY, original name EHRENGARDE MELUSINA, GRÄFIN (countess) VON DER SCHULENBURG (b. Dec. 25, 1667, Emden, Saxony—d. May 10, 1743, Kendal House, Isleworth, Middlesex, Eng.), mistress of the English king George I who had considerable political influence during his reign. She was a close friend of Robert Walpole, who said that she was "as much queen of England as ever any was."

The daughter of Gustavus Adolphus, Graf (count) von der Schulenburg, she was attached to the household of the electress Sophia and became the mistress of Sophia's son George about 1690, following him to England in 1714 when he became king of England. Titles were freely bestowed on her.

In England she was mainly renowned for her cupidity and lack of good looks and was very unpopular with the people of London. She made a fortune out of buying and selling South Sea stock and freely used her influence with the king to sell titles and public offices and to sell patent rights. After George's death she lived at Kendal House in Middlesex. She had two daughters by the king: Petronilla Melusina (*c.* 1693–1778), who was created countess of Walsingham in 1722 and married the great Earl of Chesterfield; and Margaret Gertrude (1703–73), Countess of Lippe.

Kendal, Dame Margaret; and William Hunter (Grimston), Dame Margaret *née* MARGARET SHAFTO ROBERTSON, byname MADGE (respectively b. March 15, 1849, Cleethorpes, Lincolnshire, Eng.—d. Sept. 14, 1935, Chorleywood, Hertfordshire; b. Dec. 16, 1843, London—d. Nov. 7, 1917, London), English actor-managers, husband and wife, who, by their personal and professional example, brought social respectability to the acting profession and whose theatrical company trained many performers who afterward attained eminence.

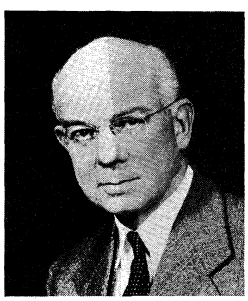
Madge Kendal was a brilliant actress with a wide emotional range who, unlike most dramatic actors of her day, performed in a natural manner. On the stage she overshadowed her husband partly because she was a better performer and partly because he chose plays that would display her great talents to advantage. His contributions were less visible; an astute businessman, he rarely picked a bad play. Gifted with a fine artistic sense, he designed lavish but minutely accurate costumes and scenery.

Sister of the dramatist Thomas William Robertson, Madge Robertson first appeared on the stage as a child along with her actor parents. Her adult fame began with her 1865 London debut as Ophelia in Shakespeare's *Hamlet.* In subsequent years she played other Shakespearean roles, including Desdemona in *Othello* and Lady Macbeth in *Macbeth;* she also sang and danced in variety shows.

William Kendal, son of an artist, made his first stage appearance in 1861 in Glasgow, subsequently toured the provinces, and then joined the Haymarket Company (London) in 1866, playing everything from Shakespeare to burlesque. In 1868, at a London benefit, he played Don Octavio to Madge Robertson's Hypolita in Colley Cibber's *She Wou'd and She Wou'd Not.* They married a year later, and from that time their careers ran parallel.

In 1874 they started an annual tour of the provinces, which they continued until their retirement in 1908. From 1879 to 1888 they managed the St. James's Theatre, London, with Sir John Hare, bringing it fame and prosperity. After 1888 they made several highly successful tours of the United States. Madge Kendal was created Dame Commander of the British Empire in 1926 and in 1927 received the Order of the Grand Cross of the British Empire.

Kendall, Edward Calvin (b. March 8, 1886, South Norwalk, Conn., U.S.—d. May 4, 1972, Princeton, N.J.), American chemist who, with Philip S. Hench and Tadeus Reichstein, won the Nobel Prize for Physiology or Medicine in 1950 for research on the structure and biological effects of adrenal cortex hormones.



Edward Kendall
Archiv fur Kunst und Geschichte, West Berlin

A graduate of Columbia University (Ph.D. 1910), Kendall joined the staff of the Mayo Foundation, Rochester, Minn., in 1914. His early research concerned the isolation of the active constituent (thyroxine) of the thyroid hormone. He also crystallized and established the chemical nature of glutathione, a compound important to biological oxidation–reduction reactions. His most important research, however was the isolation from the adrenal cortex of the steroid hormone cortisone (which he originally called compound E; 1935). With Hench, he successfully applied the hormone in treatment of rheumatoid arthritis (1948). Kendall and Hench, along with Reichstein of Switzerland, received a Nobel Prize in 1950, and Kendall retired from his position as head of its biochemistry division of the Mayo Foundation in 1951. Kendall also acted as head of the biochemistry laboratory there from 1945 to 1951, and he was later visiting professor of chemistry at Princeton University.

Kendall, Henry (b. April 18, 1839, Yatteyattah, near Milton, N.S.W., Australia—d. Aug. 1, 1882, Sydney), Australian poet whose verse was a triumph over a life of adversity.

His father, a missionary and linguist, died when Kendall and his twin brother, Basil Edward, were two years old. Their mother moved with her sons to a farm, where Kendall remained until 1854, when he went to sea with an uncle for two years. At the age of 17 he returned to Sydney to become a shop assistant, began to write, and attracted the attention of a lawyer who gave him a position in his office and let the young poet read in his library. His first verse appeared in local journals, collected in *Poems and Songs* (1862). Friends found him a government job in 1863 that enabled him to support his mother and sisters, and in 1868 he decided to marry. Less than a year later, however, he resigned his post and moved to Melbourne with his wife. Apparently, his wife and mother quarreled constantly because of the mother's heavy drinking.

In Melbourne he tried journalism without success and published *Leaves from Australian Forests* (1869), which was well received critically but sold poorly. He found another government position but resigned because he could not handle the statistical work demanded of him. Two years of great poverty and heavy drinking followed before friends again rescued him with a job as a storekeeper at Camden Haven, N.S.W. In 1880 he published his last volume of poetry, *Songs from the Mountains.*

Kendari, town, *kabupaten* (regency), and capital of Sulawesi Tenggara *provinsi* ("province"), southeastern Celebes, Indonesia. It is a port on an inlet of Kendari Bay of the Banda Sea, located about 230 miles (370 km) northeast of Ujung Pandang (Makasar). Most of the town's inhabitants are of the Makasarese and Buginese peoples. The principal road in the region connects Kendari with Kolaka to the west. Kendari also has an airport. Its industries process foods and produce textiles and paper. Handicrafts include gold and silver ornament making, filigree work, weaving, and woodworking. The gold jewelry industry is carried on mostly by the Chinese. Exports consist mainly of timber, resin, and rattan. During World War II, Kendari was a major Japanese naval base. Pop. (1980) town, 41,-021; regency, 306,670.

kendō (Japanese: "way of the sword"), traditional Japanese style of fencing with wooden swords, derived from ancient samurai (warrior class) fighting methods. Schools of *kenjutsu* ("fencing"), the technique of fighting and killing with the steel sword, were firmly established in Japan by the 15th century AD. The unification of Japan in about 1600 removed most opportunities for actual sword combat, however, and so the warrior class expanded its emphasis in swordsmanship training from effective combat techniques to the cultivation of discipline, patience, and skill as a means of building character. In the 18th century, practice armour and the *shinai,* a sword made of bamboo, were introduced to allow realistic fencing without risk of injury. The style of fencing made possible by these developments came to be known as kendō. The study of kendō has been compulsory in Japanese schools from time to time. An All-Japan Kendō Federation was formed in 1928, and later an International Kendō Federation was formed with more than 15 national associations.

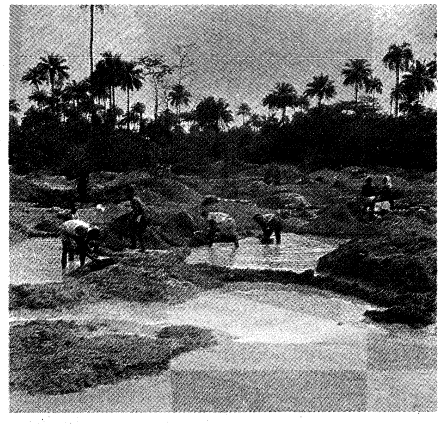
Kendō matches take place in an area 9 to 11 m (about 30 to 36 feet) square. Contestants wear the traditional *uwagi* (jacket), *hakama* (long divided skirt), *dō* (chest protector), *tare* (waist protector), *men* (mask), and *kote* (padded gloves). The *shinai* varies from 43 to 46 inches (110 to 118 cm) in length and is made of four lengths of seasoned bamboo bound by waxed cord. All blows use the "cutting" edge of the *shinai,* though this is not sharp. The *shinai* is usually held with both hands. Points are awarded for blows delivered upon the left side, right side, or top of the head; the right or left wrist; the right or left side of the trunk; and for a thrust to the throat. These are the only scoring areas. The name of the point struck must be called out simultaneously by the attacker with his blow and is verified by judges. A contest is won by the first combatant who scores two points.

Kendō is widely practiced among students (required in high schools), police, and military groups in Japan and to a lesser extent in the United States, Canada, Great Britain, and Brazil. *See also* martial arts.

Kendrew, John Cowdery (b. March 24, 1917, Oxford), British biochemist who determined the structure of the muscle protein myoglobin, which stores oxygen and gives it up to the muscle cells when needed. For his achievement he shared the Nobel Prize for Chemistry with Max Ferdinand Perutz in 1962. By employing special X-ray diffraction techniques and electronic computers, Kendrew was able to devise a three-dimensional model of the arrangement of the amino acid units in the myoglobin molecule.

Kendrew was educated at Trinity College, Cambridge, receiving his Ph.D. there in 1949. A fellow of Peterhouse College, Cambridge, from 1947 to 1975, he was also deputy chairman of the Medical Research Council Laboratory for Molecular Biology at Cambridge and, from 1971, chairman of the Defence Scientific Advisory Council. He became president of St. John's College, Oxford, in 1981.

Kenema, town, southeastern Sierra Leone, western Africa. Located on the government railway and at a gap in the Kambui Hills, the town is the centre of the Alluvial Diamond Mining Scheme Area and the site of the Government Diamond Office (1959), concerned with the exportation of diamonds. It is also an important agricultural market town for the Mende people and the centre of the timber industry of Sierra Leone. The area's production of cocoa, coffee, palm oil and kernels, furniture, and wood carvings is transported mainly by road to Freetown for sale and export. Kenema is the site of government, church, and private secondary schools, a Roman Catholic teacher-training college for women, a technical institute, a government library, and private hospitals. Pop. (1984 est.) 44,753.



Alluvial diamond mining at Kenema, Sierra Leone
Bavaria-Verlag

Keneset ha-Gedolah (ancient Jewish assembly): *see* Kneset ha-Gedola.

Keng Ching-chung, Pinyin GENG JINGZHONG (d. 1682), Chinese general whose revolt was one of the most serious threats to the authority of the Ch'ing, or Manchu, dynasty (1644–1911/12). In return for their services in establishing Manchu power in China, the Kengs had been given control of a large fiefdom in Fukien Province in South China. But in 1674 the Manchus attempted to regain control of the fiefdom. Keng thereupon joined two other Chinese generals in the Revolt of the Three Feudatories. Although he eventually surrendered and was pardoned, when the Manchus again consolidated their power over South China, charges were preferred against him, and he and his family were executed.

Kenilworth, parish (town), Warwick district, county of Warwickshire, England. The medieval town grew in the shelter of its large Norman castle. Sir Walter Scott's novel *Kenilworth* (1821) depicts the castle in the latter part of the 16th century. In the English Civil War of the mid-17th century, the castle was dismantled by Cromwell's forces and from that time abandoned; only its ruins remain. Situated within easy access to the industrial cities of Birmingham and Coventry, Kenilworth is today mainly a dormitory town for those centres, offering attractive residential areas for commuters. Pop. (1981) 19,337.

Kenite, member of a tribe of itinerant metalsmiths related to the Midianites and the Israelites who plied their trade while traveling in the region of the Arabah (the desert rift valley extending from the Sea of Galilee to the Gulf of Aqaba) from at least the 13th century to the 9th century BC. The Kenites' name was derived from Cain, whose descendants they were believed to be. The Kenites are mentioned several times in the Old Testament.

The father-in-law of Moses, Jethro, was a Kenite, and as priest-leader of the tribe he led in the worship of Yahweh, whom Moses later revealed to the Hebrews as their own God whom they had forgotten. In the period of the judges (12th–11th century BC), it was a Kenite woman, Jael, who killed the general of Israel's enemies, the Canaanites.

Settling among the Israelites, Amalekites, and Canaanites, the Kenites apparently became absorbed into the tribe of Judah. Conservative groups of Kenites retained their nomadic way of life and beliefs and practices, however, and one such group, the Rechabites (II Kings), fought alongside the rebel and future king of Israel, Jehu (reigned *c.* 842–*c.* 815), against the Omri dynasty and the worshippers of the Canaanite god Baal.

Kenitra, Arabic MINA HASSAN TANI, formerly (1932–58) PORT-LYAUTEY, port city, northern Morocco. It is situated 10 miles (16 km) above the mouth of the Sebou River. Before the French protectorate was established, Kenitra (Little Bridge) was a fort; the settlement and port, built by order of Marshal L.-H.-G. Lyautey, date from 1913. Kenitra is a shipping centre for agricultural produce (mainly fruit), fish, timber, and lead and zinc ores. The city's industrial area lies upstream of the port. Kenitra is 6 miles (10 km) east of the Mehdiya ruins, the site of six occupations dating back to the Carthaginian colony of Thymiatherion. The city is connected by railway and road with Sidi Kacem and Meknès, and by road with Casablanca and Larache.

Fish are caught along the Atlantic coast north of Kenitra, and cereals (primarily wheat), sheep, goats, and cattle are raised in the hinterland. The area is a major producer of citrus fruits. Pop. (1982) mun., 188,194.

Kenmure, William Gordon, 6th Viscount, LORD LOCHINVAR (d. Feb. 24, 1716, London), Scottish Jacobite who was miscast as a leader in the rebellion of 1715 on behalf of James Edward, the Old Pretender, against King George I.

His father, Alexander Gordon, 5th Viscount Kenmure (d. 1698), had fought for King William III against the forces of the Old Pretender's father, the deposed James II. William Gordon, however, spent part of his youth in France at the exiled Stuart court; and, though its Roman Catholicism was uncongenial to him, he nevertheless became a Jacobite. Partly, no doubt, under the influence of his wife, Mary Dalyell, who belonged to one of the most strongly Jacobite families in Scotland, he was induced (though he had no military ability and was a mild-mannered man) to lead the rising of 1715 in southern Scotland. On Oct. 11, 1715, he proclaimed the Old Pretender king of Scotland as James VIII and then led a small force to join Thomas Forster's Northumberland rebels. After an abortive march into Lancashire, Forster surrendered at Preston on November 14, and Kenmure was captured. Tried with several other rebel lords in January 1716, Kenmure was condemned to death and executed on Tower Hill. The viscountcy was forfeited, but it was revived for a descendant

in 1824, and then again became dormant in 1847.

Kennan, George F(rost) (b. Feb. 16, 1904, Milwaukee, Wis.), American diplomat and historian best-known for his successful advocacy of a "containment policy" to oppose Soviet expansionism following World War II.

Upon graduation from Princeton in 1925, Kennan entered the foreign service. He was sent overseas immediately and spent several years in Geneva, Berlin, Tallinn, Riga, and other "listening posts" around the Soviet Union, with which the United States had no diplomatic relations at the time.

Anticipating the establishment of such relations, the State Department sent Kennan to the University of Berlin in 1929 to immerse himself in the study of Russian thought, language, and culture. He completed his studies in 1931 and in 1933 accompanied U.S. ambassador William C. Bullitt to Moscow following U.S. recognition of the Soviet government. Two years later he was assigned to Vienna, and he finished the decade with posts in Prague and Berlin.

Interned briefly by the Nazis at the outbreak of World War II, Kennan was released in 1942 and subsequently filled diplomatic posts in Lisbon and Moscow during the war. It was from Moscow in February 1946 that Kennan sent a cablegram enunciating the containment policy. Later that year he returned to the United States, and in 1947 he was named director of the State Department's policy-planning staff.

Kennan's views on containment were elucidated in a famous and highly influential article, signed "X," that appeared in *Foreign Affairs* magazine for July 1947 and that analyzed in detail the structure and psychology of Soviet diplomacy. In the article Kennan questioned the wisdom of the United States' attempts to conciliate and appease the Soviet Union. He suggested that the Russians, while still fundamentally opposed to coexistence with the West and bent on worldwide extension of the Soviet system, were acutely sensitive to the logic of military force and would temporize or retreat in the face of skillful and determined Western opposition to their expansion. Kennan then advocated U.S. counterpressure wherever the Soviets threatened to expand and predicted that such counterpressure would lead either to Soviet willingness to cooperate with the United States or perhaps eventually to an internal collapse of the Soviet government. This view subsequently became the core of U.S. policy toward the Soviet Union.

Kennan accepted appointment as counselor to the State Department in 1949, but he resigned the following year to join the Institute for Advanced Study at Princeton. He returned to Moscow in 1952 as U.S. ambassador but came back to the United States the following year after the Russians declared him persona non grata for remarks he made about Soviet treatment of Western diplomats. In 1956 he became permanent professor of historical studies at the institute, a tenure broken only by a stint as U.S. ambassador to Yugoslavia (1961–63). In the late 1950s Kennan revised his containment views, advocating instead a program of U.S. "disengagement" from areas of conflict with the Soviet Union. He later emphatically denied that containment was relevant to other situations in other parts of the world—*e.g.*, Vietnam.

A prolific and acclaimed author, Kennan won simultaneous Pulitzer Prizes and National Book Awards for *Russia Leaves the War* (1956) and *Memoirs, 1925–1950* (1967).

Kennebec River, river in west-central Maine, U.S. The Kennebec rises from Moosehead Lake and flows southward for about 150 miles (240 km) to the Atlantic Ocean. The river was explored by Samuel de Champlain in 1604–05; Fort St. George, founded in 1607 at the head of navigation on the river near present-day Augusta, was the state's first English settlement. The river's name is Algonkian for "long-reach" and describes the stretch of river below Augusta.

The Kennebec furnishes hydropower at Bingham, Skowhegan, Waterville, Augusta, and Gardiner. It meets with its main tributary, the Androscoggin River, northeast of Brunswick, to form Merrymeeting Bay, which extends 16 miles (26 km) to the Atlantic Ocean.

Kennebunkport, town, York county, southwestern Maine, U.S. It is situated at the mouth of the Kennebunk River, on the Atlantic coast. It is adjacent to Kennebunk and lies 25 miles (40 km) southwest of Portland. The original settlement (1629) by Richard Vines was brought under the control of Massachusetts and incorporated in 1653. Reincorporated as Arundel in 1717, it was renamed Kennebunkport in 1821, the name being derived from an Abnaki or Micmac Indian word indicative of a "long sand bar." The adjoining town of Kennebunk was settled in about 1650 and was included in the town of Wells; it was set off and incorporated in 1820. Both Kennebunks were busy shipping and shipbuilding centres in the 18th century and are now popular summer resorts. The rocky shores of Cape Arundel are known to artists and photographers. Kennebunkport also has a noted literary and art colony. The Seashore Trolley Museum displays more than 100 antique streetcars. Pop. (1984 est.) 3,127.

Kennedy, Anthony M(cLeod) (b. July 23, 1936, Sacramento, Calif., U.S.), associate justice of the United States Supreme Court (from 1988).

Kennedy graduated from Stanford University, Calif., in 1958 and earned his law degree from Harvard University in 1961. He was called to the bar in 1962 and subsequently practiced law in San Francisco and Sacramento. He was appointed to the Federal Court of Appeals in 1975 by President Gerald Ford.

By 1987 Kennedy had become a prominent potential candidate to fill a vacant seat on the U.S. Supreme Court, but President Ronald Reagan nominated Robert H. Bork instead. Bork's extremely conservative views on constitutional law led to his rejection by the Senate. Reagan's second nominee, Douglas H. Ginsburg, withdrew from the nomination after it was disclosed that he had formerly used marijuana, and so the Reagan administration turned to Kennedy as its third choice for the vacant Supreme Court seat. Kennedy, who had earned a reputation as a thoughtful and pragmatic conservative, was confirmed by the Senate in a unanimous vote and took his seat on the Court on Feb. 18, 1988.

Kennedy, Edward M(oore), byname TED KENNEDY (b. Feb. 22, 1932, Brookline, Mass., U.S.), U.S. senator (from 1963), a prominent figure in the Democratic Party and in liberal politics during the 1970s and 1980s. He was the last surviving brother of President John F. Kennedy.

The youngest child of Rose and Joseph Kennedy, Edward Kennedy graduated from Harvard University in 1956. He then studied at the International Law School (The Hague) and received a law degree from the University of Virginia (1959).

Edward campaigned for his brother John in the 1960 presidential race, and in 1962 he was elected to the president's former U.S. Senate seat representing Massachusetts. Although unable to campaign actively for reelection (1964) for a full term because of an injury, he was swept back into office by a landslide vote. Early in 1969 he was elected majority whip in the U.S. Senate, and he became an early front-runner for the next Democratic presidential nomination. Then, on the night of July 18, 1969, he accidentally drove his car off an unmarked bridge on Chappaquiddick Island, near Martha's Vineyard, Mass., and his companion in the car, 28-year-old Mary Jo Kopechne, was drowned. Kennedy was found guilty of leaving the scene of an accident. He was reelected to the Senate in 1970 but announced that he would not seek the presidency in 1972.

Kennedy won reelection to a third full term as senator in 1976. He was a serious contender for the 1980 Democratic presidential nomination but withdrew from the race during the convention. He won a fourth term in 1982.

Throughout the 1970s and 1980s Kennedy continued to be a prominent spokesman for the policies that had come to be associated with the family name (*i.e.*, support for social welfare legislation and active participation in world affairs). He became a leading advocate in the Senate for many liberal causes, including a system of national health insurance.

Kennedy, John F(itzgerald) (b. May 29, 1917, Brookline, Mass., U.S.—d. Nov. 22, 1963, Dallas, Texas), 35th president of the United States (1961–63), who faced a number of foreign crises, especially in Cuba and Berlin, but managed to secure such achievements as the Nuclear Test-Ban Treaty and the Alliance for Progress. He was assassinated while riding in a motorcade in Dallas.



John F. Kennedy, 1961
AP/Wide World

Early life. John, the second of nine children born to Joseph Patrick and Rose Fitzgerald Kennedy, was reared in a family that demanded intense physical and intellectual competition among the children and was schooled in the religious teachings of the Roman Catholic Church and the political precepts of the Democratic Party. A graduate of Harvard University (B.S., 1940), Kennedy expanded his senior thesis on Great Britain's military unpreparedness into a best-selling book, *Why England Slept* (1940). For six months in 1938 he served as secretary to his father, then U.S. ambassador to Great Britain.

In the fall of 1941 Kennedy joined the Navy and two years later was sent to the South Pacific. By the time he was discharged in 1945 his older brother, Joe, who their father had expected would be the first Kennedy to run for office, had been killed in the war, and the family's political standard passed to John, who had planned to pursue an academic or journalistic career.

John Kennedy himself had barely escaped death in battle. Commanding a Navy motor torpedo (PT) boat, he was gravely injured when a Japanese destroyer sank it in the Solomon Islands. Marooned far behind enemy lines, he led his men back to safety. He was awarded the Navy and U.S. Marine Corps

medal for heroism and returned to active command at his own request. But his back, which had bothered him since his teens, never really healed. He also suffered from Addison's disease (which was publicly concealed). Despite operations in 1944, 1954, and 1955, he was in pain for much of the rest of his life. None of the Kennedys, however, including him, ever thought that John might choose a career less strenuous than politics. He was expected to run for office and to win.

Congressman and senator. He did win; indeed, he never lost an election. His first opportunity came in 1946, when he ran for Congress. Though still physically weak, he campaigned aggressively, bypassing the Democratic organization in the Massachusetts 11th congressional district and depending instead upon his family, college friends, and fellow navy officers. In the Democratic primary he received nearly double the vote of his nearest opponent; in the November election he overwhelmed the Republican candidate. He was only 29.

Kennedy served three terms in the House of Representatives (1947–53) as a bread-and-butter liberal. He advocated better working conditions, more public housing, higher wages, lower prices, cheaper rents, and more Social Security for the aged. In foreign policy he was an early supporter of Cold War policies. He backed the Truman Doctrine and the Marshall Plan but was sharply critical of the Truman administration's record in Asia. He accused the State Department of trying to force Chiang Kai-shek into a coalition with Mao Zedong. "What our young men had saved," he told the House on Jan. 25, 1949, "our diplomats and our President have frittered away."

His congressional district in Boston was a safe seat. Had he remained there, eventually he could have become a power in the House, perhaps even its speaker. But instead, in 1952 he ran for the U.S. Senate against the popular incumbent, Henry Cabot Lodge, Jr. His mother, Rose, and sisters Eunice, Patricia, and Jean held "Kennedy teas" across the state. Thousands of volunteers flocked to help, and 27-year-old Robert managed his brother's campaign. That fall the Republican presidential candidate, Gen. Dwight D. Eisenhower, carried Massachusetts by 208,000 votes; but Kennedy defeated Lodge by 70,000 votes. Less than a year later, on Sept. 12, 1953, John enhanced his electoral appeal by marrying Jacqueline Lee Bouvier.

Senator Kennedy quickly won a reputation for responsiveness to requests from constituents, except on certain occasions when the national interest was at stake. In 1954 he was the only New England senator to approve an extension of President Eisenhower's reciprocal-trade powers, and he vigorously backed the opening of the St. Lawrence Seaway, despite the fact that over a period of 20 years no Massachusetts senator or congressman had ever voted for it.

He was not as sensitive as liberal Democrats wished, however, to the demagogic excesses of Sen. Joseph R. McCarthy of Wisconsin, who in the early 1950s conducted witch-hunting campaigns against government workers accused of being Communists. John's father, Joseph Kennedy, liked McCarthy; he contributed to his campaign and even entertained him in the family's compound at Hyannis Port on Cape Cod in Massachusetts. John disapproved of McCarthy, but as he once observed, "Half my people in Massachusetts look on McCarthy as a hero." Yet on the Senate vote over condemnation of McCarthy's conduct (1954), Kennedy expected to vote against him. He prepared a speech explaining why, but he was absent on the day of the vote. Later, at a National Press Club Gridiron dinner, costumed reporters sang, "Where were you, John, where were you, John, when the Senate censured Joe?" Actually, John had been in a hospital, in critical condition after back surgery. For six months afterward he lay strapped to a board in his father's house in Palm Beach, Fla. It was during this period that he helped write *Profiles in Courage* (1956), his account of eight great American political leaders who had defied popular opinion in matters of conscience. In 1957 the book was awarded a Pulitzer Prize.

Back in the Senate, Kennedy led a fight against a proposal to abolish the electoral college, crusaded for labour reform, and became increasingly committed to civil rights legislation. As a member of the Senate Committee on Foreign Relations in the late 1950s, he advocated extensive foreign aid to the emerging nations in Africa and Asia, and he surprised Washington, D.C., by calling upon France to grant Algerian independence.

During these years his political outlook was moving leftward. Possibly because of their father's dynamic personality, the sons of Joseph Kennedy matured slowly. Gradually John's stature among Democrats grew, until he had inherited the legions that had once followed Gov. Adlai E. Stevenson of Illinois, the two-time presidential candidate who by appealing to idealism had transformed the Democratic Party and made Kennedy's rise possible.

Presidential candidate and president. John had nearly become Stevenson's vice presidential running mate in 1956. The handsome, young New Englander's near victory and his speech of concession on television brought him into about 40,000,000 American homes. Overnight he had become one of the most famous political figures in the country. Already his campaign for the 1960 nomination had begun. One newspaperman called him a "young man in a hurry." Kennedy felt that he had to redouble his efforts because of the widespread conviction that no Roman Catholic candidate could be elected president. He made his 1958 race for reelection a test of his popularity in Massachusetts. His margin of victory was 874,608 votes—the largest ever in Massachusetts politics and the greatest of any senatorial candidate that year.

A steady stream of speeches and periodical articles followed. Photographs of him and his wife appeared on magazine covers. To transport him and his staff around the country, his father bought a 40-passenger Convair aircraft. His brothers Robert ("Bobby," or "Bob") and Edward ("Teddy," or "Ted") pitched in. After having graduated from Harvard University (1948) and from the University of Virginia Law School (1951), Bob had embarked on a career as a Justice Department attorney and counsellor for congressional committee. Ted had graduated with honours from Harvard University (1956) and from Virginia Law School (1959). Both men were astute campaigners.

In January 1960 John F. Kennedy formally announced his presidential candidacy. His chief rivals were the senators Hubert H. Humphrey of Minnesota and Lyndon B. Johnson of Texas. Kennedy knocked Humphrey out of the campaign and dealt the religious taboo against Roman Catholics a blow by winning the primary in Protestant West Virginia. He tackled the Catholic issue again, by avowing his belief in the separation of church and state in a televised speech before a group of Protestant ministers in Houston. Nominated on the first ballot, he balanced the Democratic ticket by choosing Johnson as his running mate. In his acceptance speech Kennedy declared, "We stand on the edge of a New Frontier." Thereafter the phrase New Frontier was to become attached to his programs.

Another phrase, the Kennedy style, encapsulated the candidate's emerging identity. It was glamorous and elitist, an amalgam of his father's wealth, John Kennedy's charisma and easy wit, Jacqueline Kennedy's beauty, the charm of their children and relatives, and the erudition of the Harvard advisers who surrounded him.

Kennedy won the general election, narrowly defeating the Republican candidate, Vice President Richard M. Nixon, by a margin of 118,550 out of the total of 68,335,642 votes cast. Nixon had defended the Eisenhower record; Kennedy, whose slogan had been "Let's get this country moving again," had deplored unemployment, the sluggish economy, what he called a missile gap (a presumed Soviet superiority in the number of nuclear-armed missiles the two countries respectively held), and the newly Communist government in Havana. A major factor in the campaign was a unique series of four televised debates between the two men; an estimated 85,000,000–120,000,000 Americans watched one or more debates. Both men showed a firm grasp of the issues, but Kennedy's good looks and his superior physical poise while on camera convinced many viewers that he had won the debate.

John F. Kennedy was the youngest man and the first Roman Catholic ever elected to the presidency of the United States. His administration lasted 1,037 days. From the onset he was concerned with foreign affairs. In his memorable inaugural address he called upon Americans "to bear the burden of a long twilight struggle . . . against the common enemies of man: tyranny, poverty, disease, and war itself." He declared:

> In the long history of the world, only a few generations have been granted the role of defending freedom in its hour of maximum danger. I do not shrink from this responsibility—I welcome it. . . . The energy, the faith, the devotion which we bring to this endeavor will light our country and all who serve it—and the glow from that fire can truly light the world. And so, my fellow Americans: ask not what your country can do for you—ask what you can do for your country.

The administration's first brush with foreign affairs was a disaster. In the last year of the Eisenhower presidency, the Central Intelligence Agency had equipped and trained a brigade of anti-Communist Cuban exiles for an invasion of their homeland. The Joint Chiefs of Staff unanimously advised the new president that this force, once ashore, would spark a general uprising against the Cuban leader, Fidel Castro. But the Bay of Pigs invasion (*q.v.*) was a fiasco; every man on the beachhead was either killed or captured. Kennedy assumed "sole responsibility" for the setback. Privately he told his father that he would never again accept a Joint Chiefs recommendation without first challenging it.

The Soviet premier, Nikita Khrushchev, thought he had taken the young president's measure when the two leaders met in Vienna in June 1961. Khrushchev ordered a wall built between East and West Berlin and threatened to sign a separate peace treaty with East Germany. The president activated National Guard and reserve units, and Khrushchev backed down on his separate peace threat. In October 1962 a buildup of Soviet short- and intermediate-range nuclear missiles was discovered in Cuba. Kennedy demanded that the missiles be dismantled; he ordered a "quarantine" of Cuba—in effect, a blockade that would stop Soviet ships from reaching that island. For 13 days nuclear war seemed near; then the Soviet premier announced that the offensive weapons would be withdrawn. (*See* Cuban missile crisis.) Ten months later Kennedy scored his greatest foreign triumph when Khrushchev and Prime Minister Harold Macmillan of Great Britain joined him in signing the Nuclear Test-Ban Treaty.

Because of his slender victory in 1960, Kennedy approached Congress warily, and with good reason; Congress was largely indifferent to his legislative program. It approved

his Alliance for Progress (Alianza) in Latin America and his Peace Corps, which won the enthusiastic endorsement of thousands of college students. But his two most cherished projects, massive income tax cuts and a sweeping civil rights measure, were not passed until after his death.

Nevertheless, he was an immensely popular president, at home and abroad. At times he seemed to be everywhere at once, encouraging better physical fitness, improving the morale of government workers, bringing brilliant advisers to the White House, beautifying Washington, D.C. His wife joined him as an advocate for U.S. culture. Their two young children, Caroline Bouvier and John F., Jr., were familiar throughout the country.

Joseph Kennedy had been invalided in Hyannis Port by a stroke, but the other Kennedys were in and out of Washington, D.C. Robert Kennedy, as John's attorney general, was the second most powerful man in the country. He advised the President on all matters of foreign and domestic policy, national security, and political affairs. A strong civil rights supporter, he was widely admired by the country's blacks and Mexican-Americans and by poor people everywhere.

In 1962 Edward Kennedy was elected to the President's former Senate seat in Massachusetts. Eunice's husband, R. Sargent Shriver, Jr., became director of the Peace Corps. Jean's husband, Stephen Smith, was preparing to manage the Democratic Party's 1964 presidential campaign. Patricia had married Peter Lawford, an English-born actor, and Lawford served the family as an unofficial envoy to the entertainment world. All Americans knew who Rose, Jackie, Bobby, and Teddy were, and most could identify Bobby's wife as Ethel and Teddy's wife as Joan.

Assassination. President Kennedy believed that his Republican opponent in 1964 would be Sen. Barry Goldwater of Arizona. He was convinced that he could bury Goldwater under an avalanche of votes, thus receiving a mandate for major legislative reforms. One obstacle to his plan was a feud in Vice President Johnson's home state of Texas between Gov. John B. Connally, Jr., and Sen. Ralph Yarborough, both Democrats. To present a show of unity, the President decided to tour the state with both men. On Friday, Nov. 22, 1963, he and Jacqueline Kennedy were in a motorcade riding slowly through downtown Dallas in an open limousine. At 12:30 PM CST a sniper opened fire.

Two rifle bullets struck the President, at the base of his neck and in the head. He was dead upon arrival at Parkland Memorial Hospital. Governor Connally, though gravely wounded, recovered. Vice President Johnson took the oath as president at 2:38 PM CST. Lee Harvey Oswald, a 24-year-old Dallas citizen, was accused of the slaying. Two days later Oswald was shot to death by Jack Ruby, a local nightclub owner, in the basement of the Dallas police station. A presidential commission headed by the chief justice of the United States, Earl Warren, later found that neither the sniper nor his killer "was part of any conspiracy, domestic or foreign, to assassinate President Kennedy," but that Oswald had acted alone.

John Kennedy was dead, but the Kennedy mystique was still alive. Jacqueline Kennedy and her two children moved from the White House to a home in Georgetown, a section of Washington, D.C. Continuing crowds of the worshipful and curious made peace there impossible, however, and in the summer of 1964 she moved to New York City. Pursuit continued until Oct. 20, 1968, when she married Aristotle Onassis, a wealthy Greek shipping magnate. The Associated Press said that the marriage "broke the spell of almost complete adulation of a woman who had become virtually a legend in her own time."

(W.Man./Ed.)

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Kennedy, John P(endleton), pseudonym MARK LITTLETON (b. Oct. 25, 1795, Baltimore—d. Aug. 18, 1870, Newport, R.I., U.S.), U.S. statesman and writer whose best remembered work was his historical fiction.

Kennedy was admitted to the Maryland bar in 1816. From 1821 he served two terms in the Maryland House of Delegates and three terms in the U.S. Congress and was secretary of the navy in the Cabinet of Pres. Millard Fillmore. In the latter capacity, he organized Commodore Perry's trip to Japan.

Meanwhile, using the pen name of Mark Littleton, Kennedy wrote historical novels, including *Swallow Barn* (1832), sketches of the post-Revolutionary life of gentlemen on Virginia plantations, and *Rob of the Bowl* (1838), a tale of colonial Maryland in which Protestants overthrow Catholic control.

Kennedy's major work of nonfiction is *Memoirs of the Life of William Wirt* (1849), about the man who was an attorney for the prosecution in the trial of Aaron Burr for treason. He also co-edited the satirical magazine *Red Book* (1818–19) and wrote political articles for the *National Intelligencer.* The novels were his principal achievement, however; although their style was not original, being imitative of the work of Washington Irving and James Fenimore Cooper, they were capably and imaginatively written.

Kennedy, Joseph P(atrick) (b. Sept. 6, 1888, Boston—d. Nov. 18, 1969, Hyannis Port, Mass., U.S.), U.S. businessman and financier who served in government commissions in Washington, D.C. (1934–37) and as ambassador to Great Britain (1937–40). He was the father of U.S. Pres. John F. Kennedy.

Joseph P. was the son of a Bay State politician and grandson of an Irish immigrant. In 1912 young Kennedy was graduated from Harvard. Two years later he married Rose Fitzgerald, the daughter of John F. ("Honey Fitz") Fitzgerald, mayor of Boston. Rose bore her husband nine children and taught them love, compassion, and serenity. From their father they acquired a fierce competitive drive and a yearning for distinction.

A freckled, vigorous man whose horn-rimmed spectacles gave him a slightly owlish look, Kennedy was a bank president at age 25 and a millionaire at 30. He became a shipbuilder, a motion-picture tycoon, and a heavy contributor to the Democratic Party. In five years (1929–34) as manager of the stock division of Hayden, Stone and Company, an investment-banking firm, he mastered the art of stock-exchange manipulation. Striking out on his own, he became a brilliant plunger in the bull market of the 1920s. He retired early in 1929, having acquired enough capital to establish a million-dollar trust fund for each of his children. Then, as chairman of the Securities and Exchange Commission (1934–35) under Pres. Franklin D. Roosevelt, Kennedy outlawed the very speculative practices that had made him rich.

He became chairman of the United States Maritime Commission and, in 1937, the first Irish-American to serve as the U.S. ambassador to Great Britain. In November 1940 he resigned; he was convinced that Britain was doomed to Nazi conquest and believed America's only hope lay in isolationism.

By then, Ambassador Kennedy's family was complete—four sons: Joseph P., Jr. (born 1915), John F. (born 1917), Robert F. (born 1925), Edward M. (born 1932); and five daughters: Rosemary (born 1918), Kathleen (born 1920), Eunice (born 1921), Patricia (born 1924), and Jean (born 1928). Prodded by their parents, the children were competitive and cohesive. They vied with one another in sailboat races, touch football games, tennis matches, and rough and tumble fights. No quarter was asked or given. The important thing was winning. Often they would emerge bruised and bleeding. The girls were given no preferential treatment. If they ran home sobbing, their mother would comfort them, but if their father saw their tears, he sent them back into the fray.

The Ambassador was not trying to breed professional athletes. He had made enough money for them all. He expected his sons to prepare for public life and his daughters to be ready for marriage to distinguished men who would become "naturalized" Kennedys. The children were encouraged to read *The New York Times* at an early age, and small talk was not allowed at the dinner table. Instead, the family discussed national issues, sometimes with consequences not seen until years later. Joseph, Jr., for example, became an isolationist; John an ardent advocate of U.S. participation in world affairs; and Robert, perhaps because of the age gap, became shy—an affliction he battled throughout his life.

The family experienced its first misfortune when Rosemary was found to be mentally defective. Then tragedy befell Kathleen. In 1944 she married an Englishman, William Cavendish, marquess of Hartington; that same year Hartington was killed during the Allied invasion of Normandy. Four years later she herself died in a European plane crash. Joseph Kennedy had expected his eldest son to be the first Kennedy to run for public office, but young Joe was killed too, in 1944, during the war. Thus, the family's political standard passed to the next oldest son, John, who had planned to pursue an academic or journalistic career. John F(itzgerald) Kennedy (*q.v.*) served as U.S. president for 1,037 days before being assassinated. His brother Robert F(rancis) Kennedy (*q.v.*), who served as U.S. attorney general and as senator from New York, announced his candidacy for the presidency in mid-March 1968, but he was fatally wounded by gunshot less than three months later.

Joseph Kennedy was invalided in Hyannis Port by a stroke for several years and died at the age of 81. His last remaining son, Sen. Edward M. Kennedy, read the eulogy, which had been written in 1967 by Robert:

> He has called on the best that was in us. There was no such thing as half-trying. Whether it was running a race or catching a football, competing in school—we were to try. And we were to try harder than anyone else. We might not be the best, and none of us were, but we were to make the effort to be the best. "After you have done the best you can," he used to say, "the hell with it."

(W.Man./Ed.)

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Kennedy, Robert F(rancis) (b. Nov. 20, 1925, Brookline, Mass., U.S.—d. June 6, 1968, Los Angeles), U.S. attorney general and adviser during the administration of his brother

Pres. John F. Kennedy (1961–63). Later U.S. senator (1965–68), he was assassinated while campaigning for the presidential nomination.

Robert interrupted his studies at Harvard University to serve in the U.S. Navy during World War II but returned to the university and was graduated in 1948. After receiving his law degree from the University of Virginia Law School in 1951, he began his political career in Massachusetts the next year with the management of his brother John's successful campaign for the U.S. Senate. Robert Kennedy first came into national prominence in 1953, when he was an assistant counsel to the Senate Permanent Subcommittee on Investigations, headed by Joseph R. McCarthy (he resigned in mid-1953, returning in 1954 as counsel to the Democratic minority). In 1957 he was chief counsel to the Senate select committee conducting investigations into labour racketeering, which led to his long-standing feud with James R. Hoffa of the Teamsters Union. Kennedy resigned from the committee staff in 1960 to conduct his brother's campaign for the U.S. presidency and was subsequently appointed (1961) attorney general in the Cabinet of Pres. John F. Kennedy.

On Nov. 22, 1963, the President was assassinated in Dallas, Texas. Robert Kennedy continued to serve as attorney general until he resigned in September 1964. The months after his brother's death were a desperate time for him. He was stooped by grief and spent long periods staring out windows or walking in the Virginia woods. He had presided over the Department of Justice for 44 months. He had emerged as a statesman of the law, improving the lot of many. Learning on May 20, 1961, that a hostile mob threatened the civil rights leader Martin Luther King, Jr., and about 1,200 of his supporters in Montgomery, Ala., Attorney General Kennedy sent 400 federal marshals to protect them. In subsequent racial crises he used long telephone sessions to work out the strategies of peace officers in the South. He also led a tough and imaginative drive against organized crime. One of his proudest achievements was assembling the evidence that convicted Hoffa. On Robert Kennedy's departure from the Department of Justice *The New York Times,* which had criticized his appointment three years earlier, said editorially, "He named excellent men to most key posts, put new vigor into protecting civil rights through administrative action, played a pivotal role in shaping the most comprehensive civil rights law in this country. . . . Mr. Kennedy has done much to elevate the standard." He was the author of *The Enemy Within* (1960), *Just Friends and Brave Enemies* (1962), and *Pursuit of Justice* (1964).

In November 1964 he was easily elected U.S. senator from New York. Within two years Kennedy had established himself as a major political figure in his own right. He became the chief spokesman for liberal Democrats and a critic of Pres. Lyndon B. Johnson's Vietnam policy. On March 16, 1968, he announced his candidacy for the presidency. By June 4 he had won five out of six presidential primaries, including one that day in California. Shortly after midnight on June 5 he spoke to his followers in Los Angeles' Ambassador Hotel. As he left through a kitchen hallway he was fatally wounded by a Palestinian immigrant, Sirhan Bishara Sirhan. Robert Kennedy was buried near his brother at Arlington National Cemetery. (W.Man./Ed.)

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Kennedy, Walter (b. *c.* 1460—d. *c.* 1508), Scottish poet, remembered chiefly for his *flyting* (Scots dialect: "scolding") with his professional rival William Dunbar. *The Flyting of Dunbar and Kennedie,* in which the two poets alternate in heaping outrageous abuse on one another, is the outstanding example of this favourite sport of the 16th-century Scots poets.

Kennedy was the younger brother of John, 2nd Lord Kennedy of Dunure in Ayr, and a descendant of Robert III. He was graduated from Glasgow in 1476 and received his M.A. in 1478. Little else is known about his life. Dunbar's poetic portrait of Kennedy in the *flyting* is a remarkable piece of grotesquerie; it may be realistic caricature, but there is probably no truth in his farcical account of Kennedy's life. The remainder of Kennedy's work is mainly religious.

Kennedy Channel, Arctic sea passage between Ellesmere Island, Canada (west), and northwestern Greenland (east). It is 16–24 mi (26–39 km) wide and extends northward for 110 mi from the Kane Basin to the Hall Basin, forming part of the waterway between Baffin Bay, an inlet of the North Atlantic Ocean, to the south and the Lincoln Sea, part of the Arctic Ocean, to the north. The channel is sometimes navigable in late summer and autumn. It was first explored in 1871 by Charles F. Hall of the United States.

Kennelly, Arthur Edwin (b. Dec. 17, 1861, Colaba, India—d. June 18, 1939, Boston), U.S. electrical engineer who made innovations in analytic methods in electronics, particularly the definitive application of complex-number theory to alternating-current (ac) circuits.

After working as an office boy for a London engineering society, as an electrician, and on a cable-engineering ship, in 1887 Kennelly joined Thomas Edison's staff at West Orange, N.J., where he was chief assistant until 1894. Then, with Edwin J. Houston, he formed the consulting firm of Houston and Kennelly in Philadelphia.

The mathematical analysis of direct-current circuits was a simple matter, but the analysis of ac circuits was more complicated. The publication of Kennelly's paper "Impedance" immediately allowed engineers to begin applying complex-number techniques to ac theory.

Kennelly noticed that Guglielmo Marconi's reception, in Newfoundland in 1901, of radio signals transmitted from England was received far better than was predicted by radio-wave theory. The following year he postulated that the radio waves were being reflected back to Earth from an ionized layer in the upper atmosphere. Shortly thereafter the British physicist Oliver Heaviside independently propounded the same theory, and the layer thus became known as the Kennelly–Heaviside layer (now called the E region [*q.v.*] of the ionosphere).

Kennelly–Heaviside layer: *see* E region.

Kenner mission, in U.S. history, secret attempt on the part of the Confederacy in 1864 to elicit European recognition in exchange for Southern abolition of slavery.

Duncan Farrar Kenner, a prosperous Louisiana sugar planter and Thoroughbred horse breeder, represented his state in the Confederate House of Representatives throughout the war. As the conflict dragged on, he became increasingly convinced that the South could not win without English and French recognition of the legitimacy of the Confederate government.

In 1864 Kenner convinced Confederate Secretary of State Judah P. Benjamin to send a special commission to Europe, offering the abolition of slavery in exchange for recognition. The South was desperate, and Pres. Jefferson Davis reluctantly agreed to the plan. But Davis knew that such a proposal would inflame Southern opinion, and he decided to send Kenner alone to Europe without informing the Confederate Congress.

Bearing the title minister plenipotentiary and in disguise, Kenner made his way to New York and sailed for Europe on Feb. 11, 1865. The South was clearly defeated by the time he arrived, however, and the mission accomplished nothing.

Kennet, district, county of Wiltshire, southern England, with an area of 370 sq mi (958 sq km) in the east central part of the county, about midway between Bristol and London. Kennet is a rural district of rolling chalk uplands, including Marlborough Downs (about 400 to 950 ft [120 to 290 m] high) on the north and northeast and the Salisbury Plain (nearly as high) on the south and southeast. The centrally located, fertile clay Vale of Pewsey is surrounded by these chalk uplands on the north, east, and south. The northern and western limits of the district generally coincide with the chalk uplands' steep western escarpment.

Kennet district has many prehistoric monuments, and much of it has been designated by the government as an Area of Outstanding Beauty. The village of Avebury below the scarp of the northwest Marlborough Downs contains remains of massive earthworks and megaliths dating from about 2000 to 1600 BC. Nearby Silbury Hill, extending 130 ft above a chalk ridge, is thought to be the tallest prehistoric mound in Europe.

Cattle and some sheep graze the coarse grass of the Marlborough Downs, and fodder crops are grown. Marlborough is the only parish (town) of consequence in this area. Devizes, the district seat in the open end of the Vale of Pewsey, is situated in a mixed farming area with significant cultivation of tobacco.

Most of the Salisbury Plain in southwest Kennet has been turned into a mock battle area for military training. The Savernake Forest in southeast Kennet is a magnificent oak-and-beech woodland containing many trees growing since the 18th century. Pop. (1982 est.) 63,300.

Kenneth I, also called KENNETH MacALPIN (d. *c.* 858, Forteviot, Scot.), first king of the united Scots of Dalriada and the Picts and so of Scotland north of a line between the Forth and Clyde rivers.

Of his father, Alpin, little is known, though tradition credits him with a signal victory over the Picts by whom he was killed three months later (*c.* 834). Kenneth succeeded him in Dalriada and ruled in Pictavia also, ruling for 16 years. The period is obscure. The gradual union of the two kingdoms from 843 doubtless owes much to intermarriage. By the Pictish marriage custom, inheritance passed through the female. Nevertheless, Kenneth probably made some conquests among the eastern Picts and possibly invaded Lothian and burned Dunbar and Melrose. After attacks on Iona by Vikings he removed relics of St. Columba, probably in 849 or 850, to Dunkeld, which became the headquarters of the Scottish Columban church. He died at Forteviot, not far from Scone in Pictish territory, and was buried on the island of Iona.

Kenneth II (d. 995, Fettercairn, Scot.), king of the united Picts and Scots (from 971), son of Malcolm I.

He began his reign by ravaging the Britons, probably as an act of vengeance, but his name is also included among a group of northern and western kings said to have made submission to the Anglo-Saxon king Edgar in 973, perhaps at Chester; and the chronicler Roger

of Wendover (*Flores Historiarum,* under the year 975) states that shortly afterward Kenneth received from Edgar all the land called Lothian (*i.e.,* between the Tweed and the Forth). This is the first mention of the Tweed as the recognized border between England and Scotland. Kenneth was slain, apparently by his own subjects, at Fettercairn in the Mearns.

Kenneth III (d. 1005, Monzievaird, Scot.), king of the Scots (from 997), son of Dub and grandson of Malcolm I. He succeeded to the throne perhaps after killing his cousin Constantine III (reigned 995–997); he was himself killed at Monzievaird by Malcolm (son of Kenneth II), who became Malcolm III. Gruoch, wife of the future King Macbeth, was apparently a granddaughter of Kenneth III.

Kenneth, SAINT, also called CANICE, or KENNY, Latin CANICUS, Gaelic CHAINNECH (b. 515/516 or 521/527, Glengiven, County Derry, Ire.—d. 599/600, Aghaboe, County Leix; feast day October 11), Irish abbot, monastic founder, and missionary who contributed to the conversion of the Picts. He is one of the most popular Celtic saints in Scotland (where he is called Kenneth) and in Ireland (where he is called Canice) and patron saint of the diocese of Ossory in Ireland.

Much of what has been written about his life is based on tradition. He is said to have studied under the abbots Finnian at Clonard, County Meath (543); Mobhi at Glasnevin, County Dublin (544); and Cadog at the important Welsh monastery at Llancarfan, Glamorganshire, where he was ordained priest in 545. He is thought to have visited Rome.

Kenneth was a close friend and associate of the celebrated Columba of Iona, whom he accompanied to the Scottish mainland to help Christianize the Picts. Near Inverness they met the Pictish king Brude Mac Maelchon, whom Kenneth allegedly paralyzed with the sign of the cross when he threatened them; Brude and his kingdom subsequently were converted.

Kenneth is also known to have ministered extensively in the offshore Scottish Hebrides islands. Testimony to his influence and travels is found in monastic and church ruins (*e.g.,* Kil-Chainnech on Tyree Island) and places dedicated to his name, particularly the islet Inchkenneth. According to tradition, he established the ecclesiastical settlement that later developed into the royal Scottish burgh of St. Andrews, Fife.

Returning to Ireland (*c.* 577), Kenneth founded monasteries at Aghaboe and at Kilkenny, the capital of the kings of Ossory. The Cathedral of St. Canice in Kilkenny is believed to occupy the site of Kenneth's original church, and the Gaelic name of the city itself (Cill Choinnigh) means Church of St. Canice.

The son of a bard, Kenneth was also a poet. His commentary on the Gospels is commonly known as *Glas-Choinnigh.* Accounts of him appear in St. Adamnan's *Life of Columba* (Eng. trans. by A.O. and M.O. Anderson, 1961) and in C. Plummer's *Vitae Sanctorum Hiberniae* (2 vol., 1919).

Kennewick, city, Benton County, southeastern Washington, U.S., on the Columbia River, opposite Pasco and immediately southeast of Richland. Laid out in 1892 by the Northern Pacific Irrigation Company, it is surrounded by farm country producing alfalfa, corn, beans, sugar beets, grapes, and cherries. Hydroelectric dams on the Columbia River and the Hanford Works of the Energy Research and Development Administration (ERDA, now the Department of Energy) just northwest of the tri-city group are important to the economy. Kennewick has chemical and agricultural processing plants near the confluence of the Columbia with the Snake and Yakima rivers. The city's name, probably of Indian origin, is believed to mean "grassy place." Inc. 1904. Pop. (1980) city, 34,397; metropolitan area (SMSA), 144,469.

kenning, concise compound or figurative phrase replacing a common noun, especially in Old Germanic, Old Norse, and Old English poetry. A kenning is commonly a simple stock compound such as "whale-path" or "swan road" for "sea"; "God's beacon" for "sun"; or "ring-giver" for "king."

Many kennings are allusions that become unintelligible to later generations. A non-Germanic analogue is the Homeric epithet, *e.g.,* "rosy-fingered dawn." *See also* skaldic poetry.

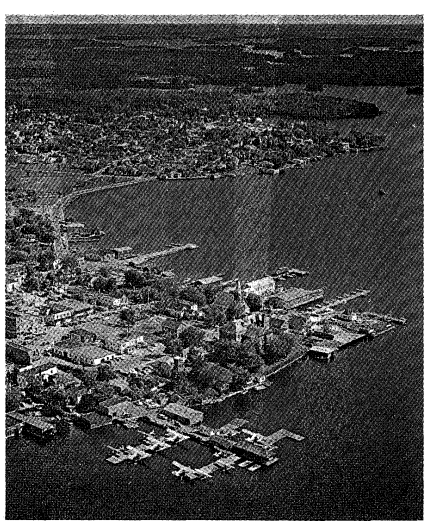
Kenny, SAINT: *see* Kenneth, Saint.

Keno, gambling game played with cards bearing numbered squares; a number on the card may be marked when an announcer selects and calls that number from a randomly selected pellet. Keno in its standard version is indistinguishable from lotto or bingo except that the numbered balls are rolled out of a container called the Keno goose.

The most widely used form of Keno is a variation called Race-Horse, or Nevada, Keno, played in gambling casinos, in which any number of players, even one, may play against the house. In Race-Horse Keno the player is given a card with 80 squares numbered from 1 to 80 in rows of 10. The player may bet on any number or numbers but not more than 15, marking them on his card or ticket, which a clerk then records as the player pays out his wager for each number selected. Numbers are drawn by the operator from a blower device in which ping-pong balls numbered 1 to 80 are agitated by a jet of compressed air. They are picked one at a time until 20 have been called.

Keno players bet on numbers singly (a one-spot ticket), several at a time, or in various combinations. With a five-spot ticket, at least three of the numbers picked by the player must be called to win; then the house pays off at 3–1 odds; four of five pays at 26–1; and all five at 332–1. Actual odds, of course, are significantly higher, favouring the house by from 20 to 25 percent.

Kenora, town, Kenora District, northwestern Ontario, Canada, on Lake of the Woods, 300 mi (480 km) northwest of Thunder Bay. The Hudson's Bay Company built a trading post on Old Fort Island (1790). Lumbering was followed by a gold mining boom (1890–91). The settlement was incorporated as a Manitoba town in 1882 when it became a divisional railroad point, but it was awarded to Ontario following a territorial dispute. It became an Ontario township in 1883 and a town in 1892. Kenora derived its name from the first two letters of Keewatin (its sister town), nearby Norman, and Rat Portage, an early name given to the town because of the migration of muskrats between the lake and the Winnipeg River.



Kenora on the Lake of the Woods, Ontario

By courtesy of the Canadian Government Travel Bureau, Ottawa; photograph Malak

Economic activities are based primarily on pulp and paper milling, flour milling, fish processing, and boatbuilding, augmented by tourism. There is an airport 8 mi northeast, and a seaplane base is located in a downtown lake area. The colourful Lake of the Woods International Pow-Wow is an annual (August) event. Pop. (1981) 9,817.

Kenoran orogeny, a Precambrian thermal event on the Canadian Shield that occurred 2,500,000,000 years ago (± 150,000,000 years). Rocks affected by the Kenoran event represent some of the oldest rocks in North America and occur in the Superior Province surrounding Hudson Bay on the south and east; the Slave Province in northwestern Canada; and the small Eastern Nain Province on the northeastern Labrador coast.

Beyond the shield area, rocks equivalent in age to Kenoran rocks occur in Wyoming and the Black Hills. Parts of the Lewisian Gneiss of Scotland have been dated at 2,400,000,000 to 2,600,000,000 years ago, and these have been correlated with the Kenoran thermal event.

Kenosha, city, seat (1850) of Kenosha County, southeastern Wisconsin, U.S., on Lake Michigan at the Pike River Estuary, just north of the Illinois state line. Founded in 1835, it was first called Pike Creek, then Southport, and in 1850 it was renamed Kenosha (Potawatomi for "pike" or "pickerel").

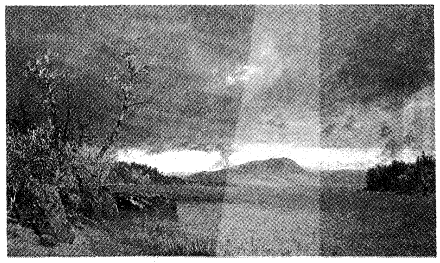
A St. Lawrence Seaway port, it has diversified manufactures, including automobiles, furniture, apparel, and metal products. It is the seat of Carthage College (1847), Gateway Technical Institute—Kenosha Campus (1912), and the University of Wisconsin—Parkside (1965). The first public school in Wisconsin was opened there in 1849. The city's Harmony Hall is the headquarters for the Society for the Preservation and Encouragement of Barber Shop Quartet Singing in America. Inc. 1850. Pop. (1980) city, 77,685; metropolitan area (SMSA), 123,137.

Kensett, John Frederick (b. March 22, 1816, Cheshire, Conn., U.S.—d. Dec. 14, 1872, New York City), U.S. landscape painter, the leader of the second generation of the Hudson River school.

He was trained as an engraver by his father, Thomas Kensett, and his uncle, Alfred Daggett, a bank-note engraver.

In 1838 Kensett went to New York City to work for a bank-note company. Two years later, together with Asher B. Durand, John W. Casilear, and Thomas P. Rossiter, he went to Europe, where, in the manner of artists of his generation, he received his artistic education by travelling, looking at pictures, and visiting leading artists in their studios. When Kensett returned to the United States in 1847 he found his reputation had been established through paintings he had sent from Europe. In 1849 he was elected to the National Academy of Design and was one of the founders of the Metropolitan Museum of Art in New York City.

Though Kensett's painting never lost the engraver's sense of draughtsmanship, his major concern was the depiction of light, using colour values to render minute gradations in intensity (*e.g.,* "Storm over Lake George," 1870; Brooklyn Museum). His palette was low in key, and much of his work has a silvery paleness. Whether his painting is of the White or Green mountains, the Catskills, or a lonely strip of Atlantic shoreline, the sense of locale is conveyed through the careful observation of



"Storm over Lake George," oil on canvas by Kensett, 1870; in the Brooklyn Museum, New York City

By courtesy of the Brooklyn Museum, New York City, gift of Mrs. W.W. Phelps

detail and a deep sensitivity to the nuances of atmosphere.

Kensington and Chelsea, royal borough in Greater London, on the north bank of the River Thames, west of the City of Westminster. It forms part of London's fashionable West End and is predominantly residential in character. The south of the borough is traversed by roads lined with fashionable boutiques, shops, restaurants, apartments, offices, and, more recently, hotels. Battersea Bridge (1887–90, replacing the picturesque wooden bridge depicted in paintings by Whistler and Turner), Albert Bridge (opened 1873), and Chelsea Bridge (rebuilt 1934–37) connect the borough with the south bank of the Thames.

In early times, the Manor of Chelsea was in the possession of Westminster Abbey. Henry VIII acquired it, together with Sir Thomas More's estate, in 1535 and gave it to his last wife, Catherine Parr. Kensington became the property of the De Veres, whose memorial court is preserved in the name Earl's Court, now an area of apartments.

Kensington Palace, still lived in by members of the royal family, is an enlargement of Nottingham House, bought by William III in 1689 and rebuilt by Sir Christopher Wren and William Kent. Queen Victoria (reigned 1837–1901) was born there in 1819. Kensington Gardens are now overlooked by the Royal Garden Hotel (1965).

The grounds of the Royal Hospital, used for the annual flower show of the Royal Horticultural Society, occupy Ranelagh Gardens. "Chelsea Pensioners" (army veterans) still inhabit the Royal Hospital built by Wren (1682–92) to house invalid soldiers. The adjacent Botanic Garden (established 1673) was in 1722 given to the Society of Apothecaries by Sir Hans Sloane. Cottonseed from the garden helped in 1732 to establish cotton growing in the southern British North American colonies.

Important buildings include the Commonwealth Institute (1962), Chelsea College of the University of London, Earl's Court Exhibition Hall, and, in South Kensington, the internationally known British Museum of Natural History, Science Museum, Victoria and Albert Museum, and Geological Museum. The southern part of the borough has long been a favoured address for artists, writers, musicians, and statesmen. The borough covers an area of 5 sq mi (12 sq km). Pop. (1982 est.) 136,800.

Kensington Stone, supposed relic of a 14th-century Scandinavian exploration of the interior of North America. Most scholars deem it a forgery, claiming linguistically that the carved writing on it is many years out of style; a few scholars, notably Robert A. Hall, Jr., former professor at Cornell University, have argued for its probable authenticity. A 200-pound (90-kilogram) slab of graywacke inscribed with runes (medieval Germanic script), the stone is said to have been unearthed on a farm near Kensington, Minn., in 1898. The inscription, dated 1362, is purported to be by a group of Norwegian and Swedish explorers from Vinland who visited the Great Lakes area in that year. The stone is housed in a special museum in Alexandria, Minn., and a 26-ton replica stands in nearby Runestone Park.

Kent, one of the kingdoms of Anglo-Saxon England, probably geographically coterminous with the modern county, famous as the site of the first landing of Anglo-Saxon settlers in Britain, as the kingdom that received the first Roman mission to the Anglo-Saxons, and for its distinctive social and administrative customs.

According to tradition, the first settlers, led by Hengest and Horsa, landed at the invitation of the British king Vortigern at Ebbs Fleet in Kent around the mid-5th century. After the reigns of Hengest and of his son Aesc, or Oisc (from whom members of the Kentish royal house were named Oiscingas), nothing is known of Kentish history from 512 until the reign (560–616) of Aethelberht, who by 595 had become overlord of all the kingdoms south of the River Humber. His wife Bertha, daughter of Charibert, the Frankish king of Paris, was a Christian, and it may have been for that reason that Pope Gregory the Great sent Augustine's mission to Aethelberht's court in 597. Aethelberht, after his conversion, gave a dwelling place in Canterbury to the missionaries, and hence this became the first and senior archiepiscopal see of the English church.

No Kentish kings ever recovered the overlordship held by Aethelberht, but his great grandson Egbert (664–673) was king in Surrey as well as in Kent. From the mid-8th century, Offa, king of Mercia, established his power in Kent, which remained subject to Mercia until conquered by Egbert, king of Wessex, in 825. Henceforward, Kent was a province of Wessex, whose kings became kings of all England in the mid-10th century.

The social organization of Kent had many distinctive features, which support the statement of the Venerable Bede that its inhabitants were a different tribe from the Angles and Saxons, namely the Jutes. The place of their continental origin is disputed. Instead of two classes of nobles, or *gesithcund,* as in Wessex and Mercia, Kent had only one, the *eorlcund;* and the Kentish *ceorl,* or peasant, was a person of considerably greater substance than those elsewhere. Freehold land in Kent was usually subject to gavelkind, or partible inheritance; administratively, Kent was divided into lathes, apparently centred on royal vills.

Kent, county of England, lying along the English Channel at the southeastern extremity of the British Isles. A line of chalk hills (the North Downs) running from west to east forms the spine of the county; north of the ridge the land falls to the marshy and low-lying shore of the Thames Estuary, while to the south there is an area of clays and sands forming a rolling, wooded region known as The Weald. The area of the county is 1,440 sq mi (3,731 sq km). The county has 14 districts: Ashford, Dartford, Dover, Gillingham, Gravesham, Maidstone, Rochester upon Medway, Sevenoaks, Shepway, Swale, Thanet, Tonbridge and Malling, Tunbridge Wells, and the city of Canterbury.

The long coastline of Kent is alternately flat and cliff-lined. The low Thameside coast is bordered by islands (Grain and Sheppey), while further east the former Isle of Thanet now forms part of Kent. There are chalk cliffs at Thanet at the North Foreland and again between Dover and Deal, but further south is the low-lying area of Romney Marsh, which has emerged from the sea, in part by reclamation, since Roman times. In the extreme southeast is the shingle promontory of Dungeness.

Because of its position facing the continent of Europe across the Strait of Dover, Kent has been subjected to numerous invasions and has attracted successive waves of settlement. Evidence of early continental invaders is seen at Kits Coty House near Aylesford, a long barrow at Chilham, and at Bigbury (a Belgic hill fort).

Roman settlement began with the subjugation of the area in AD 43. The chief Roman supply port was Richborough, and the administrative centre was at Canterbury, where Roman baths and a theatre have been unearthed.

Early in the 5th century Kent was invaded by Jutes and Saxons, and it became one of the seven kingdoms of Anglo-Saxon Britain. In 597 the King of Kent welcomed St. Augustine's Christian mission. Augustine founded an abbey outside the walls of Canterbury, a monastery inside (where the cathedral now stands), and a second diocese (604) at Rochester.

After the Norman Conquest the Normans rebuilt Rochester and Canterbury cathedrals and constructed a number of castles, of which those at Dover and Rochester survive. In 1170 Canterbury cathedral was the scene of the murder of Thomas Becket, the archbishop. Many pilgrims subsequently visited his shrine, and those of the 14th century were immortalized by Geoffrey Chaucer in his *Canterbury Tales.*

In the 16th century, when defense of Britain's shores became a preoccupation, coastal forts were built (*e.g.,* at Deal), and naval dockyards were established at Chatham and Sheerness. Sensitivity to the defense of Kent reached a peak in Napoleonic times and again in 1940, when a German invasion was expected.

Kent has long been known as the "Garden of England." Fruits, especially apples and cherries, and hops are grown, mainly in the Medway Valley and in north Kent. Market gardening is extensively practiced. Important arable crops include barley, wheat, oats, and potatoes. Romney Marsh, one of the world's finest natural grasslands, is famous for its sheep, but a section of it has been plowed up for the production of spring flowers and bulbs. Industries include papermaking along the Darent and Medway; engineering and the production of chemicals along the Thames; and the production of plastics, bricks, tiles, and cement on the Lower Medway and Swale. There are oil refineries on the Isle of Grain and railway workshops at Ashford.

Northwestern Kent has experienced decades of encroachment upon its farmland by the suburbs of London, and such towns as Sevenoaks and Tonbridge lie well within the commuter belt of the capital. Britain's entry into the European Economic Community (EEC) in 1973 greatly strengthened links between the southeastern section of the county and the Continent by increasing Channel trade; it has brought new importance to eastern Kent as a warehousing area and focus of shipping and other transportation routes. Pop. (1981) 1,467,619.

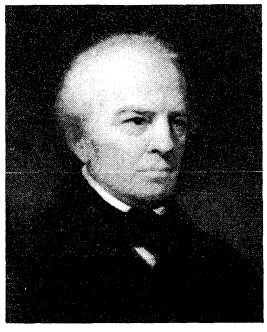
Kent, city, Portage County, northeastern Ohio, U.S., on the Cuyahoga River, immediately northeast of Akron. The site was first settled in about 1805 by John and Jacob Haymaker and called Riedsburg. It was later named Franklin Mills, and when incorporated as a village in 1867 it was renamed for Marvin Kent, a promoter of the Atlantic and Great Western Railroad (later Erie Lackawanna Railway).

Community growth was stimulated by the foundation in 1910 of a state normal school, later Kent State University. In 1970 the university received international attention when an anti-Vietnam War protest there resulted in the deaths of four students. Manufactures (promoted by Akron's industrial expansion) include motor homes, electric motors, machine tools, and machinery. Inc. city, 1920. Pop. (1980) 26,164.

Kent, Edmund Plantagenet, 1st earl of, byname EDMUND OF WOODSTOCK (b. Aug. 5, 1301, Woodstock, Oxfordshire, Eng.—d. March 19, 1330, Winchester, Hampshire), youngest brother of England's King Edward II, whom he supported to the forfeit of his own life.

He received many marks of favour from his brother, whom he steadily supported until the last act in Edward's life opened in 1326. He fought in Scotland and then in France and was a member of the council when Edward III became king in 1327. Soon at variance with Queen Isabella and her lover, Roger Mortimer, Edmund was involved in a conspiracy to restore Edward II, who he was led to believe was still alive (he had been murdered in September 1327); Edmund was arrested and beheaded. Although he had been condemned as a traitor, his elder son Edmund (*c.* 1327–33) was recognized as earl of Kent in December 1330, the title passing on his death to his brother John (*c.* 1330–52).

Kent, James (b. July 31, 1763, Fredericksburgh, Putnam County, N.Y.—d. Dec. 12, 1847, New York City), jurist whose decisions and written commentaries shaped the inchoate common law in the formative years of the United States and also influenced jurisprudence in England and other common-law countries. As chancellor of the New York Court of Chancery (1814–23), he is said to have made equity jurisprudence effective for the first time in U.S. legal history.



James Kent, portrait by Daniel Huntington; in the National Portrait Gallery, Washington, D.C.

By courtesy of the National Portrait Gallery, Smithsonian Institution, Washington, D.C.

A lawyer at Poughkeepsie, N.Y., from 1785 and a New York state legislator from 1790, Kent moved to New York City in 1793, when he was appointed the first professor of law at Columbia University. He became a justice of the New York Supreme Court in 1798, chief justice of that tribunal in 1804, and chancellor of the state Court of Chancery (then the highest judicial office in New York) in 1814.

Once more professor of law at Columbia (1823–26), Kent delivered lectures that he revised and elaborated as *Commentaries on American Law*, 4 vol. (1826–30). This work deals with international law; the U.S. Constitution and the federal system; the law of various U.S. states; personal rights; and the law of property, both real and personal. In content and in organization it bears little resemblance to its great English counterpart, Sir William Blackstone's *Commentaries on the Laws of England*, 4 vol. (1765–69).

As judge and commentator, Kent relied as much as possible on the old English law. When common-law precedent was inadequate or lacking, he turned to the civil (Roman-derived) law; in the United States, England, and elsewhere, common-law courts citing Kent perforce adopted many principles derived from civil law.

James Kent: A Study in Conservatism, 1763–1847, by John Theodore Horton, was published in 1939.

Kent, Nun of, also called HOLY MAID OF KENT: *see* Barton, Elizabeth.

Kent, Odo, earl of: *see* Odo of Bayeux.

Kent, Rockwell (b. June 21, 1882, Tarrytown Heights, N.Y., U.S.—d. March 13, 1971, Plattsburgh, N.Y.), painter and illustrator whose works, though never radically innovative, represented scenes of nature and adventure with such vividness and drama that he became one of the most popular U.S. artists of the first half of the 20th century.



"The Road Roller," oil on canvas by Rockwell Kent, 1909; in the Phillips Collection, Washington, D.C.

By courtesy of the Phillips Collection, Washington, D.C.

Kent studied architecture at Columbia University but turned to painting and was a pupil of William M. Chase, Robert Henri, and Abbott Thayer. His early works, mostly moody landscapes and seascapes, are highly stylized with dramatic tonal contrasts, as seen in "The Road Roller." In the course of a varied career he worked as an architectural draftsman, as a lobsterman and carpenter on the coast of Maine, and as a ship's carpenter. He explored the waters about Tierra del Fuego in a small boat and lived in Newfoundland, Alaska, and Greenland, drawing heavily upon these experiences for his paintings and travel books.

Kent illustrated books for a number of contemporary writers, as well as an autobiography, *It's Me, O Lord* (1955), and works by Chaucer, Shakespeare, and Melville. In 1966 he was elected to the Academy of Arts of the U.S.S.R.

Kent, Thomas Holland, 3rd earl of: *see* Surrey, Thomas Holland, duke of.

Kent, William (b. *c.* 1685, Bridlington, Yorkshire, Eng.—d. April 12, 1748, London), painter and architect, a principal master of the Palladian architectural style in England and pioneer in the creation of the "informal" English garden.

Kent was said to have been apprenticed to a coach painter at Hull. Local patrons, impressed by his talent, sent him to study painting in Rome. There he studied under Benedetto Luti.



William Kent, engraving

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

In Rome he also met the Earl of Burlington, the foremost architectural patron of the 18th century in England and the principal promoter of Palladio's classical building style (Palladianism). He took Kent back to London to decorate Burlington House in Piccadilly, where Kent then lived for the rest of his life. The association with Burlington had a determining effect on Kent's rather severe architectural style, which was characterized by well-proportioned masses arranged in simple relationships. Although later Neoclassical architects, such as Robert Adam, were to criticize Kent's works as "immeasurably ponderous," his influence on them was considerable. Kent was also familiar with the style of Inigo Jones, whose *Designs* (published 1727) Kent edited.

By the 1730s Kent had become a fashionable architect. Among his principal buildings is Holkham Hall, Norfolk (begun 1734). Here, as in other works, Kent designed interiors and even furniture, becoming one of the earliest architects to attempt a unified effect. Kent's best known works came out of his appointment, through Burlington's influence, to the London Board of Works (1726). The Royal Mews (1732), the treasury buildings, Whitehall (1734–36), and the Horse Guards Building in Whitehall (1750–58; completed after Kent's death) are all part of Burlington's grand intention of rectifying the sorry state of England's architecture by adhering more closely to classical precedent.

The rather theatrical interiors of some of these structures, as of the masterful No. 44 Berkeley Square (1742–44), built for Lady Isabella Finch, and Kent's taste for fanciful Gothic style in furniture designs suggest that he wore his Palladianism lightly and that, in the absence of Burlington's overpowering influence, Kent might as easily have become a master of the Baroque.

It was in his gardens—conceived of as natural settings to contrast with his formal buildings—that Kent may have achieved his freest expression. He created gardens at Rousham Hall, Oxfordshire (1738–41), and Stowe House, Buckinghamshire (*c.* 1730), where winding paths and open vistas lead to small classical temples in informal wooded glades. In describing the revolt from formality in garden design, Horace Walpole wrote that Kent saw that "all Nature was a garden." The attempt at these sites and others, such as Pope's Villa, Twickenham, Middlesex (for Alexander Pope; *c.* 1730), and Richmond Gardens, Surrey, where he built a Merlin's Cave (1735), was to create a three-dimensional picture. This style soon crossed the Channel and had a substantial impact in France during the second half of the 18th century.

Kent and Strathern, Edward Augustus, duke of, EARL OF DUBLIN (b. Nov. 2, 1767, Buckingham Palace, London—d. Jan. 23, 1820, Sidmouth, Devonshire, Eng.), fourth son of King George III of Great Britain, father of Queen Victoria.

He made his career in the army and saw service at Gibraltar, Canada, and the West Indies, where he was renowned as a severe disciplinarian. Like most of his brothers, he was not on good terms with his father, and for most of his life he was heavily in debt.

In 1790 he took command of the royal fusiliers at Gibraltar, and in 1791 he led his regiment to Canada, where he spent two years at Quebec. He was promoted to major general in 1793 and led a brigade of grenadiers in the capture of Martinique and St. Lucia from the French. He then returned to Canada until 1798, when an injury forced him back to England. In 1799 he was made duke of Kent and Strathern and earl of Dublin and was promoted to general in command of British forces in North America. Ill health prevented his staying long in Canada, but while there he

managed to develop good relations with the French-speaking population. The Île Saint-Jean was renamed Prince Edward Island in 1799 in his honour.

The duke was appointed governor of Gibraltar in 1802, but his harsh rule provoked a mutiny there and he was recalled to England. He became a field marshal in 1805, though he did not engage actively in the army. In 1815 the duke retired to Brussels, but in 1818, in order to provide an heir to the throne, he was compelled to part with his mistress, Thérèse Bernadine Montgenêt (known as Mme de Saint-Laurent), with whom he had lived for 20 years; and in 1818 he married Princess Mary Louisa Victoria of Saxe-Saalfeld-Coburg (1786–1861), who became the mother of Queen Victoria.

Kentau, city, Chimkent *oblast* (province), Kazakh Soviet Socialist Republic, on the slopes of the central Karatau Mountains. Formed in 1955 from several settlements, Kentau (Kazakh: "Ore Mountains") is a rapidly growing mining city with a plant for enriching polymetallic ores and reinforced concrete (ferroconcrete), transformer, and excavator works. The city is linked by road to the Turkestan railway station on the Tashkent–Orenburg railway. Pop. (1987 est.) 60,000.

Kentigern, SAINT, byname MUNGO (b. Culross, Fifeshire—d. *c.* 612, possibly Glasgow; feast day January 14), abbot and early Christian missionary, traditionally the first bishop of Glasgow and the evangelist of the ancient Celtic kingdom of Cumbria in southwestern Scotland. Little else is known about him except from late, dubious hagiographies.

According to legend he was of royal descent, presumably illegitimate, and is reputed to have been a noted, energetic preacher, who combated the heresy of Pelagianism (which stressed the goodness of human nature and the freedom of the human will). About 550 he went to Glasgow to convert its British tribes and established a Christian community there. He reportedly had as a patron the king of Strathclyde, for whom he founded the see of Glasgow. The succeeding Christian king Rydderch (Rederech) was overthrown by a pagan reaction, and Kentigern went to Cumbria or, less likely, to Wales. He was recalled to Strathclyde after Rydderch had regained power. Kentigern is also reported to have collaborated with the celebrated missionary abbot St. Columba of Iona (island of the Scottish Inner Hebrides). The modern Glasgow Cathedral, reputedly containing Kentigern's grave, stands on the probable site of a church he built.

Although called Kentigern (Celtic: "High Lord"), he is equally known as Mungo (Celtic: "My Dear Friend"), a name said to have been given to him by his teacher Bishop St. Serf. The chief documents on Kentigern's life were written for two 12th-century bishops of Glasgow. Glasgow's heraldic arms display a ring and a fish, associated with an early miracle attributed to Kentigern.

BIBLIOGRAPHY. "The Sources for the Life of St. Kentigern," by Kenneth Hurlstone Jackson, is in Nora Chadwick *et al., Studies in the Early British Church* (1958, reissued 1973), pp. 273–357.

Kenton, Stan, byname of STANLEY NEWCOMB KENTON (b. Feb. 19, 1912, Wichita, Kan., U.S.—d. Aug. 25, 1979, Los Angeles), American jazz bandleader, pianist, and composer who commissioned and promoted the works of many modern composer-arrangers and thrust formal education and big-band jazz together into what became the stage (or concert) band movement of the 1960s and '70s, involving thousands of high school and college musicians.

Kenton began writing music in his teens, was a pianist and arranger for dance bands in the 1930s, and was influenced by Earl Hines as a pianist and by Claude Thornhill and Benny Carter as an arranger. Kenton formed his own band in 1940 and continued forming bands and touring almost until his death.

Much of Kenton's music is more like nonswing 20th-century concert music than jazz or dance music, especially the serious works of Robert Graettinger ("City of Glass"), Johnny Richards ("Cuban Fire"), and Russ Garcia ("Adventures in Emotions") and pieces by Bill Holman, Bill Russo, and others. Kenton also featured outstanding jazz improvisers, including saxophonists Lee Konitz and Art Pepper, trumpeter Conte Candoli, and trombonist Frank Rosolino, but the emphasis was less on improvisation than on elaborate arrangements, often employing instruments uncommon to earlier jazz such as bass saxophone, tuba, French horn, strings, and mellophonium (a trumpet–French horn hybrid commissioned by Kenton). He also showed a keen interest in Latin-American music and often used a Latin percussionist. The most typical band sound involved high, loud, block-voiced trumpet playing, with five- and six-note chords, and open-voiced trombone-section harmonies. Saxophone passages written in sixteenth notes were also a Kenton trademark, as was his use of the full range of loudness levels that could be extracted from a band.

Kenton was responsible for the "progressive jazz" label that some mistake for all modern jazz and some use to identify all Kenton-linked jazz. Some critics place his music in the "cool jazz" category and, being based in California, many of his players—including Shorty Rogers, Bill Perkins, and Shelly Manne—were identified with West Coast jazz, a subcategory of cool jazz.

From 1970 Kenton ran his own combination record company, publishing house, and promotional network, called Creative World. His best-known composition is "Artistry in Rhythm," the band's theme. Among his most popular recordings are "Intermission Riff," "Eager Beaver," and "Peanut Vendor."

BIBLIOGRAPHY. Biographies include Carol Easton, *Straight Ahead: The Story of Stan Kenton* (1973, reprinted 1981); and William F. Lee, *Stan Kenton: Artistry in Rhythm* (1980), with a discography.

Kent's Cavern, also called KENT'S HOLE, large limestone cave near Torquay, Devonshire, Eng., that yielded some of the earliest evidence of human coexistence with extinct animals. The Reverend J. McEnery, who investigated the upper deposits (1825–29), was perhaps first to proclaim this fact. Excavations (1865–80) made by William Pengelly provided conclusive evidence. The deposit has been divided into six layers from top to bottom: Roman, Iron, and Bronze Age sherds; stalagmite with Neolithic pottery; black band of burned bones and ash; red cave earth; stalagmite floor; and bone and pebble breccia. The implements have been classified typologically into five stages: Acheulian, Mousterian, Middle Aurignacian, proto-Solutrian, and Magdalenian. The animals, apart from the bones of a cave bear in the lowest layer, appear to have come mainly from the red cave earth and are Late (Upper) Pleistocene. Species represented include mammoth, wooly rhinoceros, bison, reindeer, and giant deer (*Megaceros*). Human fragments have been found but have not yet been equated with the archaeological phases.

Kentucky, constituent state of the United States of America, lying in the eastern south-central region of the country.

A brief treatment of Kentucky follows. For full treatment, *see* MACROPAEDIA: United States of America: *Kentucky*.

Facing Ohio, Indiana, and Illinois across the Ohio River to the north, Kentucky is also bounded by West Virginia and Virginia on the east, Tennessee on the south, and Missouri on the west. The capital is Frankfort. The state extends about 425 miles (685 km) from east to west and 40 to 180 miles (65 to 290 km) north to south.

The earliest human inhabitants were agricultural and hunting peoples who left burial mounds and other traces. For many centuries before the arrival of the white settlers, the Kentucky region was a hunting ground and battlefield for such Indian tribes as the Shawnee from the north, the Iroquois from the east, and the Cherokee from the south.

Exploration by whites was relatively unsuccessful until Daniel Boone penetrated to the Bluegrass country in 1769. Following the American Revolution, immigrants poured down the rivers and traveled the Wilderness Road through the Cumberland Gap. The original Kentucky settlements constituted a judicial district of Virginia, but the ties were severed in 1792, when Kentucky became the 15th state. The citizens were divided on the issue of slavery, but until the American Civil War, proslavery forces maintained control of the state government. Kentucky did not secede, and a majority of its troops fought on the side of the Union. In the Reconstruction period after the war, however, popular sentiment became strongly pro-South.

Physiographically Kentucky can be divided into three main regions: (1) the Appalachian Highlands of the east, containing the great eastern coalfields of the Cumberland and Pine ranges; (2) the Interior Lowlands, containing the plains of the Bluegrass, the rounded hills of the Knobs, the karstic Pennyrile (Pennyroyal), and the Western Coal Field; and (3) the Coastal Plains containing the Purchase, the fertile northernmost extension of the Gulf Coastal Plain lying between the Tennessee, Mississippi, and Ohio rivers. The drainage pattern through Kentucky's low, rolling topography is highly dendritic, with most streams flowing generally northward into the Ohio River.

The Kentucky climate is temperate with a mean annual temperature between 55° and 60° F (13° and 16° C). The growing season lasts from 176 to 197 days a year. Mean annual rainfall is about 45 inches (1,140 mm), evenly distributed throughout the year. Rich alluvial soils lie along the streams and rivers.

From its early settlement, Kentucky has been a strongly rural state of small towns and crossroads. About one-half of the population is classified as rural, and only two cities, Louisville and Lexington, have populations greater than 200,000. The state's proportion of black population has steadily decreased since before the Civil War, by 1990 reaching only about 7 percent.

The economy of Kentucky has been focused traditionally on tobacco farming, coal mining, and the manufacture of bourbon whiskey. Tobacco is still a major cash crop, but farm output also includes cattle and calves, dairy products, soybeans, corn (maize), and hogs. Kentucky ranks first nationally in the breeding of thoroughbred horses. Kentucky mines more bituminous coal than any other state. Petroleum, natural gas, asphalt, and iron ore are also among its mineral resources.

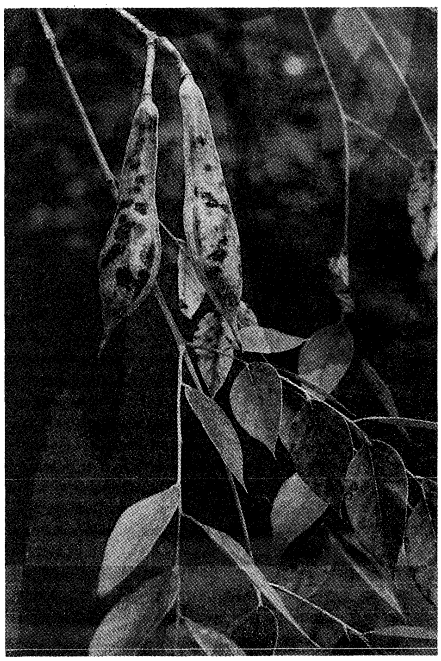
An extensive system of scenic, multilane tollroads has been partly incorporated into the interstate-highway system. Barge traffic on the Ohio–Mississippi system carries many of Kentucky's products to world and national markets. Railroads and airways crisscross the state. Fort Knox has been the gold bullion depository for the United States since 1936.

Images of Kentuckians vary from leisurely colonels to hard-hatted coal miners. Unique state attractions include the annual running of the Kentucky Derby at Churchill Downs and the limestone anomalies of Mammoth Cave National Park. The state maintains a system

of almost 100 vocational-education centres. The University of Kentucky and the University of Louisville are the largest universities. Area 40,409 square miles (104,659 square km). Pop. (1990 est.) 3,745,000.

Kentucky coffee tree (species *Gymnocladus dioica*), plant of the pea family (Fabaceae), native in North American woods from New York and southern Ontario to Oklahoma. In colonial times the seeds of the tree were used for coffee.

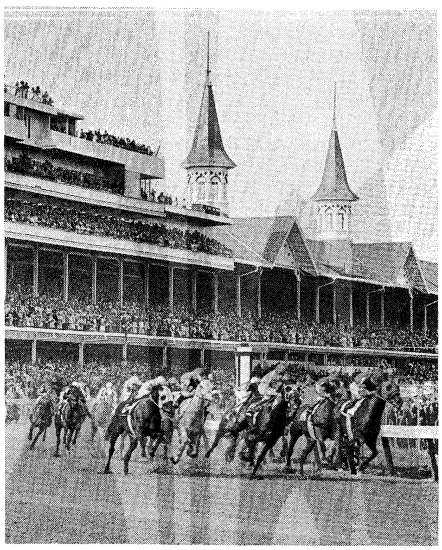
Sometimes cultivated as an ornamental, the tree grows to about 30 m (100 feet) tall. The bipinnate leaves are twice compound (*i.e.*, the



Kentucky coffee tree (*Gymnocladus dioica*)
Kitty Kohout from Root Resources—EB Inc.

leaflets, in turn, bear leaflets). The greenish white flowers, about 1 cm (0.4 inch) long, are borne in large clusters. The fruit is a dark brown pod 5–25 cm (about 2–9 inches) long, containing lens-shaped seeds about 2.5 cm (1 inch) broad.

Kentucky Derby, one of the classic American horse races, established in 1875 and run annually on the first Saturday in May at Churchill Downs track, Louisville, Ky. With the Preakness (run in mid-May) and Belmont (early in June) stakes, it makes up U.S. racing's coveted Triple Crown. The Derby field is limited to three-year-olds; fillies carry 121 pounds and colts 126 pounds. The race distance was reduced in 1896 from 1.5 to its present 1.25 miles (about 2,000 m). *See* Sporting Record: *Horse racing.*



Rounding the first turn at the Kentucky Derby
Caufield & Shook, Inc.

Kentucky Lake, one of the world's largest man-made lakes, situated in Marshall, Calloway, Lyon, and Trigg counties, southwestern Kentucky, U.S.; its southern extremity overlaps into Tennessee. The lake is 184 miles (296 km) long and has more than 2,300 miles (3,700 km) of shoreline. It was created in 1944 by the impoundment of the Tennessee River by the Kentucky Dam, the largest (206 feet [63 m] high, 8,422 feet [2,567 m] long) in the Tennessee Valley Authority (TVA) system. The dam, near Gilbertsville and 22 miles (35 km) upstream from Paducah, regulates the flow from the Tennessee River into the Ohio River for navigation, hydropower, and flood control. Major recreation spots are Kenlake State Park on the lake's west shore and Kentucky Dam Village State Resort Park near the dam at the lake's northern end. There are facilities for boating, and the lake is stocked with bass, catfish, rockfish, bluegill, and crappie.

Lake Barkley, another huge reservoir that has an approximately 1,000-mile (1,609-kilometre) shoreline and is impounded on the Cumberland River by Barkley Dam, lies east of Kentucky Lake. A 170,000-acre (68,790-hectare) wooded isthmus between the two lakes known as the Land Between the Lakes was developed by the TVA as a major recreation and conservation area and is the site of an environmental-education centre.

Kentucky Resolution (1798–99): *see* Virginia and Kentucky Resolutions.

Kentucky River, tributary of the Ohio River in north-central Kentucky, U.S., and navigable along its 259-mile (417-kilometre) course by means of locks. It is formed by the confluence of North, Middle, and South forks near Beattyville in Lee county and empties into the Ohio at Carrollton, Ky. The North Fork rises in the Cumberland Mountains in Letcher county, near the Virginia line, and flows 168 miles (270 km) southwest, then northwest. The Middle and South forks originate in Leslie and Bell counties in the Cumberlands, and both flow generally north for 97 miles and 75 miles (156 km and 120 km), respectively, before joining the main stream.

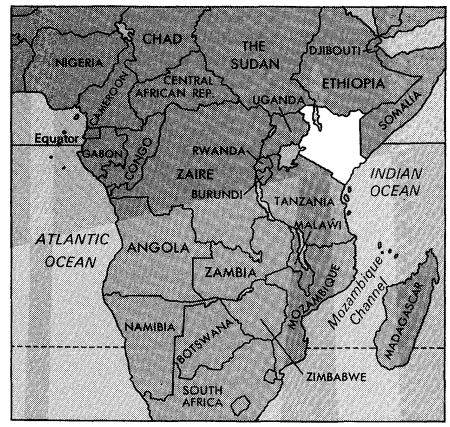
Kenya, officially REPUBLIC OF KENYA, Swahili JAMHURI YA KENYA, African country along the Indian Ocean, covering an area of 224,961 square miles (582,646 square km). The capital is Nairobi. Situated astride the equator on the East African coast, Kenya is bounded by Ethiopia and The Sudan on the north, by Somalia and the Indian Ocean on the east, by Tanzania on the south, and by Uganda on the west. The population in 1990 was estimated to be 24,872,000.

A brief treatment of Kenya follows. For full treatment, *see* MACROPAEDIA: Eastern Africa.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. Kenya can be divided into five contrasting regions. The first of these is the Lake Victoria basin in the southwestern corner of the country. This basin extends eastward from the lake to the Central Rift highlands and is a level plateau averaging 3,500 feet (1,070 m) above sea level.

The Central Rift highlands run from north to south down the western half of Kenya and are split by the Rift Valley into two sections, the Mau Escarpment on the west and the



Kenya

Aberdare Range and accompanying highlands on the east. The Mau Escarpment in the west rises above 9,000 feet (2,740 m) and stretches for more than 200 miles (320 km) northward from the Tanzanian border to the west-central border with Uganda. The Aberdare Range to the east, forming the eastern border of the Rift Valley, rises nearly 10,000 feet (3,050 m) and extends from near Nairobi northward to the Laikipia Plateau. Mount Kenya, the nation's highest mountain, rises to 17,058 feet (5,199 m) just east of the Aberdare Range.

Much of Kenya's eastern half is composed of the vast eastern plateau forelands, which sprawl between the central highlands to the west and the coastal strip on the east and slope gently toward the sea. Semiarid and arid regions cover most of northern Kenya.

The last of the major regions is the coastal belt, which runs about 250 miles (400 km) along the Indian Ocean littoral and is limited on the west by a series of low hills. Kenya is drained by a network of small rivers and streams that are generally shallow and exhibit seasonal changes in flow. Kenya's most important river, the Tana, rises in the central highlands and drains some 16,300 square miles (42,200 square km), roughly 7 percent of the country's total land area, before flowing into the Indian Ocean. Northern Kenya receives little rainfall, but regions in the southern part of the country are plentifully watered. On the coast and the immediate interior, the daily maximum temperature averages about 90° F (32° C). It is generally warmer in the northeast and cooler in the highlands. Kenya has two rainy seasons: the long rains from late March to May and the short rains from October to December. In the highlands the characteristic landscape consists of patches of evergreen forest separated by wide expanses of bamboo grass. East and west of the highlands, the vegetation gives way to low trees that are scattered through grass that grows 5 to 8 feet (1.5 to 2.4 m) high. Semidesert conditions in the north below 3,000 feet (915 m) give rise to thornbush interspersed with thick-trunked baobabs. In the coastal belt, dense, high bush alternates with limited areas of forest and open glades. Kenya is noted for its wildlife, which includes lion, leopard, wild dog, elephant, buffalo, rhinoceros, zebra, antelope and gazelle, hippopotamus, and crocodile. Only about 4 percent of the land is arable; nearly all of this is cropped, mainly with corn (maize) and other grains. About 7 percent of the land is used for grazing cattle, goats, and sheep.

The people. There are between 30 and 40 different ethnic groups in Kenya. They are distinguished from each other by language and culture. The most numerous groups are the Kikuyu, Luhya, Luo, Kamba, Kalenjin, and Masai. These and other peoples speak languages belonging to three major language groups: Bantu, Nilotic, and Cushitic. Swahili and English are official languages. Three-

fourths of the people profess some form of Christianity, about one-fifth are animists, and the rest are Muslim or Hindu.

Kenya is one of the most populous countries in sub-Saharan Africa. The population density is highest near Lake Victoria, in the central area of the country, and on the Indian Ocean coast. The arid northern areas are very sparsely settled. Kenya's birth rate far exceeds its relatively high death rate, resulting in an extraordinarily high natural rate of population increase. No slowing of population growth is in sight. The population is young; more than three-fourths of it is less than 29 years of age. Life expectancy is 57 years for men and 61 years for women. A majority of the population lives in rural settlements, but urban population growth has been rapid since the early 1970s; one-fifth of the total population is urban.

The economy. Kenya has a developing market economy largely based on agriculture. Although the republic has experienced one of the most impressive rates of economic growth in Africa since independence in 1963, the rapidly growing population is putting increasing demands on the economy's ability to provide jobs, land, and social services. Unemployment is a problem, and the rate of inflation has risen in conjunction with the expansion of government spending. The gross national product (GNP) per capita has grown slowly since independence and continues to be among the lowest in Africa.

Agriculture accounts for more than one-fourth of the GNP and employs about four-fifths of the work force. There is little irrigated land, and output is greatly dependent upon the weather. More than one-half of total agricultural output is subsistence production, and occasional shortages of the staple corn as well as of wheat and milk have necessitated food imports. Coffee (principally arabica) and tea are Kenya's leading exports, and fluctuations in world prices have a profound effect on the economy. Other important crops include sugarcane, potatoes, cassava, wheat, sisal, pyrethrum, pineapples, green beans and other vegetables, and seed cotton. Livestock and dairy production are important both for domestic consumption and for export.

Industry accounts for about one-tenth of the GNP and employs a tenth of the work force, making Kenya the most industrialized country in eastern Africa. Electricity is largely generated by hydroelectric power. Crude petroleum imported to meet domestic needs is refined at Mombasa. Major manufactures include food and beverages, tobacco, textiles, assembled vehicles, cement, and petroleum products. About one-half of industrial investment is foreign-owned.

Service industries account for about half of the GNP and employ about one-eighth of the work force. The steadily expanding tourist industry has become one of Kenya's largest sources of foreign exchange.

Rising expenditures on fuel imports and government services combined with variable production and fluctuations in the price of coffee and tea have resulted in a substantial budget deficit. Major trading partners are the United Kingdom, Japan, Saudi Arabia, Germany, and the United States.

Kenya has an extensive transportation system, with port facilities at Mombasa, international airports at Mombasa and Nairobi, and a substantial road network. A major project to improve the railways was in progress during the late 1980s with foreign assistance.

Government and social conditions. Kenya is an independent republic. Its constitution, adopted in 1963 and amended from time to time, provides for one legislative house, the National Assembly, with 202 members, most of whom are directly elected. The president, who must be a member of the National Assembly, is elected by popular vote to serve a five-year term. The president appoints the vice president and other ministers from among the members of the assembly, and together they form the Cabinet. The judiciary is headed by the Kenya Court of Appeal and includes the High Court, resident magistrates' courts, and district magistrates' courts. Islāmic customary law is accepted in the courts. The only legally permitted political party is the ruling Kenya African National Union (KANU).

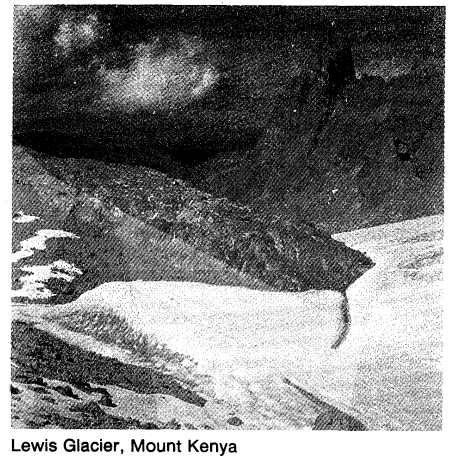
Health services are provided by government agencies and private practitioners. Malaria, gastroenteritis, venereal diseases, diarrhea and dysentery, and trachoma are major health problems. Although a nationwide insurance system does not exist, the government participates in the development of family and child-welfare services, the care and rehabilitation of the disabled, and the provision of assistance to the handicapped. Provision of housing is a critical national problem in the cities and towns, because of the expanding population. To alleviate the problem, the National Housing Corporation has constructed rental flats and private units in the cities.

The national educational system is noncompulsory and consists of three educational levels: eight-year primary, four-year secondary, and university. Private schools receive liberal government assistance. The University of Nairobi (1956) is now Kenya's independent university. The press is independent, but it generally avoids conflict with the government by practicing self-censorship. Radio and television services are government-owned, and programs are broadcast in Swahili and English; many are imported from the United States and the United Kingdom.

Cultural life. Kenya is a country of diverse and rich cultural traditions. Music and dance play an integral role in social and religious life. A theatre school provides professional training in the performance of traditional music and dance. Visual arts are largely confined to the mass production of wood sculpture. Swahili literature, both oral and written, is traditional in form and content, and contemporary novels deal with the social frictions between traditional and modern society. The national museum contains collections of wildlife, archaeological remains, and objects of Kenya's material culture.

History. The earliest recorded history of Kenya concerns the coastline, which for centuries had trading relations with southern Arabia. Outsiders knew little about the interior until the 19th century, when Arabs and Swahili-speakers formed caravans (in search of ivory) that penetrated from Mombasa to Lake Victoria, and then to Mount Elgon. This route was not as popular as the caravan trails farther south, because of the difficulty in crossing the desert of the Taru Plain and because of the hostility of the Masai people. The Masai probably came into central Kenya from the north in the 18th century. The Hehe (Wahehe) of Tanzania in about 1830 checked the southward advances of the Masai, but their raiding parties continued to range. At about the same time, the Kikuyu, a much larger group of people, expanded northward, westward, and southward from their territory in the Fort Hall area. By the end of the 19th century, their advance had reached the Masai territory to the north, south, and the upper slopes of the Aberdare Mountains to the west. The first Europeans to penetrate the interior were German agents of the Church Missionary Society, who established a mission station at Rabai, in the early 19th century. Later the Germans and then the British took control of the country, which the Masai had ravaged but never ruled. The area was established as a British protectorate in 1890 and as a crown colony in 1920, with the British East Africa Company holding commercial control. In 1948 the East Africa High Commission was formed, with headquarters in Nairobi, to administer certain services of common benefit to Kenya, Uganda, and Tanzania. It consisted of the governors of the three territories, with the governor of Kenya serving as chairman. In the 1950s the Mau Mau Rebellion brought about the proclamation of a state of emergency. The rising was limited to the Kikuyu tribe and was directed against the presence of Europeans in Kenya. The emergency ended in the early 1960s. In 1963 Kenya became fully independent, and a year later a republican government was elected with Jomo Kenyatta as the first president. Under Kenyatta's rule Kenya benefited from both political stability and sustained economic growth. With the death of Kenyatta in 1978, Daniel arap Moi became president. In the following years Kenya had to deal with economic problems caused by, among other factors, rises in the price of imported oil and a population that grew at a faster rate than did opportunities for employment.

Kenya, Mount, Swahili KIRINYAGA, volcano, central Kenya, lying immediately south of the equator. At the 8,000-foot (2,438-metre) contour, the circumference of this vast dome of rock is approximately 95 miles (153 km); in the restricted summit area of steep, pyramidal peaks, the principal heights are those of Batian (17,058 feet [5,199 m]), Nelion (17,022 feet [5,188 m]), and Lenana (16,355 feet [4,985 m]). This long-extinct volcano is much eroded, and the highest peaks consist of the crystalline nepheline-syenite that plugged the former vent. Around this core are gently dipping lavas, agglomerates, and tuffs. Ridges



Lewis Glacier, Mount Kenya
Gerald Cubitt

that radiate from the central peaks are separated by seven principal valleys and by some smaller ones as well. Twelve small glaciers, of which Lewis and Tyndall are the largest, have been retreating during the 20th century. A markedly radial drainage is characteristic, but all streams eventually drain into the Tana River or the Ewaso Ng'iro plain.

From the grassland (with species of acacia and *Themeda*) in the basal plateau to the west and north and from the formation of low trees and high grasses in the south and east, a ring of dense forest covers the slopes of Mount Kenya up to about 10,500 feet (3,200 m). Cedar and yellowwood are prominent on the drier western and northern flanks; on the upper margins of the forest—*i.e.,* from about 8,000 feet (2,400 m)—bamboo predominates. Alpine-zone vegetation consisting of heaths and lobelias gives way at about 15,000 feet (4,600 m) to bare rock and snow. Mount Kenya National Park (276 square miles [716 square km]) contains a variety of big game, such as elephant and buffalo. The park includes the moorland above 10,800 feet (3,300 m)

and forest reserve over much of the slopes. The lower fertile slopes are cultivated by the Kikuyu and the related Embu and Meru.

The Kikuyu called the mountain Kirinyaga or Kere-Nyaga (Mountain of Whiteness). Johann Ludwig Krapf was the first European to see the mountain (1849), and it was partially climbed by Samuel Count Teleki (1887) and the British geologist John Walter Gregory (1893). The British geographer Halford John Mackinder was the first to reach the summit, in 1899. Nanyuki (connected by rail to Nairobi), at the northwestern foot, is the chief base for ascents.

Consult the INDEX *first*

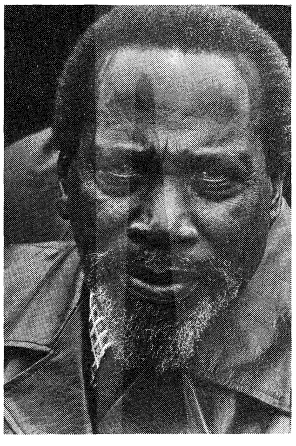
Kenyah, indigenous people of Sarawak and Indonesian Borneo, grouped with the Kayan or under the general name Bahau. In the 1970 Sarawak census, 21,279 Kenyah were reported. They live near river headwaters, in close association with the Kayan, with whose culture they have much in common though the languages differ. Traditional Kenyah economy is based on the cultivation of dry rice in jungle clearings. The forest is cut and burned, and the rice is planted among the ashes. The village often consists of only one communal house up to 400 yards long, built on piles, with a row of family rooms at the back and a wide covered veranda that serves as a general working space and village street.

Chieftainship is elective, though there is a strong bias in favour of a capable son of the old chief. They were headhunters traditionally. *See also* Dayak.

Kenyatta, Jomo, original name KAMAU NGENGI (b. *c.* 1894, Ichaweri, British East Africa—d. Aug. 22, 1978, Mombasa, Kenya), African statesman and nationalist, the first prime minister (1963–64) and then president (1964–78) of independent Kenya.

Early life. Kenyatta was born as Kamau, son of Ngengi, at Ichaweri, southwest of Mount Kenya in the East African highlands. His father was a leader of a small agricultural settlement; his grandfather was a *murogi,* or diviner, known for his knowledge of medicine and magic. Like all Kikuyu boys, Kamau learned hunting skills, close observation, memory discipline, social obligations and responsibilities, and family and clan history. From his grandfather he learned herbal remedies and gained a respect for the spiritual knowledge and powers of the diviner.

At about the age of 10 Kamau became seriously ill with jigger infections in his feet and one leg, and he underwent successful surgery at a newly established Church of Scotland mission. This was his initial contact with Europeans. Fascinated with what he had seen during his recuperation, Kamau ran away from home to become a resident pupil at the mission. He studied the Bible, English, mathematics, and carpentry and paid his fees by working as a houseboy and cook for a European settler. In August 1914 he was baptized with the name Johnstone Kamau. He was one of the earliest of the Kikuyu to run away from the confines of his own culture. And, like many others, Kamau soon left the mission life for the bright lights of Nairobi.



Kenyatta
John Moss—Black Star

He secured a job as a clerk in the Public Works Department and during World War I enjoyed relative affluence. He added the name Kenyatta, the Kikuyu term for a fancy belt that he wore. After serving briefly as an interpreter in the High Court, Kenyatta transferred to a post with the Nairobi Town Council. About this time he married and began to raise a family. According to his younger brother, he was "not interested in politics."

The first African political protest movement in Kenya against a white-settler-dominated government began in 1921—the East Africa Association (EAA), led by an educated young Kikuyu named Harry Thuku. Kenyatta joined the following year. One of the EEA's main purposes was to recover Kikuyu lands lost when Kenya became a crown colony (1920). The Africans were dispossessed, leaseholds of land were restricted to white settlers, and native reservations were established. In March 1922 Thuku was arrested; he was later deported and overt protest was silenced. Kenyatta, however, continued to work privately for the EAA as propaganda secretary. As a government employee, he was supposed to avoid politics, but he managed to remain inconspicuous. In 1925 the EAA disbanded as a result of government pressures, and its members reformed as the Kikuyu Central Association (KCA). Three years later Kenyatta became its general secretary, though he had to give up his municipal job as a consequence.

Entrance into full-time politics. In May 1928 Kenyatta launched a monthly Kikuyu-language newspaper *Mwigithania* ("He Who Brings Together"), aimed at gaining support from all sections of the Kikuyu. The paper was mild in tone, preaching self-improvement, and was tolerated by the government. But soon a new challenge appeared. A British commission recommended a closer union of the three East African territories (Kenya, Uganda, Tanganyika). Settler leaders supported the proposal, expecting that internal self-government might follow. To the KCA such a prospect looked disastrous for Kikuyu interests; in February 1929 Kenyatta went to London to testify against the scheme.

In London the Secretary of State for Colonies refused to meet Kenyatta, but several groups critical of British colonialism aided him; the League Against Imperialism arranged a brief trip to Moscow for him, from August to October 1929. The following July Kenyatta attended the International Negro Workers' Conference at Hamburg. His hosts urged the unity of the black proletariat as a worldwide exploited class, but Kenyatta's interests remained rivetted on the sufferings of his own people. On March 26, 1930, he wrote an eloquent letter in *The Times* of London setting out five issues championed by the KCA: (1) security of land tenure and the return of lands allotted to European settlers; (2) increased educational facilities; (3) repeal of hut taxes on women, which forced some to earn money by prostitution; (4) African representation in the Legislative Council; and (5) noninterference with traditional customs.

He concluded by saying that the lack of these measures "must inevitably result in a dangerous explosion—the one thing all sane men wish to avoid."

Again in 1931 Kenyatta's testimony on the issue of closer union of the three colonies was refused despite the help of liberals in the House of Commons. In the end, however, the government temporarily abandoned its plan for union. Kenyatta did manage to testify on behalf of Kikuyu land claims in 1932 at hearings of the Carter Land Commission. The commission decided to offer compensation for some appropriated territories but maintained the "white-highlands" policy, which restricted the Kikuyu to overcrowded reserves. Kenyatta again visited the Soviet Union (he spent two years at the University of Moscow) and travelled extensively through Europe; on his return to England he supplied information on phonetics to researchers at University College, London, and studied anthropology under Bronisław Malinowski at the London School of Economics. His thesis was revised and published in 1938 as *Facing Mount Kenya,* a study of the traditional life of the Kikuyu characterized by both insight and a tinge of romanticism. The study defended a way of life that was already deeply eroded, and it ignored the extensive adaptations the Kikuyu had made to European culture. The book signalled another name change, to Jomo (Burning Spear) Kenyatta.

During the 1930s, Kenyatta briefly joined the Communist Party, met other black nationalists and writers, and actively organized protests against the Italian invasion of Ethiopia. The onset of World War II temporarily cut him off from the KCA, which was banned by the Kenya authorities as potentially subversive. Kenyatta maintained himself in England by lecturing for the Workers Educational Association and working as a farm labourer. But he continued to produce political pamphlets publicizing the Kikuyu cause.

Kenyatta helped organize the fifth Pan-African Congress, which met in Manchester on Oct. 15–18, 1945, with W.E.B. Du Bois of the United States in the chair; Kwame Nkrumah, the future leader of Ghana, was also present. Resolutions were passed and plans discussed for mass nationalist movements to demand independence from colonial rule.

Return to Kenya. Kenyatta returned to Kenya in September 1946 to take up leadership of the newly formed Kenya African Union, of which he was elected president in June 1947. From the Kenya African Teachers College, which he directed as an alternative to government educational institutions, Kenyatta organized a mass nationalist party. But he had to produce tangible results in return for the allegiance of his followers, and the colonial government in Kenya was still dominated by unyielding settler interests. The "dangerous explosion" he had predicted in 1930 erupted in Kenya as the Mau Mau rebellion of 1952.

On Oct. 21, 1952, Kenyatta was arrested at his home at Gatundu. Police seized documents and arrested 98 other African leaders. Despite government efforts to portray Kenyatta's trial as a criminal case, it received worldwide publicity as a political proceeding. In April 1953 Kenyatta was sentenced to a seven-year imprisonment for "managing the Mau Mau terrorist organization." He denied the charge then and afterward, maintaining that the Kenya African Union's political activities were not directly associated with Mau Mau violence.

The British government responded to African demands by gradually steering the country toward African majority rule. In 1960 the principle of one man-one vote was conceded. Kenya nationalist leaders such as Tom Mboya and Oginga Odinga organized the Kenya African National Union (KANU) and elected Kenyatta (still in detention despite having completed his sentence) president in absentia; they refused to cooperate with the British while Kenyatta was detained. In a press conference Kenyatta promised that "Europeans would find a place

in the future Kenya provided they took their place as ordinary citizens."

Kenyatta was released in August 1961, and, at the London Conference early in 1962, he negotiated the constitutional terms leading to Kenya's independence. KANU won the preindependence election in May 1963, forming a provisional government; Kenya celebrated its independence on Dec. 12, 1963, with Kenyatta as prime minister.

A year later Kenya became a one-party republic with a strong central government under Kenyatta as president. Kenyatta presided over the complex problems of postindependence development and instructed his United Nations delegates on the subtleties of a "nonaligned" foreign policy. Always—in spite of his imprisonment by the British authorities—one of the more pro-British of African leaders, Kenyatta made Kenya the stablest black African country and one that attracted foreign investment on a broad scale. Under his leadership the economy prospered; agriculture, industry, and tourism all expanded. He died at Mombasa in 1978. (Jo.R.)

BIBLIOGRAPHY. George Delf, *Jomo Kenyatta: Towards Truth About "The Light of Kenya"* (1961), written while Kenyatta was still detained, defends Kenyatta from charges of leading Mau Mau. A later biography, by Jeremy Murray-Brown, is *Kenyatta* (1972). Anthony Howarth, *Kenyatta: A Photographic Biography* (1967), assembles information on Kenyatta's early life from a variety of published sources and includes excellent pictures. Two works by Kenyatta are *Facing Mount Kenya* (1938), a study of traditional Kikuyu life; and *Kenya: Land of Conflict,* with an introduction by George Padmore (1944), a pamphlet that signals Kenyatta's shift toward more aggressive demands on behalf of Kenya Africans. Carl Rosberg and John Nottingham, *The Myth of "Mau Mau"* (1966), is a survey of the rise of nationalist politics in Kenya.

Kenyon, Dame Kathleen (Mary) (b. Jan. 5, 1906, London—d. Aug. 24, 1978, Wrexham, Clwyd, Wales), English archaeologist who excavated Jericho to its Stone Age foundation and showed it to be the oldest known continuously occupied human settlement.

After working (1929) with the British archaeologist Gertrude Caton-Thompson at the Zimbabwe ruins in Southern Rhodesia (now Zimbabwe Rhodesia), she directed much attention to the archaeological remains of ancient Britain, working at a number of sites and publishing numerous findings between 1930 and 1951. She excavated the Roman town of Sabratha in 1948–49 and 1951. She was associated with the University of London Institute of Archaeology (1935–62) until she became principal of St. Hugh's College, Oxford (1962–73). She was created Dame of the British Empire in 1973.

While serving as director of the British School of Archaeology in Jerusalem (1951–66), Kathleen Kenyon conducted her researches (1952–58) at Tell as-Sulṭān, Jordan, the site of prehistoric and Old Testament Jericho. Though her chief interests lay in determining the dates of its initial settlement (8th millennium BC) and its destruction by Joshua and the Israelites (*c.* 1425 BC), she accomplished much more. She placed the establishment of an agricultural economy at about 7000 BC, from which a massive stone wall and a great tower also date, and found an elaborate domestic architecture from the 7th millennium. The unearthing of extraordinary 7th-millennium portrait sculptures of plaster modelled over human skulls was particularly illustrative of her meticulous excavation technique. From 1961 to 1967 she turned her attention to Jerusalem. Writings related to her later work include *Digging up Jericho* (1957), *Excavations at Jericho* (vol. 1 and 2, 1960 and 1965), *Amorites and Canaanites* (1966), *Royal Cities of the Old Testament* (1970), and *Digging up Jerusalem* (1974).

Kenzan (Japanese potter): *see* Ogata Kenzan.

Keokuk (b. 1790?, along Rock River [near present-day Rock Island, Ill., U.S.]—d. 1848? [in present-day Franklin County, Kan.]), masterful Sauk Indian orator and politician who became chief by ceding Indian lands to win white support and by rallying opposition to his own tribe's resistance leaders.

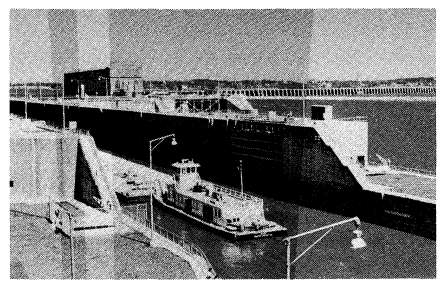
Born of the Fox clan, Keokuk early exhibited physical prowess, keen intelligence, and a gift of persuasion, he rose to prominence in the tribal council. During the War of 1812, he tried to seize power from Black Hawk, who had left the Sauk village to fight with the British. Thus began a lifelong struggle between the two leaders who disagreed completely on how to meet the challenge posed by advancing white settlement. Black Hawk stood for resistance; Keokuk represented accommodation and concession. Many Indians, witnessing the showering of gifts and honours on Keokuk by U.S. Indian agents and military leaders, turned to him for leadership.

Keokuk urged patience as white settlers moved closer and closer to ancient tribal lands along the Rock River. In the late 1820s, he advocated compliance with the government's demand that the Sauk and Fox move westward. In 1832, Black Hawk led a short-lived resistance effort against the white encroachments. Keokuk counselled peace and surrender, and he even provided advance warning to the U.S. Indian agent at Rock Island of Black Hawk's intention to take to the warpath.

For his assistance, the U.S. government named Keokuk to head the Sauk nation. Keokuk responded by ceding the Illinois lands of the Sauk and Fox and moving his people to Iowa. Through the remainder of his life, he continued to give away tribal land until the Sauk and Fox had to settle on a reservation in Kansas, where, in disgrace among his own people despite the wealth and power he had accumulated, Keokuk died.

Keokuk, city, Lee County, extreme southeastern Iowa, U.S., on the Mississippi River (there bridged to Hamilton, Ill.) at the mouth of the Des Moines, 120 mi (193 km) southeast of Davenport. Settled in 1836, it was named for Keokuk, a chief of the Sauk Indians who remained neutral during the Black Hawk War. Located at the foot of the Des Moines rapids, beyond which steamboats could not pass, the settlement served as a transshipment point after the completion of the Keokuk and St. Paul Railroad in the 1860s. A ship canal (1877) was constructed around the rapids, and in 1910–13 the river was dammed for hydropower, navigation, and flood control, creating Lake Keokuk.

Keokuk has a large wholesale-distribution



The ship canal, Keokuk, Iowa
Milt and Joan Mann from CameraMann

trade, agricultural industries, and varied manufactures, notably rubber products, and steel castings. Southeastern Community College (South campus) was opened (1953) in Keokuk. The "George M. Verity" stern-wheeler is preserved as a riverboat museum, and a replica of Iowa's first schoolhouse (the Galland School, 1830) is 13 mi north. Inc. town, 1937; city, 1847. Pop. (1980) 13,536.

Keonjhar, also spelled KEONJARGARH, town, administrative headquarters of Keonjhar district, northern Orissa state, eastern India. It is a trade centre for farm and forest products. Handloom weaving is also important. The town contains an old raja's palace and is the site of colleges affiliated with Utkal University.

Keonjhar district, with an area of 3,181 sq mi (8,240 sq km), has two natural divisions, a southern fertile plain and a northern hilly region. The chief river, the Baitarani, venerated in popular epics and legends, provides water for irrigation. Most of the potentially arable land is not under cultivation. Rice is the principal crop, with timber, bamboo, and lac obtained from the forests. The northern hills contain rich deposits of iron ore and other minerals. Before independence Keonjhar was one of the princely Orissa states; it was incorporated into the present state in 1948. Pop. (1981) town, 28,059; district, 1,114,622.

Kéos (Greece): *see* Kéa.

Kep-sur-Mer (Kampuchea): *see* Kêb.

Kepes, Gyorgy (b. Oct. 4, 1906, Selyp, Hung.), Hungarian-born U.S. painter, designer, photographer, teacher, and writer, who had considerable influence in many areas of



"Flame Orchard," a 20-foot field of burning gas flames that responds to music, designed by Gyorgy Kepes in collaboration with William Walton, Paul Earls, and Mauricio Bueno, at Cambridge, Mass., 1972
By courtesy of the Center for Advanced Visual Studies, Massachusetts Institute of Technology, Cambridge; photograph, Nishan Bichajian

design, particularly through his contributions to the understanding of light and colour.

Shortly after his graduation from the Royal Academy of Fine Art, Budapest (1928), he experimented with photograms (photographic prints made by placing objects on sensitized paper and exposing the paper to light) and later made prints he called "photo-drawings," in which paint was applied to a glass plate that was printed as though it were a negative.

From 1930 to 1936 he worked in Berlin and London, designing for motion pictures, stage productions, and commercial exhibitions. In 1937 he went to the United States to head the light and colour department of the New Bauhaus (later the Institute of Design) in Chicago. He moved to the Massachusetts Institute of Technology in 1946, where he was named professor of visual design, retiring in 1980; from 1967 he was director of the Center for Advanced Visual Studies. His writings include *Language of Vision* (1944) and *The New Landscape in Art and Science* (1956).

Kepler, Johannes (b. Dec. 27, 1571, Weil der Stadt, Württemberg—d. Nov. 15, 1630, Imperial Free City of Regensburg), German astronomer who discovered that the Earth and planets travel about the Sun in elliptical orbits. He transformed the old, geometrical description of the heavens into dynamical astronomy.

A brief account of the life and works of Johannes Kepler follows; for a full biography, *see* MACROPAEDIA: Kepler.

Kepler, after studying astronomy at the University of Tübingen under Michael Mästlin, who believed in the Copernican theory, wrote a paper that came to the attention of Galileo and Tycho Brahe. Subsequently, while lecturing on mathematics, rhetoric, and Virgil at the Lutheran high school in Graz, Austria, Kepler was invited to join Tycho's research staff at the observatory outside Prague. In the following year (1601) Tycho died and Kepler was appointed, as his successor, the imperial mathematician. Using Tycho's extraordinarily accurate observational data, Kepler was able to deduce three fundamental planetary laws that later enabled Sir Isaac Newton to formulate his theory of gravitational force. Kepler also founded modern optics by postulating the ray theory of light to explain vision.

In 1627 there appeared the *Tabulae Rudolphinae,* containing tables that held their place for more than a century, being universally used in calculating planetary positions; tables of refraction and of logarithms; and an extended catalog of 1,005 stars based on Tycho's observations of 777 star positions. In 1628 Kepler and his family moved to Silesia where he still concerned himself with ephemerides and in 1629 drew attention to approaching transits in *Admonitio ad astronomos.*

Keplerian telescope, instrument for viewing distant objects, the basis for the modern refractive telescope, named after the great German astronomer Johannes Kepler (1571–1630). Its eyepiece, or ocular, is a convex (positive, or convergent) lens placed in back of the focus, the point at which the parallel light rays converge; and the instrument produces an inverted ("real") image that can be projected or made visible. An additional convergent lens is provided between the objective and the eyepiece to right the image. The instrument needs to be rather long because of the intermediate inversion of the image, and the tube is often constructed to be collapsible.

Kepler's laws of planetary motion, in astronomy and classical physics, laws describing the motions of the planets in the solar system. They were derived by the German astronomer Johannes Kepler (1571–1630), whose analysis of the observations of the 16th-century Danish astronomer Tycho Brahe enabled him to announce his first two laws in the year 1609 and a third law nearly a decade later, in 1618. Kepler himself never numbered these laws or specially distinguished them from his other discoveries.

Kepler's three laws of planetary motion can be stated as follows: (1) All planets move about the Sun in elliptical orbits, having the Sun as one of the foci. (2) A radius vector joining any planet to the Sun sweeps out equal areas in equal lengths of time. (3) The squares of the sidereal periods (of revolution) of the planets are directly proportional to the cubes of their mean distances from the Sun. Knowledge of these laws, especially the second (the law of areas), proved crucial to Issac Newton in 1684–85, when he formulated his famous law of gravitation between the Earth and the Moon and between the Sun and the planets, postulated by him to have validity for all objects anywhere in the universe. Newton showed that the motion of bodies subject to central gravitational force need not always follow the elliptical orbits specified by the first law of Kepler but can take paths defined by other, open conic curves; the motion can be in parabolic or hyperbolic orbits, depending on the total energy of the body. Thus, an object of sufficient energy—*e.g.,* a comet—can enter the solar system and leave again without returning. From Kepler's second law, it may be observed further that the angular momentum of any planet about an axis through the Sun and perpendicular to the orbital plane is also unchanging.

The usefulness of Kepler's laws extends to the motions of natural and artificial satellites as well as to unpowered spacecraft in orbit in stellar systems or near planets. As formulated by Kepler, the laws do not, of course, take into account the gravitational interactions (as perturbing effects) of the various planets on each other. The general problem of accurately predicting the motions of more than two bodies under their mutual attractions is quite complicated; analytical solutions of the three-body problem are unobtainable except for some special cases. It may be noted that Kepler's laws apply not only to gravitational but also to all other inverse-square-law forces and, if due allowance is made for relativistic and quantum effects, to the electromagnetic forces within the atom.

Kepler's Nova, also called NOVA OPHIUCHI 1604, one of the few supernovae (violent stellar explosions) known to have occurred in the Milky Way Galaxy of which the solar system is a part. Jan Brunowski, Kepler's assistant, first observed the phenomenon in October 1604; Kepler studied it until early 1606, when the supernova was no longer visible to the unaided eye. At its greatest apparent magnitude (about −2.5), the exploding star was brighter than Jupiter. No stellar remnant is known to exist, though traces of nebulosity are observable at the position of the supernova. Like Tycho's Nova, Kepler's served at the time as evidence of the mutability of the stars.

Keppel (of Elvedon), Augustus Keppel, Viscount, BARON ELDEN (b. April 25, 1725—d. Oct. 2, 1786, Elveden Hall, Suffolk, Eng.), English admiral and politician whose career as a seagoing commander ended in a controversy of political origin during the American Revolution.

A sailor from the age of 10, Keppel served actively throughout the Seven Years' War (1756–63). A leading Whig member of the



Keppel, detail of an oil painting by Sir Joshua Reynolds; in the National Maritime Museum, Greenwich, Eng.

By courtesy of the National Maritime Museum, Greenwich, Eng., Greenwich Hospital Collection

House of Commons (1761–80), Keppel, as admiral commanding the western squadron, was a political opponent of his civilian superior, the 4th Earl of Sandwich, first lord of the Admiralty. Sent to fight against France (which was allied with the U.S.), he engaged in an indecisive battle (July 27, 1778) off Ushant (Ouessont), a small island near Brittany. Keppel blamed his failure on Sir Hugh Palliser, his subordinate at sea but a member of the Admiralty board. Recriminations in the press led to the trial and acquittal of Keppel for neglect of duty and of Palliser for insubordination. The Whigs regarded Keppel's vindication as a defeat for Lord North's ministry. Although Keppel was discharged from his command in 1779, he became first lord of the Admiralty and was created a viscount in 1782, after American victory in the war precipitated the fall of Lord North's government, but he soon resigned (1783) in disillusionment over the Earl of Shelburne's refusal to consult his Cabinet.

Keppel never married, and his titles became extinct upon his death.

Keppel Bay, inlet of the Pacific Ocean, indenting eastern Queensland, Australia. It is about 30 mi (48 km) long and 12 mi wide and is protected from the sea by Curtis Island (east). The Keppel Islands lie in the northern section of the inlet near the mouth of the Fitzroy River. Sighted in 1770 by the British navigator Capt. James Cook, the bay was named by him after Rear Adm. Augustus Keppel, later first lord of the Admiralty.

Bay shore resorts include Emu Park and Yeppoon. Tropical fruits (pineapples and bananas) are cultivated inshore. The bay waters yield prawns, scallops, and game fish.

Keppler, Joseph (b. Feb. 1, 1838, Vienna—d. Feb. 19, 1894, New York City), Austria-born U.S. caricaturist and founder of *Puck,* the first successful humorous weekly in the United States. Keppler studied art in Vienna. Following the Revolution of 1848, his father emigrated to the United States and settled in Missouri, where Joseph joined him in 1867. Two years later he established his first humorous weekly newspaper in St. Louis. It failed, and in 1870 he founded *Puck,* a German-language weekly that was also short-lived.

Keppler then moved to New York City, and by 1875 he was drawing cover cartoons for *Frank Leslie's Illustrated Newspaper.* He broke with Leslie in 1876 and founded a second German-language *Puck,* which was so successful that in 1877 an English-language version was begun. The English version lasted until 1918, 22 years longer than the German. Initially Keppler drew all the cartoons for *Puck,* and, although later many other artists contributed, his influence remained strong. His cartoon "Forbidding the Banns," published in behalf of anti-Garfield forces in the Garfield–Hancock presidential campaign of 1880, attracted widespread attention.

Ker, also spelled CER, in Greek religion, a destructive spirit. Popular belief attributed death and illness to the action of impersonal powers, often spoken of in the plural (Keres). The word is also used of an individual's doom, with a meaning resembling the notion of destiny. In the Attic festival of the Anthesteria, when the spirits of the dead were expelled from the house, they were addressed as Keres; thus some scholars suppose that this was the original meaning of the word.

Ker, Sir Robert, Ker also spelled CARR: *see* Somerset, Robert Carr, earl of.

Kerak (Jordan): *see* Karak, al-.

Kerala, constituent state of the Republic of India, varying in width from 20 to 75 mi (32 to 120 km) as it stretches for about 360 mi (576 km) along the Malabār Coast on the western side of the Indian peninsula. It is bounded by Karnātaka (Mysore) state to the north, Tamil Nādu (Madras) to the east and south, and the Arabian Sea to the west. Despite the fact that it occupies just 1 percent of the land area of India, Kerala supports almost 4 percent of the nation's population.

The following article summarizes the administrative history, geography, demographic patterns, economy, and culture of modern Kerala; for additional treatment of its geography and history, *see* MACROPAEDIA: India.

The first known mention of Kerala occurs on one of the rock inscriptions left by Aśoka, emperor of India in the 3rd century BC; the area was then an independent kingdom known as Keralaputra. During this period, Aryans migrated into Kerala, introducing Hinduism. Arab traders probably brought Islām to Kerala

in the 7th and 8th centuries AD, and the two centuries following were characterized by a golden age of philosophy, education, and the fine arts. This period also marked the origin of Malayālam as a separate language.

For a time, Kerala was a conglomeration of warring chieftaincies. Then, with the arrival of the Portuguese at Calicut in 1498, the area became the first in India to experience European intervention. The Dutch ousted the Portuguese in th 17th century, after which Kerala was invaded by forces from Mysore. The area came under British suzerainty in the 1790s. Revolts against the British early in the 19th century failed. After India achieved independence in 1947, the area was known as Travancore-Cochin state. The present Kerala was constituted as a state on a linguistic basis (including a number of Malayālam-speaking areas) in 1956.

Kerala is a region of great natural beauty. From the majestic heights of the Western Ghāts the country undulates westward, presenting a panorama of river valleys clothed in the richest green. Among the many rivers of the area, the more important are the Periyār, the Pamba, and the Bharatapuzha. The climate is equable and varies little from season to season. The temperature normally ranges between 80° and 90° F (27° and 32° C) in the plains but drops to about 70° F (21° C) in the highlands. The state gets its share of both the southwest and northeast monsoons, and the rainfall is heavy, averaging 118 in. (3,000 mm) annually.

The most densely populated state in India, Kerala has an ethnic distribution representative of the subcontinent's history. Several of the hill tribes exhibit Negroid features, while others appear to be related to the Veddas, the forest nomads of Sri Lanka. The bulk of the population belongs to the Dravidian group (early Indian peoples), and there is a sprinkling of descendants of the later Aryan migrants from the north. The majority of Malayālis belong to the Hindu community, and there are also large Christian and Muslim minorities.

Agriculture is the state's main economic activity, and the majority of the population has been unaffected by industrialization. Cash crops such as rubber, coffee, tea, black pepper, cardamom, and cashew nut, which account for 40 percent of the total land under cultivation, earn foreign exchange, but concentrating on these crops has resulted in a shortage of food for local consumption. Though livestock is of poor quality, commercial poultry farming is one of the best developed in India, and Kerala exports eggs. The state also accounts for a major share of India's fish production.

The forests yield such industrially significant raw materials as bamboo (used in the rayon industry), wood pulp, charcoal, gums, and resins, as well as teak and rosewood. Cottage industries—such as processing of coconut fibre and cashews or weaving—employ about three-fifths of Kerala's industrial workers. Most of those employed by larger industrial enterprises are engaged in food and textile processing. The state participates in most industrial concerns; products include fertilizers, chemicals, electrical equipment, titanium, aluminum cables, plywood, and synthetic fibres. Three major ports—Cochin, Alleppey, and Calicut—handle both coastal and foreign traffic. Trivandrum, the state capital, has an international airport, and Cochin has a domestic one.

Educationally, Kerala is India's most advanced state, with a literacy level of about 75 percent among males and 65 percent among females. In addition, women enjoy high social status and are found in all walks of life. Kerala has about 50 polytechnical and industrial training institutes, more than 100 arts and sciences colleges, and about 30 professional colleges along with 4 universities.

The state's cultural heritage contains elements of ancient Hindu culture that have been enriched by centuries of contact with both East and West. Literature and learning have flourished from the 2nd century AD onward. In recent times, dramatic production in the Kerala style—which combines poetry, music, and dance—have entered folk tradition, and the Kalāmandalam, a cultural institution, seeks to revive and promote traditional arts. A display of various visual arts takes place during Ōṇam, the major festival of Kerala, and the splendid murals that adorn the walls of palaces, temples, and churches reveal a tradition and style that is distinct from classical Indian painting. Area 15,005 sq mi (38,863 sq km). Pop. (1981) 25,453,680.

Kerala Plains, narrow strip of coastland, southwestern India, fronting the Arabian Sea to the west and constituting almost all of Kerala state and most of the Malabar Coast (*q.v.*). With an area of approximately 11,000 sq mi (28,000 sq km), the plains are indented by numerous shallow lagoons, known locally as *kayes*, formed by sand dunes (resembling sand bars) and known locally as *teris*. The sandy beaches are covered with coconut palms. According to the *Purāṇas*, the region, also known as Paraśurāma-Khetram, was reclaimed from the sea by the sage Paraśurāma. The Kerala Plains lie below 33 ft (10 m), with hills of the Western Ghāts, the Nīlgiri, and the Southern Ghāts to the east. Narrow in the north and wide in the south, the plains are about 330 mi (530 km) long and from 12 mi to 60 mi wide.

Many streams crisscross the plains and serve as inland waterways, comprising about one-fifth of India's total length of waterways. The Periyār River is the most important river that crosses the plains. About half of the land is under cultivation, mainly planted with rice and cassava. Sugarcane, ginger, ragi (cereal grass), peanuts (groundnuts), and sesame seeds are also grown. Cash crops include coconut, pepper, betel nut, cardamom, rubber, coffee, and tea. Cashews, tea, and fish are processed; cement, aluminum, rayon, and electrical goods are manufactured; and coir, plywood, and paper are made. The plains are densely populated, and Malayālam, an offshoot of Tamil, is the local language. The chief towns include Cochin, Trivandrum, Kozhikode, Alleppey, Trichūr, and Quilon.

Kerang, town, northern Victoria, Australia, on the Loddon River. It was settled in 1857; its name is derived from an Aboriginal term meaning "cockatoo," "parasite," or "moon." Declared a shire in 1871, it was made (1888) the terminus of a railroad from Koondrook on the New South Wales border.

Kerang is now on the rail line to Melbourne, 150 mi (240 km) southeast, and is the centre of an area of intensive irrigation (supplied by the Turrumbarry Weir) that produces grains, wool, citrus fruits, and dairy products. Kerang lies at the junction of the Murray Valley and Loddon highways and is also an important railhead for shipping livestock. It has iron and brass foundries, sawmills and flour mills, and agricultural, tool, and clothing plants. Pop. (1981) 4,049.

keratin, fibrous structural protein of hair, nails, horn, hoofs, wool, feathers, and of the epithelial cells in the outermost layers of the skin. The polypeptide chains of keratin are arranged in parallel sheets held together by hydrogen bonding.

Of the amino acids in keratin, cystine may account for as much as 24 percent. The numerous disulfide bonds formed by cystine are responsible for the great stability of keratin: it is completely insoluble in hot or cold water and is not attacked by proteolytic enzymes (the enzymes that cleave protein molecules).

The length of keratin fibres depends on their water content: complete hydration (approximately 16 percent water) increases their length by 10 to 12 percent.

keratitis, inflammation of the cornea, the transparent portion of the eyeball that is in front of the iris and pupil. There are several varieties. Often there is inflammation of both the cornea and the conjunctiva, the mucous membrane that lines the eyelid and covers the white of the eye.

Two types of keratitis result from dryness of the cornea. One of these, keratitis sicca, also called Sjögren's syndrome (*q.v.*) and keratoconjunctivitis sicca, is dryness and inflammation of the cornea and conjunctiva because of failure to secrete sufficient tears. The cornea may also become dry and inflamed when, because of protrusion of the eyeball or paralysis of the muscle that closes the lids, a person is unable to shut his eyes completely. This condition is called lagophthalmic ("hare-eyed") keratitis because of the ancient belief that hares are unable to close their eyes.

Keratitis leading to the spread of blood vessels into the corneal area and even to blindness from a completely opaque cornea can result from chemical burns, particularly burns from acids and alkalis. Early flooding of the eye with water, either slightly salted or straight from the tap, is standard procedure, since the extent of the damage depends in large part upon the length of time that the chemical remains in the eye. The most serious chemical burns are caused by alkali, which, if not quickly removed, can do progressive damage over periods of months or years.

Interstitial keratitis, an inflammation deep in the cornea, may be caused by congenital syphilis, by tuberculosis organisms, by the virus of herpes zoster, or even by physical injury to the eye. Affected persons are usually children whose eyes are painful, tend to water, and are sensitive to light. Treatment is of the underlying disease.

In dendritic ("branching") keratitis, or dendritic ulcer, the cornea is inflamed by infection with the herpes simplex, or cold sore, virus. The lesions, as the name suggests, follow branching lines, along which minute blisters may form and break, leaving raw areas. Often the cornea becomes insensitive, so that the process may not be painful.

Rosacea keratitis is a complication of acne rosacea, a disease in which the skin of the face is affected first by pronounced flushing and later by the formation of nodules and pustules. The keratitis causes severe pain and corneal scarring with impairment of vision.

Neuroparalytic keratitis is inflammation of the cornea as a sequel to interruption of sensory impulses over the fifth cranial (trigeminal) nerve. The cornea's loss of sensitivity leaves it much more subject to injury and infection. This type of keratitis tends to lead to ulceration of the cornea, the collection of pus in the anterior chamber of the eye (a condition called hypopyon), and the impairment of vision, and may result in perforation of the eyeball, with consequent loss of that eye. Treatment includes the intensive use of antibiotics.

keratitis, infectious bovine: *see* bovine infectious keratoconjunctivitis.

keratosis, any protuberance on the skin resulting from the overdevelopment of the horny outermost covering of the skin, or epidermis, the main constituent of which is the protein keratin, which is synthesized in special cells of the skin, the keratinocytes. More generally, keratosis is any skin disorder attended by horny growths. The causes and lesions characteristic of keratotic skin disorders are varied, giving rise to some 20 different forms of keratosis; the more common ones are as follows:

1. Palmar and plantar keratosis is a congenital, often hereditary, thickening of the horny layer of the skin of the palms and soles, sometimes with painful lesions resulting from the formation of fissures.
2. Keratosis pilaris, also called ichthyosis follicularis, lichen pilaris, or follicular xeroderma, is a condition in which abnormal keratinization is limited to the hair follicles, manifesting itself as discrete, tiny follicular papules (solid, usually conical elevations); they are most commonly seen on the outer surface of the arms and thighs.
3. Seborrheic keratosis is a benign skin tumour, ordinarily developing as a small yellow or brown, sharply marginated, slightly raised protuberance, covered by a thin greasy scale; these lesions result from an abnormal increase in the number of keratinocytes and seldom either undergo malignant changes or disappear spontaneously.
4. Senile keratosis is a condition marked by sharply outlined, gray to grayish black, slightly elevated flat papules, which are generally associated with aging and exposure to sunlight. They are more frequent in sunny climates and occur on exposed areas of the body—unless ingestion of arsenic compounds has taken place in the past, in which case the lesions may appear on the palms, soles, and trunk. In some cases, the lesions become cancerous, especially those on the lips and other mucous surfaces. *See also* wart; callus.

Kerbela (Iraq): *see* Karbalā'.

Kerch, also spelled KERČ, city and seaport, Crimea *oblast* (administrative region), Ukrainian Soviet Socialist Republic, on the western shore of the Strait of Kerch at the head of a small bay. Founded as the colony of Panticapaeum in the 6th century BC by Miletan Greeks, it flourished as a trading centre, and in the 5th century it became the capital of the kingdom of the Cimmerian Bosporus. Abundant archaeological evidence of its wealth occurs in catacombs and burial mounds, notably the King's Mound. Later part of the Roman Empire, Panticapaeum suffered severely from barbarian invasions and was devastated by the Huns in AD 375. After a checkered history, it was ceded by the Mongols to the Genoese in 1318. It was then known as Korchev (Italian Cerco, or Cerchio), from which the present name was derived. In the 15th century Kerch passed to the Turks, who lost it to the Russians in 1771.

Kerch was a transshipment point for cargoes entering the Sea of Azov. Its large iron ore deposits were first exploited in the late 19th century; large quantities are shipped to the Donets Basin. The metallurgical works, dating from 1897, were destroyed in World War II, when the town was severely damaged. Modern Kerch has a large ore-sintering plant, and cast-iron piping is manufactured. There are also ship-repair yards. Fishing and fish processing are important. Pop. (1982 est.) 162,000.

Kerckring, valve of (anatomy): *see* plica circularis.

Kerema, minor port and administrative headquarters of Gulf province, south central Papua New Guinea. Located on Kerema Bay on the Gulf of Papua, the town occupies hilly savanna land between the deltas of the Vailala and Lakekamu rivers. The district (now provincial) headquarters were moved from Kikori to Kerema in 1958.

Rubber is grown in the surrounding area, and coconuts are raised along the coast southeast of the town. Kerema has a fish-processing factory for barramundi and prawns caught in the gulf. It has an airstrip and is connected by road with Malalaua to the southeast. Pop. (1980) 3,389.

Kerensky, Aleksandr Fyodorovich (b. May 4 [April 22, old style], 1881, Simbirsk, Russia—d. June 11, 1970, New York City), moderate Socialist revolutionary who served as head of the Russian provisional government from July to October 1917 (O.S.).

While studying law at the University of St. Petersburg, Kerensky was attracted to the Narodniki (or populist) revolutionary movement. After graduating (1904), he joined the Socialist Revolutionary Party (*c.* 1905) and became



Kerensky
EB Inc.

a prominent lawyer, frequently defending revolutionaries accused of political offenses. In 1912 he was elected to the 4th Duma as a Trudoviki (Labour Group) delegate from Volsk (in Saratov province), and in the next several years he gained a reputation as an eloquent, dynamic politician of the moderate left.

Unlike some of the more radical Socialists, he supported Russia's participation in World War I. He became increasingly disappointed with the tsarist regime's conduct of the war effort, however, and, when the February Revolution broke out (1917), he urged the dissolution of the monarchy. He enthusiastically accepted the posts of vice chairman of the Petrograd Soviet of Workers' and Soldiers' Deputies and of minister of justice in the provisional government, formed by the Duma. The only person to hold positions in both governing bodies, he assumed the role of liaison between them. He instituted basic civil liberties—*e.g.,* the freedoms of speech, press, assembly, and religion; universal suffrage; and equal rights for women—throughout Russia and became one of the most widely known and popular figures among the revolutionary leadership.

In May, when a public uproar over the announcement of Russia's war aims (which Kerensky had approved) forced several ministers to resign, Kerensky was transferred to the posts of minister of war and of the navy and became the dominant personality in the new government. He subsequently planned a new offensive and toured the front, using his inspiring rhetoric to instill in the demoralized troops a desire to renew their efforts and defend the revolution. His eloquence, however, proved inadequate compensation for war weariness and lack of military discipline. Kerensky's June Offensive was an unmitigated failure.

When the provisional government was again compelled to reorganize in July, Kerensky, who adhered to no rigid political dogma and whose dramatic oratorical style appeared to win him broad popular support, became prime minister. Despite his efforts to unite all political factions, he soon alienated the moderates and the officers' corps by summarily dismissing his commander in chief, Gen. Lavr G. Kornilov, and personally replacing him (September); he also lost the confidence of the left wing by refusing to implement their radical social and economic programs and by apparently planning to assume dictatorial powers.

Consequently, when the Bolsheviks seized power (October Revolution, 1917), Kerensky, who escaped to the front, was unable to gather forces to defend his government. He remained in hiding until May 1918, when he emigrated to western Europe and devoted himself to writing books on the revolution and editing émigré newspapers and journals. In 1940 he moved to the United States, where he lectured at universities and continued to write books on his revolutionary experiences.

Kerensky Offensive (World War I): *see* June Offensive.

Kerényi, Károly (b. Jan. 19, 1897, Temesvár, Hung.—d. April 14, 1973, Zürich), Hungarian classical philologist and authority in comparative religions, who pioneered research in ancient cultures and formulated a theory of the "Humanism of integral man."

A professor of classical studies (Pécs, Szeged) and visiting professor of Hungarian language (Basel), Kerényi joined the Carl Jung Institut (Zürich) in 1948, investigated primitive mythology, and founded the periodical *Albae Vigiliae* to disseminate anthropological studies. His many works on classical mythology include *Die antike Religion* (1940; "Ancient Religion") and *Die Mythologie der Griechen* (1951; "Mythology of the Greeks").

Keresun (Turkey): *see* Giresun.

Kerguelen cabbage (*Pringlea antiscorbutica*), plant resembling the common cabbage and belonging to the same family (*Brassicaceae*). It was named for Kerguelen Island. The leaves of the plant contain a pale-yellow, highly pungent essential oil rich in ascorbic acid (vitamin C), for which reason it was a useful dietary supplement against scurvy. It was discovered by Capt. James Cook during his first voyage (1776), but the first account of it was published by the English botanist Sir Joseph Dalton Hooker upon his return from the Antarctic voyage of the "Erebus" and "Terror" in 1839–43. During the stay of the latter expedition on the island, daily use was made of this vegetable either cooked alone or boiled with the ship's beef, pork, or pea soup.

Although belonging to a family of insect-pollinated plants, it has become modified for wind pollination, having projecting stamens (male parts) and long threadlike projections on the stigma (female part). This peculiarity is apparently in adaptation to the absence of winged insects on the island.

Kerguelen Islands, archipelago in the southern Indian Ocean. Administratively a part of Terres Australes et Antarctiques Françaises (*q.v.*), it consists of the island of Kerguelen (also known as Desolation Island) and nearly 300 islets, which together cover about 2,400 sq mi (6,200 sq km). Heavily glaciated Kerguelen Island, about 100 mi (160 km) in length, has active glaciers and peaks up to 6,445 ft (1,965 m) above sea level.

Discovered in 1772 by the French navigator Yves-Joseph de Kerguélen-Trémarec and later explored by the British circumnavigator Capt. James Cook, the archipelago was often frequented by whalers and seal hunters. In 1950 a permanent base and scientific centre, Port-aux-Français, was established on the main island. Pop. (1972 est.) Port-aux-Français, 90.

Kérkira (Greece): *see* Corfu.

Kerkrade, *gemeente* (municipality), Limburg *provincie* (province), southeastern Netherlands, east of Maastricht on the German border. One of Europe's oldest coal-mining towns, it was an important coal-mining centre from 1113 until the early 1970s, when the mines were closed.

The former abbey of Rolduc (1104) has a notable Romanesque church; its courtyard buildings now serve as a boys' school. A natural history and mining museum is housed in Oud Ehrenstein Castle. International music contests are held periodically in the Europaplein Park. Kerkrade metropolitan area

is contiguous with Heerlen (*q.v.*). Pop. (1983 est.) 53,353.

Kerll, Johann Caspar von (b. April 9, 1627, Adorf, Saxony—d. Feb. 13, 1693, Munich), leading master of the middle-Baroque generation of south-German Catholic composers.

In 1645 Kerll was sent by Ferdinand III to study in Rome with the prominent composers Giacomo Carissimi and Girolamo Frescobaldi; earlier he had studied in Vienna. His study in Italy had great influence on his composition, much of which is Italianate in style. From 1656 to 1674 Kerll was the court opera conductor in Munich, where several of his operas were produced. In 1677 he was court organist and organist of St. Stephen's Cathedral in Vienna. In 1684 he returned to Munich.

Kerll introduced operatic dramatic devices into his church music. He wrote masses, requiems and Magnificats, often in polychoral style (*e.g.*, for two or three choruses), and made use of instrumental accompaniments in which instruments were pitted against voices for deliberate dramatic contrast—the so-called concertato style, which Kerll played an important role in establishing in Germany. His sacred play *Pia et Fortis Mulier* (1677; "Pious and Strong Woman") was likewise composed throughout in operatic fashion.

Kerll was influential as a teacher, and his music was copied and studied by later composers, including Bach and Handel.

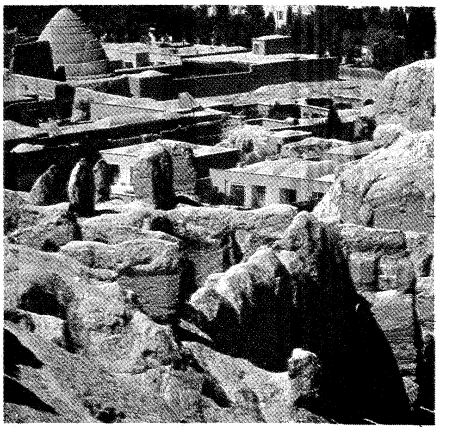
Kerma (Sudan): *see* Karmah.

Kermadec Islands, volcanic island group in the South Pacific Ocean, 600 mi (1,000 km) northeast of Auckland, New Zealand; they are a dependency of New Zealand. They include Raoul (Sunday), Macauley, and Curtis islands and l'Esperance Rock and have a total land area of 13 sq mi (34 sq km). Raoul, the largest (11.3 sq mi), has rugged coastal cliffs that rise to Mt. Mumukai (1,723 ft [525 m]). It is heavily wooded and fertile, but its indigenous flora and fauna have been adversely affected by the introduction of cats, rats, and goats. Raoul enjoys a mild climate and receives 57 in. (1,450 mm) of rainfall annually, some of which forms lagoons. Lying at the western edge of the Kermadec Trench, the group is frequently shaken by earth tremors.

Curtis and Macauley were discovered (1788) by the crew of the British ship "Lady Penrhyn." The others were found (1793) by the French navigator Joseph d'Entrecasteaux, who named the entire group after one of his ships. The first Europeans who settled there (1837) sold garden crops to passing whalers, but they were forced to leave by a volcanic eruption in 1872; the islands were resettled in 1878 but were evacuated at the beginning of World War I. The group was annexed to New Zealand in 1887. A meteorological–communications station, established on Raoul in 1937, remains, but permanent settlement is discouraged by the extreme isolation of the group.

Kermadec Trench, submarine trench in the floor of the South Pacific Ocean, about 750 mi (1,200 km) in length, forming the eastern boundary of the Kermadec Ridge. The two together comprise the southern half of the Tonga–Kermadec Arc, a structural feature completed to the north by the Tonga Trench and Ridge. The Kermadec Trench reaches a maximum depth of 32,962 ft (10,047 m).

Kermān, also spelled KIRMĀN, city, provincial capital, and *ostān* (province), southeastern Iran. The city lies on a sandy plain, 5,738 ft (1,749 m) above sea level, under barren, rocky hills. Surrounded by mountains on the north and east, it has a cool climate and frequent sandstorms in the autumn and spring. The population is mostly Persian-speaking Muslims, with a Zoroastrian minority. Kermān is the largest carpet-exporting centre of Iran (*see* Kermān carpet). The city formerly owed its



Ruins of castle in Kermān, Iran, built in the 3rd century AD by Ardashīr I

Laurence D. Loeb

industrial reputation to its shawl making, but this industry was surpassed by carpet making, particularly in Māhānī suburb. In the mid-1970s an industrial centre was established that included a cement plant, a textile factory, and a cold-storage plant. There is a thermoelectric plant; water is brought by *qarats* (underground aqueducts) from the surrounding hills. Kermān is linked by road to Bandar ʿAbbās and Meshed. It also has an airport.

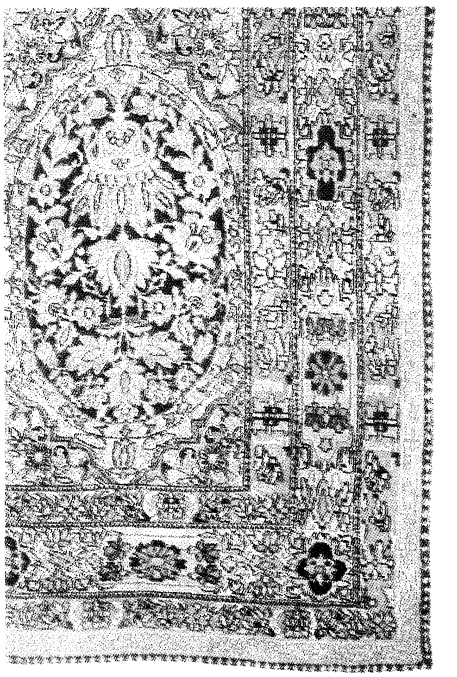
Kermān city was probably founded by Ardashīr I (reigned AD 224–241) of the Sāsānian dynasty (although Ptolemy mentions the name of a city called Kerman in the 2nd century) and was called Behdesīr, Berdesīr, or Berdeshīr. Under the Ṣafavids it came to be known as Kermān and was made capital of a province in the 10th century. It was sacked by the Uzbeks in 1509 and occupied by Afghans in 1720. Kermān was pillaged by Āghā Moḥammad Khān Qājār when Loṭf ʿAlī Khān of the Zand dynasty took refuge there. It was rebuilt under Fatḥ ʿAlī Shāh, the founder of the Qājār dynasty (ruled 1797–1834). The bazaar is large, and there are some old mosques, including Masjed-e Malek (Mosque of the King; 11th century, now restored), Masjed-e Jomʿeh (Friday Mosque), Masjed-e Bazar-e-Shāh (Mosque of the Shāh's Bazaar; founded under the Seljuqs), and Masjed-e Pa Minar (built in 1390 under the Timurids). At the western end of the bazaar is the Ark (Arg), the former citadel of the Qājār dynasty. Next to it is the Qalʿeh, allegedly constructed as a citadel by the Afghans during a short-lived subjugation of Kermān in 1722. On the Kerman plain stands the Jabel-e Sang (Mountain of Stone), a tomb built probably in the 11th or 12th century, and to the west is the Bagh-e Sirif, a luxuriant garden.

Kermān *ostān* has an area of 71,997 sq mi (186,472 sq km) and is bounded by the *ostāns* of Balūchestān va Sīstān on the west, Yazd on the north, and Khorāsān on the northeast. It includes the southern part of the central Iranian desert, the Dasht-e Lūt. The southern Lūt is relatively dry and unsaline, while in the east are sand dunes and in the west, wind-carved ridges 180–240 ft (55–70 m) high, called *kalūt.* Elsewhere are wind-eroded cuestas, locally called *shahr lūt.*

Chains of mountains stretch northwest–southeast across much of the *ostān;* Kūh-e Lāleh Zār (14,350 ft [4,374 m]) and Kūh-e Hazārān (14,500 ft [4,419 m]) are extinct volcanoes. The Khalīl Rūd is the only river of importance. In the lowest depressions, the dry heat of summer is unsurpassed anywhere in the world, but most of the upland valleys enjoy a pleasant climate.

The hills are now almost bare; settlement and cultivation are patchy because of the scarcity of water and occur in scattered oases and in the foothills of low interior mountain chains. The upland regions produce cereals, cotton, sugar beets, oilseeds, fruit, and vegetables. In the warm region below 3,600–4,500 ft, rice, corn (maize), henna, and fruits are grown. Gum tragacanth is also gathered. Animal products are chiefly wool and *kork,* a kind of soft wool used in Kermān shawls. The province is rich in minerals such as copper, coal, chromium, lead, zinc, uranium, and aluminum, but difficulty of access has restricted mining on a large scale. Springs of crude oil have been found in the Kermān region. A gas pipeline from Bandar ʿAbbās to Kermān and a network for the transmission of electricity have helped the development of industry in the *ostān.* Besides Kermān, the other towns of note are Bāft, Bam, Rafsanjān (Bahrāmābād), Shahr-e Bābak, and Esmāʿīlābād. Pop. (1976) city, 140,309; (1983 est.) *ostān,* 1,317,000.

Kermān carpet, Kermān also spelled KIRMĀN, floor covering handwoven in or about the city of Kermān in southern Iran, which has been the origin since the 16th century of highly sophisticated carpets in well-organized designs. To this city is now generally attributed



Detail of the field pattern and border of a Kermān carpet, late 19th century; in a private collection in New York state

In a private collection, New York state; photograph, Otto E. Nelson—EB Inc.

a wide variety of 16th- and 17th-century carpets, including Vase carpets; rugs with rows of shrubs; arabesque carpets; the finest of the Garden carpets; and, on the basis of constructional similarities, a group of medallion carpets with animals. All of these had Sehna knotting on cotton warps, with stiff, heavy woollen weft pulled straight and silk or cotton wefts between, left relatively slack. The result is a "double-warped" carpet, the warps of one level lying almost directly behind their neighbours. The colour schemes are among the richest and most varied found in Persian carpets.

Although Vase carpets apparently continued to be made in the 18th century, in general there ensued a long period of quiescence, such as occurred in other Persian centres. A revival of carpet weaving became noticeable toward the end of the 19th century, and Kermān rapidly developed into one of the most important carpet industries in Persia. Late 19th-

and 20th-century Kermān carpets have presented a kaleidoscope of successive styles and fashions. Tours de force created include copies of French paintings, architectural scenes with mosques and minarets, and symbolic and personage rugs such as were also made at Kāshān and Tabrīz. In many recent carpets, based to a degree upon French carpet patterns, the border design is allowed to burgeon out into the field or exists only as a Rococo frame for the carpet. The trend has also turned toward cream shades for the ground. The foundation is now all cotton, but the knotting is still Sehna.

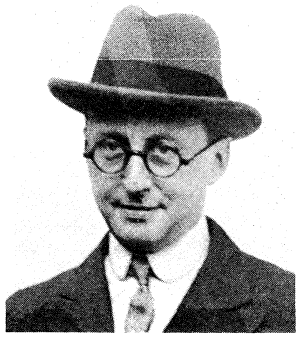
It has been a practice of dealers to use the term Kermān–Lavere, after the weaving village of Rāvar in the district, for examples considered choice. Kermanshah carpets, made in the distant city previously of that name (renamed Bakhtarān), were woven in the style of those produced in Kermān and often sold as Kermān carpets.

Kermanshah (Iran): *see* Bakhtarān.

kermes, either the scale insect (*Kermes ilicis*) or the bright-red dye obtained from the dried bodies of these insects. The dye was often part of the tribute paid to conquering Roman armies, and, in the Middle Ages, landlords accepted it as payment for rent. The oldest known red dyestuff, resembling but inferior to cochineal, it was used by the early Egyptians.

Kern, Jerome (David) (b. Jan. 27, 1885, New York City—d. Nov. 11, 1945, New York City), one of the major U.S. composers of musical comedy, whose *Show Boat* (with libretto by Oscar Hammerstein II) inaugurated the serious musical play in U.S. theatre.

Kern studied music in New York City and in 1903 in Heidelberg, Ger., later gaining the-



Jerome Kern
EB Inc.

atrical experience in London. After his return to New York in 1905, he worked as a pianist and salesman for various music publishers and wrote new numbers for revivals of European operettas.

In 1912 he produced *The Red Petticoat,* the first musical comedy containing only his own music; its success was surpassed by *Very Good Eddie* in 1915. Subsequent musicals included *Oh, Boy!* (1917), *Sally* (1920), *Sunny* (1925), *Show Boat* (1927), *The Cat and the Fiddle* (1931), *Music in the Air* (1932), and *Roberta* (1933). In 1933 he moved to Hollywood, where he was active as a composer of film music.

Kern's music is noted for its natural flow of rhythm and for the often folk-song-like quality of its melodies, which possess an indefinable but unmistakeably American character. *Show Boat,* based on the novel by Edna Ferber, was the earliest U.S. musical play with a serious plot drawn from a literary source.

Kern's songs that have become classics include "The Song is You," "Smoke Gets in Your Eyes," and "Ol' Man River." In 1946 a film biography of Kern, *Till the Clouds Roll By,* was released.

Kern, Johann Conrad (b. June 11, 1808, Berlingen, Thurgau, Switz.—d. April 14, 1888, Zürich), longtime Swiss minister to France and one of the authors of the Swiss federal constitution of 1848.

A lawyer and doctor of jurisprudence, Kern was, after 1837, the guiding spirit of Thurgau's cantonal government, especially in the administration of justice. As deputy to the national Diet, he was almost alone in opposing (1838) the extradition of Louis-Napoléon Bonaparte, the nephew of Napoleon, who was trying to overthrow the French government. He combatted the clericalist policies of the dissident Sonderbund league of seven Catholic cantons, ultimately proposing its suppression by force (November 1847).

Following the ensuing Sonderbund War, Kern joined with Henri Druey of Vaud in drafting a new federal constitution (1848) and, after its ratification, served as president of the Federal Supreme Court (Bundesgericht). He was sent to Paris to persuade the French government to mediate in the Neuchâtel controversy (1857), in which the Prussian king Frederick William IV renounced his rights to the canton. Kern remained as Swiss minister to France until 1883.

kernel, in mathematics, known function that appears in the integrand of an integral equation. Thus, in the equation

$$f(x) = g(x) + \int_a^b K(x,y) f(y)\, dy$$

(for symbol, *see* integration), both the kernel function, $K(x, y)$, and $g(x)$ are given, and $f(x)$ is the function sought. As an example, in Abel's equation for the curve followed by a particle moving in a vertical plane under the influence of gravity, which takes the form of the integral equation

$$f(x) = \int_0^x \frac{s(t)\, dt}{\sqrt{2g(x-t)}},$$

in which t is time, the kernel function is

$$\frac{1}{\sqrt{2g(x-t)}},$$

with g the acceleration of gravity.

Other kernels in mathematics, such as the Dirichlet kernel and Fejér's kernel, are concerned with Fourier series. *See* integral transform.

Kerner, Justinus Andreas Christian (b. Sept. 18, 1786, Ludwigsburg, Württemberg—d. Feb. 21, 1862, Weinsberg), German poet and spiritualist writer. He and the poet Ludwig Uhland founded the so-called Swabian group of late Romantic poets.

After the death of his father (1799), Kerner worked in a cloth factory until he was able to study medicine at Tübingen. There he met



Kerner, *c.* 1860
Archiv fur Kunst und Geschichte, West Berlin

Uhland and spent most of his time reading and writing poetry. He became a practicing physician and in 1818 settled in Weinsberg, where he frequently entertained the leading poets of the time; he influenced his contemporaries more by his personality than by his written work. His first book, *Reiseschatten: von dem Schattenspieler Luchs* (1811; "Travel Shadows: of the Shadow Player Luchs"), is characterized by the typically Romantic mixture of poetry and prose, seriousness and humour. The first collection of his *Gedichte* ("Poems") in 1826 reveals an uncharacteristic melancholy and mystic longing for death. The influence of the *Volkslied* ("folk song") is also clear in this poetry. Interested in somnambulism, he examined the somnambulist and clairvoyant Friederike Hauffe from 1826 to 1829 and published his results in *Die Seherin von Prevorst. Eröffnungen über das innere Leben der Menschen und über das Hereinragen einer Geisterwelt in die unsere* (1829; *The Seer of Prevorst. Disclosures About the Inner Life of Men and the Projection of a Spiritworld into Ours,* 1845). In 1856 he also published a work on the physician and hypnotist Franz Anton Mesmer and animal magnetism. A fifth and enlarged edition of his poetry, *Lyrische Gedichte,* appeared in 1854.

kernicterus, severe brain damage caused by abnormal concentration of the bile pigment bilirubin in tissues at or shortly after birth. It formerly accounted for 10 percent of cerebral palsy cases; the use of massive transfusions to replace the newborn infant's blood and the development of phototherapy to treat neonatal jaundice have, however, greatly reduced the incidence of such brain damage. Kernicterus may occur because of blood-group incompatibility between mother and child, as in erythroblastosis fetalis (*q.v.*), where the mother's immune system destroys fetal blood cells, resulting in severe anemia and jaundice in the newborn. Other common causes are certain types of drug therapy and jaundice associated with prematurity.

kernite, also called RASORITE, borate mineral, hydrated sodium borate ($Na_2B_4O_7 \cdot 4H_2O$), that was formerly the chief source of borax (*q.v.*). It forms very large crystals, often 60 to 90 centimetres (2 to 3 feet) thick; the largest observed measured 240 by 90 cm. The crystals are colourless and transparent but are usually covered by a surface film of opaque white tincalconite. Kernite is associated with other borate minerals as veins, irregular masses, and crystals embedded in shale, as in Kern County, Calif., and Catamarca province, Argentina. For detailed physical properties, *see* borate mineral (table).

kerogen, complex mixture of compounds with large molecules containing mainly hydrogen and carbon but also oxygen, nitrogen, and sulfur. It is the organic component of oil shales, hence their alternative names of kerogen shales or kerogenites. Kerogen is insoluble in water; upon heating, it breaks down into recoverable gaseous and liquid substances resembling petroleum. It may consist of compacted organic material, such as algae and other low plant forms, pollen, spores and spore coats, and both adult and larval insects. The name was first applied to oil-bearing shales in Scotland.

kerosine, also spelled KEROSENE, also called PARAFFIN, PARAFFIN OIL, OR COAL OIL, flammable pale-yellow or colourless oily liquid with a not unpleasant, characteristic odour. It is obtained from petroleum and used for burning in lamps and domestic heaters or furnaces, as a fuel or fuel component for jet engines, and as a solvent for greases and insecticides.

Kerosine accounts for between 10 and 25 percent of the total volume of crude petroleum. It is separated physically from the other por-

tions by fractional distillation. It can also be produced chemically by cracking, or decomposing, the less volatile portions of mineral oils at atmospheric pressure and elevated temperatures.

Kerosine was first manufactured in the 1850s from coal tar and shale oils, but petroleum became the major source after 1859, when E.L. Drake drilled the first petroleum well in Pennsylvania. Because of its use in lamps (*see* kerosine lamp), kerosine was the major refinery product until the automobile made gasoline important.

Chemically, kerosine is a mixture of hydrocarbons; the chemical composition depends on its source, but it usually consists of about 10 different hydrocarbons, each containing from 10 to 16 carbon atoms per molecule; the constituents include *n*-dodecane, alkyl benzenes, and naphthalene and its derivatives. Kerosine is less volatile than gasoline; it boils between about 140° and 320° C (285° and 610° F).

kerosine lamp, vessel containing kerosine with a wick for burning to provide light. Such lamps were widely used from the 1860s, when kerosine first became plentiful, until the development of electric lighting. Compared with other oil lamps they were safe, efficient, and simple to operate. The kerosine fed the wick by capillary action alone. An adjustment knob, the only mechanism needed, controlled the lamp's brightness by raising or lowering the wick to vary the size of the flame. A glass chimney, which was used more widely and effectively on kerosine lamps than on any previous lamps, enhanced the steadiness, brightness, and cleanness of the flame.

No inventor of the kerosine lamp can be named, but hundreds of persons filed patent applications for modifications. In 1865 the duplex burner, with two flat wicks set near each other to augment the heat and brilliance of their flames, was introduced. In Europe, Argand burners with cylindrical wicks were widely used. *See also* Argand burner; lamp.

Kerouac, Jack, original name JEAN-LOUIS KEROUAC (b. March 12, 1922, Lowell, Mass., U.S.—d. Oct. 21, 1969, St. Petersburg, Fla.), U.S. poet and novelist, leader and spokesman of the Beat movement (*q.v.*). Kerouac gave the Beat movement its name and celebrated its code of poverty and freedom in a series of novels of which the first and best known is *On the Road* (1957).

Of French-Canadian descent, Kerouac learned English as a second language as a schoolboy. Discharged from the Navy during World War II as a schizoid personality, he served as a merchant seaman. Thereafter he roamed the United States and Mexico, working at a variety of jobs that included railroad man and forest ranger, before he published his first novel, *The Town and the City* (1950). Dissatisfied with fictional conventions, however, Kerouac developed a new, spontaneous, nonstop, unedited method of writing that shocked more polished writers. *On the Road,* written in three weeks, was the first product of the new style. A formless book, it deals with a number of frenetic trips back and forth across the country by a number of penniless young people who are in love with life, beauty, jazz, sex, drugs, speed, and mysticism but have absolute contempt for alarm clocks, timetables, road maps, mortgages, pensions, and all traditional American rewards for industry.

The book drew the attention of the public to a widespread subterranean culture of poets, folksingers, hipsters, mystics, and eccentrics, including the writers Allen Ginsberg, Gregory Corso, William Burroughs, John Clellon Holmes, Peter Orlovsky, Gary Snyder, and Philip Whalen, all important contributors to the Beat movement. All of Kerouac's works, including *The Dharma Bums* (1958), *The Subterraneans* (1958), *Doctor Sax* (1959), *Lonesome Traveler* (1960), and *Desolation Angels* (1965), are autobiographical, and most of them feature other prominent Beat writers as characters. The posthumously published *Visions of Cody* (1972) was originally a part of *On the Road.*

Jack's Book: An Oral Biography (1978), edited by Barry Gifford and Lawrence Lee, is a collection of statements about Kerouac by his friends and colleagues.

Kéroualle, Louise-Renée de: *see* Portsmouth, Louise de Kéroualle, duchess of.

Kérouané, town and administrative capital of Kérouané region, southeastern Guinea, West Africa, on the road from Beyla to Kankan. It is the chief trading town (rice, millet, cattle) for savanna lands inhabited mainly by the Muslim Malinke people. Local rivers have been an important source of alluvial diamonds since the 1950s, and the Simandou Mountains in the eastern part of the region contain iron ore. Pop. (1977 prelim.) region, 60,000.

Kerr, Sir John Graham (b. Sept. 18, 1869, Arkley, Hertfordshire, Eng.—d. April 21, 1957, Barley), English embryologist and pioneer in naval camouflage who greatly advanced knowledge of the evolution of vertebrates and, in 1914, was among the first to advocate camouflage of ships by means of "dazzle"—countershading and strongly contrasting patches.

Kerr's scientific education began when he was a student of medicine, but in 1889 he joined an Argentine expedition to the Pilcomayo River in Paraguay, an experience recounted in *A Naturalist in the Gran Chaco* (1950). In 1891 he entered Christ's College, Cambridge, and upon graduation, led a second expedition to Paraguay to study the lungfish *Lepidosiren* (1896–97). He returned to Cambridge where he remained until appointed regius professor of natural history at Glasgow in 1902 and professor of zoology in 1903. He held that post until 1935, when he was elected a member of Parliament for the Scottish universities. He was made a fellow of the Royal Society of London in 1909 and knighted in 1919.

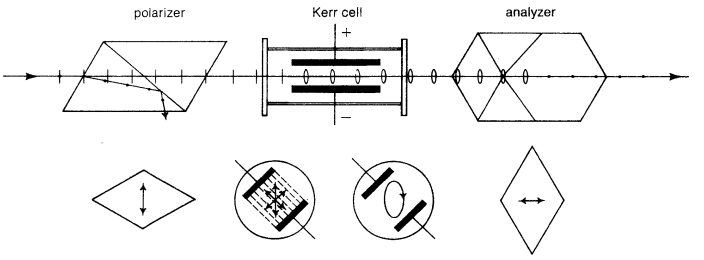
Kerr's approach to zoology was morphological and phylogenetic. Although best known for his studies of the embryology of lungfishes, he also published papers on many other zoological subjects. His most important works are *A Textbook of Embryology with the Exception of Mammalia* (1914–19), *Zoology for Medical Students* (1921), and *Evolution* (1926).

Kerr, Roy P(atrick) (b. May 16, 1934, Kurow, N.Z.), New Zealander mathematician who solved (1963) Einstein's field equations of general relativity to describe rotating black holes, thus providing a major contribution to the field of astrophysics.

Kerr received a master of science from New Zealand University (now dissolved) and his Ph.D. from Cambridge University. He became a professor of mathematics at the University of Canterbury, Christchurch, N.Z.

Kerr worked in the tradition of Karl Schwarzschild (*q.v.*), who in 1916, shortly after the appearance of Einstein's general relativity theory, formulated from Einstein's field equations a mathematical description of a static, nonrotating black hole and the effect of its gravity on the space and time surrounding it. Scientists surmise, however, that black holes probably are not static. Since they are theoretically formed from the collapse of massive dead stars, and since virtually all stars rotate, black holes probably rotate also. Kerr's mathematical formula provides the sole basis for describing the properties of black holes theorists expect to find in space. His solution is called the Kerr metric, or Kerr solution, and rotating black holes are also called Kerr black holes. In later work (written jointly with A. Schild), he introduced a new class of solutions, known as Kerr–Schild solutions, which have had a profound influence on finding exact solutions to Einstein's equations.

Kerr electro-optic effect, in physics, the inducement of double refraction of light in a transparent substance when a strong electric field is applied in a direction transverse to the beam of light. In double refraction, the index of refraction (a measure of the amount the ray is bent on entering the material), and hence the wave velocity of light vibrating in the direction of the electric field, is slightly different from the index of refraction of the vibration perpendicular to it. Optically, the substance behaves like a crystal with its optic axis parallel to the electric field. This effect was discovered in the latter part of the 19th century by a Scottish physicist, John Kerr. The same behaviour in solids is sometimes called the Pockels effect.



Arrangement for an optical shutter, operating by the Kerr effect

From F.A. Jenkins and H.E. White, *Fundamentals of Optics.* Copyright (1950). Used with permission of McGraw-Hill Book Co.

The Kerr cell, also referred to as a Kerr electro-optical shutter, is a device employing the Kerr effect to interrupt a beam of light up to 10^{10} times per second. Linearly polarized light (light vibrating in one plane, as shown in the Figure) is passed through a liquid, such as nitrobenzene, contained in a cell with transparent walls. The beam of light is intercepted by another polarizer (analyzer in this case) set at 90° to the plane of polarization. When an electric potential is placed across two plates straddling the light beam at 45° with respect to the plane of polarization, the plane-polarized light is resolved into two components parallel and perpendicular to the electric field. The light beam emerges from the cell circularly polarized because the two components travel with different speeds and thus have a phase difference. Consequently, the beam will be partially transmitted by the analyzer. The Kerr cell has been employed in the photography of transient phenomena, in measuring the speed of light, and is useful in laser and communication studies.

Kerrier, district, county of Cornwall, southwestern England, occupying an area of 183 sq mi (473 sq km) near the western tip of England. It spans the peninsular county of Cornwall and is bordered by St. George's Channel on the north and the English Channel on the south. The north coastal and central sections are generally a rolling plateau composed of hard sandstone soils. Heavy winds and dampness discourage cereal cultivation there, but

dairy cattle are grazed and fodder crops grown. Early season vegetables, fruits, and flowers for the London market are intensively grown in sheltered valleys and coves on both coasts. Wendron Moor, 400 to 800 ft (120 to 245 m) in elevation, an igneous-based granite intrusive in the centre of the plateau, is used for grazing cattle. Since the early 18th century the northern border area of Wendron Moor and the adjacent sandstone plateau was a principal tin-mining area of Cornwall but is much less so in modern times. The small conurbation of Camborne-Redruth within the northern border area manufactures mining equipment (including rock drills and air compressors) for both local and international markets. The Lizard Peninsula in southern Kerrier district includes the southernmost point of England and is a heather-covered moorland, 200 to 300 ft high, jutting into the English Channel. It is composed of Precambrian metamorphic rocks including gniesses, schists, gabbros, and serpentines, the latter quarried for their ornamental value. The coastal scenery of the Lizard Peninsula is magnificent with offshore rocks, rugged cliffs, and small coves. Camborne and Helston are co-district seats. Pop. (1982 est.) 84,400.

Kerry, Irish CIARRAÍ, county in the province of Munster, southwestern Ireland. With an area of 1,815 sq mi (4,701 sq km), it is bounded by Counties Limerick and Cork to the east and by the Atlantic Ocean or its inlets to the south, west, and north. Tralee is the county town (seat). The principal highlands of Kerry, including the highest mountains in Ireland, are of sandstone. Three, and part of a fourth, of the six Atlantic peninsulas of southwestern Ireland are in Kerry. These consist of mountainous ridges, in places intersected by deep valleys and generally surrounded by lowlands. The most northerly is the Kerry Head peninsula, 7 mi (11 km) long; the Dingle peninsula extends for nearly 40 mi from Tralee to the Blasket Islands; the Iveragh peninsula, 30 mi long and 15 mi wide, continues the line of hills from western County Cork to Valencia Island; south of the Iveragh peninsula lies the Caha peninsula. The highest points on the peninsulas include Baurtregaum (2,798 ft [853 m]) and Brandon Mountain (3,127 ft [953 m]) on the Dingle peninsula; Carrantoohill (3,414 ft [1,041 m]) and Mangerton (2,756 ft [840 m]) on the Iveragh peninsula.

The winters are mild; vegetation grows throughout the year, livestock may be pastured in winter, and the woods of Killarney have arbutus trees of Mediterranean origin. Rainfall is high, and some of the deep peat bogs have remnants of forests dating from drier climatic phases.

Kerry has numerous prehistoric remains. Church sites of antiquity include Ardfert and Aghadoe cathedrals and the medieval monastic church in Muckross (founded 1448).

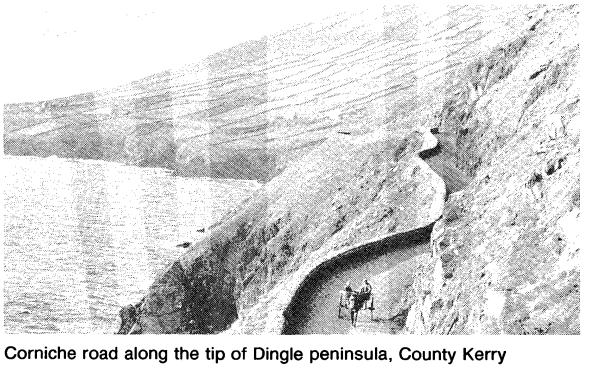
The name Kerry is derived from Ciar (son of Fergus, king of Ulster), whose descendants occupied this part of Munster. Kerry was divided in 1127 between the O'Brien kingdom of Thomond, or North Munster, and the MacCarthy kingdom of Desmond, or South Munster; but with the coming of the Anglo-Norman invaders in the 13th century this area and a large part of Cork fell to the Fitzgeralds. After an unsuccessful revolt and the ruin of the Fitzgeralds of Desmond, Kerry fell within the scope of the plantation of Munster, begun in 1586. The Cromwellian and Williamite settlements further transformed the ownership of Kerry, which was modified again by the land acts of the 19th and 20th centuries.

Kerry's Gaelic speakers are concentrated on the Blasket Islands and the Dingle peninsula. Approximately one-third of the people live in towns and villages, the largest of which are Tralee and Killarney. In the peninsulas settlement is confined to the lowlands and some interior valleys, many of which are covered with peat bogs. Two-thirds of the farms are of less than 50 ac (20 ha). Oats and potatoes are the main crops, with young cattle and sheep the main cash resources. At Tralee are bacon curing and boot factories, and Killarney (*q.v.*) has a footwear factory but relies mainly on market and tourist income. There is an engineering industry and crane manufacture. Other towns are small trading centres, and fishing is of some significance at Dingle and Valencia. Pop. (1981) 122,770.

Kerry blue terrier, versatile breed of working terrier that is used as a hunter, land and water retriever, and sheep and cattle herder. The Kerry blue originated in County Kerry, Ireland, where it has been bred since the 1820s. It is 17.5 to 19.5 inches (44.5 to 49.5 centimetres) tall, weighs 29 to 40 pounds (13 to 18 kilograms), and has a distinctively coloured, soft, wavy coat, black at birth and becoming slate blue to blue gray with maturity. Boxy in appearance, somewhat like the Airedale, the breed is characterized as lively, demonstrative, hardy, and long-lived.

Kerschensteiner, Georg (Michael) (b. July 29, 1854, Munich—d. Jan. 15, 1932, Munich), German educational theorist and reformer who was a leader in the growth of vocational education in Germany.

Kerschensteiner studied physics and mathematics in Munich and taught mathematics in Nürnberg and Schweinfurt before being named director of public schools in Munich in 1895. In that post, which he held until 1919, and as a professor of the University of Munich from 1920, he advocated a pragmatic approach to elementary and secondary education, blending classical studies with manual labour. He also developed a system of vocational schools in Munich. He wrote extensively both on the necessity of a well-rounded education that includes physical activities and on the value of purely vocational education, and he summarized many of his theories in his last major work, *Theorie der Bildungsorganisation* (1933).



Corniche road along the tip of Dingle peninsula, County Kerry

Authenticated News International

Kertanagara (fl. 13th century), last king (1268–92) of Tumapel (or Singhasāri) in Java, still venerated among the Javanese as one of their greatest rulers. He united Java, extended his influence over Sumatra, and resisted Mongol attempts to exact tribute from his kingdom.

Life. Kertanagara was the son of respectable families—King Vishnuvardhana of Janggala and a princess of Kaḍiri—so that by birth he was a reuniter of the two halves of the Javanese kingdom. Even his name, Kertanagara, meaning "order in the realm," might refer to reunion, which was the achievement of a great king according to the Javanese dualistic cosmology. Probably for this reason, he was consecrated a king in 1254 before his father's death. For the ceremony people from Janggala and Kaḍiri went to Kutaraja, the capital city of Tumapel, which was then renamed Singhasāri. From that time Tumapel was also called Singhasāri. Kertanagara was too young to rule the country; therefore, his father was still the de facto ruler. Kertanagara came to power only in 1268.



Stone sculpture thought to be Kertanagara in the form of *hari-hara ardhanari*, c. early 14th century; acquired by the Museum für Völker Kunde, Berlin, in 1865

Kertanagara's reign coincided with the expansion of Kublai Khan's realm in Southeast Asia. Kertanagara thought that he could stop an invasion only by aligning himself with or conquering neighbouring states and by strengthening himself with religious rites. He believed that Kublai Khan had already acquired a type of secret knowledge, which he himself could also gain. His chief minister Raganatha disagreed with Kertanagara's policy and, as a result, was removed from the post; Aragani, who was an ardent supporter of the policy, therefore came to power.

Kertanagara married a princess of Champa (southern Vietnam), a country that was dangerously exposed to Kublai Khan. Kertanagara sent envoys to Malayu (Sumatra) in 1275, and his statue as Amoghapāśa (Dhyāni Buddha Avalokiteśvara) was erected in the area (Jambi) in 1286, an indication that his influence had reached Sumatra. He also conquered Bali in 1284. A statue of a meditative Buddha, known as Jaka Dolog, discovered in Surabaja (eastern Java), was also erected by Kertanagara. According to its inscription, the statue was erected for the benefit of the King, the royal family, and the unity of the kingdom. Because the statue was erected on the hermitage of Bharada, the great wizard who had been asked to divide eastern Java into

two kingdoms during the reign of Airlangga (1019–49), it must also have been aimed at neutralizing the evil effects of Bharada's division of his land.

When an envoy of Kublai Khan, Meng Ch'i (or Meng K'i), arrived in Java in 1289 to ask for tribute, Kertanagara refused to pay. This infuriated the Khan, who sent armed forces to punish Kertanagara. Before the troops arrived, however, Kertanagara was killed by the ruler of his vassal state, Jayakatwang of Kaḍiri, in the course of a Tantric ritual drinking bout.

Assessment. Kertanagara is still venerated by Indonesians as one of their greatest rulers. The information on him is sketchy and is primarily based on the two Javanese chronicles—the *Pararaton* ("Book of Kings") and *Nāgarakertāgama* (the epic of Majapahit), which give contradictory pictures of the King.

Pararaton says only that the King was a drunkard and fond of good food. He dismissed his able chief minister Raganatha (Kebo Arema) and appointed Aragani, who could serve him delicious food every day. Aragani is also known as Kebo Tengali, though some scholars say these were two separate men. He drank palm wine and held orgies, which eventually led to his death—he was killed by his enemies during one of his wild parties.

Nāgarakertāgama describes Kertanagara as a great and wise king and as a zealous follower of Tantric Buddhism, which dealt with magic and demons and encouraged drinking and orgies of a ritual sort having nothing to do with pleasure-seeking. He believed that he was living in the Kali *yuga,* in Hindu cosmology the last of the four periods of world history, which was full of confusion, fear, and disaster, and that he, as a ruler, should save the world. According to at least one 20th-century scholar, however, "he knew the practical difficulties of protecting the world in Kali *yuga,* therefore he zealously upheld his religious duties and vows, in order to strengthen the Buddhist faith and to follow the example of former rulers with a view to securing the welfare of the world."

Both the Jaka Dolog and the Amoghapāśa statues indicate that Kertanagara was very religious, as suggested by *Nāgarakertāgama.* This does not mean, however, that he was unskilled in politics and government; in fact, he often used religion as an aid in gaining political ends.

Nāgarakertāgama indicates that toward the end of his life, Kertanagara became more involved in religious practices. It can be argued that he was too involved in his religion to provide for security of his throne and his country. Thus, although he thought of himself as being strong enough to resist Kublai Khan and hence refused to pay him any homage, he was not able to defend himself against an internal rival. Nonetheless, he was worshipped as a great king by many later Javanese leaders.

Many scholars tend to accept the *Nāgarakertāgama* because it fits in the historical context and is in accordance with the historical evidence. (L.Sur.)

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Kertész, André (b. July 2, 1894, Budapest—d. Sept. 27, 1985, New York City), Hungarian-born American photojournalist whose spontaneous, unposed pictures exerted a strong influence on magazine photography.

While working as a clerk on the Budapest Stock Exchange in 1912, Kertész began to photograph the world around him. During World War I he served in the Hungarian Army, saw action in most of central Europe, and was severely wounded. After the war he returned to business but had occasional photographs printed in Hungarian magazines.



Self-portrait by André Kertész, 1927
Andre Kertesz

Aware that Budapest offered little opportunity for artistic development, in 1925 he left for Paris. There he became friendly with many avant-garde artists, writers, and filmmakers. Kertész became a photographic historian of the Parisian cultural milieu of the 1920s and '30s; soon his photographs appeared in leading European newspapers. As his photojournalistic style called for the responsiveness and flexibility of the small camera, in 1928 he bought one of the first Leica cameras. A one-man show in 1927 was warmly received, as were his photographs shown the following year at the influential First Independent Salon of Photography. Kertész became a major contributor to *Vu,* which began publication in 1928, and *Art et Médecine,* which began publication in 1930, as well as other important illustrated periodicals in Europe.

In 1936 he went to New York City to work for a one-year period in a commercial studio, but, with the advent of World War II, he remained, carrying out commercial (largely fashion) photography for major American magazines. He became a U.S. citizen in 1944. About 1962 he began to work again in his previous creative style. In 1964 the Museum of Modern Art in New York City gave a retrospective exhibition of his work. Books of his photographs include *Day of Paris* (1945), *André Kertész, Photographer* (1964), *André Kertész* (1967), *On Reading* (1971), *André Kertész: Sixty Years of Photography* (1972), and *Distortions* (1976).

kerygma and catechesis, in Christian theology, respectively, the initial proclamation of the gospel message and the oral instruction given before baptism to those who have accepted the message. Kerygma refers primarily to the preaching of the Apostles as recorded in the New Testament. Their message was that Jesus Christ, in fulfillment of the prophecies of the Old Testament, was sent by God, preached the coming of the Kingdom of God, died, was buried, rose from the dead, and was raised to the right hand of God in heaven. To those who accepted this proclamation, the reward was deliverance from sin, or salvation. Acceptance into the church required conversion—that is, a turning away from a life of sin. Early Christian catechesis was usually accompanied by self-denial and exorcism (an attempt to expel the devil from the potential convert).

The mode of teaching, geared to the general absence of literacy, was characterized by the use of formalized expressions (some of which are preserved in the New Testament). As the practice of infant baptism became more common in subsequent centuries, the relation between instruction and baptism became less obvious. Once an important duty of bishops, instruction was more often left to the parents or parish priests. The emphasis given to the use of the Apostles' Creed and the Lord's Prayer as mnemonic devices, as well as the frequent use of numbered lists (seven being a favourite number), is indicative of the rote nature of the instruction during the early medieval period. In the East, the connection between the liturgy and practical instruction had never been lost; this was not the case in the West, where only a minority understood Latin, the language of liturgy and theology.

In the 16th century, the Lutheran reform reemphasized the preached word; both Protestants and Catholics, however, began to make extensive use of written manuals called catechisms (*e.g.,* Luther's Small Catechism). By the 19th century the term catechetics referred to all religious education outside of that found in the liturgy and preaching. Twentieth-century developments have reflected an appreciation of recent trends in the psychology of learning and pedagogy, as well as the renewal in the theology of the sacraments and in biblical scholarship. In reaction to the abstract catechesis of recent centuries, some have called for a "kerygmatic theology" that would be concerned more with the saving work of Jesus Christ than with scientific, speculative theology. Although this distinction has not been generally accepted, there has been a renewed appreciation of the view of the Christian message as an event to be experienced rather than ideas to be studied. The effect of this movement was to reorientate religious education to a return to the kerygma and catechesis of the New Testament church.

kēryx, inviolable ancient Greek messenger. In Homer's time, the *kēryx* was simply a trusted attendant or retainer of a chieftain. The role of *kērykes* expanded, however, to include acting as inviolable messengers between states, even in time of war, proclaiming meetings of the council, popular assembly, or court of law, reciting there the formulas of prayer, and summoning persons to attend. Hermes, himself the *kēryx* of the gods, was their patron and carried the caduceus, the herald's staff. The word also often simply meant a crier. A clan of *kērykes* had certain duties in connection with the Eleusinian Mysteries.

Kesennuma, city, Miyagi Prefecture (*ken*), Honshu, Japan, facing the Pacific Ocean. Its harbour and commercial fishing port are located on the deeply indented coast at the head of Kesennuma-wan (Kesennuma Bay). Deep-sea fishing (tuna, bonito, and saury) is important, and oysters are cultivated. Industries produce textiles and rubber and leather goods. The nearby scenic coastal area is part of Rikuchu-kaigan National Park. Pop. (1980) 68,551.

Keshab Chunder Sen, also spelled KESHUB CHANDRA SEN (b. Nov. 19, 1838, Calcutta—d. Jan. 8, 1884, Calcutta), Hindu philosopher and social reformer who attempted to incorporate Christian theology within the framework of Hindu thought.

Although not of the Brahman caste, Sen's family was prominent in Calcutta, and he received the required education. At age 19 he joined the Brahmo Samaj (Society of Brahmā,

also translated as Society of God) founded in 1828 by the Hindu religious and social reformer Rammohan Ray. The Brahmo Samaj was intended to revitalize Hindu religion through use of ancient Hindu sources and the authority of the Vedas. Sen was convinced, however, that only Christian doctrine could bring new life to Hindu society.

By the use of dynamic and practical Christian missionary methods, Sen effected social reforms badly needed in India; he organized relief campaigns for the poor, promoted literacy among his countrymen by founding schools for children and adults, and issued a number of inexpensive publications to bring reading matter within the reach of all. He condemned child marriage and was instrumental in having the marriage rites of his society recognized by law in 1872. He also advocated widow-remarriage and even inter-caste marriage. While his contemporaries Debendranath Tagore and Ramakrishna remained thoroughly Hindu in outlook, Sen very nearly converted completely to Christianity. The deterrent proved to be his belief that Christ, however admirable, was not unique. Nevertheless, he did want his people to emulate Christ, believing that only a vital Christianity would be the salvation of a stratified and ossified Hindu society. He was more interested in the practical application of religion to social conditions than in depth of thought. An open break with Debendranath Tagore followed, and Sen formed a new society in 1866 called the Bharatvarshiya Brahmo Samaj (the Society of Brahmā of India). The original society was renamed the Adi Samaj (the Old Society) and was quickly purged of Christian teaching.

In 1870 Sen lectured widely in England and was presented to Queen Victoria. Again he was impressed with Christianity as a force in English life. Back in India, however, he allowed his 14-year-old daughter to marry the son of the Maharaja of Cooch Behār, thus publicly repudiating his avowed opposition to child marriage. As a result, some of his followers broke away, and he organized a new society, Naba Bidhan, or Nava Vidhana (New Dispensation), continuing to preach a mixture of Hindu philosophy and Christian theology. He revived many ancient Vedic practices and sent out 12 disciples to preach under a flag bearing a crescent, a cross, and a trident. Sen remained high in public esteem until his death.

Keski-Suomi, in full KESKI-SUOMEN LÄÄNI, Swedish MELLERSTA FINLANDS LÄN, *lääni* (province), south central Finland. Its land area of 6,344 sq mi (16,430 sq km) encompasses much of the Päijänne and Keitele lake systems. The administrative capital is Jyväskylä. Keski-Suomi generally consists of flat farming and timber lands broken up by many lakes. Local industry is based on farming and timber products, and most of the towns serve as lumber-processing centres. The larger towns include Jämsä in the southwest and Äänekoski and Suolahti in the east. Pop. (1982 est.) 244,343.

Kesselring, Albert (b. Nov. 20, 1885, Marktstedt, Bavaria, Ger.—d. July 16, 1960, Bad Nauheim, W.Ger.), field marshal who, as German commander in chief, south, became one of Adolf Hitler's top defensive strategists during World War II, containing the Allied offensive in Italy and eventually succeeding to the command over the entire German armed forces in the West.

After serving in World War I and remaining in the army under the Weimar Republic, Kesselring transferred to the Luftwaffe (Air Force), created after Hitler's accession to power in October 1933. Early in World War II Kesselring commanded air fleets in Poland (September 1939) and France (May–June 1940) and during the Battle of Britain (1940–41). Having already had experience in the bombing of civilian population centres such as Warsaw and Rotterdam, he advocated the bombing of London. This proved to be a fateful decision because the resulting discontinuance of attacks on British air fields gave the Royal Air Force Fighter Command time to recover and eventually defeat the German air offensive against England.

After participating in the attack on the Soviet Union (summer 1941), Kesselring became commander in chief, south (late 1941), to bolster Italy's efforts in North Africa and against Malta. Though unable to reduce the strategic island, he shared the direction of the Axis campaign in North Africa with Erwin Rommel and, after the Allied invasions of Sicily and Italy in the summer of 1943, fought a brilliant defensive action that prevented an Allied victory in that theatre for more than a year. Injured in October 1944, he became commander in chief, west, in March 1945, replacing Field Marshal Gerd von Rundstedt, but proved unable to stop the Anglo-American drive into Germany and surrendered the southern half of the German forces on May 7, 1945.



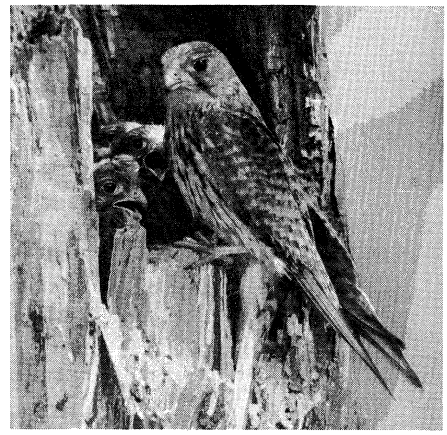
Kesselring
Ullstein, Berlin

In 1947 Kesselring was tried and convicted of war crimes (for ordering the shooting of Italian hostages) and received a life sentence but was freed in 1952 and subsequently became active in veterans' organizations. He wrote *Soldat bis zum letzten Tag* (1953; *The Memoirs of Field Marshal Kesselring,* 1953).

Kesteven, Parts of, also called KESTEVEN, formerly one of the three separately administered divisions of the county of Lincolnshire, England. After the 1974 reorganization of local government it formed two county districts, North Kesteven and South Kesteven. Both are under the county authority seated in Lincoln city to the north. They are profoundly rural in character; light industry is represented mainly at Grantham.

kestrel, any of several small birds of prey of the genus *Falco* (family Falconidae) known for its habit of hovering while hunting. Kestrels prey on large insects, birds, and small mammals. They exhibit sexual colour dimorphism, rare among hawks: the male is the more colourful. Kestrels are mainly Old World birds, but one species, the American kestrel (*F. sparverius*), called sparrow hawk in the U.S., is common throughout the Americas. The American kestrel is about 30 centimetres (12 inches) long, white or yellowish below, reddish brown and slate gray above with colourful markings on the head.

The common kestrel (*F. tinnunculus*), ranging over most of the Old World and sometimes called the Old World, Eurasian, or European kestrel, is slightly larger than the American kestrel but less colourful. It is the only kestrel in Britain, where it is called "windhover" from its habit of hovering while heading into the wind, watching the ground for prey. The Australian kestrel, *F. cenchroides*, is also called a sparrow hawk.



Common kestrel (*Falco tinnunculus*)
Eric Hosking

Kęstutis (Lithuanian), Polish KIEJSTUT (b. *c.* 1300—d. Aug. 15, 1382, Kriavas, Lithuania?), grand duke of Lithuania (1381–82) who defended his country's western borders against the Teutonic Knights.

One of the seven sons of Gediminas, the grand duke of Lithuania (ruled 1316–41) who had built that nation into a powerful east European empire, Kęstutis acted as ruler of western and southern Lithuania even before his father's death (1341). After Gediminas died, his son Jaunutis (Jewnut Iwan) succeeded him, but Kęstutis overthrew Jaunutis (1345) and made Algirdas (Olgierd), another of his brothers, the official grand duke of Lithuania. For himself, as co-ruler, he retained control of western and southern Lithuania and placed Lithuania's Russian territories under Algirdas' rule.

While Algirdas extended Lithuania's territory farther to the south and east, Kęstutis prevented its neighbours, the Teutonic Knights, from conquering Lithuania and making it the centre of their eastern Baltic domain. Having unsuccessfully attempted to occupy Samogitia (the land corresponding to most of the present Lithuanian S.S.R.) in 1345, the Knights later resorted to a tactic of continual raids on Lithuanian territory. In response, Kęstutis led expeditions into their Prussian lands, and in 1370 he and Algirdas attacked the order, imposing heavy losses upon it at the Battle of Rudava. In the same year, after a prolonged dispute (1349–70) with Poland over Galicia and Volhynia, Kęstutis gained control over both of those regions.

After Algirdas' death (1377) Kęstutis became embroiled in a series of dynastic intrigues. Although Algirdas was succeeded by his son Jogaila (Jagiełło), the harmonious relationship that had existed between Kęstutis and the



Kęstutis, engraving, 18th century
By courtesy of Istorijos Etnografijos Muziejus, Vilnius, Lithuanian S.S.R.

Grand Duke disappeared. Jogaila's brother Andrew sought alliances with the Livonian Order (a branch of the Teutonic Order) and with Muscovy against Kęstutis, while another brother, Skirgaila (Skirgiełło), plotted against Kęstutis with the Teutonic Knights. These circumstances forced Kęstutis to sign a 10-year peace treaty with the Teutonic Order (1379). The following year Jogaila also concluded a secret treaty with the order against Kęstutis. Informed of his nephew's act by the Knights, Kęstutis arrested Jogaila and became grand duke of Lithuania (1381). But while Kęstutis was suppressing a rebellion in his Russian territories beyond the Dnieper River in 1382, Jogaila escaped and seized the major Lithuanian cities of Vilnius and Trakai. When Kęstutis arrived at Trakai, he was arrested and brought to Kriavas, where he was presumably killed. Four years later (1386) Jogaila became king of Poland as Władysław II Jagiełło.

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Keswick, parish (town), Allerdale district, county of Cumbria, England. It lies at the north end of the Derwentwater (lake), below the peak of Skiddaw. Keswick is the main transportation focus, tourist resort, and shopping centre of the northern part of Lake District National Park. Lead mining was formerly of economic importance. The local museum contains relics of the rich geological, folk, and art associations of the region. Pop. (1981 prelim.) 5,635.

Ket, indigenous people of central Siberia who live in the Yenisey River Basin; in 1979 they numbered about 1,100. Certain traits of the Ket suggest a southerly origin. Their language, Ket, is the last survivor of the Yeniseian group spoken in the area. Usually classed as Paleosiberian, this small language family has no firmly established relation with any other.

Their traditional taiga economy was based on hunting squirrel, sable, fox, deer, elk, bear, and hare and selling the furs, mostly to Russian merchants. Traditionally, reindeer breeding and fishing have been of great importance. Ket transport depends heavily on domesticated reindeer for hauling sledges; they also use skis and boats as the weather dictates. They dwell in conical tents in summer and in semisubterranean houses in winter.

The Ket were divided into two exogamous kinship groups, or phratries, of ceremonial and cultic importance; these were subdivided into clans that were territorial and economic units as well as mutual-aid groups. Shamans served as mediators with the good and evil spirits. The Ket have come under strong influences from Russians and neighbouring indigenous peoples, the degree of acculturation being reflected by the fact that nearly all Ket speak Russian; some also speak Selkup. During the Soviet period they have been collectivized, and their hunting and fishing carried forward; reindeer breeding has increased in importance.

Ket, Robert, Ket also spelled KETT (d. Dec. 7, 1549, Norwich, Norfolk, Eng.), English leader of the Norfolk rising of 1549, afterwards called Ket's Rebellion. He was either a tanner or, more probably, a small landowner.

The rising seems to have originated in a quarrel between the people of Wymondham, in Norfolk, and a certain Flowerdew and was at first intended only as a demonstration against enclosures of common land. A feast held at Wymondham in July 1549 developed into a riot and gave the signal for the outbreak. Leading his followers to Norwich, Ket formed a camp on Mousehold Heath, where he is said to have commanded 16,000 men, introduced a regular system of discipline and justice, and blockaded the city. He refused the royal offer of an amnesty on the ground that innocent and just men had no need of pardon and on Aug. 1, 1549, attacked and took possession of Norwich. But the rebels were soon driven out by forces under John Dudley, earl of Warwick, who attacked their main body at Dussindale on August 27. Ket's men were easily routed by the trained soldiery, and Robert Ket and his brother William were seized and taken to London, where they were condemned to death for treason. Both were executed early in December 1549; Robert at Norwich and William at Wymondham.

Keta, town, Volta Region, Ghana, West Africa, on the Gulf of Guinea (Atlantic Ocean), near the Volta River mouth. It is built on a sandspit separating the Atlantic from the saltwater Keta Lagoon. The area was part of the African kingdom of Anlo prior to the arrival of Europeans in the 15th century. The settlement was a port for trade in slaves, ivory, spices, and gold. The expanding Ashanti empire controlled much of the region by the first half of the 18th century. A Danish fort was built on the site in 1784 and in 1850, when Keta became a British colony, the Danes sold the fort to the British. Until Tema Harbour began operations to the west in 1962, Keta served as an open roadstead port. It is now the headquarters of an administrative district and commercial centre of the Volta Basin.

Its double waterfront is an asset to fishing and fish processing, the main occupations. The lagoon is worked for salt, and the sandspit supports coconut palms and shallots. Further expansion of the town is inhibited by the size of the lagoon and the aridity of the surrounding plains. Pop. (1982 est.) 12,053.

Ketch, Jack, byname of JOHN KETCH (d. November 1686), English executioner notorious for his barbarous inefficiency; for nearly two centuries after his death his nickname was popularly applied to all of England's executioners.

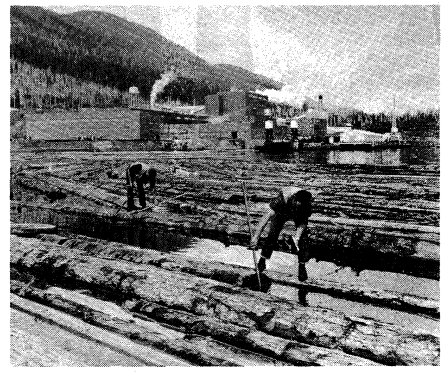
He is believed to have received his appointment as public hangman in 1663. The first recorded mention of Ketch appears in an anti-Roman Catholic broadside published in 1678 entitled *The Plotters Ballad; Being Jack Ketch's Incomparable Receipt for the Cure of Traytorous Recusants; or Wholsesome Physick for a Popish Contagion.* He is reported to have executed Lord William Russell (1683) in a brutal and inept manner, and in 1685 he took at least eight strokes of the axe in beheading James Scott, duke of Monmouth.

Ketchel, Stanley, original name STANISLAUS KIECAL, byname MICHIGAN ASSASSIN (b. Sept. 14, 1886, Grand Rapids, Mich., U.S.—d. Oct. 15, 1910, Conway, Mo.), U.S. professional boxer, considered by some boxing historians the greatest fighter in the history of the middleweight division (present weight limit 160 pounds).

He began his career in 1903, at the age of 16. In 1905 he scored knockouts in all of his 14 bouts. After the retirement of world middleweight champion Tommy Ryan, Ketchel won a version of the championship by knocking out Joe Thomas in the 32nd round in San Francisco on Sept. 2, 1907. His first-round knockout of Mike (Twin) Sullivan at Colma, Calif., on Feb. 22, 1908, gained him worldwide recognition as champion. In Los Angeles on Sept. 7, 1908, he was knocked out by Billy Papke in the 12th round of a title match, but in San Francisco on November 26 of that year Ketchel regained the championship by knocking out Papke in the 11th round. At Colma on Oct. 16, 1909, he fought champion Jack Johnson for the world heavyweight title. In the 12th round he knocked the much bigger Johnson down but was himself knocked out later in that round. From 1903 to 1910, Ketchel had 61 bouts, winning 49, 46 by knockouts.

Ketchel was noted for his aggressive style and powerful hitting and for his hard living outside the ring. He was still the middleweight champion when he was shot to death in a personal quarrel. In 1954 he was elected to the Boxing Hall of Fame.

Ketchikan, city, port of entry, on Revillagigedo Island, Alexander Archipelago, southeastern Alaska, U.S. Originally a fishing settlement and a supply centre for miners during the gold rush of the 1890s, its Tlingit Indian name, Kach Khanna, means "spread wings of prostrate eagle." Served by air transport and by steamship lines along the Inside Passage (Alaska Marine Highway), it has an economy based on fishing, canning, logging, pulp milling, and tourism. The salmon derbies are annual fishing contests. Ketchikan Community College was opened in 1954. Saxman Totem Park and Totem Bight, both nearby, have large collections of Indian totem poles. Inc. 1900. Pop. (1980) 7,198.



Scaling logs for a pulp mill, Ketchikan, Alaska
By courtesy of the U.S. Forest Service

ketchup (tomato condiment): *see* catsup.

Keteleeria, a genus in the family Pinaceae, contains two or three species of coniferous evergreen trees, native to China and Taiwan. The trees resemble true firs (members of the genus *Abies*) but have clusters of 5 to 10 male reproductive structures on short, scaly stalks; spine-tipped leaves on young plants; buds with many overlapping scales that form a sheath around the shoot base; and cones whose scales do not fall at maturity.

ketene, any of a class of organic compounds containing the functional grouping C=C=O; the most important member of the class being ketene itself, CH_2=C=O, which is used in the manufacture of acetic anhydride and other industrial organic chemicals. The name suggests that ketenes are unsaturated ketones, but their chemistry resembles that of carboxylic acid anhydrides.

Ketene is prepared by heating acetic acid or acetone to about 700° C (1,300° F). Ketene is remarkably reactive: it combines with compounds containing an easily replaced hydrogen atom to yield derivatives of acetic acid. Ketene reacts with aldehydes and ketones to form enol acetates or β-lactones. In the absence of a reactive substrate, ketene combines with itself to form diketene, a β-lactone used industrially to prepare derivatives of acetoacetic acid, such as ethyl acetoacetate and acetoacetamides.

The higher ketenes are generally synthesized by elimination of hydrogen chloride from acid chlorides, although methylketene and dimethylketene can be made from propionic and isobutyric anhydrides, respectively. The substituted ketenes react like ketene, but less vigorously. The lactone dimers of long-chain monoalkylketenes have been used as sizing agents for paper.

Ketene, a colourless, irritant gas, is toxic,

producing delayed respiratory damage. The high reactivity of all ketenes makes them somewhat dangerous.

ketone, any of a class of organic compounds characterized by the presence of a carbonyl group in which the carbon atom is covalently bonded to an oxygen atom. The remaining two bonds are to other carbon atoms or hydrocarbon molecules. Ketones are highly reactive, although less so than aldehydes, to which they are closely related. Much of their chemical activity results from the nature of the carbonyl group.

A brief treatment of ketones follows. For full treatment, *see* MACROPAEDIA: Chemical Compounds.

Ketones readily undergo a wide variety of chemical reactions. A major reason is that the associated carbonyl group is partially oxidized—*i.e.*, it is deficient in electrons. This means that the ketone can be easily reduced (electrons added) or oxidized further. The carbonyl group is also highly polar—it has an uneven distribution of electrons. This, too, increases the chemical activity of ketones and affects their physical properties as well.

Ketones can be synthesized by a wide variety of methods. Because of their ease of preparation, relative stability, and high reactivity, ketones are nearly ideal chemical intermediates. Many complex organic compounds are synthesized using ketones as building blocks.

A number of ketones are important industrial compounds and are manufactured on a large scale. The widest use of ketones is as solvents, especially in industries that manufacture explosives, lacquers, paints, and textiles. They are also used in tanning, as preservatives, and in hydraulic fluids.

The most important ketone, acetone, is a liquid with a sweetish odour. It is used primarily as a solvent in paints and lacquers and for cellulose plastics. When heated, acetone produces ketene, which has many uses in organic synthesis.

Ketone compounds have important physiological properties. They are found in several sugars and in compounds for medicinal use, including natural and synthetic steroid hormones. Molecules of the anti-inflammatory agent cortisone contain three ketone groups.

ketosis, metabolic disorder marked by high levels of ketones in the tissues and body fluids, including blood and urine. There is less sugar than normal in the blood and less glycogen (the storage form of sugar) in the liver; fat accumulates in the liver, as do amino acids, from which the liver can produce more glycogen. Ketosis may be present in diabetes mellitus (*q.v.*). When cattle are affected, they lose weight and produce less milk; dietary adjustment to meet special requirements of individual cattle helps avoid the condition.

ketou: *see* kowtow.

Kett, Robert (English rebel): *see* Ket, Robert.

Ketteler, Wilhelm Emmanuel, Freiherr von (baron of) (b. Dec. 25, 1811, Münster, Westphalia—d. July 13, 1877, Burghausen, Bavaria), social reformer who was considered by some to have been Germany's outstanding 19th-century Roman Catholic bishop.

Ordained a priest in 1844 and appointed bishop of Mainz in 1850, Ketteler attracted national attention by his sermons and his writings. Always interested in political and social problems, he was a member of the Frankfurt National Assembly (1848) and later of the German Reichstag (1871–72). His concern was for the working class, whose well-being, he proposed, was the church's responsibility. Ketteler's opposition to papal infallibility caused him to become one of the leaders of



Ketteler, detail of an engraving by A. Neumann, *c.* 1860
Archiv fur Kunst und Geschichte, West Berlin

the "inopportunists" (those against the "infallibilists") at the first Vatican Council (1869–70).

His views on social reform were most comprehensively expressed in his book *Die Arbeiterfrage und das Christenthum* (1864; "The Labourer Question and Christianity"), which strongly stimulated the interest of German Roman Catholics in social problems. Ketteler's paramount concern for the need of a Christian foundation supplied the quintessence of his other writings and his sermons. His most important works were edited by Johannes Mumbauer, *Wilhelm Emmanuel von Ketteler Schriften* (3 vol., 1911; 2nd ed., 1924). Fritz Vigener's biography, *Ketteler: Ein deutsches Bischofsleben des 19. Jahrhunderts* ("Ketteler: The Life of a German Bishop of the 19th Century"), appeared in 1924.

Kettering, town and district (borough), county of Northamptonshire, England, with an area of 90 sq mi (234 sq km). Kettering was a centre from the 17th century for the production of woollen cloth and, later, of silk and plush. Since the Industrial Revolution, however, the town has been associated, like all its Northamptonshire neighbours, with leatherworking and the footwear industry. As the latter declined, Kettering sought more modern industries, competing since 1950 against Corby (*q.v.*), a designated new town only 8 mi (13 km) away, for which Kettering serves as the railhead. Kettering has remained a prosperous town, with good road as well as rail connections. Pop. (1981 prelim.) town, 45,356; (1982 est.) district, 71,700.

Kettering, city, Montgomery County, southwestern Ohio, U.S., immediately south of Dayton, in the Miami Valley. Stone quarries first attracted settlers to the site, which was organized in 1841 as Van Buren Township. In 1952 it was incorporated as a village and renamed in honour of the industrial scientist Charles F. Kettering. Although the city is mainly residential, there has been planned industrial development, including testing laboratories and the manufacture of electric motors and generators, precision tools, automotive and aircraft accessories, and building materials. In the city are the Kettering College of Medical Arts (1967), the Cox Coronary Heart Institute, and the Charles F. Kettering Memorial Hospital, known for its medical research facilities. Inc. city, 1955. Pop. (1970) 71,864; (1980) 61,186.

Kettering, Charles F(ranklin) (b. Aug. 29, 1876, Loudonville, Ohio, U.S.—d. Nov. 25, 1958, Dayton, Ohio), U.S. engineer whose inventions, which included the electric starter, were instrumental in the evolution of the modern automobile.

In 1904 Kettering began working for the National Cash Register Company in Dayton, where he developed the first electric cash register. He became chief of the inventions department before he resigned in 1909.

With Edward A. Deeds, Kettering founded Delco (Dayton Engineering Laboratories Company) to design automotive electrical equipment. He developed improved lighting and ignition systems as well as the first electric starter, introduced on Cadillacs in 1912.

In 1916 Delco became a subsidiary of United Motors Corporation, later General Motors Corporation (GM). Kettering was vice president and director of research for GM from 1920 to 1947. In 1914 he also founded the Dayton-Wright Airplane Company, which during World War I developed a propeller-driven guided missile with a 200-pound (90-kilogram) bomb load.

Kettering contributed much to the development of quick-drying lacquer finishes for automobiles and of antiknock fuels and leaded gasoline in collaboration with the U.S. chemist Thomas Midgley, Jr. He developed the high-speed, two-cycle diesel engine, making it more efficient by improving its design. In 1951 he also developed a revolutionary high-compression automobile engine.

Kettering's interest in science was manifested in the establishment of the Sloan-Kettering Institute for Cancer Research at the Memorial Cancer Center, New York City, and the C.F. Kettering Foundation for the Study of Chlorophyll and Photosynthesis.

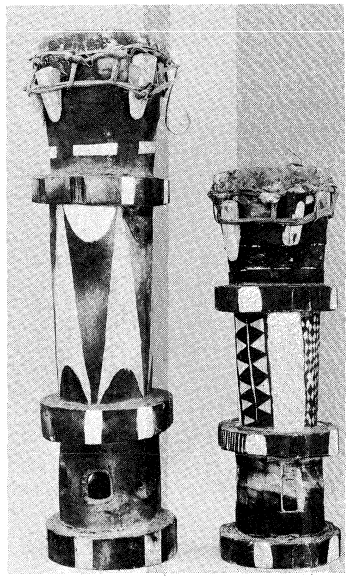
kettle, also called KETTLE HOLE, in geology, depression in a glacial outwash drift made by the melting of a detached mass of glacial ice that became wholly or partly buried. The occurrence of these stranded ice masses is thought to be the result of gradual accumulation of outwash atop the irregular glacier terminus. Kettles may range in size from 5 metres (15 feet) to 13 kilometres (8 miles) in diameter and up to 45 m in depth. When filled with water they are called kettle lakes. Most kettles are circular in shape because melting blocks of ice tend to become rounded; distorted or branching depressions may result from extremely irregular ice masses.

Two types of kettles are recognized: a depression formed from a partially buried ice mass by the sliding of unsupported sediment into the space left by the ice, and a depression formed from a completely buried ice mass by the collapse of overlying sediment. By either process, small kettles may be formed from ice blocks that were not left as the glacier retreated but rather were later floated into place by shallow meltwater streams. Kettles may occur singly or in groups; when large numbers are found together, the terrain appears as mounds and basins and is called kettle and kame topography. *See also* kame.

kettle gong, percussion instrument of the Bronze Age cultures of China, Indochina, and Indonesia. It was used primarily in rainmaking rites. Some kettle gongs from northern Vietnam are dated between the 5th and 3rd centuries BC. When played, they are suspended so that the striking surface (the head) is vertical.

kettledrum, percussion instrument in which a membrane is stretched over a hemispherical or similar-shaped shell and held taut, usually by a hoop with rope lacings, adjusting screws, or various mechanical devices; in some varieties the lacings may pierce the skin directly or the membrane may be tied on with a thong. When struck by sticks or, less commonly, by the hands, the membrane produces a sound of identifiable pitch. The form of the sound wave is not completely known, nor are the acoustical roles of the shell's shape and the volume of air it encloses.

The kettledrum apparently originated in the Middle East, but its age is not known with certainty. It is speculated that its precursors were primitive pot drums formed by holding or fastening a skin over a clay pot. Arabic writings from the 10th century AD mention varieties of large and small kettledrums, and the Persian reliefs at Ṭāq-e Bostān (*c.* AD



African kettledrums from the Congo Basin, 19th century; in the Metropolitan Museum of Art, New York City

By courtesy of the Metropolitan Museum of Art, New York City, gift of Mrs. John Crosby Brown, 1910

600) show a small, shallow version sometimes called a bowl drum. The earliest known pictures of large, deep kettledrums date from 12th-century Mesopotamia. The early flat-bottomed varieties developed into the now typical egg-shaped and hemispherical types; and metal, as well as clay, shells were used.

Kettledrums spread with Islāmic culture through Africa, Central and South Asia, and Europe. In these areas they are often associated with trumpets as symbols of royal power and status. They are usually played in pairs, with the two drums tuned to different pitches. Large kettledrums may be paired on horses, elephants, and camels in military regiments (including European cavalry and artillery) and civil ceremonies. Smaller instruments may appear in chamber music (*e.g.*, the Indian tabla) and dance accompaniments.

Small paired kettledrums, or nakers, reached Europe by the 13th century via the Crusades. In the mid-15th century the large paired kettledrums of the Ottoman Turks were brought to Europe, principally by way of Hungary and Germany. By the 16th century, screws were placed around the circumference of copper shells to control tensioning and tuning of the calfskin heads. By that time trumpet and kettledrum players were established in most important noble households, and players of both instruments belonged to the same exclusive guild.

No written kettledrum music survives from the 16th century, because the technique and repertory were learned by oral tradition and were kept secret. An early example of trumpet and kettledrum music occurs at the beginning of Monteverdi's opera *Orfeo* (1607).

During the 17th and 18th centuries kettledrumming developed into an elaborate and ostentatious ceremonial art that used complicated drum patterns based on the multiple tonguing technique of trumpeters. Kettledrums entered the orchestra in the mid-17th century; orchestral kettledrums are commonly called timpani (*q.v.*).

ketubba, also spelled KETUBAH, or KETHUBAH (Hebrew: "marriage contract"), plural KETUBBOT, KETUBOTH, or KETUBBAS, formal Jewish marriage contract written in Aramaic and guaranteeing a bride certain future rights before her marriage. Since Jewish religious law permits a man to divorce his wife at any time for any reason, the *ketubba* was introduced in ancient times to protect a woman's rights and to make divorce a costly matter for the husband. The conditions stipulated in the document also guarantee the woman's right to property when her husband dies. A Jewish wife carefully preserves the *ketubba,* not as evidence of marriage but for its future value.

In Orthodox and Conservative congregations, the *ketubba* is a prerequisite for marriage. It must be signed by two witnesses not related to the couple or to each other and, in some congregations, by the bridegroom also. A summary of the conditions is often added in the vernacular, and this is usually read together with the formal document just before or during the marriage ceremony.

Handwritten *ketubbot* with illuminated margins, common in the Middle Ages, have now generally been replaced by printed formulas with a space provided for the specific conditions of the contract. The formula used by Conservative Jews obliges the couple to appear before a rabbinic court to settle future marital disputes. This obligation provides an opportunity for counselling and precludes the possibility of immediate divorce agreed to in a state of high emotion.

Ketuvim (Hebrew), English WRITINGS, Greek HAGIOGRAPHA, the third division of the Hebrew Bible, or Old Testament. Divided into four sections, the Ketuvim include: poetical books (Psalms, Proverbs, and Job), the Megillot, or Scrolls (Song of Solomon, Ruth, Lamentations of Jeremiah, Ecclesiastes, and Esther), prophecy (Daniel), and history (Ezra, Nehemiah, and I and II Chronicles).

Thus the Ketuvim are a miscellaneous collection of liturgical poetry, secular love poetry, wisdom literature, history, apocalyptic literature, a short story, and a romantic tale. They were composed over a long period of time—from before the Babylonian Exile in the early 6th century BC to the middle of the 2nd century BC—and were not entirely accepted as canonical until the 2nd century AD. Unlike the Torah and the Nevi'im (Prophets), which were canonized as groups, each book of the Ketuvim was canonized separately, often on the basis of its popularity.

Kevin, SAINT, Gaelic CAEMGEN, Latin COEMGENUS (b. near Dublin—d. June 3, 618, Glendalough, County Wicklow, Ire.; feast day June 3), one of the patron saints of Dublin, founder of the monastery of Glendalough.

The earliest life (10th/11th century?) states that Kevin was born into the royal line of the ancient Irish kingdom of Leinster and chose as a young man to become a hermit in Glendalough, where he later founded the monastery. With Kevin as abbot, it became one of Ireland's leading monastic centres. The several lives of Kevin are largely legendary; they often represent him as a protector of animals.

Kew Gardens, formally ROYAL BOTANIC GARDENS, botanical garden located at Kew, site of a former royal estate in the London borough of Richmond. The original botanical collection was begun by Lord Capel in the late 1600s, and by the end of the 19th century the gardens covered 117 ha (288 ac). Sir William Chambers designed the orangery, a superb example of Georgian architecture, and also the pagoda, a 49.7-m- (163-ft-) high Chinese-style building which serves as a landmark.

In 1841 the gardens were conveyed to the nation, and they soon developed into an important botanical institution, with more than 40,000 different kinds of plants, an herbarium of 6,500,000 dried specimens, and a library of more than 230,000 volumes. Its three museums are largely devoted to economic plant products and a laboratory of phytogenetics and taxonomy. The collections of tropical orchids, succulents, tropical ferns, and Australian plants are exceptionally fine.

Kew originated the plantation industry of rubber and still plays an important role in plant introduction and as a quarantine station. The garden's publications, the *Kew Bulletin* and the *Index Kewensis,* for which supplements are issued every five years, maintain a record of all described higher plant species of the world from the time of Linnaeus.

Kewanee, city, Henry County, northwestern Illinois, U.S. Founded in 1854 by settlers from New England after the arrival of the Chicago, Burlington and Quincy Railroad and originally called Berriam, it was renamed Kewanee (Indian for "prairie chicken"). In 1924 it absorbed the nearby community of Wethersfield. The economy is based on agriculture (notably hogs) and manufacturing (heating equipment, farm implements, and work clothes). Black Hawk College–East Campus was established in Kewanee in 1969. Inc. village, 1872; city, 1897. Pop. (1980) 14,508.

Keweenaw Bay, inlet of southern Lake Superior, indenting for 22 mi (35 km) the coast of the Upper Peninsula of Michigan, U.S. The bay narrows from a 12-mi width at its mouth, and it is the eastern outlet for the Keweenaw Waterway, which cuts northward via Portage Lake through the Keweenaw Peninsula. The villages of Keweenaw Bay, Baraga, and L'Anse lie along the bay, which is popular as a summer resort area and is noted for its fishing. Early explorers, trappers, and missionaries used the site as a campground. L'Anse Indian Reservation lies along the bay's southern shore.

Keweenawan System, division of Late Precambrian rocks and time in North America (the Precambrian began about 4,600,000,000 years ago and ended 570,000,000 years ago). Rocks of the Keweenawan System are about 10,700 metres (about 35,000 feet) thick, overlie rocks of the Huronian System, and underlie rocks of the Cambrian System; it has been suggested that the youngest Keweenawan rocks actually may be Cambrian in age. In the Lake Superior region, Keweenawan rocks consist of reddish sandstones, siltstones, shales, and some conglomerates. Great thicknesses of lava flows also occur; it has been estimated that about 100,000 cubic kilometres (24,000 cubic miles) of lava were produced. The burden of the great weight of lava caused the crust beneath to sag and produced the basin that Lake Superior now occupies. The Keweenawan System has been divided into Lower, Middle, and Upper series; the lavas are primarily concentrated in the Middle Keweenawan Series, whereas the Lower Keweenawan Series is dominated by sediments. The Keweenawan System is named for prominent exposures studied at Keweenaw Point, Michigan.

key (island): *see* cay.

key, in locksmithing, an instrument, usually of metal, by which the bolt of a lock (*q.v.*) is turned.

The Romans invented metal locks and keys and the system of security provided by wards. This system was, for hundreds of years, the only method of ensuring that only the right key would rotate in the keyhole. The wards are projections around the keyhole (inside the lock) that make it impossible for a plain key to be turned in it. If, however, the key has slots cut in it that correspond to the projections, the slots clear the projections, the key can be turned, and the bolt is thrown back. Throughout the centuries immense ingenuity was exercised by locksmiths in the design of the wards, and, consequently, some keys are very complicated. All the same, it was not difficult to make an instrument that could be turned in spite of the wards, to achieve what is known as "picking" a lock.

Little progress was made in the mechanism of the lock and key until the 18th century, when a series of improvements began that led, in the 1860s, to the development of the Yale cylinder lock, with its thin, convenient key capable of many thousands of variations. The key is made in a number of different cross sections so that only a particular variety of key will fit into a particular keyhole; this, in effect, is a form of ward. The serrations on the edge of the key raise pin tumblers to exactly the correct height, allowing the cylinder of the lock to revolve and withdraw the bolt. Although not impossible to pick, these locks are convenient and compact and offer a reasonable degree of security. In the late 20th century they were the most usual form of fastening for an outside door and were made by locksmiths in all parts of the world.

A special system is that of the master key. This system is used when a number of locks (such as those securing bedrooms in a hotel), each having a different key, must all be opened by a landlord or caretaker using a single key. Where the only security is by wards, a skeleton key that avoids the wards may be the type of master key chosen. In other cases, many methods are employed; for instance, there may be two keyholes (one for the servant key, the other for the master), or two sets of tumblers or levers, or two concentric cylinders in a Yale lock.

key, in machine construction, a device used to prevent rotation of a machine component, such as a gear or a pulley, relative to the shaft on which it is mounted. A common type of key is a square bar that fits half in a groove (keyway) in the shaft and half in an adjoining keyway in the component. If the shaft and the key are of the same material, a key with a width and depth equal to one fourth of the shaft diameter will have the same torque capacity as the solid shaft if its length is 1.57 times the shaft diameter. These proportions are closely approximated in practice.

key, in music, closed system of functionally related chords generated by certain tonal conventions associated with the Western concept of diatonic major and minor scales. Each of the pitches, or tones, used in Western music can serve as a tonic note, or keynote, for a major or minor key. Thus, the key of G major refers to a system of fixed relations between chords that is based on the tones of the major scale beginning on the note G, its tonic note. In musical notation, key is indicated by the key signature, a group of sharp or flat symbols at the beginning of each line of music.

The concept of key is integral to the system of tonality (organization of notes, chords, and keys around a centrally important, or focal, tone). Different keys are closely or distantly related to one another according to the number of notes their diatonic scales share: the keys of C major and G major have six of their seven notes in common and are closely related. The distantly related keys of C major and C♯ major have no notes in common. The ability of a listener to sense key relationships is exploited in musical forms such as the sonata. The broader term tonality is sometimes used as a synonym for key.

Key, David M(cKendree) (b. Jan. 27, 1824, Greene Co., Tenn., U.S.—d. Feb. 3, 1900, Chattanooga, Tenn.), lawyer and Confederate Army officer who was appointed U.S. postmaster general by Pres. Rutherford B. Hayes in fulfillment of a campaign pledge made by Hayes during the disputed election of 1876.

Admitted to the bar in 1850, Key practiced law in Chattanooga and became active in Democratic politics. In 1856 he stood as a presidential elector for James Buchanan and four years later for John C. Breckinridge. An opponent of secession, he worked to keep Tennessee in the Union but remained loyal to his state once it joined the Confederacy. In 1861 he was commissioned an officer in the Confederate Army, rising to the rank of lieutenant colonel by war's end. At Vicksburg (1862) he was wounded and taken prisoner.

After the war Key worked to heal sectional grievances and restore the Union. In 1870 he was a delegate to the Tennessee state constitutional convention and was elected a state chancellor. He was appointed to the U.S. Senate (1875), succeeding former president Andrew Johnson, but two years later was defeated in a bid to retain the seat. In the disputed presidential election of 1876, Key supported Samuel J. Tilden over Rutherford B. Hayes. When the election was turned over to a specially appointed electoral commission, Hayes—in return for Southern support—promised, among other things, that he would name a Southern Democrat to a post in his Cabinet. Hayes's intent had been to appoint the Confederate general Joseph E. Johnston as secretary of war; but the proposal drew such heated criticism within his own party that he settled on Key, a less prominent representative of the Confederacy, whom he in 1877 appointed postmaster general. Key resigned in 1880 to accept a seat on the U.S. District Court in Tennessee, where he served until his retirement in 1894. As a jurist he was noted for seeking justice rather than for adhering to the strict letter of the law.

Key, Ellen (Karolina Sofia) (b. Dec. 11, 1849, Sundsholm, Swed.—d. April 25, 1926, Strand), Swedish feminist and writer whose advanced ideas on sex, love and marriage, and moral conduct had wide influence; she was called the "Pallas of Sweden."

Key was born the daughter of the landowner and politician Emil Key (1822–92). Family misfortune obliged her to take up teaching in Stockholm in the late 1870s, and for the next 20 years she also lectured at the workers' institute there. *Barnets århundrade* (1900; *The Century of the Child,* 1909) made her world famous. This book and numerous other publications concerning the issues of marriage, motherhood, and family life were translated into many languages. In 1903 she started lecture tours abroad, particularly in Germany. She also propagated her ideas through an enormous correspondence, and many young authors were influenced by her. Her liberal and radical opinions in most fields of cultural life, and especially on love and marriage, led to controversy.

Key, Francis Scott (b. Aug. 1, 1779, Frederick County, Md., U.S.—d. Jan. 11, 1843, Baltimore), U.S. lawyer, best known as the author of the U.S. national anthem, "The Star-Spangled Banner."

In September 1814, after the burning of the city of Washington by the British during the War of 1812, Key was sent to the British fleet in Chesapeake Bay to secure the release of his friend William Beanes, who had been captured after the defeat of the U.S. forces at Bladensburg, Md. He was detained aboard ship during the shelling of Ft. McHenry, one of the forts that successfully defended Baltimore. During the night of the bombardment, September 13–14, Key's anxiety was at high pitch, and in the morning when he saw the American flag still flying over the fortress, he wrote "The Star-Spangled Banner." Released that day, he rewrote the poem in a Baltimore hotel. It was printed anonymously under the title "Defence of Fort M'Henry" and on September 20 was published by the *Baltimore Patriot.* Set to the tune of an English drinking song, "To Anacreon in Heaven," it soon became popular throughout the nation. It was later adopted by the army and navy as the national anthem, and in 1931 it was officially adopted by Congress.



Francis Scott Key, portrait by an unknown artist

By courtesy of the Pennsylvania Academy of the Fine Arts, Philadelphia

Key, V(aldimer) O(rlando), Jr. (b. March 13, 1908, Austin, Texas, U.S.—d. Oct. 4, 1963, Cambridge, Mass.), U.S. political scientist known for his studies of the U.S. political process and for his contributions to the development of a more empirical and behavioral political science.

Educated at the University of Texas (B.A., 1929; M.A., 1930) and the University of Chicago (Ph.D., 1934), Key joined the faculty of the University of California at Los Angeles. In 1936–38 he served with the Social Science Research Council and the National Resources Planning Board. He taught at Johns Hopkins University (1938–49) with interruptions for government service with the Bureau of the Budget during World War II. He taught at Yale in 1949–51 and at Harvard University from 1951 until his death.

In 1942 Key published *Politics, Parties, and Pressure Groups,* in which he analyzed the part played by organized interests in the political process. His *Southern Politics in State and Nation* (1949) pioneered in the use of quantitative techniques and was a classic in regional political studies. In *Public Opinion and American Democracy* (1961) he analyzed the link between the changing patterns of public opinion and the governmental system. He was vigorous in opposing the idea that voters' preferences are socially determined, and in his posthumous work, *The Responsible Electorate: Rationality in Presidential Voting 1936–60* (1966), he analyzed public opinion data and electoral returns to show what he believed to be the rationality of voters' choices. Other works by Key include *The Techniques of Political Graft in the United States* (1936), *A Primer of Statistics for Political Scientists* (1954), and *American State Politics: An Introduction* (1956). He served as president of the American Political Science Association in 1958–59.

key bed (geology): *see* marker bed.

Key deer, subspecies of white-tailed deer (*q.v.*).

Key Islands (Indonesia): *see* Kai Islands.

Key Marco carving, group of carvings excavated at Key Marco, Fla., that provide the finest extant examples of North American Indian wood carving up through the 15th century. The highly realistic and sensitive animal carvings are thought to be the work of the now-extinct Calusa Indians.

The sculptures, presumed to have had a ceremonial use, retain traces of paint that highlighted the sculptural form. Parts of some, such as the ears of a deer, were originally hinged with leather to allow movement. Shell inlays were used for eyes. The degree of realism achieved in these carvings is unequalled in sculpture produced north of Mexico, and some scholars have speculated—without evidence—that commerce might have gone on

between the Indians of the Florida Keys and those of Mexico.

key pattern (architecture): *see* fret.

Key West, city, seat of Monroe county, southwestern Florida, the southernmost settlement within the continental limits of the United States. It lies about 100 miles (160 km) from the mainland on a sand and coral island about 4 miles (6.5 km) long and 1.5 miles (2.4 km) wide in the western Florida Keys. The name is an English corruption of Cayo Hueso ("Bone Islet"), the name given to it by Spanish explorers who found human bones there. The Spanish crown granted the island to a Spanish army officer, Juan Pablo Salas, who sold it to John Simonton of Mobile, Ala., in 1822. That year the island was occupied by U.S. forces under Matthew C. Perry, and a naval depot was soon established by David Porter as a base of operations against pirates. A fire destroyed much of the town in 1886. A booming cigar-manufacturing industry survived the fire but moved to the mainland following labour troubles late in the 19th century. The Overseas Highway (opened 1938) connects the keys by 42 bridges, some several miles long, over vast expanses of water.

There is a unique blend of Cuban, West Indian, Bahamian, and American atmosphere in the city of Key West. Tourism and fishing are major sources of income. Tropical fruits, including breadfruit and lime, flourish, and millions of pounds of food fish, crabs, lobsters, and shrimp are marketed annually. Throughout its history the city has been a seat of naval activity, and nearby is a U.S. naval air station. It is a seat of Florida Keys Community College (1965), and the home of Ernest Hemingway and residence of John James Audubon have been preserved. Inc. 1828. Pop. (1987 est.) 26,034.

keyboard instrument, musical instrument that produces sounds in response to the touching of keys, push buttons, or parallel levers arranged in a row before the performer. In nearly all cases those sounds are consecutive notes in the chromatic scale (all the notes, in series, possible to a keyboard or wind instrument with fixed tempered intervals), running from the bass at the left to the treble at the right. Keyboard instruments can be broadly grouped in three basic categories: aerophones are those that make sound by sending air through pipes, including the organ (*q.v.*), melodion, and harmonium; chordophones are those in which the action of the key directly instigates some mechanical effect, whether plucking a string, as in the harpsichord, or hammering a string, as in the clavichord and piano; electrophones are those in which the keyboard operates an electronic system of making sound, as in the electronic organ and synthesizer.

A brief treatment of keyboard instruments follows. For full treatment, *see* MACROPAEDIA: Musical Instruments.

Keyboards of some kind appear to have been known in antiquity, but information is sketchy; there are also only a few instances of rudimentary keyboard instruments developed outside Europe and North America. The keyboard is, therefore, a characteristic of Western music, on which it has had a powerful influence. It is hard to imagine that Western harmony could have reached its vast complexity without instruments capable of sounding many notes at once and without the system of equal temperament (where intervals between each key consist of semitone units, each set at a 12th of an octave) that keyboard instruments encouraged.

The seeds of these developments can be traced to the 14th century. This was the period of the earliest surviving keyboard music, the Robertsbridge Codex of about 1320, and of the earliest surviving keyboard instrument, a Swedish organ from later in the century. The latter had a keyboard covering an octave and a sixth, including all the sharps and flats. At this stage, however, the keys were usually several centimetres wide, and so the instruments were capable only of the most simple harmony, preferably in a slow tempo. The development of keyboard music did not take off until the 16th century, when keyboards began to be built according to specifications that have since remained standard. An octave was made to span a distance of about 6.5 inches (16.5 cm), making it possible for the interval to be covered by one hand; and the diatonic keys (those of the C major scale) were given a white finish, the chromatic keys set back and given a black finish, though sometimes the colour-coding was reversed.

This modernization of the keyboard went hand in hand with the development of new instruments of the plucked-string type, notably the harpsichord, the spinet, and the virginals. All of these instruments were first mentioned in the 15th century, but no examples survive from before the early 16th; and certainly it was during the latter century that the harpsichord and its relatives became common. Naturally, keyboard music began to appear in much greater quantities, and the possibilities of keyboard technique began to be exploited. Composers discovered effects such as broken chords, trills, and other ornaments that were much more natural with keyboard instruments than with others.

Development of keyboard instruments and keyboard music went on during the 17th century and the early part of the 18th without essential change, but gradually during the 18th century the harpsichord gave way to the piano. The piano's special feature was that it did not pluck the strings but hammered them, enabling the performer to vary the weight of attack and hence the volume of sound: the very name pianoforte (Italian: "soft-loud") points out this distinction from the level-toned harpsichord. Pianos were first made by Bartolomeo Cristofori in Florence in about 1709, but they made little impression until the second half of the century, when they were made in two basic shapes: either curved like the grand piano or rectangular like the square piano. The upright piano was introduced in 1800 by John Isaac Hawkins of Philadelphia.

During the 19th century, pianos became bigger and heavier, and the music written for them underwent a corresponding change; the harpsichord, meanwhile, virtually disappeared until it was revived early in the 20th century. The celesta, producing bell-like tones from the action of hammers on metal plates instead of strings, was invented by Auguste Mustel in Paris in 1886, but this is an orchestral specialty instrument, not an everyday practice and performance instrument such as the organ, harpsichord, and piano.

Electronic keyboard instruments include the Ondes Martenot, the electronic organ (first marketed by Laurens Hammond in the United States in 1935), the electronic piano, and the synthesizer in most of its forms. Even in this new world of sound, the presence of a keyboard ensures a close correlation with music as it has been known in the West since the 16th century.

Keyes (of Zeebrugge and of Dover), Roger John Brownlow Keyes, 1st Baron, also called (1918–43) SIR ROGER KEYES, 1ST BARONET (b. Oct. 4, 1872, Tundiani Fort, India—d. Dec. 26, 1945, Buckingham, Buckinghamshire, Eng.), British admiral who planned and directed the World War I raid on the German base at Zeebrugge, Belg., April 22–23, 1918, and thus helped to close the Strait of Dover to German submarines.

Keyes entered the Royal Navy in 1885. For bold action during the Boxer Rebellion in China in 1900, he was promoted to commander. As commodore in charge of submarines (1910–14), he was partly responsible for the British victory in the Battle of Helgoland Bight (Aug. 28, 1914). In 1915 he was chief of staff for the unsuccessful Dardanelles expedition.

Appointed director of plans at the Admiralty in 1917, Keyes began to prepare operations for blocking the entrances to Zeebrugge and Ostend. On the first attempt, the mission at Zeebrugge succeeded, but the blockships could not find the Ostend entrance. Two weeks later, Keyes sent the *Vindictive* to Ostend, where its volunteer crew sank the ship at the harbour entrance, thus discouraging most German U-boat operations in Dover Command waters.

After the Armistice Keyes was made a baronet and received a government grant of £10,000. He held a number of commands, attaining the rank of admiral of the fleet from 1930. He sat in Parliament from 1934 until his elevation to the peerage in 1943. Briefly, in May 1940, he returned to prominence in an attack on Neville Chamberlain's conduct of World War II.

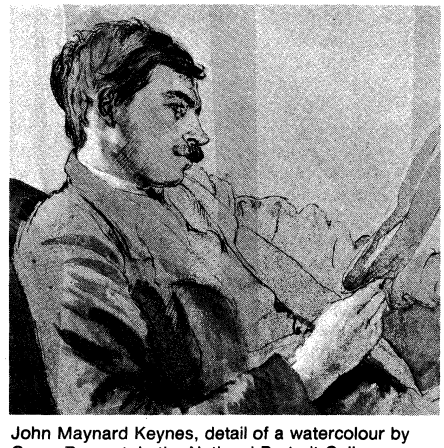
He wrote *The Naval Memoirs of Admiral of the Fleet Sir Roger Keyes,* 2 vol. (1934–35), and *Adventures Ashore & Afloat* (1939).

Keyhole Nebula (astronomy): *see* Eta Carinae.

Keynes, John Maynard (b. June 5, 1883, Cambridge, Cambridgeshire, Eng.—d. April 21, 1946, Firle, Sussex), English economist, journalist, and financier, best known for his revolutionary economic theories (Keynesian economics) on the causes of prolonged unemployment. His most important work, *The General Theory of Employment, Interest and Money* (1935–36), advocated a remedy for economic recession based on a government-sponsored policy of full employment.

Background. Keynes was born into a moderately prosperous family of the professional elite. His father was an esteemed economic scholar and later academic administrator at the University of Cambridge. His mother, the daughter of a minister endowed with advanced opinions, was one of the first female graduates of the same university.

An obviously gifted youngster, Keynes traveled the customary educational route provided for the upper-class and upper-middle-class child. From his preparatory school, he went to Eton, the most prestigious public (*i.e.,* private) boy's school in the land. In sharp contrast to the bitter school memories of such gifted Englishmen as the writers George Orwell and Cyril Connolly, Keynes appears to have enjoyed every moment of his Eton experience. He was somewhat delicate of constitution and no athlete, but he excelled both as a mathe-



John Maynard Keynes, detail of a watercolour by Gwen Raverat; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

matician and as a scholar of the classics. His essays on such varied themes as Bernard of Cluny, the character of the Stuart monarchs, and the differences between East and West won numerous prizes. As his greatest feat, he secured the respect and admiration of his irreverent contemporaries by a general affability and a pronounced talent for the management of student societies. His classmates honoured him with election to Pop, the student society that traditionally participates in the government of Eton affairs.

At Cambridge, which Keynes entered in 1902, he fared even better. At King's College, one of the oldest and richest of Cambridge endowments, he "quickly established," as one biographer put it, "the ascendancy that he had achieved over his contemporaries at Eton." He blossomed as a polemical speaker, becoming president of the University Union Society, the undergraduate counterpart of the House of Commons. Gradually, as he came under the influence of Alfred Marshall, the leading Cambridge economist, his mathematical interests diminished, and his attachment to politics and economics increased.

Cambridge introduced Keynes to an important circle of writers and artists. The early history of Bloomsbury, that exclusive circle of the cultural elect, which counted among its members Leonard and Virginia Woolf, the painter Duncan Grant, and the art critic Clive Bell, centres upon Cambridge and the remarkable figure of Lytton Strachey. Strachey, who had entered Cambridge two years before Keynes, inducted the younger man into the exclusive private club known simply as "the Society." Its members and associates (some of them homosexual, like Keynes himself) were the leading spirits of Bloomsbury. Throughout his life, Keynes was to cherish the affection and respond to the influence of this tribe of free souls.

Early career. After graduating from Cambridge, Keynes became a civil servant and moved to the India Office in Whitehall. His experience there formed the basis of his first major work, which is still the definitive examination of pre-World War I Indian finance and currency. He then returned to Cambridge, where he taught economics with great success until 1915. The onset of World War I brought him back to government employment, this time in the Treasury, an agency even more powerful than its American counterpart. There he was daily concerned with the economic management of the war. His special responsibility covered relations with allies and the conservation of England's scant supply of foreign currencies.

His performance marked Keynes for a great public career, but the Versailles Peace Conference was to transform his prospects. Accompanying his prime minister, Lloyd George, to France as an economic adviser, Keynes soon became so distressed at the political chicaneries of the proceedings and the unrealistic character of the reparations policies to be imposed upon a defeated Germany that his health deteriorated, and he resigned his post, oppressed, to quote from a letter to his father, at the impending "devastation of Europe."

Always an activist, Keynes translated personal distress into public protest. In two summer months he composed the indictment of the Versailles settlement that by Christmas 1919 reached the bookstores as *The Economic Consequences of the Peace.* The permanent importance of this polemical essay lies in its economic analysis of the excessive weight of reparations upon the German economy and the corresponding lack of probability that they ever would be paid. What guaranteed the book general success were the blistering sketches of Woodrow Wilson, Clemenceau, and Keynes's old chief, Lloyd George. As a consequence, in some Whitehall circles Keynes remained to the end of his life a man not quite to be trusted, an iconoclast perfectly willing to rock any boat into which he had imprudently been invited.

In Cambridge, to which Keynes now returned, his reputation was rather different. He was quite simply esteemed as the most brilliant student of Alfred Marshall and A.C. Pigou, the two Cambridge economists who between them had produced the authoritative explanation of how competitive markets functioned, business firms operated, and consumers spent their incomes. Although the tone of Keynes's major writings in the 1920s was occasionally skeptical, he did not directly challenge the conventional wisdom of the period that held laissez-faire, only slightly tempered by public policy, the best of all possible social arrangements.

Two of Keynes's opinions did foreshadow the theoretical revolution over which he presided in the 1930s. In 1925 he opposed England's return to the gold standard at the prewar dollar–pound ratio of $4.86; and, long before the Great Depression, Keynes was worried about the persistent unemployment of British coal miners, shipyard workers, and textile operatives. Reconciled by this time to Lloyd George (who was never to return to office), he supported the Liberal Party's program of public works to take the unemployed off welfare and place them in useful jobs. But respectable economists still relied upon the expected automatic adjustments of the free market, and the Treasury was attached to the still more doctrinaire view that public works were necessarily useless because any increase in the government deficit would surely reflect itself as an equal decline in private investment. Since Keynes could not yet offer a theoretical refutation of his colleagues' opinions, his agitation for public works had little political effect.

His private life was more satisfactory. In 1925 he married the talented and charming ballerina Lydia Lopokova. Despite the doubts expressed by Cambridge conservatives of his wisdom in courting a "chorus girl," the marriage was happy. Indeed, in the judgment of the widow of the economist Alfred Marshall it was "the best thing Maynard ever did." His friendships with the Bloomsbury circle prospered, and he easily financed a comfortable London apartment from the proceeds of highly successful stock speculations. Always a late riser, Keynes conducted the management of his investments in civilized fashion while he breakfasted in bed. As a journalist he extended his reputation, writing in the leftist *New Statesman* (whose Board of Directors he later joined) as well as the major newspapers, *The Times* (of London) and the *Manchester Guardian* (now the *Guardian*).

Keynes and the Depression. What altered Keynes's public reputation a second time and swept him to permanent fame was his response to the economic tragedies of the 1930s. With a few noteworthy exceptions politicians and economists were universally bewildered by events and shorn of confidence in traditional policies. Conventional economic wisdom still held, against mounting evidence to the contrary, that time and nature would restore prosperity if government did not try to manipulate the economy. After all, the unemployed could always get jobs if they only were willing to work for lower wages. Businessmen could always restore their sales by the parallel strategy of slashing their prices. In the process a few of the weaker brethren would indubitably be wiped out. Nevertheless, if all groups accepted the discipline of competitive adjustment, soon recovery, prosperity, and higher wages would return.

Unhappily, the remedy worked nowhere. In the United States Franklin Roosevelt's 1932 landslide presidential victory over Herbert Hoover attested to the political bankruptcy of laissez-faire. New explanations and new policies were urgently needed. These Keynes supplied. His enduring triumph was his composition in the early 1930s of the most influential treatise composed by an economist thus far in this century, comparable to the *Wealth of Nations* as an intellectual event and to Malthus' *Essay on Population* as a guide to public policy. *The General Theory of Employment, Interest and Money,* which appeared in 1935–36, is a highly technical, even abstruse exposition of new ideas that had been partly foreshadowed in his *Treatise on Money* (1930). The central message is readily translated into two powerful propositions. The first declared the existing theory of unemployment nonsense. In a depression, according to Keynes, there was no wage so low that it could eliminate unemployment. Accordingly, it was wicked to blame the unemployed for their plight. The second proposition proposed an alternative explanation about the origins of unemployment and depression. This centred upon aggregate demand—*i.e.,* the total spending of consumers, business investors, and public agencies. When aggregate demand was low, sales and jobs suffered. When it was high, all was well.

From these generalities there flowed a powerful and comprehensive view of economic behaviour. Because consumers were limited in their spending by the size of their incomes, they were not the source of business cycle fluctuations. The dynamic actors were business investors and governments. In depressions the thing to do was either to enlarge private investment or to create public substitutes for private investment deficiencies. In mild economic contractions, monetary policy in the shape of easier credit and lower interest rates just might stimulate business investment and restore the aggregate demand caused by full employment. Severer contractions required as therapy the sterner remedy of deliberate public deficits either in the shape of public works or subsidies to afflicted groups.

In an extremely short space of time, Keynes converted most of his professional colleagues to his economic beliefs. During World War II and after, one Western democracy after another affirmed its new commitment to maintain high employment. In the United States the Employment Act of 1946 formally imposed upon presidents and congresses the duty of maintaining prosperity.

Later career. The *General Theory* was Keynes's last major written work. In 1937 he suffered a severe heart attack. Two years later, though not completely recovered, he returned to teaching at Cambridge, wrote three influential articles on war finance entitled *How to Pay for the War,* and served once more in the Treasury as an all-purpose adviser. As the war drew to a victorious conclusion, Keynes turned his thoughts to the design of international financial institutions calculated to limit the spread of depression. At the Bretton Woods Conference in 1944 he played a prominent part. But the institutions that resulted from the conference, the International Monetary Fund and the World Bank—two agencies that survive into the 1980s—bear much stronger marks of the orthodox theories of the United States Treasury of that time than of Keynes's thinking.

His last major public service was his brilliant negotiation in the autumn and early winter of 1945 of a multibillion-dollar loan granted by the United States to England. By this time the British establishment was more than ready to welcome home its errant son. He was now both a member of the Court of the Bank of England (as its governing board is termed) and, as Lord Keynes of Tilton, a peer of the realm. In the old Bloomsbury tradition of disrespect for the conventional, he wryly commented, "I am not sure which of us is

being made an honest woman—the Old Lady [as the Bank of England is popularly known] or me." The worry was groundless. Keynes's old enemies had by now capitulated to one of their country's supreme intellects.

Overstrained by wartime exertion, Keynes died in 1946. An intimate of artist, scholar, and politician alike, cultural entrepreneur, gifted teacher, loyal friend, and original thinker, this child of the philosophical tradition of Locke, Hume, and Mill late in his life expressed as a single regret that he had not drunk more champagne. Bloomsbury had always preferred effervescence to pomposity. (R.L./Ed.)

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Keynes, John Neville (b. Aug. 31, 1852, Salisbury, Wiltshire, Eng.—d. Nov. 15, 1949, Cambridge, Cambridgeshire), British philosopher and economist who synthesized the two poles of economic thought, using both inductive and deductive reasoning in his methodology.

J.N. Keynes was educated at the universities of London and Cambridge. After graduating from Cambridge (1875), he was a university lecturer in moral science at Cambridge (1884–1911) and then served as registrar of the university (1910–25). He was active in the foundation of the Economics Tripos at Cambridge. Keynes's most important contributions to economics were as a logician and methodologist. His two chief works are *Studies and Exercises in Formal Logic* (1884) and his classic work on economic methodology, *The Scope and Methods of Political Economy* (1891). This work categorized the various approaches to methodology as inductive and deductive, with Keynes adopting a syncretistic position. At a time when the German-speaking world was engaged in the *Methodenstreit* "battle of method") between the Austrian economic school led by Carl Menger, which advocated a deductive approach and stressed the importance of pure theory, and the followers of German economist of Gustav Schmoller, who insisted on the importance of inductive studies, Keynes, by contrast, insisted that both induction and deduction were required. He felt that inductive reasoning provided the general premises upon which deduction had to be based and deduction resulted in generalizations or laws which then had to be tested by inductive procedures. Keynes was the father of perhaps the most influential economist of the 20th century, John Maynard Keynes.

Keynes, Richard Darwin (b. Aug. 14, 1919, London), British physiologist who was the first to trace the movements of sodium and potassium during the transmission of a nerve impulse by using radioactive sodium and potassium.

After receiving his Ph.D. in 1949 from Cambridge University, Keynes joined its faculty. He was head of the physiology department of the Agricultural Research Council's Institute of Animal Physiology at Babraham in 1960–64 and assumed the directorship of the institute from 1965 to 1973. Since 1981 he has been president of the International Union for Pure and Applied Biophysics. In 1959 he became a fellow of the Royal Society of London.

Keynes contributed many papers to scientific journals, primarily on ion (*i.e.,* charged atom) transport in tissue and on the biochemistry and thermodynamics of the electrical organs found in some eels and fishes.

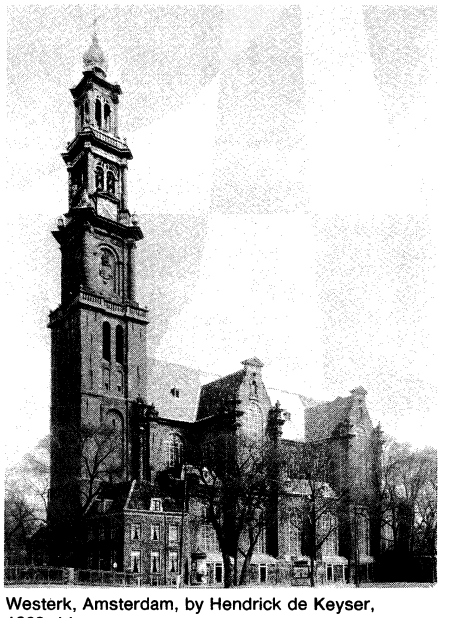
keynote (music): *see* tonic.

Keyri (ancient Finnish feast day): *see* Kekri.

Keys, John: *see* Caius, John.

Keyser, Hendrick de (b. May 15, 1565, Utrecht, Neth.—d. May 15, 1621, Amsterdam), most important Dutch sculptor of his day and an architect whose works formed a transition between the ornamental style of the Dutch Renaissance and the classicism of the 17th century.

Appointed stonemason and sculptor of the city of Amsterdam in 1594, Keyser became municipal architect in 1612. Most of the buildings he designed were in Amsterdam,



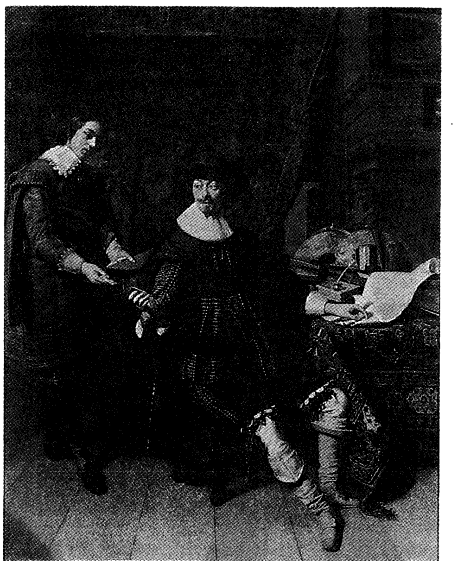
Westerk, Amsterdam, by Hendrick de Keyser, 1603–14

Foto Marburg—Art Resource/EB Inc.

such as the Zuiderkerk (1603–14), the first Protestant church in the Netherlands; the East India House (1606); and his greatest building, the Westerkerk (1620).

Keyser's sculptural masterpiece was a tomb for William the Silent in the Nieuwe Kerk Delft (1614–21). His terra-cotta busts suggest the immediacy and directness of Frans Hals's 17th-century portraits. His son-in-law and best known pupil was the English sculptor Nicholas Stone. His sons Pieter, Willem, and Hendrick became sculptors, and Thomas was an outstanding portrait painter.

Keyser, Thomas de (b. *c.* 1596, Amsterdam—d. June 7, 1667), Dutch Baroque painter and architect, best known for his portraiture of leading civic figures in Amsterdam. He was the son of the distinguished architect and sculptor Hendrick de Keyser. De Keyser chiefly excelled as a portrait painter, though he also executed historical and mythological pictures, such as the "Theseus" and "Ariadne" in the Amsterdam Town Hall. His portraiture is full of character and is often distinguished by a rich, golden glow of colour and Rembrandtesque chiaroscuro. Some of his portraits



"Constantin Huygens and His Secretary," oil on oak by Thomas de Keyser, 1627; in the National Gallery, London

By courtesy of the trustees of the National Gallery, London; photograph, J.R. Freeman & Co. Ltd.

are life-size, but the artist generally preferred to keep them on a considerably smaller scale, even when full-length, as in "Constantin Huygens and His Secretary" (1627). He painted few pictures during the last 27 years of his life. De Keyser's major architectural work is the tower of the Amsterdam Town Hall.

Keyserling, Hermann Alexander, Graf von (Count of) (b. July 20, 1880, Könno, Livonia, Russian Empire—d. April 26, 1946, Innsbruck, Austria), German social philosopher whose ideas enjoyed considerable popularity after World War I.

After studying at several European universities, he began a world tour in 1911, which provided the material for his best known work, *Das Reisetagebuch eines Philosophen* (1919; *The Travel Diary of a Philosopher,* 1925). Keyserling's approach to philosophy was essentially nonacademic, and his ideas, which centred on the theme of spiritual regeneration, were often platitudinous or obscure. His other works include: *Unsterblichkeit* (1907; *Immortality,* 1938), *Schöpferische Erkenntnis* (1922; *Creative Understanding,* 1929), *Wiedergeburt* (1927; *The Recovery of Truth,* 1929), *America Set Free* (1929; *Amerika, der Aufgang einer neuen Welt,* 1931), and *Südamerikanische Meditationen* (1932; *South American Meditations,* 1932).

Keystone Kops, in silent film comedies, insanely incompetent police force, dressed in ill-fitting, unkempt uniforms, appearing regularly in Mack Sennett's slapstick farces from 1914 to the early 1920s. They became enshrined in U.S. film history as genuine folk-art creations, whose comic appeal was based on a native irreverence for authority.

What the Kops lacked in sense, they made up for in zeal, as they dashed off to the chase on foot or drove off in a tin lizzie (one accommodated the entire force), in jerky, speeded-up tempo. Whether they collided with one another around corners or became entangled in clotheslines, ladders, or folding tents, their facial expressions of dour dignity never changed. Many of the great silent film comedians, such

as Roscoe "Fatty" Arbuckle, rose from the ranks of the Kops.

Kezilahabi, Euphrase (b. April 13, 1944, Ukerewe, Tanganyika [now in Tanzania]), Tanzanian novelist, poet, and scholar writing in Swahili.

Kezilahabi received his B.A. from the University of Dar es-Salaam in 1970, taught in various schools throughout his country, and then returned to the university to take graduate work and teach in the department of Swahili. He later completed his graduate studies at the University of Wisconsin in the United States.

Kezilahabi's first novel, *Rosa Mistika* (1971 and 1981), which dealt with the abuse of schoolgirls by their teachers, was a popular success and, though at first banned for classroom use, was later adopted as a standard book for secondary schools in Tanzania and Kenya. His later novels included *Kichwamaji* (1974; "Waterhead"), *Dunia Uwanja wa Fujo* (1975; "The World Is a Chaotic Place"), and *Gamba la Nyoka* (1979; "The Snake's Skin"). The recurrent theme of Kezilahabi's fiction is the difficulty of an individual's integration into a society that is undergoing the stresses brought on not only by development and urbanization but also by the Tanzanian experiment with African Socialism (*ujamaa*), begun in the late 1960s. Many of Kezilahabi's protagonists fail to survive these stresses, but at the point of resolution the author usually manages to convey a sense of, if not optimism, at least the hope that dogged perseverance in the social order will bring its reward.

His greatest skill is in developing an interesting flow of narrative action with a spare, uncomplicated use of language, which allows for a powerful, evocative imagery. This quality reflects Kezilahabi's work as a poet and a theorist of poetics. His poems, such as those in *Kichomi* (1974; "Stabbing Pain"), as well as some of his critical writings on poetry have stirred some controversy on the Swahili literary scene. Kezilahabi broke with the formal traditions of Swahili poetry and argued and demonstrated the legitimacy of the use of blank verse in the language, becoming the first Swahili writer to attempt such innovation.

Kezilahabi is a respected Swahili scholar. His *Ushairi wa Shaaban Robert* ("Poetry of Shaaban Robert"), an appreciative study of the major Swahili poet of the previous generation, was published in 1976, and he served as a consultant in the Institute of Kiswahili Research, which concerns itself with the development and standardization of the language.

K.G., knight of the Garter, member of one of the most exclusive orders of knighthood in the world. *See* Garter, The Most Noble Order of the.

Kgama III (African king): *see* Khama III.

KGB, Russian in full KOMITET GOSUDARSTVENNOY BEZOPASNOSTI ("Committee for State Security"), political police and security agency, the primary intelligence and counterintelligence entity of the Soviet Union. Its responsibilities are domestic as well as international and include, in addition to overt and covert intelligence and counterintelligence, the protection of Soviet political leaders, the use of special internal-security troops, the supervision of border troops, the protection of state and military secrets, the prevention of sedition and subversion, the supervision of censorship, and the control of travel to and from the U.S.S.R.

Established in 1954, the KGB is the most durable of a line of predecessor agencies reaching back to the Cheka, created in December 1917 in the first days of the Bolshevik government. The Cheka (originally VECHEKA, an acronym derived from the Russian for All-Russian Extraordinary Commission for Combating Counterrevolution and Sabotage) was charged with preliminary investigation of counterrevolution and sabotage, but it quickly took upon itself the arrest, imprisonment, and execution of "enemies of the state." Its jurisdiction expanded during the Civil War (1918–20) to include all enemies of Bolshevism, including the bourgeoisie, the former nobility, and the clergy. The Cheka aided in crushing the anti-Soviet Kronshtadt and Antonov uprisings and the suppression of the Nepmen. Its power and autonomy increased, and the Bolshevik government found it necessary to abolish the Cheka—with "expressions of gratitude for heroic work"—in 1922.

The Cheka was immediately supplanted by the GPU (Russian initials for State Political Administration), whose mission was the suppression of counterrevolution and espionage and whose first chief was the Polish Bolshevik Feliks Dzerzhinsky, who had headed the Cheka. When the U.S.S.R. was constituted in 1923, the new secret-police agency was retitled OGPU (for Unified State Political Administration), and its purview was explicitly made all-union—*i.e.,* nationwide—and included additional duties such as the administration of corrective labour camps and the execution of broad new investigative and judicial powers. OGPU forcibly implemented mass collectivization and the deportation of the "kulaks" in the early 1930s. It also staged the show trials (1928–33) of the Mensheviks and other "wreckers." By 1931 OGPU had not only a monopoly on all Soviet police functions but also its own army; a vast network of spies and informers in factories, government offices, and units of the Red Army; and a rapidly growing network of prisons and forced-labour camps.

A reorganization in 1934 saw the OGPU absorbed into the new NKVD (for People's Commissariat of Internal Affairs), which used the extensive investigative and judicial powers it had inherited to carry out Stalin's purges in the 1930s. Among its victims were its first two chiefs, Genrikh G. Yagoda (who had briefly headed the OGPU) and Nikolay I. Yezhov. They were succeeded by Lavrenty P. Beria.

In 1941 the state-security function was separated from the NKVD and became the NKGB (People's Commissariat for State Security). Both agencies, Internal Affairs and State Security, became ministries in 1946, when all commissariats were so redesignated. Beria continued to head the Ministry for Internal Affairs (then MVD), and V.S. Abakumov was chief of the Ministry of State Security (MGB). The latter agency in its various guises conducted Soviet espionage and counterespionage during World War II, administered prisoner-of-war camps, exercised political supervision of the armed forces, and was generally responsible for internal security.

After the end of the war and during Stalin's waning years, the MGB's scope was extended throughout the Soviet bloc and enforced rigid conformity in the satellite states of eastern Europe by functioning as overlord of the satellites' police agencies and by infiltrating and destroying anti-Communist, anti-Soviet, or independent groups. In those countries, as in the Soviet Union itself, citizens were often arrested and punished by the MGB without due process of law. Persons who were politically unreliable were arrested and imprisoned wholesale. When trials were politically necessary, the MGB made the arrests and obtained the necessary confessions. It (and the earlier NKVD) conducted the prewar deportations of the Karachay, Kalmyks, Chechen-Ingush, Crimean Tatars, Balkars, and Volga Germans (1941–44); it carried out the executions and imprisonments of A.A. Zhdanov's supporters in the Leningrad Affair (1948) and the purge of Jewish medical men thought to be plotting against the state in the Doctors' Plot (1953).

Immediately upon the death of Stalin in March 1953, the MGB was merged back into the Ministry for Internal Affairs (MVD), under the old Stalinist Lavrenty Beria. Before summer the post-Stalinist leadership turned the secret-police apparatus against its chief; and, like at least two of his predecessors, Beria was deposed and executed. A series of trials and executions that went on into 1956 eliminated a number of his senior associates. In the meantime, millions of political prisoners had been released from the MVD's vast system of forced-labour camps during the period of liberalization after Stalin's death. The Gulag (*q.v.*), as this camp system is known, consequently shrank greatly, along with the MVD's apparatus of police terror. The MVD was gradually downgraded and abolished in 1960.

Meanwhile, the KGB had been created in 1954 to take over state security and to remain—unlike its forebears—firmly under Communist Party control. The new agency played a major role in the purge of the Beria supporters, and the scope and effectiveness of that purge tended to discredit security police generally. An extensive campaign was undertaken to rehabilitate the secret police—in its new manifestation as KGB—in the eyes of Soviet citizens. The former policy of denying any foreign espionage was abandoned, and heroes of Soviet espionage such as Richard Sorge, executed by the Japanese during World War II, and Rudolf Abel, the master spy who operated in the United States after World War II, were introduced to the public and eulogized in Soviet news media.

By the mid-1960s the KGB had become firmly established as the party's security watchdog, and its value as an instrument of social and political control is reflected in the appointment of its head, Yury Andropov, to the Politburo (1973) and his succession to the helm of the nation (1982–84).

The KGB is the largest secret-police and espionage organization in the world, one whose professional competence is widely respected and whose power and influence within Communist Party and Soviet government circles are substantial. Its organization comprises 17 separate entities. There are a number of chief directorates, concerned with such matters as counterintelligence, foreign intelligence (or espionage), and internal security. The Border Guards Chief Directorate controls the KGB's approximately 300,000 troops, with armour, artillery, and naval vessels, and is responsible for the security of Soviet borders and for keeping intruders out and citizens in. There are several lower-level directorates charged with security operations in the armed forces, technical operations, administration, personnel, surveillance, communications and cryptology, and guard service. There are independent departments for special investigations, finance, operational analysis, physical security, and registry and archives.

Western intelligence sources assert that the KGB conducts the most extensive espionage operations of any nation in the world. KGB agents use "covers" such as Amtorg, the Soviet international trade organization and TASS, the Soviet news agency, as well as the diplomatic cover that is used by the intelligence agency of virtually every government represented at the United Nations and in foreign capitals. The agency also administers the Patrice Lumumba People's Friendship University in Moscow, a school for foreign students from developing countries created, in Nikita Khrushchev's words, "to educate anticolonialist cadres, cadres who would be familiar with Soviet culture and the Communist worldview." According to Western intelligence authorities, the KGB is known to have infiltrated every major Western intelligence service except the U.S. CIA, which is suspected to have been penetrated. The KGB

does not have responsibility for purely military intelligence; it is the purview of the GRU (Glavnoye Razvedyvatelnoye Upravleniye, or Central Intelligence Office), which is the chief intelligence directorate of the army general staff.

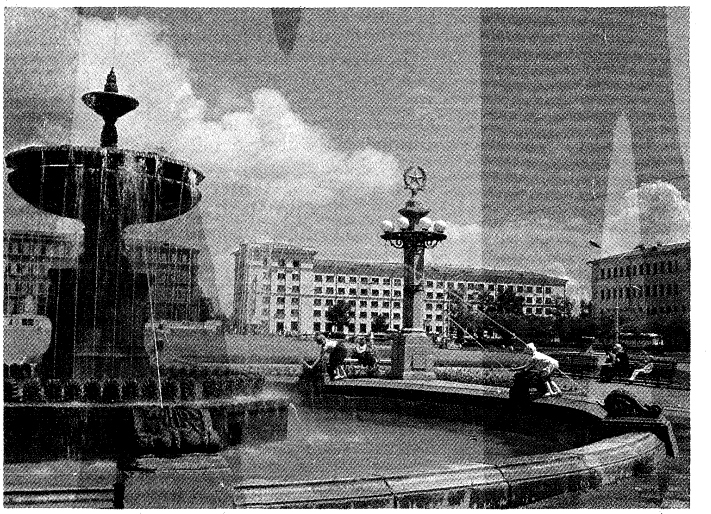
Kgositsile, Keorapetse (William) (b. Sept. 19, 1938, Johannesburg, S.Af.), South African poet and essayist whose writings focus on Pan-African liberation as the fruit of informed heroism and compassionate humanism. Kgositsile's verse uniquely combines indigenous South African and Afro-American structural and rhetorical traditions.

Kgositsile attended Madibane High School in Johannesburg and wrote for the subsequently banned political weekly *New Age*. He began a self-imposed exile in 1961 in Dar es-Salaam, Tanzania, writing for *Spearhead* magazine. From 1962 to 1975 he lived in the United States, first as a graduate student in Pennsylvania, New Hampshire, and New York and then as a teacher or poet-in-residence at the University of Denver in Colorado, the New School for Social Research in New York City, and the North Carolina Agricultural and Technical State University at Greensboro. He then returned to Tanzania to lecture in English at the University of Dar es-Salaam.

Kgositsile's poetry includes *Spirits Unchained* (1969), *For Melba* (1970), *My Name is Afrika* (1971), *The Present Is a Dangerous Place to Live* (1974), *Places and Bloodstains* (1975), and *Herzspuren* (1981; "Traces of the Heart"). He also edited *The Word Is Here: Poetry from Modern Africa* (1973).

Khabarovsk, also spelled CHABAROVSK, *kray* (region), far-eastern Russian Soviet Federated Socialist Republic, occupying an area of 318,375 square miles (824,600 square km), including the Yevreyskaya (Jewish) autonomous *oblast* (province). Its focus is the basin of the lower Amur River, flanked by the Sikhote-Alin mountains (south) and by the complex of mountains (north) dominated by the Bureya Range and a series of long, parallel ranges fronting the Sea of Okhotsk, known collectively as the Dzhugdzhur mountains. Almost the entire *kray* is in dense swampy forest, or taiga, of larch, spruce, and fir, though in the extreme south some deciduous trees occur. The population is overwhelmingly of Russian settler origin, with small numbers of Jews and indigenous groups: Nanais, Evenks, Ulchi, Nivkhs (Gilyaks), and Orochi. The *kray* is rich in minerals, including coal, iron ore, manganese, tin, gold, molybdenum, and tungsten. The main branches of the economy are timber working in the Amur Basin, seal hunting and fishing on the coast, tin production in the Solnechny mining area, and metallurgy and petroleum refining in the two main towns of Khabarovsk, the administrative centre, and Komsomolsk. Agriculture is limited to cultivation of wheat, soybeans, oats, and vegetables in the Amur Basin. Pop. (1987 est.) 1,794,000.

Khabarovsk, also spelled CHABAROVSK, formerly (1858–93) KHABAROVKA, city and administrative centre of Khabarovsk *kray* (region), far-eastern Russian Soviet Federated Socialist Republic, on the Amur River just below its confluence with the Ussuri. The town was named after the Russian explorer E.P. Khabarov, who made several expeditions to the Amur Basin in the mid-17th century. The modern city was founded in 1858 as a military outpost. Its nodal position at the point at which the Trans-Siberian Railroad crosses the Amur made it always an important focus of the Soviet Far East, and at one time it administered the entire area to the Bering Strait. Modern Khabarovsk, undulating across a series of small valleys and ridges perpendicular to the Amur, with its attractive waterfront park and esplanade, juxtaposes modern apartment blocks, factories, and old, one-story wooden houses. It is a major industrial centre, with most enterprises located in the upstream district; they include a wide range of engineering and machine-building industries, oil refining, timber working, furniture making, and many light industries. There are polytechnic, agricultural, medical, teacher-training, and railway-engineering institutes and several scientific research establishments. Pop. (1987 est.) 591,000.



Fountain in the city square, Khabarovsk, Russian S.F.S.R.
Bob and Ira Spring—EB Inc.

Khābūr River, Arabic NAHR AL-KHĀBŪR, Turkish HABUR NEHRİ, Sumerian KHUBUR, Akkadian KHABŪR, river, an important tributary of the Euphrates. It rises in the mountains of southeastern Turkey near Diyarbakır and flows southeastward to al-Ḥasakah, Syria, where it receives its main affluent, the Jaghjaghah; it then meanders south to join the Euphrates downstream from Dayr az-Zawr. The Khābūr ("Source of Fertility") has a total length of about 200 miles (320 km). Although of little navigational value, it has long been important for irrigating the fertile al-Jazīrah region of northeastern Syria. Following World War II, the construction of new dams and an improved canal network increased the total cultivated area to more than 4,000,000 acres (1,600,000 hectares). The Khābūr valley is now Syria's leading wheat-producing district and an important source of cotton, barley, rice, sesame, and vegetables.

Khachaturian, Aram (Ilich) (b. June 6, 1903, Tiflis, Georgia, Russian Empire [now Tbilisi, Georgian S.S.R., U.S.S.R.]—d. May 1, 1978, Moscow), Soviet composer best known for his *Piano Concerto* (1936) and his ballet *Gayane* (1942), which includes the popular, rhythmically stirring *Sabre Dance*.

Trained at the Gnesiny State Musical and Pedagogical Institute in Moscow and at the Moscow Conservatory, and professor at both from 1951, Khachaturian was influenced as a young composer by contemporary Western music, particularly that of Maurice Ravel. In his *First Symphony* (1935) and later works, this influence gave way to Khachaturian's interest in his national heritage of Armenian folk music, as well as in other folk traditions of Georgia, Russia, Turkey, and Azerbaijan. His *Second Symphony* (1943) was written for the 25th anniversary of the Bolshevik Revolution. His other works include a symphonic suite, *Masquerade* (1944; from incidental music to a play by Mikhail Lermontov); ballets, *Happiness* (1939) and *Spartak* (1953; "Spartacus"); a *Third Symphony;* a violin concerto (1940); a cello concerto (1946); and numerous shorter works. He was twice a recipient of the Stalin Prize, and he composed the music for the Armenian national anthem. He also composed film scores and incidental music.

In 1948, along with Dmitry Shostakovich and Sergey Prokofiev, Khachaturian was accused by the Central Committee of the Communist Party of bourgeois tendencies in his music. He admitted his guilt and was restored to prominence. After Stalin's death in 1953, however, he publicly condemned the Central Committee's accusation. He was named People's Artist of the Soviet Union in 1954 and was awarded the Lenin Prize in 1959.

Khachaturian's family was prominent in Soviet cultural affairs; his wife, Nina Makarova, and his nephew, Karen Khachaturian, were also composers.

Khadafy, Muammar: *see* Qaddafi, Muammar al-.

Khadījah (d. 619, Mecca, Arabia [now Saudi Arabia]), the first wife of the Prophet Muḥammad (the founder of Islām), whom she met when she was the widow of a wealthy merchant and had become prosperous in the management of her own commercial dealings.

Having hired Muḥammad as a business agent, she soon came to see him as a suitable husband. She had been married twice before and had children from each marriage. According to most sources she was about 40 and Muḥammad about 25 when they married. That she bore him at least six children, however, may suggest that she was younger. She gave Muḥammad support and encouragement when he received his first revelations and remained loyal to him when many prominent Meccans began to oppose him. While she lived, Muḥammad took no other wives.

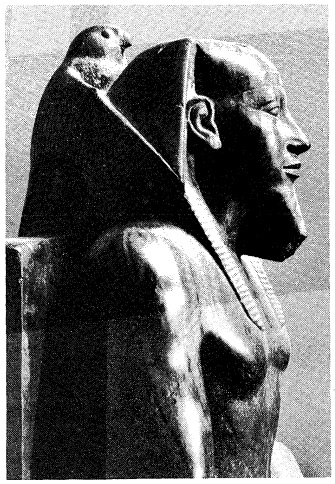
Khaḍir, al- (Islāmic legend): *see* Khiḍr, al-.

Khadzhi-Tarkhan (city, Russian S.F.S.R.): *see* Astrakhan.

Khafre, also spelled KHAFRA, Greek CHEPHREN, or SOUPHIS (fl. late 26th century BC), fourth king of the 4th dynasty (*c.* 2575–*c.* 2465 BC) of Egypt and builder of the second of the three Pyramids of Giza.

Khafre was the son of King Khufu and succeeded the short-lived Djedefre (Redjedef), probably his elder brother. He married his sister Khamerernebti, Meresankh III, and perhaps two other queens. Although many of his relatives were hastily buried in cheap tombs, his own pyramid was almost as vast as the Great Pyramid of his father. Khafre's valley temple, linked to the pyramid by a causeway, was constructed of great monolithic blocks of

granite and contained remarkable statues of the king carved from diorite taken from a remote quarry in the Nubian Desert. Near the causeway is located the Great Sphinx, which many consider to bear Khafre's features.



Khafre, detail of a statue with the god Horus in the shape of a falcon; in the Egyptian Museum, Cairo

By courtesy of the Egyptian Museum, Cairo; photograph, Hirmer Fotoarchiv, Munchen

Khai Dinh, original name NGUYEN BUN DAO (d. Nov. 6, 1925), emperor of Vietnam in 1916–25 and an advocate of cooperation with the colonial power, France.

Khai Dinh was the eldest son of the emperor Dong Khanh and was immediately preceded as emperor by Thanh-thai (1889–1907) and Duy Tan (1907–16). He believed that Vietnam was too backward technologically to assert itself among modern nations and that it should acquire an understanding of French civilization and Western scientific knowledge before becoming independent. He became the first reigning Vietnamese monarch to visit Europe when he attended a colonial exposition at Marseille in 1922 and advocated an autonomous Vietnam associated with France.

Khai Dinh's pro-French attitude was condemned by Vietnamese nationalists, who accused him of betraying his people.

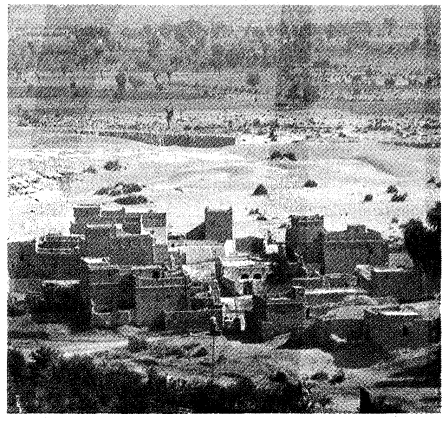
Khaibar Pass (Pakistan): *see* Khyber Pass.

Khairāgarh, also called KHAIRAGARH RAJ, town, southeastern Madhya Pradesh state, central India. The town was the capital of the former Khairāgaṛh princely state, one of the Chhattīsgarh states that merged into Drug (or Durg) district in 1948. A road and rail junction, Khairāgarh is a major agricultural distribution centre. The manufacture of brass vessels, wooden furniture, and cigarettes are the chief industries. Constituted a municipality in 1900, it is the seat of the musical academy, Indira Kala Sangeet University (founded 1956). Pop. (1981) 9,812.

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Khairpur, also called KHAIRPUR MIRS, city, Sind province, south-central Pakistan. The city lies along the Mīr Wāh Canal, 11 miles (18 km) south of the Indus River. It was founded in 1783 by Mīr (chief) Sohrāb Khān, who established the Khairpur branch of the Tālpur family. The settlement was selected as the seat of the *mīr*s (chiefs) of northern Sind. A communications centre, it is connected by rail with Peshāwar and Karāchi and by road with Sukkur and Karāchi. After the establishment of Pakistan in 1947, the city developed industrially, with textile, silk, leather, and carpet manufactures and sugar and flour mills. Amenities include several parks, the *mīr*'s palace, hospitals, a library, a stadium, and several colleges affiliated with the University of Sind. The University of Sind's Shah Abdul Latif campus was established in 1975.

The area in which Kairpur is situated consists of a fertile alluvial plain along the Indus River. A series of sandhills (part of the Great Indian Desert called Nāra) lie toward the east, while a ridge of limestone hills lies to the northeast. Irrigation is by means of canals leading from the Indus at the Sukkur Barrage. The region's chief products are rice, wheat, millet, cotton, oilseeds, mustard, gram (chick-peas), and tobacco. Fruits grown include mangoes, dates, apples, and pomegranates. Horse and donkey breeding is widespread. In the desert area east of Khairpur are natron pits, which yield sodium carbonate. Cottage industries in the region include handloomed cotton, silk, and blanket weaving. The *mīr* of Khairpur is a member of the Tālpur, a Baluchi family that rose on the fall of the Kalhōṛā dynasty of Sind in 1782. The former princely state of Khairpur was recognized by the British in 1832, who allowed it to retain its political existence after the British annexation of Sind in 1843. In October 1955 the Khairpur state acceded to Pakistan.

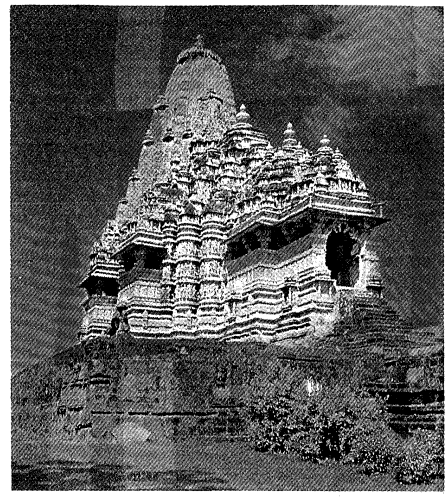


Kot Diji archaeological site south of Khairpur, Pakistan

Frederic Ohringer from the Nancy Palmer Agency—EB Inc.

Kot Diji, 15 miles (25 km) south of Khairpur, is a major archaeological site that reveals primary occupation levels dating from and prior to the Indus Valley civilization (*c.* 3000 BC). Excavations indicate well-settled communities with structured societies familiar with stone tools and pottery. There is no knowledge of the inhabitants' racial and linguistic affinities. Pop. (1981 prelim.) city, 62,000.

Khajurāho, also spelled KHAJRĀHO, historic town, northern Madhya Pradesh state, central India. Khajurāho is famous for its temples, which were built by the Candella Rājput kings of Bundelkhand and dedicated to Śiva (Shiva), Vishnu, and Jaina patriarchs. Of the area's 85 original temples, about 20 are still reasonably well preserved. With few exceptions, the temples are of sandstone, built about AD 950–1050. Both internally and externally they are richly carved with excellent sculptures that are chiefly erotic in subject matter. Most notable is the Śaivite temple Kaṇḍārya Mahādeva (*c.* 1000), a 116-foot (35-metre) agglomeration of porches and turrets culminating in a spire. Khajurāho served as the capital of the Jejākabhukti (Jijhoti) kingdom, corresponding with modern Bundelkhand, and epigraphical records discovered have yielded valuable historical evidence. Its name derives from the prevalence of *khajūr,* or date palm, trees in the area. Pop. (1981) 4,680.



Kaṇḍārya Mahādeva temple at Khajurāho, Madhya Pradesh, India

Art Resource—EB Inc.

Khakass, also spelled KHAKAS, or HAKAS, people who have given their name to the Khakass autonomous *oblast* (province) of the Russian S.F.S.R. The general name Khakass encompasses five Turkic-speaking groups that differ widely in their ethnic origin as well as in their culture and everyday life: the Kachin (Khaas), Sagay, Beltir, Kyzyl, and Koybal. Before the Russian Revolution the Kachin were seminomadic pastoralists raising cattle, sheep, and horses. The Kyzyl had permanent villages and engaged in both pastoralism and farming. The Sagay, of heterogeneous ethnic composition and origin, changed from hunting and fishing to farming and stockbreeding. The Beltir (meaning "river-mouth people"), famed as trappers and as smiths, have also become farmers and stockbreeders. The Koybal, not a tribe in the ethnographic sense but a territorial group, have retained their Kachin language but assumed the Russian peasant way of life. In the late 20th century there were 71,000 Khakass in the Soviet Union.

Khakass, autonomous *oblast* (province), Krasnoyarsk *kray* (region), central Russian S.F.S.R. The *oblast* has an area of 23,900 square miles (61,900 square km) and occupies the western half of the broad Minusinsk Basin on the upper Yenisey River. The Abakan River, a tributary of the Yenisey, is the axis of the *oblast.* South of the Abakan's valley rise the Zapadny (West) Sayan mountains, reaching 9,613 feet (2,930 m) in Mount Karagosh, and to the north are the Abakan and Kuznetsk Alatau mountains, with their highest point at Mount Verkhny Zub (Upper Tooth), 7,146 feet (2,178 m). The enclosed basin has a dry, severely continental climate that has produced a steppe and forest-steppe vegetation in the lowlands, though much grassland has been plowed, especially in the Virgin and Idle Lands Campaign after 1954. The mountains are covered with forests of pine, fir, and spruce.

The Khakass people are a Siberian Turkic group who originally were nomadic herdsmen, but the great majority of the *oblast*'s population today is Russian (nearly 80 percent). The raising of sheep and goats remains an important economic activity. In the lowlands the construction of irrigation projects has increased stock capacity of pastures and the area and yield of crops, primarily wheat, oats, millet, and potatoes. Mining has been important since copper first attracted Russian settlers in the 18th century. Rich iron ore is mined at Abaza and Teya, gold on the upper Chulym, coal at Chernogorsk, and barites at Askiz, and there are several molybdenum and molybde-

num–copper–tungsten deposits. The forests of the *oblast* are exploited for timber. Abakan (*q.v.*) is the administrative centre. In the early 1980s the Soviet Union's largest hydroelectric station was under construction on the Yenisey at Sayanogorsk, with a projected capacity of 6,400 megawatts. The station is to provide the power for major industrial development in the Minusinsk Basin. Pop. (1983 est.) 523,000.

khaki, light dusty brown fabric used primarily for military uniforms. It is made in cotton, wool, worsted, and combinations of these fibres as well as with blends of man-made fibres and can include a variety of weaves, such as serge.

Khaki uniforms were worn by British colonial troops in India and were found to be especially effective for field service and battle. It was widely used by the time of the Indian Mutiny (1857–58) and thereafter served as the official colour for uniforms of British armies, native and colonial, in India; later it was adopted in other parts of the British Empire and by other nations.

During the South African War (1899–1902), cotton khaki proved to be unsatisfactory because of climatic conditions, so woollen and worsted serge were introduced. The use of olive tints, which reduce visibility against bare ground and foliage, began during World War I. The name is also used for some brown-toned fabrics used for uniforms.

Khaldūn, Ibn (Arab historian): *see* Ibn Khaldūn.

Khalépa, Pact of: *see* Halepa, Pact of.

Khālid (ibn ʿAbd Allāh) al-Qasrī (d. November 743, Kūfah, Iraq), a governor of Iraq under the Umayyad caliphate.

Khālid began his official career in 710 as governor of Mecca, a position he held until 715, when the caliph al-Walīd, who had appointed him, was succeeded by Sulaymān, who dismissed him. Until 724 he lived in retirement but was then given the highly important governorship of Iraq, where he exercised ruthless brutality to achieve an administrative efficiency untroubled by any expressions of discontent. He also attempted to develop the agricultural prosperity of Iraq. Marshes were drained, great areas of virgin soil were brought under cultivation, and the country was kept free from military disturbances. But he was unable to reduce the tension between the two great Arab tribal confederations, the Qays and the Yemeni. Khālid's position was complicated by the fact that his mother was a Christian, and to please her he had built a church in Kūfah.

Under much pressure from the enemies of Khālid al-Qasrī, the caliph Hishām in 738 dismissed him from office, even jailing him on charges of embezzlement, although after a year he was released and allowed to live peacefully in Damascus for the rest of Hishām's reign. Under Hishām's successor, al-Walīd ibn Yazīd, Khālid was taken to Kūfah and executed.

Khālid ibn ʿAbd al-ʿAzīz as-Saʿūd (b. 1913, Riyadh, Arabia—d. June 13, 1982, Ta'if, Saudi Arabia), king of Saudi Arabia (1975–82), who succeeded his half brother Faysal as king when Faysal was assassinated in 1975. A moderate influence in Middle East politics and a relatively retiring man, he left much of the administration of the country to his half brother Prince Fahd, who became his successor.

Born in Riyadh when it was a small desert town, Khālid became the closest supporter of his brothers Saʿūd and Faysal. When he was 14, his father Ibn Saʿūd, founder of the Saudi kingdom, sent him as his representative to the desert tribes to hear their grievances. In 1934 he took part in the Saudi expedition against Yemen led by his brother Faysal, and afterward he was regarded as a "man of the desert," one more at home with desert pursuits than with politics or diplomacy.

In 1939 he left Arabia for the first time to take part in the abortive London conference on Palestine. He hastened to return and, unlike most of his brothers, he never pursued higher educational studies abroad. He concerned himself with the problems of the Bedouin and took a special interest in desert reclamation projects through the use of groundwater. When in Riyadh, he devoted himself to charitable work. His modest and self-effacing personality, coupled with his reputation for calm reason, made him the chief conciliator in the disputes that arose among the large family of royal princes. Such qualities led to his appointment as crown prince, in preference to his more forceful and ambitious brothers Fahd and Sultan, when King Saʿūd was deposed in November 1964 and was succeeded by Faysal.

From 1970, illness inhibited his role in public life and cast doubt on his eventual succession to the throne. However, he did take over following Faysal's assassination and was welcomed as a figure who enjoyed much popularity, especially with the Bedouin. He reacted moderately to Egyptian President Anwar as-Sadat's Israeli peace initiative and benefitted from the success of the 1979 visit to his country of Queen Elizabeth II and his return visit to the United Kingdom in 1981.

Khālid ibn al-Walīd, byname SĪF, or SAYF, ALLĀH (Arabic: Sword of God) (d. 642), one of the two generals (with ʿAmr ibn al-ʿĀṣ) of the enormously successful Islāmic expansion under the Prophet Muḥammad and his immediate successors, Abū Bakr and ʿUmar.

Although he fought against Muḥammad at Uḥud (625), he was later converted (627/629) and joined Muḥammad in the conquest of Mecca in 629; thereafter he commanded a number of conquests and missions in the Arab Peninsula. After the death of Muḥammad, Khālid recaptured a number of provinces that were breaking away from Islām and was sent northeastward by the caliph Abū Bakr to invade Iraq, where he conquered al-Ḥīrah. Crossing the desert, he aided in the conquest of Syria; and, though the new caliph, ʿUmar, formally relieved him of high command (for unknown reasons), Khālid remained effective leader of the forces facing the Byzantine armies in Syria and Palestine.

Routing the Byzantine armies, he surrounded Damascus, which surrendered on Sept. 4, 635, and pushed northward. Early in 636 he withdrew south of the Yarmūk River before a powerful Greek force that advanced simultaneously from the north and from the coast of Palestine. The Greek armies were composed mainly of Arab, Armenian, and other auxiliaries, however; and, when a rebellion broke out in the Byzantine camp, Khālid, reinforced from Medina and possibly from the Syrian Arab tribes, attacked and destroyed the Greek forces in the precipices of the Yarmūk valley (Aug. 20, 636). Some 50,000 Byzantine troops were slaughtered, and the way was open for many other Islāmic conquests.

Khalīfah, Tall al- (Jordan): *see* Ezion-geber.

Khalīj-e Gavāter (Iran and Pakistan): *see* Gwādar Bay.

Khalīl, al- (Israeli-occupied Jordan): *see* Hebron.

Khalīl, al-Ashraf Ṣalāḥ ad-Dīn (d. 1293), Mamlūk sultan of Egypt who completed his father Qalā'ūn's campaign to drive the Franks from Syria. He captured Acre in the spring of 1291, and the remaining Crusader fortresses were surrendered by the end of the year. He was murdered by his *amīr*s, who were alarmed by his ambition.

Khalil, Patrona: *see* Halil, Patrona.

Khalīl ibn Aḥmad, al-, in full AL-KHALĪL IBN AḤMAD IBN ʿAMR IBN TAMĪM AL-FARĀHĪDĪ AL-AZDĪ AL-YUḤMADĪ AL-BAṢRĪ ABŪ ʿABD AL-RAḤMĀN (b. *c.* 718, Oman—d. between 776 and 791, Basra, Iraq), Arab philologist who compiled the first Arabic dictionary and is credited with the formulation of the rules of Arabic prosody.

When he moved to Basra, al-Khalīl left the Ibāḍī sect of Islām, which was popular in his native Oman, for Sunnism (the largest branch of Islām). He lived simply and piously in Basra, where he taught. The renowned Sībawayh was among his students. His dictionary, *Kitāb al-ʿayn* ("Book of the Letter 'Ayn"), may have been written in part by his student al-Layth ibn al-Muẓaffar of Khorāsān, at one time secretary to the Barmakid viziers of the ʿAbbāsid court. It is arranged according to a novel alphabetical order based on pronunciation, beginning with the letter *ʿayn*. His sample verses from his work on poetry, *Kitāb al-ʿarūḍ* ("Book of Prosody"), are known, although his book is lost.

Khaljī DYNASTY (1290–1320), the second ruling family of the Muslim sultanate of Delhi. This dynasty, like the previous Slave dynasty, was of Turkish origin, though the Khaljī tribe had long been settled in Afghanistan. Its three kings were noted for their faithlessness, their ferocity, and their penetration of the Hindu south.

The first Khaljī sultan, Jalāl-ud-Dīn, was established by a noble faction on the collapse of the last feeble Slave king, Kay-Qubādh. Jalāl-ud-Dīn was already elderly, and for a time he was so unpopular, because his tribe was thought to be Afghān, that he dared not enter the capital. His son-in-law Jūnā Khān led an expedition into the Hindu Deccan, captured Ellichpur and its treasure, and returned to murder his father-in-law.

With the title of ʿAlā'-ud-Dīn, Jūnā Khān reigned for 20 years. He captured Ranthambhor (1301) and Chitor (1303), conquered Mālwa (1305), and annexed the rich Hindu kingdom of Gujarāt. He also repelled Mongol raids. ʿAlā'-ud-Dīn's lieutenant, Malik Nā'ib, was sent on a plundering expedition to the south in 1308, which led to the capture of Warangal, the overthrow of the Hoysala dynasty south of the Krishna River, and the occupation of Madura in the extreme south. Malik Nā'ib returned to Delhi in 1311, laden with spoils. Thereafter, the fortunes of ʿAlā'-ud-Dīn and the dynasty declined.

The Sultan died in early 1316. Malik Nā'ib's attempted usurpation ended with his own death. The last Khaljī, Quṭb-ud-Dīn Mubārak Shāh, was murdered in 1320 by his chief minister, Khusraw Khān, who was in turn replaced by the first ruler of the Tughluq dynasty.

Khalkha, largest group of the Mongol peoples, comprising 75 percent of the population of the Mongolian People's Republic. In the latest census they numbered more than 901,000. Their language, Khalkha, is understood by 90 percent of the country's population as well as by many Mongols elsewhere.

Traditionally the Khalkha were a nomadic, pastoral people, who under Genghis Khan and his successors became a warlike imperial nation. In later centuries they were squeezed between the expanding empires of the Russians and the Manchus. The eastern groups of Khalkha submitted to the Manchus, became part of China, and today belong to Inner Mongolia, a part of the People's Republic of China. Beginning in the 1920s the western group came increasingly under the influence of the Soviet Union.

The old Khalkha society was based on kinship traced through the paternal line and was

organized in clans and tribes. Leadership was determined on the basis of ability. Married sons often lived near their fathers and other male relatives. A class of nobility was set apart from the commoners. Under Manchu dominance the importance of kin groups declined, giving way to Chinese methods of civil administration.

Traditionally most Khalkha lived in mobile herding camps that were moved four or five times a year from one pasturage to another. The Communist governments have attempted to collectivize the nomads and to increase the production of livestock, but these efforts have met with considerable resistance. Attempts have also been made to draw the nomads into farming and industrial labour. In the late 1970s more than 25 percent of the population lived in the capital and industrial city of Ulaanbaatar.

The traditional dwelling was the circular felt tent called a *ger* (in Turkic languages, the yurt, or yurta), which could be taken down and carried to a new place. In the late 20th century it was still a common form of housing in Ulaanbaatar, where the growth of the population outpaced the construction of apartment buildings. Food consists almost entirely of meat, milk, and other animal products. The most popular drink is fermented mare's milk, or *airag,* called koumiss in Russian.

The Khalkha acquired Tibetan Buddhism in the 17th century and afterward. In the early 20th century the monasteries of the Mongolian Tibetan Buddhist Church had great power and wealth, but by the 1960s most of them had been closed or converted to other uses. The indigenous religion of the Khalkhas was based on shamanism.

Khalkidhikí (Greece): *see* Chalcidice.

Khalkís (Greece): *see* Chalcis.

Khālsā ("the pure," from the Persian *khāleṣ,* "pure"), the dominant order of Sikhism. Most Sikh boys and girls undergo initiation into the Khālsā upon reaching puberty. The ceremony, called *pahul* ("baptism"), is conducted by five members of the Khālsā, who mix sweets in water with a double-edged dagger while reciting hymns. The initiates drink the preparation from the same cup, signifying the breakdown of caste differences. Boys are given the surname Singh ("Lion"), girls the surname Kaur ("Lioness").

The male initiates must agree to wear the five K's, which are the emblem of the Khālsā: *keṣa* (uncut hair and beard), *kaṅghā* (comb), *kacch* (short trousers), *karā* (steel bracelet), and *kirpān* (double-edged dagger). In addition, they vow not to use tobacco or liquor, to eat only *jhaṭkā* meat (from an animal killed with one blow), and not to commit adultery.

The Khālsā brotherhood was founded as a militant fraternity by Gurū Gobind Singh in Ānandpur in 1699, when the Sikhs were severely persecuted under the Mughals. Within a few days some 80,000 members were initiated into the new order, and it soon assumed leadership within Sikhism. Sikhs who did not join the order and remained clean-shaven became known as Sahajdhārīs ("Those Who Are Slow to Adopt"), and the division between the Khālsā and the Sahajdhārī has continued to the present day.

Kham Um (Tai chief): *see* Deo Van Tri.

Khama III, byname KHAMA THE GOOD, Khama also spelled KGAMA (b. *c.* 1837, Mushu, Bechuanaland [now Botswana]—d. Feb. 21, 1923, Serowe), southern African chief who allied himself with British colonizers in the area.

Khama was converted to Christianity in 1860, and after more than a decade of dissension among his supporters and those loyal to his father, he succeeded to the paramount chieftainship of the Ngwato (Mangwato, or Bamangwato) people in 1875. In 1885 Khama III had Bechuanaland declared a protectorate of the British Empire. He used British support to secure his northern borders from attacks by Lobengula's Ndebele kingdom (now in Zimbabwe) and his eastern borders from the Boer republic of the Transvaal (now in the Republic of South Africa). He lent reinforcements to the British expedition that crushed Lobengula in 1893. In 1895 Khama traveled to England and pleaded successfully against a British plan to annex Bechuanaland to the territory of the British South Africa Company, thereby blocking the company's acquisition of commercial and administrative rights in Bechuanaland.

Khama, Sir Seretse (b. July 1, 1921, Serowe, Bechuanaland [now Botswana]—d. July 13, 1980, Gaborone, Botswana), first president of Botswana (1966–80), after the former Bechuanaland protectorate gained independence from Great Britain.

Seretse Khama was the grandson of Khama III the Good, who had allied his kingdom of Bechuanaland with British colonizers in the late 19th century. Seretse Khama succeeded his father to the chieftainship of the Ngwato (Mangwato, or Bamangwato) people at age four. He was educated in South Africa and studied law at the University of Oxford. His marriage to a British woman in 1948 caused considerable controversy in both Britain and Bechuanaland and was among the reasons the British government forced his exile from Bechuanaland until he agreed to renounce the chieftainship in 1956.

Following his return to Bechuanaland as a private citizen, he founded the Democratic Party in 1962, and in 1965 he became prime minister. He helped negotiate the terms of Botswana's independence, and he was knighted in 1966.

As president of Botswana, Khama promoted his ideal of a multiracial democracy. He achieved free universal education in Botswana and sought to diversify and strengthen the country's economy. He was reelected to successive terms and served as president of Botswana until his death.

Khāmastāshar Māyo, Madīnat, residential town, al-Qāhirah (Cairo) *muḥāfaẓah* (governorate), Egypt. The town is a suburb of the industrial town of Ḥulwān and is located in the Wadi Ḥawf 2 miles (3 km) north of Ḥulwān, on a desert tract of 15 square miles (39 square km). Constructed in the late 1970s, it is part of the Egyptian government's program to shift population away from Cairo and the cultivable parts of the Nile Valley.

In the 1980s a regional water-recycling project centred at Ḥulwān was under construction; the water is to be used to cultivate vegetable crops. In the spring of 1981 the town was opened for occupancy. A commuter railway and a highway link the town to Cairo (9 miles [14 km] north) and Ḥulwān.

Khambhāt (India): *see* Cambay.

Khambu (people): *see* Rai.

Khamīs Mushayṭ, city, southwestern Saudi Arabia. It is situated about 17 miles (27 km) northeast of Abhā. Khamīs Mushayṭ is located inland in a mountainous region with fertile soil. It is traditionally a commercial centre; its name ("Thursday Mushayṭ") signified the Thursday market of the Mushayṭ clan. The establishment of army and air force bases to the south brought rapid expansion to the city. Aside from the city's increasing military importance, agriculture represents a major aspect of the economy, the main crops being wheat, rice, coffee, and henna. Pop. (1974) 49,581.

Khammam, town, north-central Andhra Pradesh state, southern India. It lies along the Central Railway, south-southeast of Warangal. The town is a trade and commercial centre. Rice, sorghum, corn (maize), and pulses are grown in the surrounding area, and coal, garnet, iron ore, and talc are obtained in the locality. Pop. (1981) town, 98,757.

Khams, also called MDO-STOD, one of three regions into which the area of Central Asia inhabited by Tibetans is traditionally divided. During the 7th to the 9th centuries AD, the central Tibetan kingdom was extended until it reached the Tarim River Basin on the north, China on the east, India and Nepal on the south, and Kashmir on the west. The newly added dominions to the east and northeast were called Mdo-Khams. The Khams region extended from between Sog-la skya-bo near the town of Sog (So-hsien) and the upper bend of the Huang Ho, or Yellow River, southeastward into what is now the western part of Szechwan province, China. In the reign of the Manchu emperor Yung-cheng (1722–35), the area east of the upper reaches of the Yangtze River was taken under Chinese administration, though it was not incorporated into the Chinese provincial system.

In 1928 the northwestern part of the Khams region was incorporated into the Chinese provincial system as part of Tsinghai Province. The southeastern part of the Khams region long remained in dispute between Tibet and China. In 1956 the disputed area of Khams east of the Yangtze was incorporated into Szechwan Province as the Kan-tzu Tibetan autonomous *chou* (district). Khams is the most fertile and populous of the traditional Tibetan regions.

khamseh, in Persian and Turkish literature, a set of five long epic poems composed in rhyming couplet, or *masnavī,* form. *Khamseh* takes its name from the five great epic poems written by Neẓāmī (*q.v.;* d. 1209) and entitled *Khamseh* ("The Quintuplet"). The first of these five poems, all of which were composed in the *masnavī* form, is the didactic work *Makhzan ol-asrār* (*The Treasury of Mysteries*); the next three are traditional love stories; and the fifth, the *Eskandar-nāmeh,* records the adventures of Alexander the Great. Inspired by Neẓāmī's influential model, several other notable poets including Amīr Khosrow of Delhi (fl. *c.* 1300) and ʿAlī Shīr Nawāʾī the Chagatay Turk (fl. *c.* 1485) wrote *khamsehs* in Persian and in Turkish.

khamsin, also spelled KHAMSEEN, or CHAMSIN, hot, dry, dusty wind in North Africa and the Arabian Peninsula that blows from the south or southeast in late winter and early spring. It often reaches temperatures above 40° C (104° F), and it may blow continuously for three or four days at a time and then be followed by an inflow of much cooler air.

The khamsin results when a low-pressure centre moves eastward over the Sahara or the southern Mediterranean Sea. On its forward side, the centre brings warm, dry air northward out of the desert, carrying large amounts of dust and sand; on its rear side, it brings cool air southward from the Mediterranean. The name khamsin is derived from the Arabic word for "50" and refers to the approximately 50-day period in which the wind annually occurs.

khan, also spelled CHAM, historically, the ruler or monarch of a Mongol tribe (*ulus*). At the time of Genghis Khan (early 13th century) a distinction was made between the title of khan and that of *khāḳān,* which was the title Genghis assumed as Great Khan, or supreme ruler of the Mongols. The term khan was subsequently adopted by many Muslim societies. Among the Seljuqs and the Khwārezm-Shāhs of central and western Asia, khan was the highest title of the nobility; in Ṣafavid Iran, it denoted a type of provincial governor. The meaning of the term eventually extended

downward along the socioeconomic scale until khan became an affix to the name of any Muslim property owner, particularly in Afghanistan, Pakistan, India, and Bangladesh. It is now often used as a surname.

Khan, (Khan) Abdul Ghaffar (Pashtun leader): *see* Ghaffar Khan, (Khan) Abdul.

Khan, Ali Akbar (b. April 14, 1922, Shibpur, Bengal, India), composer and virtuoso sarod (*q.v.*) player active in presenting Indian music to Western audiences. Khan's music is rooted in the Hindustani (northern) tradition of Indian music.

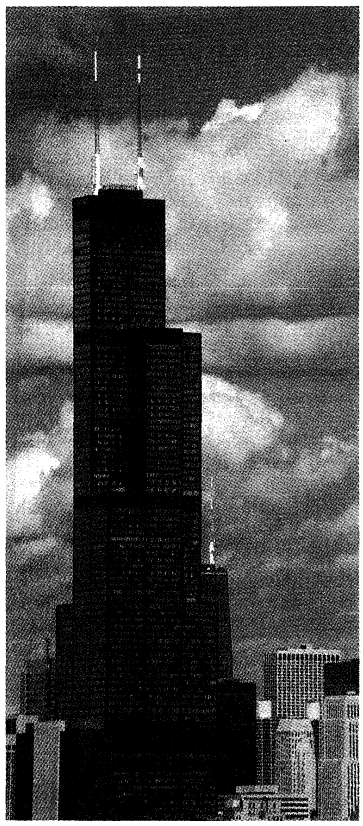
Khan was trained by his father, the master Alauddin Khan, and began performing at age 14, soon becoming the court musician to the Maharaja of Jodhpur. After 1955, when the violinist Yehudi Menuhin invited him to New York City, he often performed in the West, frequently in collaboration with his brother-in-law, the composer and sitarist Ravi Shankar. As a composer Khan is known for his film scores and as the creator of many ragas. He founded schools of music in Calcutta (1956) and Marin County, Calif. (1967).

Khan, Fazlur R(ahman) (b. April 3, 1929, Dacca, India—d. March 27, 1982, Jidda, Saudi Arabia), Daccan-born American civil engineer known for his innovations in high-rise building construction.

After obtaining a B.A. in engineering from the University of Dacca in 1950, Khan worked as assistant engineer for the India Highway Department and taught at the University of Dacca. Qualifying for a scholarship in 1952, he enrolled at the University of Illinois, Champaign-Urbana, where he received master's degrees in both applied mechanics and structural engineering and a Ph.D. in structural engineering. He returned briefly to East Pakistan and won an important position as executive engineer of the Karachi Development Authority. Deciding that administrative demands kept him from design work, however, he returned to the United States and joined the prestigious architectural firm of Skidmore, Owings & Merrill in Chicago in 1955, eventually becoming a partner (1966). In 1967 he became a naturalized U.S. citizen.

Among his many designs for skyscrapers are Chicago's John Hancock Center (1970) and the Sears Tower (1973), which are among the world's tallest buildings, and One Shell Plaza in Houston. The Sears Tower was his first skyscraper to employ his "bundled tube" structural system, which consists of a group of narrow steel cylinders that are clustered together to form a thicker column. The system was innovative because it minimized the amount of steel needed for high towers, eliminated the need for internal wind bracing (since the perimeter columns carried the wind loadings), and permitted freer organization of the interior space.

His later projects included the strikingly different Haj Terminal of the King Abdul Aziz International Airport, Jidda, Saudi Arabia (1976–81), and King Abdul Aziz University, also in Jidda (begun in 1977).



The Sears Tower, Chicago, designed by Fazlur Khan, 1973; photograph, 1982

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Khan Tengri (mountain): *see* Han-t'eng-ko-li Peak.

Khānaqīn, town, northeastern Iraq. Located 5 miles (8 km) from the Iranian border at a rail terminus, Khānaqīn is a customs station and lies on a main road that, until the outbreak of the Iranian–Iraqi war in 1980, was used by Iranian Muslims on pilgrimages to Iraqi and Arabian holy cities. The town lies in a fertile and intensively cultivated area along the Alwand River and is a local trade centre for agricultural produce and livestock. There is an oil field nearby, and a refinery is at Alwand, 3 miles (5 km) to the southeast of Khānaqīn. Local oil production and the town's economy in general were seriously disrupted in the 1980s by the war, however. Pop. (1985 est.) 30,848.

khandha (Buddhist philosophy): *see* skandha.

Khandwa, town, southwestern Madhya Pradesh state, central India. Located on the major roads leading from northern India to the Deccan region, it is identified with the Kognabanda of the Greek geographer Ptolemy and is traditionally said to have been surrounded by the Khāṇḍava forests that were described in the Sanskrit epic *Mahābhārata.* In the 12th century AD the town was an important seat of Jaina worship. A major road and rail junction, Khandwa is engaged in cotton, timber, and grain trade; cotton ginning, oilseed milling, and sawmilling are important industries. Constituted a municipality in 1867, it has an experimental sericulture farm and several government colleges affiliated with the University of Saugar. Pop. (1981) 114,725.

Khangai Mountains (Mongolia): *see* Hangayn Mountains.

Khaniá, also spelled CANEA, city and capital of Crete (since 1841) and of the *nomós* (department) of Khaniá, Greece. It lies along the east corner of the Gulf of Khaniá and occupies the neck of a low, bulbous peninsula between the gulf and Soúdhas Bay on the site of ancient Kydonia. The city was occupied in 1252 by Venetians, who held it, except for a brief period under the Genoese (1267–90), until 1645, when it fell to the Turks. In 1878, after numerous revolts against Turkish rule, various privileges were granted to the Cretans. Khaniá joined the kingdom of Greece in 1912. It was severely damaged in 1941 during the German aerial invasion of Crete. After World War II improvements to neighbouring Soúdhas Bay strengthened the city's position as a major port of Crete. Khaniá exports most of the island's citrus fruit as well as olive oil and wine. Among the local monuments are massive walls of the Venetian period and an arsenal. Pop. (1981) city, 47,451; *nomós,* 125,-856.

Khaniá, Gulf of, Modern Greek KÓLPOS KHANÍON, gulf on the northwestern coast of Crete, Greece. It is part of the *nomós* (department) of Khaniá. It is enclosed on the west by the north–south Rodhopós Peninsula, which rises to 2,454 feet (748 m) in Mount Títiron, and on the east by the mushroom-shaped Akrotíri Peninsula. The well-defined gulf is some 19 miles (30 km) wide between the tips of its confining peninsulas and has depths up to 650 feet (200 m). At the base of the Akrotíri Peninsula is Khaniá, site of ancient Kydonia and now the principal settlement on the bay. Just offshore is the small island of Áyios Theódhoros.

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Khanka, Lake, Russian OZERO KHANKA, Wade-Giles romanization HSING-K'AI HU, Pinyin XINGKAI HU, shallow lake on the boundary between the Soviet Union and China. Most of the lakeshore is in the Primorsky *kray* (region) of the Russian Soviet Federated Socialist Republic; the northern shore is in Heilungkiang *sheng* (province), China. Much of the lake is surrounded by swampland; it varies in area from about 1,500 to 1,700 square miles (4,000 to 4,400 square km). Around the southern end is the Khanka Lowland, a rich black-earth area with some of the best soils in the Soviet Far East. Lake Khanka's outlet is the Sungacha River, a tributary of the Ussuri.

khānqāh (Islām): *see* zāwiyah.

Khansā', al- (Arabic: "The Pug-nosed"), byname of TUMĀḌIR BINT ʿAMR IBN AL-ḤĀRITH IBN ASH-SHARĪD (d. after 630), one of the greatest Arab poets, famous for her elegies. The deaths of two of her brothers, sometime before the advent of Islām, threw al-Khansā' into deep mourning; it was her elegies on these deaths and that of her father that made her the most celebrated poet of her time. She accepted Islām with her tribe but persisted in wearing the heathen sign of mourning. When her four sons were slain in the Battle of Qādisīyah (637), the caliph ʿUmar is said to have written her a letter congratulating her on their heroism and assigned her a pension.

The collected poetry of al-Khansā', the *Dīwān* (edited by L. Cheikho, 1895; published in French translation in 1889), reflects the pagan fatalism of the tribes of pre-Islāmic Arabia. The poems are generally short and imbued with a strong and traditional sense of despair at the irretrievable loss of life. The elegies of al-Khansā', if not particularly original, were highly influential, especially among later elegists.

Khants, also spelled KHANTY (peoples): *see* Ostyak and Vogul.

Khanty-Mansi, autonomous *okrug* (district), in Tyumen *oblast* (province), central Russian Soviet Federated Socialist Republic. The Khanty-Mansi national *okrug* was established in 1930 for the Khanty (Ostyak) and Mansi (Vogul) peoples, although the majority of the present population are Russian settlers; the national *okrug* became an autonomous *okrug* in 1977. Its 202,000 square miles (523,100 square km) cover a vast, level, swampy area in the West Siberian Plain, rising in the far northwest to the Urals crestline, culminating in Mount Narodnaya (6,214 feet [1,894 m]). The surface is either peat bog and grass marsh or dense swampy forest.

From the 1960s the area was transformed economically, and its population increased rapidly as a result of the discovery and exploitation of huge petroleum and natural-gas

deposits along the Ob River, especially near Surgut and Nizhnevartovsk. Khanty-Mansiysk is the administrative centre. Pop. (1989) 1,268,000.

Khanty-Mansiysk, also spelled CHANTY-MANSIJSK, formerly (until 1940) OSTYAKO-VOGULSK, city and administrative centre of Khanty-Mansi autonomous *okrug* (district), a part of Tyumen *oblast* (province), Russian S.F.S.R., in the West Siberian Plain. Situated near the confluence of the Ob and Irtysh rivers, it was formed in 1950 from the urban settlement of Khanty-Mansiysk (founded 1931) and the village of Samarovo. Woodworking and fish-canning industries are important. Teacher-training and medical colleges are in the city. Pop. (latest est.) 25,000.

Khāqānī, in full AFẒAL OD-DĪN BĀDEL EBRĀHĪM EBN ʿALĪ KHĀQĀNĪ SHĪRVĀNĪ (b. *c.* 1106, Shīrvān, Seljuq empire [now Azerbaijan S.S.R., U.S.S.R.]—d. *c.* 1190, Tabrīz, Iran), Persian poet, whose importance rests mainly on his brilliant court poems, satires, and epigrams.

His father was a carpenter and a Muslim and his mother was of Nestorian Christian origin. Brought up in poverty, he was fortunate to be educated by his learned uncle. As a young man he composed lyrics under the name of Ḥaqāʾīqī ("Seeker of Truth"). He then gained entry into the court of the ruler of Shīrvān, the *khāqān,* Manūchehr, from whom he took his pen name, Khāqānī.

Embittered by personal disputes and court intrigues, he set out on the pilgrimage to Mecca in 1156/57, after which he composed one of his greatest works, a *masnavī* (long poem in rhyming couplets), the *Tuḥfat al-ʿIrāqayn* ("Gift of the Two Iraqs"). It consists of five parts and is essentially a description of the poet's travels.

Returning to the court, Khāqānī was imprisoned for reasons that are not clear. His sufferings moved him to write a *ḥabsīyah* ("jail ballad"), considered one of the finest of its kind. In 1171 he made another pilgrimage to Mecca, after which he returned to the court of Shīrvān and his patron, Manūchehr's son, Akhsatan. After the deaths of his son and wife in 1175, he made another pilgrimage and then settled in the city of Tabrīz, writing much of the poetry in his divan. In addition to the obscure nature of his style, which renders his work difficult for the average reader, Khāqānī filled his poems with Christian imagery, one of the few Persian poets to have done so.

Khara-Khorin (Mongolia): *see* Karakorum.

Kharagpur, also spelled KHARAKPUR, town, south-central West Bengal state, northeastern India, just south of the Kāsai River. Originally only the railway suburb of Midnapore, Kharagpur is now an important rail junction, with workshops and a large, carefully laid-out railway settlement. Rice milling and the manufacture of chemicals, shoes, and silk cloth are important industries. The town has a Muslim saint's shrine that is venerated by Muslims and Hindus alike. Declared a municipality in 1911, Kharagpur has a museum and is the seat of the Indian Institute of Technology (founded in 1951), which has the status of a university. Pop. (1981) town, 150,475; metropolitan area, 232,575.

kharāj, a special Islāmic fiscal imposition that was demanded from recent converts to Islām in the 7th and 8th centuries.

The origin of the concept of the *kharāj* is closely linked to changes in the status of non-Muslims and of recent converts to Islām in newly conquered Islāmic territories. The indigenous Jewish, Christian, or Zoroastrian populations of these territories were permitted either to convert to Islām or to maintain their previous religious affiliations. Those individuals who preferred not to convert were required to pay a special tribute, usually in the form of a poll or head tax known as the *jizyah.* But those who chose to convert, in theory, would be placed on an equal fiscal footing with other Muslims.

Under Islāmic law, only original Muslims or converts to Islām could own land. Thus, there was incentive for non-Muslim cultivators to convert to Islām so that they could maintain their agricultural holdings. Upon conversion, the cultivators were required to pay the *ʿushr* (or tithe), a tax equivalent to one-tenth of their produce. In theory these converts were exempt from other taxes on their lands. But the Umayyad caliphs (ruled 661–750), faced with increasing financial problems, imposed a kind of *kharāj* on the land of recent converts in addition to their payment of *ʿushr.* This extra imposition of the *kharāj* was unpopular, and many converts felt that it violated the egalitarian principles of Islām.

In Khorāsān, the northeastern province of Iran, the collection of the *kharāj* was one of the grievances that led to Abū Muslim's revolt in 747, which precipitated the downfall of the Umayyad caliphate. During the early years of the succeeding ʿAbbāsid caliphate, the collection of the *kharāj* fell into disuse.

Khārān, also called KHĀRĀN KALĀT, town, north-central Baluchistan province, Pakistan. The town lies 6 miles (10 km) distant from the Baddo River. It was long a caravan depot and still trades in salt, millet, wheat, melons, carpets, and baskets.

The surrounding area is mostly desert but has cultivated tracts, dependent upon flood irrigation, along foothills and the Baddo and Māshkel rivers; wheat, barley, and dates are grown. Camel, goat and sheep breeding are the main occupations. There are also important chromite deposits. A former princely state, the region came under British control in 1884. It acceded to Pakistan in 1948. Pop. (1981 prelim.) 10,000.

Kharg Island, Persian JAZĪREH-YE KHĀRK, Arabic JAZĪRAT KHĀRG, small Iranian island in the northern Persian Gulf, 34 miles (55 km) northwest of the port of Bushire (Būshehr). In the 15th century the Dutch established a factory (trading station) on the island. Their influence, however, was transitory, and in 1766 Kharg was taken by pirates based at Bandar-e Rīg, a small Persian port north of Bushire. The island was virtually uninhabited for long periods thereafter, but, with Iran's 20th-century mineral prosperity, it became important as a processing and refining centre. It became a crude-oil terminal and loading facility in the 1960s. Later, supertankers docked there rather than at Abadan for bulk landing. Sulfate fertilizers, liquid gas, and other petroleum products are shipped from the island. The oil terminal was damaged in the 1980s during fighting between Iraq and Iran.

Kharga, el- (Egypt): *see* Wāḥāt al-Khārijah, al-.

Khargon, also spelled KHARGONE, town, southwestern Madhya Pradesh state, central India, just east of the Kundi River. It is a major agricultural-produce and timber market and is engaged in cotton ginning and rice and oilseed milling. It attained considerable importance under the Mughals and now contains an old fort with several tombs and palaces. The town has a library and a government college affiliated with Vikram University. Pop. (1981) 52,749.

Kharia, hill people living in the Chota Nāgpur area of Orissa and Bihār states, northeastern India, and numbering more than 88,000 in the late 20th century. One of the Munda tribes, they speak a Munda dialect of the Austro-Asiatic language family but are of uncertain racial origin, being either Mongoloid or Austro-Asiatic. The Kharia have three subdivisions: Hill Kharia, Dhelki, and Dudh. All are patrilineal, with the family as the basic unit, and are led by a tribal government consisting of a priest, a headman, and village leaders. The Dhelki and the Dudh are organized into ancestral clans.

The Dudh are the most numerous and progressive branch; they live along the Sankh and South Koel rivers. The Dhelki are concentrated near Gāngpur. Both live in settled villages, and intervillage federations enforce the feeling of social solidarity. They traditionally build separate large dormitories for unmarried men and women, although this practice has been abandoned by Christian Kharia. The Kharia's traditional religion includes a form of sun worship, in which each family head makes five sacrifices to Bero to protect his generation.

The Hill Kharia live in small groups in remote areas of the Simlipal Range in Orissa state. Depending on shifting agriculture, they grow rice and millet but constantly face the problem of land scarcity. The Hill Kharia also collect silk cocoons, honey, and beeswax for trade.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Khārijah, Al-, city, capital of the *muḥāfaẓah* (governorate) of Al-Wādī Al-Jadīd (Arabic: "New Valley") and chief town of Al-Khārijah (Kharga) Oasis, Egypt. The town's history dates back to the 25th dynasty (*c.* 750–656 BC), though inscriptions record that the oasis was a place for political exiles from Thebes in the 21st dynasty (*c.* 1075–*c.* 945 BC). The town flourished under Persian and Roman rule, and there are extensive ruins of those periods in the area around the town. Other ruins show that in the Byzantine period Al-Khārijah's inhabitants became Christian, but raids by desert tribes reduced its prosperity.

The modern town is situated in the centre of the northern part of Al-Khārijah Oasis, partly on a rocky outcrop into which its streets are cut. The population consists mainly of Arabic-speaking Berbers with a Bedouin Arab admixture. During the 1970s the population grew as the Egyptian government encouraged Nile valley farmers to settle reclaimed land in the oasis. The town is a collection point for locally grown crops, including dates, olives, wheat, rice, grapes, citrus fruits, and berseem (clover, used for animal feed). Cattle and poultry, bred for the oasis environment, are raised for meat, making Al-Khārijah self-sufficient in food. Shale is quarried in the oasis, and the town has tile- and brickmaking plants. Many of the townspeople work in the Abū Ṭarṭūr phosphate mines, west of the oasis.

Al-Khārijah is served by a railway line that carries phosphates from Abū Ṭarṭūr to Naj‘ Ḥammādī in the Nile valley. Roads from Asyūṭ and Naj‘ Ḥammādī converge in the town, and there is an airfield to the east of Al-Khārijah. Pop. (1986 prelim.) 38,544.

Khārijite, Arabic KHAWĀRIJ, the earliest Islāmic sect, which traces its beginning to a religio-political controversy over the caliphate. After the murder of the third caliph, ʿUthmān, and the succession of ʿAlī (Muḥammad's son-in-law) as the fourth caliph, Muʿāwiyah, the governor of Syria, sought to avenge the murder of ʿUthmān. After fighting the indecisive Battle of Ṣiffīn (July 657) against ʿUthmān's forces, ʿAlī was forced to agree to arbitration by umpires. This concession aroused the anger of a large group of ʿAlī's followers, who protested that "judgment belongs to God alone" (Qurʾān 6:57) and believed that arbi-

tration would be a repudiation of the Qur'ānic dictum "If one party rebels against the other, fight against that which rebels" (49:9). A small number of these pietists withdrew (*kharajū*) to the village of Ḥarūrā' under the leadership of Ibn Wahb and, when arbitration proved disastrous to 'Alī, were joined near Nahrawān by a larger group.

These Khārijites, as they came to be known, were opposed equally to 'Alī's claims and to those of Mu'āwiyah. Repudiating not only the existing caliphal candidates but all Muslims who did not accept their views, the Khārijites engaged in campaigns of harassment and terror. In the Battle of Nahrawān (July 658) Ibn Wahb and most of his followers were killed by 'Alī, but the Khārijite movement persisted in a series of uprisings that plagued both 'Alī (whom they assassinated) and Mu'āwiyah (who succeeded 'Alī as caliph). In the period of civil war (*fitnah*) following the death of the caliph Yazīd I (683), the Khārijites were the source of serious disruptions within the Umayyad domain and in Arabia. Subdued through the intensive campaigning of al-Ḥajjāj, the Khārijites did not stir again until the collapse of the Umayyads, and then their two major rebellions, in Iraq and Arabia, ended in defeat.

The Khārijites' constant harassment of the various Muslim governments was less a matter of personal enmity than a practical exercise of their religious beliefs. They held that the judgment of God could only be expressed through the free choice of the entire Muslim community. They insisted that anyone, even a black slave, could be elected caliph (that is, head of the Muslim community) if he possessed the necessary qualifications, chiefly religious piety and moral purity. A caliph may be deposed upon the commission of any major sin. The Khārijites thus set themselves against the legitimist claims (to the caliphate) of the tribe of Quraysh (among the Sunnites) and of 'Alī's descendants (among the Shī'ites). As proponents of the democratic principle, the Khārijites drew to themselves many who were dissatisfied with the existing political and religious authorities.

Besides their democratic theory of the caliphate, the Khārijites were known for their puritanism and fanaticism. Any Muslim who committed a major sin was considered an apostate. Luxury, music, games, and concubinage without the consent of wives were forbidden. Intermarriage and relations with other Muslims were strongly discouraged. The doctrine of justification by faith without works was rejected, and literal interpretation of the Qur'ān was insisted upon.

Within the Khārijite movement the Azāriqah of Basra were the most extreme subsect, separating themselves from the Muslim community and declaring death to all sinners and their families. The more moderate subsect of the Ibāḍīyah, however, survived into the 20th century in North Africa, Oman, and Zanzibar, with about 500,000 members.

Kharj, Al-, oasis, east-central Saudi Arabia, southeast of Riyadh, the national capital, with which it is associated administratively. Situated around a series of deepwater pools, near which numerous ancient tombs have been found, Al-Kharj was chosen as the site of a government experimental farm in the late 1930s. Since then it has grown into a flourishing agricultural oasis, producing cereals, dates, vegetables, and fruits. Other economic activities include livestock and poultry raising and horse breeding. A traditional dairy industry was greatly expanded in 1981 by the inauguration of a meat and dairy combine that, at its opening, was the largest in the Middle East. A planned city supporting a projected population of 100,000 was under development at Al-Kharj in the 1980s. Al-Kharj is linked to Riyadh and the Persian Gulf by a railroad.

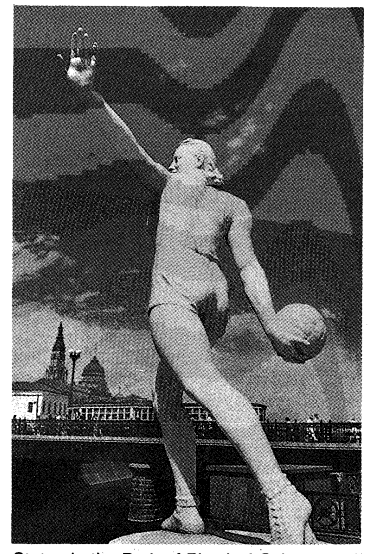
Khārk Island (Iran): *see* Kharg Island.

Kharkov, also spelled CHAR'KOV, *oblast* (province), with an area of 12,100 square miles (31,400 square km), in the eastern Ukraine, U.S.S.R. The valley of the Donets River forms the axis of the *oblast,* which also covers the southern end of the Central Russian Upland. Most of the area is steppe; some forest-steppe with groves of oak and other deciduous trees occurs in the northwest. Soils are very fertile, and almost everywhere the natural vegetation has disappeared under the plow (there is severe gully erosion, especially on the uplands). A relatively high rural population density remains despite a steady decline in numbers of rural dwellers since 1939. Grain production, especially winter wheat and corn (maize), predominates, taking up some two-thirds of the cropland; sugar beets, sunflowers, hemp, and tobacco are significant industrial crops. Cattle, pigs, and poultry are kept in large numbers, and dairying is well developed. The economy is overshadowed, however, by the huge industrial conurbation of the city of Kharkov, in which half of the *oblast*'s population lives. Other communities are small and chiefly concerned with processing agricultural produce. Vast deposits of natural gas occur at Shebelinka and Yefremovka; the gas is piped to many cities of the European Soviet Union. Pop. (1989) 3,195,000.

Kharkov, also spelled CHAR'KOV, Ukrainian KHARKIV, city and administrative centre of Kharkov *oblast* (province), Ukraine, U.S.S.R. It lies at the confluence of the Udy, Lopan, and Kharkov rivers. It was founded in 1656 as a military stronghold to protect Russia's southern marchlands; part of the old kremlin wall survives. The centre of a region of fertile soils and rapid colonization in the 18th century, it quickly developed important trade and handicraft manufactures and became a seat of provincial government in 1732. Its nodal position was enhanced in the later 19th century by the opening of the adjacent Donets Basin coalfield, first reached by rail from Kharkov in 1869. At that period Kharkov's own industries, especially engineering, grew rapidly. After the 1917 Revolution and the establishment of the Ukrainian S.S.R. in 1917, Kharkov was made its first capital but lost this function to Kiev in 1934. In World War II this key junction was bitterly contested and changed hands several times, with very heavy destruction.

Today Kharkov retains its role as a communications centre: after Moscow and Leningrad, it is the largest rail junction of the Soviet Union, with eight trunk lines converging on it and three main-line stations. Kharkov is also a node on the trunk highway system of the European Soviet Union, with highways to Moscow, to Kiev and the western Ukraine, to Zaporozhye and the Crimea, and to Rostovna-Donu and the Caucasus. It has a major airport. It is the sixth city in size of the Soviet Union and is the centre of a metropolitan area comprising about 20 satellite towns. The industrial structure of Kharkov is headed by engineering. The wide range of products includes diesel locomotives, machine tools, mining machinery, tractors and other agricultural machinery, bicycles, generators, steam turbines, and many electrical items. There are also light industries producing foodstuffs and other consumer goods. Much of the power for industry and heating in the city derives from natural gas.

The great destruction of World War II made it possible for contemporary Kharkov to be largely a rebuilt city of broad streets, large apartment blocks, imposing, often ponderous administrative and office buildings, and large industrial plants. Among survivals of the past

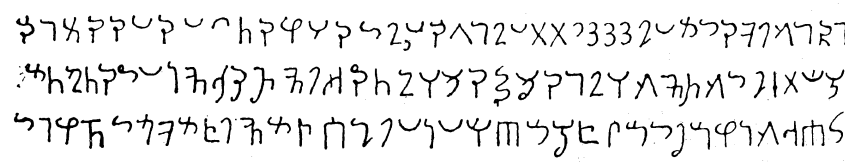


Statue in the Park of Physical Culture, Kharkov, Ukraine, U.S.S.R., with a government office building in the background
Jerry Cooke

are the 17th-century Pokrovsky Cathedral, the 19th-century Patriarchal Cathedral, and the belltower commemorating the victory over Napoleon I in 1812.

Kharkov is one of the most important cultural and educational centres of the Soviet Union. Its A.M. Gorky University was founded in 1805. There are numerous other institutions of higher education, including polytechnic, medical, agricultural, and various engineering establishments. In addition, the city has a number of scientific-research institutions, a park of physical culture, and a botanical garden. Kharkov has a philharmonic hall, several theatres (the oldest of which dates from 1780), a planetarium, and a number of museums. The opening of a subway system in 1975 made the city the sixth in the Soviet Union to possess such a utility. Pop. (1989 prelim.) 1,611,000.

Kharoṣṭī, a writing system used in northwestern India before about AD 500. The earliest extant inscription in Kharoṣṭī dates from 251 BC, and the latest from the 4th–5th century AD. The system probably derived from the Aramaic alphabet while northwestern India was under Persian rule in the 5th century BC. Aramaic, however, is a Semitic alphabet of 22 consonantal letters, while Kharoṣṭī is syllabic and has 252 separate signs for consonant and vowel combinations. A cursive script written from right to left, Kharoṣṭī was used for commercial and calligraphic purposes. It was influenced somewhat by Brāhmī, the other Indian script of the period, which eventually superseded it.

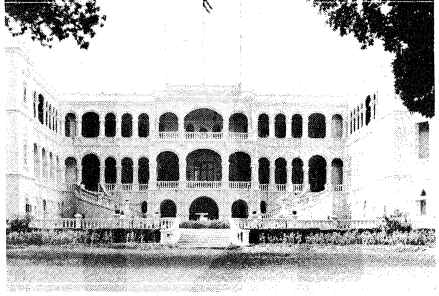


Kharoṣṭī inscription
From *The Alphabet* by David Diringer. Copyright 1948 by David Diringer. With permission of Funk & Wagnalls Publishing Company, Inc. and Hutchinson Publishing Group Ltd.

Kharsāwān, town, southern Bihār state, northeastern India, on the Son River. It served as the capital of the former princely state of Kharsāwān, which was founded in the 17th century by the Porahat rajas. It was later a *sanad* (grant) state of the Choṭa Nāgpur Commission and was one of the former Orissa states until it was incorporated into Singhbhūm district in 1948. The town is an agricultural trade and lac (shellac) growing centre. The locality, a forested hilly tract, has major copper and kyanite deposits. Pop. (1981) 5,106.

Khartoum, Arabic AL-KHURṬŪM ("Elephant's Trunk"), city, capital of The Sudan, just south of the confluence of the Blue and White Nile rivers. It has bridge connections with its sister towns, Khartoum North and Omdurman, with which it forms The Sudan's largest conurbation. Originally an Egyptian army camp (pitched 1821), Khartoum grew into a garrisoned army town. The Mahdists besieged and destroyed it in 1885 and killed Major General Charles George Gordon, then the British governor-general of The Sudan. Reoccupied in 1898, Khartoum was rebuilt by Governor-General Lord Kitchener and served as the seat of the Anglo-Egyptian Sudan government until 1956, when the city became the capital of the independent republic of The Sudan.

Khartoum is a major trade and communications centre, with rail lines from Egypt, Port Sudan, and Al-Ubayyiḍ, river traffic on the Blue and White Nile rivers, and an international airport. Built along spacious tree-lined avenues, its principal buildings include the palace, parliament, the Sudan National Museum, the University of Khartoum (formerly Gordon Memorial College, 1902), and the Khartoum Branch (1955) of the University of Cairo. There are Roman Catholic, Anglican, and Coptic cathedrals as well as Greek and Maronite churches and several mosques. Besides acting as a trading centre, Khartoum also produces textiles, gums, and glass and serves as a printing and food-processing centre. An oil pipeline between Khartoum and Port Sudan was completed in 1977. Because of immigration from other regions and from western Africa, Khartoum exhibits less of an Arabian cultural influence than its sister towns, even though most of its population speaks Arabic. Pop. (1983) city, 476,218; metropolitan area, 1,343,651.



The Republican Palace in Khartoum city, The Sudan
Authenticated News International

Khartoum, Siege of (March 13, 1884–Jan. 26, 1885), the Mahdī's siege of Khartoum, capital of the Sudan, which was defended by an Egyptian garrison under the British general Charles George ("Chinese") Gordon. The Mahdī's capture of the city and the slaughter of its defenders, including Gordon, caused a storm of public protest against the alleged inaction of the British government under Lord Salisbury.

The British government had become the prime European support of the khedive of Egypt but sought to remain aloof from the affairs of the Egyptian Sudan, especially after the Mahdī's tribesmen rose in revolt, beginning in 1881. In early 1884, following a series of Mahdist victories, the British only reluctantly acquiesced in the khedive's selection of Gordon as governor-general of the Sudan. Gordon reached the capital of Khartoum on Feb. 18, 1884, and had succeeded in evacuating 2,000 women, children, and sick and wounded before the Mahdī's forces closed in on the town.

From that time, the British government's refusal of all of Gordon's requests for aid, together with Gordon's own obdurate refusal to retreat or evacuate further, made disaster virtually inevitable. The Siege of Khartoum commenced on March 13, but not until August, under the increasing pressure of British public opinion and Queen Victoria's urgings, did the government at last agree to send a relief force under General Garnet Joseph Wolseley, setting out from Wadi Halfa (October 1884). After learning of two victories won by Wolseley's advancing forces, the Mahdī's troops were on the verge of raising the siege; but the further unaccountable delay of the relief force encouraged them to make a final, successful assault at a gap in the ramparts caused by the falling of the Nile's waters. The city's garrison was butchered, Gordon with it. The forerunners of the relief force, consisting of river gunboats under Lord Charles Beresford, arrived off the city on January 28, two days too late, and, after a brief gun duel with the Mahdist defenders, retreated downriver.

Soon after, the Mahdī abandoned Khartoum and made Omdurman his capital.

Khartoum North, Arabic AL-KHURṬŪM BAḤRĪ, city, east-central Sudan, on the east bank of the Nile, with bridge connections to its sister cities of Khartoum and Omdurman. The main industrial centre of the region and the country, the city contains dockyards, marine and rail workshops, and sawmills. Khartoum North trades in cotton, grains, fruit, and livestock; industries include tanning, brewing, brickmaking, textile weaving, and food processing. Arabic is spoken by most of the inhabitants. Pop. (1983) 341,146.

Khartsyzsk, also spelled CHARCYZSK, city, Donetsk *oblast* (province), eastern Ukraine, U.S.S.R. It is located on the Krinichnaya-Ilovaysk rail line in an upland area about 15 miles (25 km) east of Donetsk. Khartsyzsk was founded in 1869 and raised to city status in 1938. Its industry is metallurgically based (wire and cable drawing, tubes and piping, foundries), with the manufacture of machinery and armatures; there is also an agricultural-processing combine. The city is the site of a metallurgical *tekhnikum* (technical college). Pop. (1987 est.) 69,000.

Khāsā (people): *see* Pahāṛī.

Khasavyurt, also spelled CHASAVJURT, city and centre of Khasavyurt *rayon* (sector), Dagestan A.S.S.R., Russian S.F.S.R. It lies along the Yaryksu River in a cotton-growing area, with cotton-ginning and fruit- and vegetable-canning industries. Agricultural and teacher-training colleges are in the city. Pop. (1987 est.) 74,000.

Khasekhemwy, also spelled KHASEKHEMUI, or KHESEKHEM (fl. 27th century BC), sixth and last king of Egypt in the 2nd dynasty (*c.* 2775–*c.* 2650 BC) who ended the internal struggles of the mid-2nd dynasty and reunited the country.

Probably starting from a base at Hierakonpolis, in Upper Egypt, Khasekhemwy extended his control over the whole kingdom. His monuments contain references to warfare against "the northerners," apparently referring to his unification of Upper and Lower Egypt. Other inscriptions suggest that he raided Nubia, south of the First Nile Cataract, and his name has been found in Lebanon, probably indicating trade with the Syrians. Annals of the Old Kingdom record great technological advances that were made during his last six years. Khasekhemwy was an ancestor of the 3rd-dynasty king, Djoser.

Khāsi, people of the Khāsi and Jaintia hills of the state of Meghalaya in India. The Khāsi have a distinctive culture. Both inheritance of property and succession to tribal office run through the female line, passing from the mother to the youngest daughter. Office and the management of property, however, are in the hands of men identified by these women and not in the hands of women themselves. This system has been modified by the conversion of many Khāsi to Christianity, by the consequent conflict of ritual obligations under the tribal religion and the demands of the new religion, and by the right of the people to make wills in respect of self-acquired property.

The Khāsi speak a Mon-Khmer language of the Austro-Asiatic family. They are divided into several clans. Wet rice (paddy) provides the main subsistence; it is cultivated in the valley bottoms and in terrace gardens built on the hillsides. Many of the farmers still cultivate only by the slash-and-burn method, in which secondary jungle is burnt over and a crop raised for one or two years in the ash.

Under the system of administration set up in the district in the 1950s, the Khāsi's elected councils enjoy a measure of political autonomy under the guidance of a deputy commissioner. In addition, seats in the state assembly and in the national parliament are reserved for representatives of the tribal people.

Khāsi Hills, physical region, central Meghālaya state, northeastern India. The area consists mostly of hill regions and includes the Shillong plateau; it is drained by tributaries of the Brahmaputra and Surma rivers. The Cherrapunji area in the south has one of the highest average annual rainfalls in the world. The Khāsi Hills region is sometimes called the "Scotland of the East" because of its scenic beauty.

The vast majority of the population outside of Shillong, the capital of Meghālaya state, are engaged in agriculture, with wet rice, the largest crop, being cultivated in the valleys and on hillside terraces. Other farmers in the region practice shifting cultivation, burning the trees and farming the land for one or two years before moving on. The government has attempted to discourage this wasteful method, urging instead settlement on conventional farms. The distinctive culture of the Khāsi people includes a traditional matrilineal social system that has been modified by outside religious and modern legal influences. Many of the hill peoples have become Christians. The Khāsi language is considered to be one of the few surviving dialects of the Mon-Khmer family in India today.

To make the best use of the Britannica, consult the INDEX *first*

Khāsi language, also spelled KHASIA, KHASSEE, COSSYAH, or KYI, Mon-Khmer language spoken by the majority of people living in the south-central section of the Khāsi Hills and Jaintia Hills of central Assam, India. Khāsi contains a number of words borrowed from other languages, especially from Bengali and Hindi. Khāsi is one of the two ungrouped languages (the other is Khmer) of the Mon-Khmer group in the Austro-Asiatic language family.

Khasis (Semitic god): *see* Kothar.

Khaskovo, also spelled HASKOVO, town, southern Bulgaria, in the foothills of the northeastern Rhodope Mountains. Founded about 1385 at the outset of the Ottoman period, it is located on the Sofia-Istanbul road and the Belgrade-Sofia-Istanbul trunk rail line. Its populace includes many refugees from Macedonia and Aegean Thrace. Industries include the production of silk and cotton textiles, tobacco processing, vegetable packaging, and metalworking. A mineral spa with warm curative springs is located a few miles west of the town.

The surrounding region is a fertile agricultural area. Viticulture, tobacco and cotton growing, and silkworm breeding are economically important. The town has several museums, an art gallery, and a theatre. Pop. (1989 est.) 93,609.

Khatâ'na (Egypt): *see* Per Ramessu.

Khaṭīb Shalabī: *see* Kâtip Çelebi.

Khatibi, Abdelkebir (b. 1938, El Jadida, Mor.), Moroccan literary critic and novelist belonging to the angry young generation of the 1960s whose works initially challenged many of the tenets upon which the newly independent countries of the Maghrib were basing their social and political norms.

Khatibi completed his secondary education in Morocco and pursued a degree in sociology at the Sorbonne in Paris. His doctoral dissertation, *Le Roman maghrébin* ("The Maghribian Novel"), was published in 1968. From the outset Khatibi was concerned with the issue of commitment and literature, and his study on the novel raised the question of how the committed writer can avoid becoming a propagandist, especially in a postrevolutionary society. Khatibi argued for the need to create on the cultural level of the educated masses, avoiding popular demagoguery. His first novel, *La Mémoire tatouée* (1971; "The Tattooed Memory"), deals semiautobiographically with the typically Maghribian themes of acculturation and decolonization.

A wide range of interests is reflected in Khatibi's sociological studies, including a number of works on Moroccan social life (*Bilan de la sociologie au Maroc,* 1968; *Études sociologiques sur le Maroc,* 1971; and *La Blessure du nom propre,* 1974). Khatibi's early views on the use of French by Maghribian authors reflected the revolutionary tone of the late 1960s: writing was a means of passing beyond the contradictions of Western culture by use of "lyrical terror." The abstruse prose employed by the young generation of Maghribian authors reflects the desire to refuse French culture by destroying and recreating the French language, thus attacking the heart of the culture from within, with what Khatibi calls a *littérature sauvage.*

Two plays, *La Mort des artistes* (1964; "The Death of the Artists") and *Le Prophète voilé* (1979; "The Veiled Prophet"), and a novel, *Le Livre du sang* (1979; "The Book of Blood"), demonstrate his theoretical approach to literature. The novel is a poetical search for identity inspired by the Greek myth of Orpheus. *De la mille et troisième nuit* ("Of the Thousand and Third Night") was published in 1980. With his mature work Khatibi succeeds in launching savage yet lyrical attacks on and through the French language in order to serve his political goals.

Khatlon, *oblast* (province), southwest and south-central Tadzhik S.S.R. Khatlon *oblast* was created from the administrative merger of Kulyab and Kurgan-Tyube *oblast*s in 1988. The *oblast* has an area of about 9,500 square miles (24,600 square km). The city of Kurgan-Tyube is the administrative centre. The *oblast* extends from the Babatag mountain range on the west to the Khazratishokh range on the east and contains the valley of the southwest–northeast-trending Vaksh River.

Khatlon *oblast* is an area of fertile valleys alternating with mountain ranges. The climate is marked by cold winters and long, hot summers. The population is mostly rural and is settled primarily in the Vaksh and other river valleys. Cotton and grain are the main agricultural products, and sheep are the main livestock. The *oblast*'s cities are small and function mostly as agricultural service centres, with cotton ginning and food processing as their main industries. Other industrial enterprises include a chemical plant at Yavan and a fertilizer plant at Kalininabad. A railroad line connects the *oblast*'s two major cities, Kurgan-Tyube and Kulyab, with Dushanbe, the capital of Tadzhikistan. Pop. (1989) 1,702,000.

Khatr-Eddine, Mohammed (b. 1941, Tafraout, Mor.), French-language poet and novelist whose use of language made him a leader among postindependence Moroccan writers seeking a new and distinctly Moroccan poetic voice.

Khatr-Eddine completed his secondary studies in Casablanca and then worked for the government in Agadir, helping to restore order after an earthquake there. This experience led to his novel *Agadir* (1967), in which the earthquake comes to represent the "seismic" upheavals that had recently taken place in Moroccan society. Other well-known works by Khatr-Eddine include the novels *Corps négatif* (1968; "Negative Body"), *Moi l'aigre* (1970; "I, the Surly One"), and *Le Déterreur* (1973; "The Disentomber") and the collections of poetry *Soleil arachnide* (1969; "Arachnid Sun") and *Ce Maroc* (1975; "This Morocco").

Khatr-Eddine's work is strongly influenced by the stylistic experiments of the Algerian Kateb Yacine as well as by the bitter and violent tone of his older compatriot Driss Chraïbi. His style is often referred to as a kind of "linguistic guerrilla warfare" and is notable for its use of invented words and of words borrowed from Arabic, its exploding of conventional syntax, its violent and confrontive imagery, and its confusion of literary genres (often combining poetry, reportage, drama and personal confession). This technique supports themes of cultural disorientation, loss of personal values, and political conflict and hypocrisy.

Khattic language, also spelled KHATTISH: *see* Hattic language.

Khattusas, also spelled HATTUSA, HATTUSAS, or HATTUSHA, ancient Hittite city on the site of modern Boğazköy (*q.v.*).

Khattushilish (Hittite kings): *see under* Hattusilis.

Khawārij (Islāmic sect): *see* Khārijite.

Khawr Fakkān, also spelled KHOR FAKKAN, KHAWR AL-FAKKĀN, or FAKKĀN, exclave and port town, Ash-Shāriqah emirate, United Arab Emirates (formerly Trucial Oman, or Trucial States). It is on the east coast of the Oman promontory, facing the Gulf of Oman; the port and its hinterland divide the emirate of Al-Fujayrah into its two major portions.

Situated on a natural cove (Arabic: *khawr*), Khawr Fakkān was an important port in medieval times. It defied the conquering forces of Afonso de Albuquerque, viceroy and governor of Portuguese India, who reduced it in 1507. In the following two centuries, it was fought over by the Portuguese, Omanis, and Persians, the Omanis finally prevailing. The sheikh of Ash-Shāriqah, then a nominal ally of the sultan of Muscat and Oman, took advantage of the sultan's absence in his African possessions (1832) to seize Khawr Fakkān and most of the surrounding Shumaylīyah district. When Al-Fujayrah was recognized in 1952 by Britain, then protector of the Trucial States, as a separate state, most of the district passed to Al-Fujayrah, but the Khawr Fakkān area remained part of Ash-Shāriqah. In addition to its frontiers with Al-Fujayrah, it borders a small section of the Ra's Al-Khaymah emirate at the west, while in the south there is a section of undetermined sovereignty claimed by the sultanate of Oman.

Khawr Fakkān has one of the few natural harbours in the United Arab Emirates, and certainly the best in Ash-Shāriqah emirate, but, both because of its isolation and for political reasons, few investments in port improvements have been made there, notably a container port. Modernization has been confined chiefly to Ash-Shāriqah town, the capital of the emirate, on the Persian Gulf. Despite this neglect, it was estimated that when the United Arab Emirates attained independence (1971) Khawr Fakkān was the busiest port in Ash-Shāriqah emirate. It specialized in the smuggling of gold and luxury goods across the Gulf of Oman and the Arabian Sea to Indian and Pakistani ports. It now has a cement factory and pipe works.

From 1964 Ash-Shāriqah supplemented its then-meagre revenues by issuing many postage stamps labeled "Khor Fakkan"; virtually all of these were printed for sale to collectors and served no legitimate postal purposes. Stamp issues of individual emirates and their dependencies were superseded by the creation of a central United Arab Emirates post office department in 1972. Pop. (latest census) town, 1,547; exclave, 2,280.

khayāl (dance): *see* khyāl.

Khaybar Pass (Pakistan): *see* Khyber Pass.

Khayin (Semitic god): *see* Kothar.

Khayr ad-Dīn (Ottoman admiral): *see* Barbarossa.

Khaz'al Khan (b. 1861, Moḥammerah, Qājār Iran—d. May 25, 1936, Tehrān), Arab sheikh (ruler) of the city of Moḥammerah (now Khorramshahr) who attempted to create an independent state in the oil-rich Iranian region of Khūzestān.

Khaz'al was instrumental in having his brother, Sheikh Miz'al, assassinated in June 1897. He then became the ruler of Moḥammerah and the paramount chief of the Arab tribes of Khūzestān. Nominally owing allegiance to the central government in Tehrān, the Arab sheikhdom of Moḥammerah, which differed culturally and ethnically from the rest of Iran, enjoyed virtual autonomy in its internal affairs. Khaz'al's only major tie to the central government was the annual payment of nominal taxes.

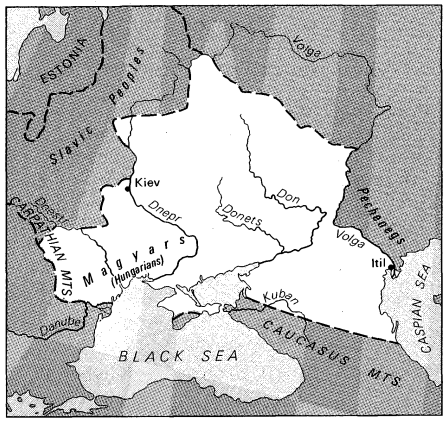
Sheikh Khaz'al believed that the Iranian state would eventually disintegrate and that its dominions would be partitioned. He hoped to establish an independent Arab state in Khūzestān. From 1898 onward he made diplomatic overtures to the British government, which had important strategic and commercial interests in the area. He promised to maintain public security in the area in return for British support of his autonomy and the implicit agreement that he would become an independent ruler if the central government should disintegrate.

The discovery of oil in Khūzestān in 1908 by a British-owned company (of which the British government became a 51 percent stockholder in 1914) increased Khaz'al's ties with the British, who in 1910 knighted him and awarded him the important decoration of Knight Commander of the Indian Empire. With the outbreak of World War I (1914–18), he actively supported the British government, while the Iranian government remained neutral. Khaz'al's power reached its zenith in 1919.

In 1921, however, when the British failed to establish a protectorate over Iran, Khaz'al's

position was weakened. He opposed the centralizing policies of Reza Khan (later Reza Shah Pahlavi, who became king of Iran in 1925), and he actively resisted the central government. Khaz'al's forces were defeated in October 1924, and in early 1925 he was arrested and exiled to Tehrān, where he died under house arrest. With his removal from the area, Khuzistan lost its autonomy within the kingdom of Iran.

Khazar, member of a confederation of Turkic-speaking tribes that in the late 6th century AD established a major commercial empire covering the southeastern section of modern European Russia. Although the origin of the term Khazar and the early history of the



The Khazar Empire in the 9th century

From W. Shepherd, *Historical Atlas*, 9th ed., Harper & Row Publishers (Barnes & Noble Books), New York; revision copyright © 1964 by Barnes & Noble, Inc.

Khazar people are obscure, it is fairly certain that the Khazars were originally located in the northern Caucasus region and were part of the western Turkic empire (in Turkistan). The Khazars were in contact with the Persians in the mid-6th century AD, and they aided the Byzantine emperor Heraclius (reigned 610–641) in his campaign against the Persians.

By the beginning of the 7th century, the Khazars had become independent of the Turkic empire to the east. But by the middle of that century, the expanding empire of the Arabs had penetrated as far northward as the northern Caucasus, and from then on until the mid-8th century the Khazars engaged in a series of wars with the Arab empire. The Arabs initially forced the Khazars to abandon Derbent (661), but around 685 the Khazars counterattacked, penetrating southward of the Caucasus into present-day Georgia, Armenia, and Azerbaijan. The Khazars and Arabs fought each other directly in Armenia in the 720s, and, though victory passed repeatedly from one side to the other, Arab counterattacks eventually compelled the Khazars to permanently withdraw north of the Caucasus. The Khazars' initial victories were important, though, since they had the effect of permanently blocking Arab expansion northward into eastern Europe. Having been compelled to shift the centre of their empire northward, the Khazars after 737 established their capital at Itil (located near the mouth of the Volga River) and accepted the Caucasus Mountains as their southern boundary.

During the same period, however, they expanded westward. By the second half of the 8th century, their empire had reached the peak of its power—it extended along the northern shore of the Black Sea from the lower Volga and the Caspian Sea in the east to the Dnepr River in the west. The Khazars controlled and exacted tribute from the Alani and other northern Caucasian peoples (dwelling between the mountains and the Kuban River); from the Magyars (Hungarians) inhabiting the area around the Donets River; from the Goths; and from the Greek colonies in the Crimea. The Volga Bulgars and numerous Slavic tribes also recognized the Khazars as their overlords.

Although basically Turkic, the Khazar state bore little resemblance to the other Turkic empires of central Eurasia. It was headed by a secluded supreme ruler of semireligious character called a khagan—who nevertheless wielded little real power—and by tribal chieftains, each known as a *beg*. The state's military organization also seems to have lacked the forcefulness of those of the greater Turkic-Mongol empires. The Khazars seem to have been more inclined to a sedentary way of life, building towns and fortresses, tilling the soil, and planting gardens and vineyards. Trade and the collection of tribute were major sources of income. But the most striking characteristic of the Khazars was the apparent adoption of Judaism by the khagan and the greater part of the ruling class in about 740. The circumstances of the conversion remain obscure, the depth of their adoption of Judaism difficult to assess; the fact itself, however, is undisputed and unparalleled in the history of central Eurasia. A few scholars have even asserted that the Judaized Khazars were the remote ancestors of many of the Jews of eastern Europe and Russia. Whatever the case may be, religious tolerance was practiced in the Khazar empire, and paganism continued to flourish among the population.

The prominence and influence of the Khazar state was reflected in its close relations with the Byzantine emperors: Justinian II (704) and Constantine V (732) each had a Khazar wife. The main source of revenue for the empire stemmed from commerce and particularly from Khazar control of the east–west trade route that linked the Far East with Byzantium and the north–south route linking the Arab empire with northern Slavic lands. Income that was derived from duties on goods passing through Khazar territory, in addition to tribute paid by subordinate tribes, maintained the wealth and the strength of the empire throughout the 9th century. But by the 10th century the empire, faced with the growing might of the Pechenegs to their north and west and of the Russians around Kiev, suffered a decline. When Svyatoslav, the ruler of Kiev, launched a campaign against the Khazars (965), Khazar power was crushed. Although the Khazars continued to be mentioned in historical documents as late as the 12th century, by 1030 their political role in the lands north of the Black Sea had greatly diminished. Despite the relatively high level of Khazar civilization and the wealth of data about the Khazars that is preserved in Byzantine and Arab sources, not a single line of the Khazar language has survived.

Kheda, also called KAIRA, town, east-central Gujarāt state, west-central India. It is situated in the lowlands between the Sābarmati and Mahi rivers. The town existed as early as the 5th century AD. Early in the 18th century it passed to the Babi family but was taken by the Marāṭhās in 1763 and handed over to the British in 1803. Kheda is now a trading centre for agricultural produce and has some light manufacturing industries. It lies along a major highway and along the Western Railway, 20 miles (32 km) south-southeast of Ahmadābād.

The area in which Kheda is situated is mostly an unbroken plain that slopes gently toward the southwest and is drained by the Sābarmati and Mahi rivers. The chief crops are grains, pulses, and cotton. Industrial activities include printing, dyeing, and glass and cotton-textile manufacture. Kheda is particularly noted as a cooperative milk-producing centre. The highway and railroad networks in the region are well-developed. Pop. (1981) town, 18,969.

khedive, Turkish HIDIV, Arabic KHIDĪWĪ, title granted by the Ottoman sultan Abdülaziz to the hereditary pasha of Egypt, Ismā'īl, in 1867 and used by his successors Tawfīq and 'Abbās Ḥilmī II. It was replaced by the title sultan in 1914, when Egypt became a British protectorate.

Khedive (card game): *see* Biritch.

Khem-Beldyr (Russian S.F.S.R.): *see* Kyzyl.

Khemisset, town, north-central Morocco. The town is located between the imperial cities of Rabat and Meknès, at the edge of the Moroccan upland plateau. It is a market centre for the local Zemmour Berbers. To the north of Khemisset lies a sandy plateau with commercially exploited cork oak and eucalyptus forests, while the town itself is situated in an area that is intensively cultivated with cereals (mostly wheat) and citrus fruits and in which sheep are raised. The Zemmour Berbers are noted for their mats and carpets made from European dwarf fan palm fibres and wool, and for their carved wooden objects. Pop. (1982) 58,925.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Khenifra, town, central Morocco. It is situated in the western foothills of the southern Middle Atlas mountains and lies along the banks of the Oum er-Rbia River at an elevation of 3,280 feet (1,000 m). The site was originally the wintering headquarters for the Aït Affi, a branch of the local Zaian (Berber) nomads. In 1688 it assumed strategic importance when the 'Alawī sultan Moulay Ismā'il built a Casbah (fortress) and a bridge there. Toward the end of the 19th century, Muha ū Hāmū ez-Zaiyānī, the governor of the local Berber tribes appointed by the sultan, established a market at the site, later constructed the town of Khenifra, and subsequently brought the surrounding area under his subjection and declared himself independent of the sultan. Although French troops occupied the town in 1914, it was not until 1921, when the local governor was killed, that the French assumed control over the region. The inhabitants of the surrounding area are mainly Tamazigt-speaking, seminomadic Zaian Berbers who are known for their formidable horsemanship and live in *ksar*s (fortified villages) in the mountains raising sheep and low-yield cereals. Pop. (1982) 38,840.

Kheperkheprure Ay (Egyptian king): *see* Ay.

Kheraskov, Mikhail Matveyevich (b. Nov. 5 [Oct. 25, Old Style], 1733, Pereyaslav, Poltava province, Ukraine, Russian Empire—d. Oct. 9 [Sept. 27], 1807, Moscow), epic poet, playwright, and influential representative of Russian classicism who was known in his own day as the Russian Homer.

The son of a Walachian noble who had settled in Russia, Kheraskov became director of Moscow University in 1763. He determined to give Russia a national epic, then the sine qua non of an independently important literature. *Rossiyada* (1771–79; "Russian Epic") is based on the capture of Kazan (1552) by Ivan the Terrible, and *Vladimir vozrozhdyonny* (1785; "Vladimir Reborn") is concerned with St. Vladimir's introduction of Christianity to Russia. Kheraskov composed 20 plays, including tragedies and comedies, embodying classical principles of dramaturgy. He also edited literary magazines. His didactic poem *Plody nauk* (1761; "The Fruits of the Sciences") was a polemic against Jean-Jacques Rousseau's attack on scientific progress. Though they were highly respected during the 18th century, Kheraskov's works were rejected by the 19th century and now are read only by specialists.

Kherson, also spelled CHERSON, *oblast* (province), Ukraine, U.S.S.R. Its area of 11,000 square miles (28,500 square km) extends across the lower Dnepr River and along the shores of the Black Sea, Sivash Lake, and the Sea of Azov. Named for its capital, it comprises a level plain, with almost no surface water apart from the Dnepr. The whole area is in steppe, although virgin steppe now survives only in the large Askaniya-Nova Nature Reserve in the south. The climate is dry, and, although much of the *oblast* is under the plow, agriculture suffers severely from drought. An irrigation-canal system carries water from a large reservoir on the Dnepr in the north, created by the dam of the Kakhovka hydroelectric station. The *oblast* has the lowest population density in the Ukraine. Pop. (1989) 1,240,000.

Kherson, also spelled CHERSON, city and administrative centre of Kherson *oblast* (province), Ukraine, U.S.S.R. It lies on the right bank of the lower Dnepr River about 15 miles (25 km) from the latter's mouth. It was founded in 1778 by the military leader and statesman Grigory Potemkin as a fortress to protect the newly acquired Black Sea frontage of Russia, and it became the first Russian naval base and shipyard on the Black Sea. Modern Kherson remains a major shipbuilding centre. There are other branches of industrial-engineering, oil-refining, and cotton-textile industries. Kherson has teacher-training and agricultural institutes and a research institute of irrigation agriculture. Pop. (1989 prelim.) 355,000.

Khesekhem (Egyptian king): *see* Khasekhemwy.

Khibinogorsk (Russian S.F.S.R.): *see* Kirovsk.

Khiḍr (Ottoman admiral): *see* Barbarossa.

Khiḍr, al- (Arabic, contraction of al-Khaḍir, "the Green One"), a legendary Islāmic figure endowed with immortal life who became a popular saint, especially among sailors and Ṣūfīs (Muslim mystics).

The cycle of myths and stories surrounding al-Khiḍr originated in a vague narrative in the Qur'ān (18:60–82) that describes the long and arduous journey of Mūsā (Moses) and his servant to the "meeting of the two seas." In the course of their travels, they lose a fish they had taken with them; a man of God appears, offering to help them in their search for the fish but performs seemingly senseless deeds along the way—he sinks a boat, kills a young man, then restores a wall in a city hostile to them. Mūsā questions what the man has done and receives a satisfactory explanation for everything; but by questioning, Mūsā forfeits the man's patronage.

On a popular level, Khiḍr has been given a name (most frequently Balyā ibn Malkān), many different genealogies, and dates that have made him a contemporary of Abraham or Alexander. Khiḍr's immortality and ability to assume a variety of local characteristics probably account for his widespread popularity among Arabs, Turks, Iranians, and other Muslims, despite orthodox Islāmic opposition. In Syria, Khiḍr became partially identified with St. George, who, according to a local tradition, is of Syrian birth; in India and Pakistan, Khiḍr is identified with a water deity (Khwādja Khiḍr) specializing in the protection of mariners and river travelers; and, among the Ṣūfīs, he is associated with their founders, who were often endowed with holiness and sainthood.

Khimki, also spelled CHIMKI, city and centre of a *rayon* (sector), Moscow *oblast* (province), Russian S.F.S.R. It lies along the Moscow-Leningrad railway northwest of the capital. Incorporated in 1939, Khimki grew from a small nucleus of summer cottages (*dachi*). It is now an important industrial centre, with engineering, tile, and glass concerns. Pop. (1989 prelim.) 133,000.

Khíos (Greece): *see* Chios.

khirqah (Arabic: "rag"), a woolen robe traditionally bestowed by Ṣūfī (Muslim mystic) masters on those who had newly joined the Ṣūfī path, in recognition of their sincerity and devotion. While most sources agree that the *khirqah* was a patched piece of cloth, there is no uniform description of the colour or shape. Some described it as a blue woolen robe, and, since blue is the colour of mourning, it signified the rejection of worldly pleasure. Others described it as white for purity.

The *khirqah* was a sign of *faqr* (poverty) and symbolized the devotee's vow to abandon the earthly world and to devote himself entirely to the love of God. It took three years of good work under the supervision of the sheikh (Ṣūfī master) for a novice to obtain the *khirqah,* which was then bestowed upon him in a special ceremony to mark his "entering upon the way of Truth."

There were different types of *khirqah.* The *khirqat al-irādah* (robe of will) was given to those who entered the Ṣūfī path fully aware of the difficult duties that they must undertake and prepared to accept and obey without question the sheikh's orders. The *khirqat at-tabarruk* (robe of benediction), which was inferior to the former, was given to those whom the sheikh felt had the potential of surviving the tests that eventually would lead to their acceptance in the Ṣūfī brotherhood, even if they did not yet know the full meaning of wearing the *khirqah.*

Many Ṣūfīs, rejecting the idea of a universal attire as unnecessary, argued that what is important is not the *khirqah* but the person who wears it; a true mystic does not need a uniform, for if his heart is pure he will not be concerned with such things as clothing. Others rejected the *khirqah* because it might allow pretenders and unaccomplished men to deceive the masses by professing to be Ṣūfīs. All Ṣūfīs agreed, however, that a real seeker of truth is known by his *ḥarqah* (inner flame), and that the *khirqah* is merely a symbol that should not be overvalued.

Khirthar Range (Pakistan): *see* Kīrthar Range.

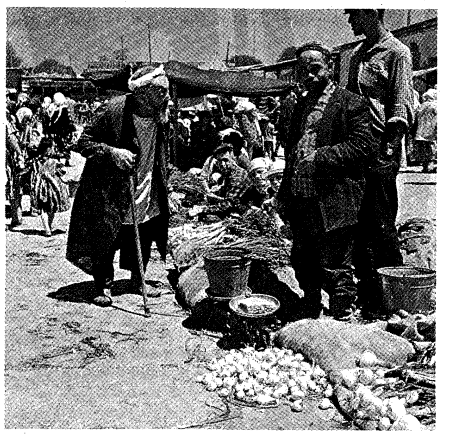
Khitan, any member of a Mongol people that ruled Manchuria and part of North China from the 10th to the early 12th century under the Liao dynasty (*q.v.*). *See also* Manchuria.

khitān, in Islām, circumcision of the male; by extension it may also refer to the circumcision of the female (properly *khafḍ*). Muslim traditions (Ḥadīth) recognize *khitān* as a pre-Islāmic rite customary among the Arabs and place it in the same category as the trimming of mustaches, the cutting of nails, and the cleaning of the teeth with a toothpick.

The legal schools of Islām, however, do not agree on the exact importance of *khitān.* The Shāf'īyah school prescribes it for both males and females as obligatory (*wājib*), while the Mālikīyah school allows that it is meritorious and recommended (*sunnah*) but not essential. Nor is there consensus regarding the age at which *khitān* should be performed: some recommend the seventh day after birth, some forbid it before the age of 10, others simply require it before adulthood. Among the followers of the religion, *khitān* far outweighs the importance accorded it by the legalists. Particulars vary from one Muslim country to another, but everywhere *khitān* is a major and celebrated rite.

Khiuma (Estonian S.S.R.): *see* Hiiumaa.

Khiva, also spelled CHIVA, city, Khorezm *oblast* (province), Uzbekistan, U.S.S.R. The city lies west of the Amu Darya (river), on the Palvan Canal. It is bounded on the south by the Kara-Kum Desert and on the northeast by the Kysylkum Desert. According to archaeological data, the city existed in the 6th–8th century, but it is first mentioned in the 10th century by two Arabian travelers. In the middle of the 16th century it became the capital of the khanate of Khiva. It was



A bazaar in Khiva, Uzbekistan, U.S.S.R.
Bjorn Bolstad—Peter Arnold

also the capital of the Khorezm People's Soviet Republic, which replaced the khanate in 1920, when the khan was overthrown with the aid of the Red Army. Since its incorporation in Uzbekistan in 1924, Khiva has lost its political importance. Today cotton ginning is the chief industry; but traditional old crafts such as carpet making, embroidery, and wood and stone carving survive. The old walled inner city, the Ichan-Kala, encloses various palaces, mosques, madrasah (Muslim theological schools), minarets, and mausoleums. Pop. (latest est.) 26,000.

Khlebnikov, Velimir Vladimirovich, original name VIKTOR VLADIMIROVICH KHLEBNIKOV (b. Nov. 9 [Oct. 28, Old Style], 1885, Tundutov, Russia—d. June 28, 1922, Santalovo, Novgorod province, U.S.S.R.), poet who was the founder of Russian Futurism and whose esoteric verses exerted a significant influence on Soviet poetry after his death.

Born into a scientific family, Khlebnikov studied both mathematics and linguistics during his university years. At that time he also began developing ideas for a renovation of poetic language. About 1912 he met the poet Vladimir Mayakovsky, and the two became the centre of the Futurist literary movement, which was directed against the mysticism and narrowness of Symbolism and which regarded art as a social utility.

Khlebnikov, unlike other Futurists, retained a kind of mysticism—of things and words rather than of ideas and symbols. Through his verbal experimentations he devised a "translogical language," creating a "new world of words" in his verse that makes it fresh and invigorating but difficult for the general reader. He was a poet's poet, influencing others who extended his experimentation into their more accessible verse.

Khlebnikov was a Slavophile who loved Russia and the Russian language; this led him to change his first name from Viktor (of Latin derivation) to Velimir. His popularity began to decline after the Revolution, although his influence did not, as the works of Mayakovsky, Boris Pasternak, Osip Mandelstam, and others clearly show. He died in a remote village in the province of Novgorod. After World War II Khlebnikov was attacked by Soviet critics as a "formalist" and "decadent," and his name fell into complete oblivion. Following the death

of Joseph Stalin, his rehabilitation was a slow one, and no new edition of the full corpus of his work had appeared by the early 1980s.

Khlesl, Melchior: *see* Klesl, Melchior.

Khmelnitsky, also spelled CHMEL'NICKIJ, formerly (until 1954) KAMENETS-PODOLSKY, *oblast* (province), Ukraine, U.S.S.R. Its area of 7,950 square miles (20,600 square km) extends across the Volyn-Podolsk Upland and slopes gently down in the south to the Dnestr River. The *oblast*'s natural forest-steppe vegetation has been almost wholly plowed up; intensive erosion has developed, and a network of gullies is widespread. The economy is overwhelmingly agricultural, and about one-half of the population is rural. The *oblast* is one of the principal sugar beet-growing areas of the Soviet Union. Grains, chiefly winter wheat and corn (maize), sunflowers, vegetables, and tobacco are also important. Dairying, pig keeping, and fruit growing are well developed, especially in the Dnestr River valley. Communities, apart from the capital, Khmelnitsky, are small and engaged chiefly in processing agricultural products, especially in sugar refining. Pop. (1989) 1,527,000.

Khmelnitsky, also spelled CHMEL'NICKIJ, formerly (until 1954) PROSKUROV, city and administrative centre of Khmelnitsky *oblast* (province), Ukraine, U.S.S.R. It lies along the upper Yuzhny (Southern) Bug River. Originally a Polish military post, it dates from the late 15th century. The fort was seized by Cossacks during the mid-17th century. In 1793 it passed to Russia by the Second Partition of Poland, and in 1795 city status was conferred on it. The modern city is a rail junction on the Odessa-Lvov and Chernovtsy-Korosten lines and has light-engineering, food-processing, and consumer-goods industries. Its educational and cultural facilities include a technological institute, theatre, and philharmonic hall. Pop. (1989 prelim.) 237,000.

Khmelnitsky, Bohdan, also spelled BOGDAN CHMIELNICKI, Russian in full BOGDAN ZINOVY MIKHAYLOVICH KHMELNITSKY (b. *c.* 1595, Chigirin, Ukraine [now in U.S.S.R.]—d. Aug. 16 [Aug. 6, Old Style], 1657, Chigirin), leader (1648–57) of the Zaporozhian Cossacks who organized a rebellion against Polish rule in the Ukraine that ultimately led to the transfer of the Ukrainian lands east of the Dnepr River from Polish to Russian control.

Although he had been educated in Poland and had served with Polish military forces against the Turks, Khmelnitsky, who had become chief of the Cossacks at Czyhryn, quarreled with the Polish governor of that region and was forced to flee (December 1647) to the fortress of the Zaporozhian Cossacks, a semimilitary community that had developed from runaway serfs, bandits, and traders who had settled along the Dnepr River. He then organized a rebellion among the Zaporozhian Cossacks and, with the support of the Crimean Tatars, marched against the Poles in April 1648. His victorious advance won him additional support from the dissatisfied peasants, townsmen, and clergy of the Ukraine, who joined him in a mass uprising that enabled him to enter Poland proper and seize Lvov (Lwów) in October 1648.

After winning more victories in 1649, Khmelnitsky made peace with the new Polish king John Casimir, concluding the Compact of Zborów (Aug. 18, 1649); its terms permitted him to establish a virtually independent Cossack principality in the Ukraine. The treaty satisfied neither the Polish gentry nor Khmelnitsky's followers, many of whom remained subject to Polish landlords; therefore, he renewed the war in the spring of 1651 but was defeated at the Battle of Beresteczko in June and was compelled to accept a new, less advantageous treaty. He then sought aid from Moscow against Poland and in 1654 directed his Cossacks to take an oath of allegiance to Alexis, the tsar of Russia (*see* Pereyaslav Agreement).

The Russians subsequently invaded Poland, but Khmelnitsky, not content with his pact with Alexis, entered into secret negotiations with Sweden, which was also at war with Poland. He was about to conclude a treaty with the Swedes, placing the Cossacks under Swedish rule, when he died.

Although Khmelnitsky sought autonomy for his Cossack followers, he succeeded only in devastating their formerly flourishing Dnepr lands and in subjecting them to the rule of Moscow, which gained control of the Ukraine east of the Dnepr and gradually curtailed their liberties.

Khmer, also called CAMBODIAN, or KAMPUCHEAN, any member of an ethnolinguistic group that constitutes most of the population of Kampuchea (Cambodia). Smaller numbers of Khmer also live in southeastern Thailand and the Mekong River delta of southern Vietnam. The Khmer language belongs to the Mon-Khmer group of Austro-Asiatic languages. The Khmer have a long history, of which the 12th-century temple complex of Angkor Wat is a monument.

The Khmer are a predominantly agricultural people, subsisting on rice and fish and living in villages of several hundred persons. Other economic pursuits include weaving, pottery making, and metalworking. Houses have gabled roofs and are built of wood or concrete. Households are based on the nuclear family and occasionally include other close relatives.

The Khmer follow Theravāda Buddhism, of which there are two varieties: the Thammayut and the Mohanikay. These coexist with pre-Buddhist animistic beliefs and the use of magic to ward off malevolent influences. Historically, Khmer arts, literature, and popular scientific ideas have been much influenced by Indian culture, as has much of the vocabulary in which they are expressed.

Khmer language, also called CAMBODIAN, Mon-Khmer language spoken by most of the people in Kampuchea (where it is the official language) and by smaller numbers in adjacent countries. The language has been written since the 7th century, in an Indian-derived script, and has a considerable literature.

Most Khmer words have one or two syllables, although words borrowed from other languages may be longer. Khmer contains a great number of loanwords, especially from Sanskrit, Pāli, Thai, Chinese, and Vietnamese. Syntactic relations among the words of a sentence are usually indicated by word order or by the use of prepositions. Khmer nouns are not marked for gender.

Khmer Rouge (French: "Red Khmer"), official (English) name COMMUNIST PARTY OF KAMPUCHEA, radical communist movement that ruled Kampuchea (Cambodia) from 1975 to 1979 after winning power through a guerrilla war.

The movement originated as the Revolutionary Cambodian People's Party, which was formed in 1951 under the auspices of the Viet Minh of Vietnam. The party's French-educated Marxist leaders eventually renamed it the Communist Party of Kampuchea. By the late 1950s the party's members were engaged in clandestine activities against the government of Prince Norodom Sihanouk, who coined the pejorative name "Khmer Rouge" for the group. For many years the Khmer Rouge made little headway against Sihanouk from its bases in remote jungle and mountain areas, partly because of Sihanouk's own popularity among the peasants whom the Khmer Rouge sought to incite to rebellion.

But after a right-wing military coup toppled Sihanouk in 1970, the Khmer Rouge entered into a political coalition with him and began attracting increased support in the Cambodian countryside, a trend that was accelerated by the destructive U.S. bombing campaigns over Cambodia in the early 1970s. By this time the Khmer Rouge were also receiving aid from North Vietnam, which had withheld its support during the years of Sihanouk's rule.

In a civil war that continued for nearly five years from 1970, the Khmer Rouge gradually expanded the areas of the Cambodian countryside under their control. Finally, in April 1975, Khmer Rouge forces mounted a victorious attack on the capital city of Phnom Penh and established a national government to rule Kampuchea. Their rule of Kampuchea over the next four years was marked by some of the worst excesses of any Marxist government in the 20th century, with as many as 1,500,000 Kampuchean dead and the country's professional and technical class almost completely exterminated.

The Khmer Rouge government was overthrown in 1979 by invading Vietnamese troops and their Kampuchean allies, who installed a puppet government propped up by Vietnamese aid and expertise. The Khmer Rouge retreated to remote areas and resumed guerrilla warfare, this time operating from bases near the border with Thailand and obtaining aid from China. In 1982 they joined a fragile coalition (under the nominal leadership of Sihanouk) with two non-Communist Khmer groups opposed to the Vietnamese-backed central government. The Khmer Rouge became the strongest partner in this coalition, and by 1990, with Vietnam having withdrawn its troops from Kampuchea, the Khmer Rouge once again seemed poised to take over the country.

Khmuic languages, group of languages spoken primarily in Laos in areas scattered around Luang Prabang and extending into parts of Thailand and northern Vietnam. The Khmuic languages are members of the Mon-Khmer language group, affiliated with the Austro-Asiatic language phylum.

Khmu' is the largest of the languages, with about 100,000 speakers on both sides of the Laos-Thailand border. Other Khmuic languages include Khao, Lamet, Puôc, Tayhat, T'in, and Yumbri.

Khobar, al- (Saudi Arabia): *see* Khubar, al-.

Khobdo (Mongolia): *see* Hovd.

Khodzhent (city, Tadzhik S.S.R): *see* Leninabad.

Khōī (Iran): *see* Khvoy.

Khoikhoin, also spelled KHOIKHOI, also called (pejorative) HOTTENTOTS, people of southern Africa whom the first European explorers found in areas of the hinterland and who now live either in European settlements or on official reserves in South Africa or Namibia. Khoikhoin (meaning "men of men") is their own name for themselves; Hottentot is the term fashioned by the Dutch (later Afrikaner) settlers, probably in imitation of the clicks in their language.

Most Khoikhoin are either Nama or Oorlams, the latter term denoting remnants of the "Cape Hottentots" together with many of hybrid descent. The main Nama concentrations are the Bondelswarts, Rooinasie, Swartboois, and Topnaars; the main Orlams groups are the Witbooi, Amraal, Berseba, and Bethanie. The Khoikhoin are not easily distinguishable physically from the San (*q.v.*), or Bushmen—the Khoikhoin's slightly taller stature and decidedly longer and narrower head being the only marked differences.

War, disease, and absorption into the Cape Coloured communities have dissipated most of the original Khoi groups. Their traditional

economy and social organization have thus changed drastically. Formerly, they practiced a herding, hunting, and gathering economy. Although some independent families still lead a nomadic pastoral life, the majority have settled and live by selling their labour, adopting the material equipment, dress, language, and general mode of living of their Europeanized rural environment. It is claimed that most Khoikhoin have become Christian. The former nomadic unit—the patriarchally organized group of related families—now finds expression as the ward of a village. The clan tribes, to which persons were affiliated by descent and within which interclan affairs were administered by a council of clan heads, have given way to reserve groups, which are often administered as political units by chiefs and headmen, loyalty to whom defines tribal membership.

Khoikhoin languages, also called HOTTENTOT, group of Khoisan languages most closely related to the Central San languages, with which they are placed by many scholars in the Central Khoisan, or Khoi, group. The most important of the Khoikhoin languages is Nama, spoken by Khoikhoins, Bergdamas, and members of a small group of San (Bushmen); all these groups live in Namibia (South West Africa). Although several Khoisan languages have been recorded in writing by linguists and missionaries, Nama is the only Khoisan language that is used in a written form by its native speakers. Other important Khoikhoin languages are !Kora (also called Korana) and the extinct Griqua (or Grikwa) language.

The most striking feature of the Khoikhoin languages, as of all Khoisan languages, is their extensive use of click sounds (*see* click). The Khoikhoin languages express number, gender, and case by means of suffixes. The languages usually have three categories of grammatical number (singular, dual, and plural) and three genders or classes of nouns (masculine, feminine, and common). Particles and inflectional elements seldom contain click consonants, which occur almost exclusively in word roots. Verb, noun, and adjective roots contain, or formerly contained, two syllables.

Some scholars in the past believed, usually on cultural rather than linguistic grounds, that the Khoikhoin languages were related to the languages formerly called Hamitic, but increasing knowledge of these two groups has led most specialists to abandon this belief.

Khoisan languages, also called CLICK LANGUAGE, a family of languages spoken by Khoikhoin, San, and other non-Bantu peoples of southern Africa. The languages of the family are usually divided into three groups: North Khoisan (also called Northern San), which includes !Khung and //Kh'au-//'en; Central Khoisan (also called Khoi), which includes the Khoikhoin languages, among which are Nama, !Kora, and Griqua, and also includes the Central San languages, among which are Naro, /Guikhoe, and //Ganakhoe; and South Khoisan (also called Southern San), which includes /'Auni, //Ng-!Ke and ≠Khomani. Some scholars combine North and South Khoisan languages in one group called San. In addition to these languages, Sandawe and Hadza, spoken by small tribal groups in Tanzania, are usually included in the Khoisan language family.

The most noticeable feature of the Khoisan languages is a series of click sounds, which form a subsystem of the consonants. (*See* click.) The number of basic clicks (each modified by the manner in which the air coming from the lungs is released when the click is made) in these languages ranges from three in Sandawe to as many as seven in some Bushman languages. Sandawe has an alveolar click (usually written as ≠), a lateral click (usually written as //), and a palatal, or cerebral, click (usually written as !); in addition, Hottentot and Hadza have a dental click (usually written as /), and some of the San languages also have a labial click, a guttural click, and a semilabial click. All languages of the family are tone languages; as many as five tonal levels have been reported.

Although similarities among the grammatical systems of the languages exist, there are few grammatical features common to all the languages of the family.

Kholmogory, also spelled CHOLMOGORY, formerly (until 1972) KOLMOGORY, village, port, and administrative centre of Kholmogory *rayon* (sector), Arkhangelsk *oblast* (province), northwestern Russian Soviet Federated Socialist Republic. It lies along the Northern Dvina River, 47 miles (75 km) southeast of the city of Arkhangelsk. The village has existed since 1355, when it served traders as a riverine port en route to the White Sea. It grew into a large commercial centre in the 15th and 16th centuries. Mikhail V. Lomonosov, the 18th-century scientist and poet, was born in the neighbouring village of Mishaninskaya (now called Lomonosovo). With the commercial development of Arkhangelsk initiated by Peter I the Great (reigned 1682–1725), the significance of Kholmogory declined.

Modern Kholmogory continues to be a centre for cattle raising. The Kholmogory breed of cattle, developed in the 18th and 19th centuries by cross-breeding local cattle with Holstein-Frisians, produces record milk yields and is particularly suited to the cold climate in the northern parts of the Soviet Union. Kholmogory is the home of the State Pedigree Stock Farm and has a livestock technical institute. Pop. (early 1970s) less than 10,000.

Khomeini, Ruhollah, also spelled RŪḤALLĀH KHOMEYNĪ, original name RUHOLLAH MUSAWI (b. May 17, 1900?, Khomeyn, Iran—d. June 3, 1989, Tehrān), Iranian Shīʿite cleric who led the revolution that overthrew Mohammad Reza Shah Pahlavi in 1979 and who was Iran's ultimate political and religious authority for the next 10 years.

Khomeini was the grandson and son of mullahs, or Shīʿite religious leaders. When he was five months old, his father was killed on the orders of a local landlord. The young Khomeini was raised by his mother and aunt and then by his older brother. He was educated in various Islāmic schools, and he settled in the city of Qom about 1922. About 1930 he adopted the name of his home town, Khomeyn, as his surname. As a Shīʿite scholar and teacher, Khomeini produced numerous writings on Islāmic philosophy, law, and ethics, but it was his outspoken opposition to Iran's ruler, Mohammad Reza Shah Pahlavi, his denunciations of Western influences, and his uncompromising advocacy of Islāmic purity that won him his initial following in Iran. In the 1950s he was acclaimed as an ayatollah, or major religious leader, and by the early 1960s he had received the title of grand ayatollah, thereby making him one of the supreme religious leaders of the Shīʿite community in Iran.

In 1962–63 Khomeini spoke out against the shah's reduction of religious estates in a land-reform program and against the emancipation of women. His ensuing arrest sparked antigovernment riots, and, after a year's imprisonment, Khomeini was forcibly exiled from Iran on Nov. 4, 1964. He eventually settled in the Shīʿite holy city of an-Najaf, Iraq, from where he continued to call for the shah's overthrow and the establishment of an Islāmic republic in Iran.

From the mid-1970s Khomeini's influence inside Iran grew dramatically owing to mounting public dissatisfaction with the shah's regime. Iraq's ruler, Saddam Hussein, forced Khomeini to leave Iraq on Oct. 6, 1978. Khomeini then settled in Neauphle-le-Château, a suburb of Paris. From there his supporters relayed his tape-recorded messages to an increasingly aroused Iranian populace, and massive demonstrations, strikes, and civil unrest in late 1978 forced the departure of the shah from the country on Jan. 16, 1979. Khomeini arrived in Tehrān in triumph on Feb. 1, 1979, and was acclaimed as the religious leader of Iran's revolution. He appointed a government four days later and on March 1 again took up residence in Qom. In December a referendum on a new constitution created an Islāmic republic in Iran, with Khomeini named Iran's political and religious leader for life.

Khomeini was able to tap the deep-seated conservatism of the Muslim fundamentalists, who had acquired new vitality by their victory over the shah. Khomeini himself proved unwavering in his determination to transform Iran into a theocratically ruled Islāmic state. Iran's Shīʿite clerics largely took over the formulation of governmental policy, while Khomeini arbitrated between the various revolutionary factions and made final decisions on important matters requiring his personal authority. First his regime took political vengeance, with hundreds of people who had worked for the shah's regime reportedly executed. The remaining domestic opposition was then suppressed, its members being systematically imprisoned or killed. According to Khomeini's dictates, Iranian women were required to wear the veil, Western music and alcohol were banned, and the punishments prescribed by Islāmic law were reinstated.

The main thrust of Khomeini's foreign policy was the complete abandonment of the shah's pro-Western orientation and the adoption of an attitude of unrelenting hostility toward both superpowers, while in the meantime Iran tried to export its brand of Islāmic fundamentalism to neighbouring Muslim countries. Khomeini sanctioned Iranian militants' seizure of the U.S. embassy in Tehrān (Nov. 4, 1979) and their holding of American diplomatic personnel as hostages for more than a year. He also refused to countenance a peaceful solution to the Iran–Iraq war, which had begun in 1980 and which he insisted on prolonging in the hope of overthrowing Iraq's ruler, Saddam Hussein. Khomeini finally approved a ceasefire in 1988 that effectively ended the war.

Iran's course of economic development foundered under Khomeini's rule, and his pursuit of victory in the Iran–Iraq War ultimately proved futile. But Khomeini was able to retain his charismatic hold over Iran's Shīʿite masses, and he remained the supreme political and religious arbiter in the country until his death.

Khoms (Libya): *see* Khums, al-.

Khomyakov, Aleksey Stepanovich (b. May 13 [May 1, Old Style], 1804, Moscow—d. Oct. 5 [Sept. 23], 1860, Ryazan, near Moscow), Russian poet and founder of the 19th-century Slavophile movement that extolled the superiority of the Russian way of life. He was also an influential lay theologian of the Russian Orthodox Church.

Khomyakov came from a family that had for many generations served the Russian tsars. His father, Stepan, lacking practical ability, brought the family's financial affairs to the brink of ruin; his mother, Maria Kireyevskaya, however, saved the situation because of her combined business sense and intelligence. Deeply devoted to the Orthodox church, she brought up her two sons and her daughters in the spirit of traditional Russian piety and enabled them to receive an excellent education. Aleksey had among his private tutors a French refugee priest, a Greek scholar, and some well-known Russian professors. He acquired a mastery of French, German, English,

Greek, and Latin; he also learned Sanskrit and compiled a Russian–Sanskrit dictionary. Though he did not enroll as a student, Aleksey passed his final examinations in mathematics at Moscow University. A visit to France for 18 months completed his education.

During the Russo-Turkish War (1828–29) he served with distinction, and he spent the remainder of his life in Moscow involved to a great extent in intellectual pursuits, though frequently visiting his family estates of Bugucharovo and Lipitsy. He was reputed to be happily married and had several children.

Khomyakov was known as a gifted writer and a brilliant controversialist; he dealt with a wide range of subjects, composed poetry, and wrote philosophical and political essays and treatises on economics, sociology, and theology. A successful landlord, he won prizes in England for the construction of agricultural machinery. Being a remarkable marksman he made important improvements in the design of guns. He was also a self-taught doctor and treated many of the peasants on his estates.

Rigid censorship in tsarist Russia permitted only some of his articles to appear in print during his lifetime. His major theological and historical works were thus published posthumously by his friends and associates. Even today his writings are proscribed in the Soviet Union.

Khomyakov belonged to what has been called the Golden Age of Russian literature. At that time (first half of the 19th century) an intellectual elite of exceptional ability created a striking contrast to the proponents of the reactionary rule of Nicholas I (1825–55). The best Russian thinkers were preoccupied with the problem of the political and social orientation of their people. Russia had been brought out of its previous isolation by Peter the Great's reforms (1682–1725), and contacts with the West had stimulated the upper classes, but under Nicholas I they felt frustrated and dissatisfied. Two main groups appeared: the Westernizers and the Slavophiles. The Westernizers saw in the political institutions of the West and in liberal and Socialist ideas a pattern for imitation. The Slavophiles, led by Khomyakov, insisted that Russia should follow its own path of development based on the pre-Petrine (prior to Peter the Great) culture inspired by the Eastern Orthodox Church.

Though Khomyakov felt at home in the Western world, he also knew and loved Russia's past, a sentiment rare among his upper-class contemporaries. His aim was to combine the best elements of both traditions, but the social system he advocated was opposed to the individualism of the West. He did not believe that secularized and selfish man, denying the existence of a divine creator, could establish a satisfactory political and social order. Criticizing both capitalism and Socialism, he regarded them as coming from the same Western outlook. He believed that the root of man's problems lay in what he viewed as the defects of Western interpretations of Christianity, and he blamed Roman Catholicism and Protestantism equally for their failure to solve the problem of the relationship between authority and freedom. "Rome kept unity at the expense of freedom. Protestants had freedom but lost unity." He was convinced that the Orthodox Church possessed a more balanced presentation of Christian teaching than any of the Western churches. Indeed, Khomyakov's contribution to the movement was chiefly in the field of theology, rather than through political nationalism.



Khomyakov, engraving by Ivan Pozhalostin, 1879

Novosti—Sovfoto

In Khomyakov's system the key term was *sobornost*, a word with a number of broad translations, among them togetherness and symphony. This word, in the Slavonic version of the Nicene Creed, corresponds to "catholic." It does not, however, mean "universal" but denotes a perfect organic fellowship of redeemed people united by faith and love. Khomyakov believed that a person could best achieve spiritual and intellectual maturity in an organic community that respected the liberty of its members and that true progress would depend not on competition (as in the West) but on cooperation. He thus claimed that the task of the church was to teach mankind how to live in unity and freedom. In Khomyakov's estimation, the Christian West, after its separation from the East, had not been able to fulfill this role. His writings on *sobornost* are among the more influential of his works.

In another aspect of his Slavophile thought, Khomyakov idealized the Russian peasants, exalted their humility and sense of brotherhood, and regarded them as better fitted to realize a Christian social order than the more aggressive Western nations.

Khomyakov's vast erudition, his literary gifts, his integrity, and his strength of convictions should have procured for him a distinguished political and academic career. But he lived under the oppressive rule of Nicholas I and had no opportunity of using his talents for the public good. He remained until his death a mere retired cavalry captain. He died from cholera, which he caught from the peasants whom he treated. (N.Z./Ed.)

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Khon Kaen, town and *changwat* (province) in the Northeastern region of Thailand, on the Khorat Plateau. Khon Kaen town, the provincial capital, is a rice-trading centre on the railway between Nakhon Ratchasima and Udon Thani. Khon Kaen University was founded in 1966; the Thai-German Technical Institute (1964) is also there. Other major towns include Ban Phai and Phon.

The province has an area of 4,203 sq mi (10,886 sq km) and is drained by the Lam Nam (river) Chi and the Nam Phong. A dam was built on the Nam Phong in 1966 for irrigation and hydroelectricity. Rice and freshwater fish are major products. Pop. (1980) town, 85,863; (1983 est.) province, 1,421,312.

Khond, also spelled KOND, KANDH, or KONDH, people of the hills and jungles of Orissa state, India, mainly in the districts of Baudh Khondmāls, Koraput, and Kalāhāndi. Their numbers are estimated to exceed 800,000, of which about 550,000 speak Kui and its southern dialect, Kuwi, of the Dravidian family. Most Khond are now rice cultivators, but there are still groups, such as the Kuttia Khond of Baudh Khondmāls, who practice slash-and-burn agriculture (*jhum*).

The Khond have been in contact for many centuries with Oriya-speaking neighbours to the west, north, and east, and with Telugu-speaking groups to the south. By degrees they have taken on the language and customs of their neighbours. In the Baudh Plains there are Khond who speak only Oriya; farther into the hills the Khond are bilingual; in the remoter jungles Kui alone is spoken. There is an analogous gradation in the practice of Hindu customs concerning caste and untouchability and in the knowledge of Hindu deities. The process of acculturation progressed rapidly in the 1970s.

Khone, Chutes des, English KHONE FALLS, series of cataracts on the Mekong River, Laos, on the Kampuchean (Cambodian) border. The falls are the principal impediment to navigation of the river and have impeded economic use of the Mekong by the peoples of the Kampuchean plain to the south and those of Laos to the north; a narrow-gauge railway was once built for transport around the falls. The double series of cataracts is caused by a resistant bed of basalt over which the river tumbles 45 ft (14 m) to a pool 269 ft above sea level. The strata causing the falls are also responsible for several islands, the largest of which, Don (island) Không, has a small port based on the portaging of goods around the falls. The Khone has the greatest volume of the world's waterfalls, its 2,500,000 gallons per second being nearly double that of Niagara Falls. Under United Nations auspices, the falls have been designated for a major multipurpose hydroelectric-dam complex.

Khor Fakkan (United Arab Emirates): *see* Khawr al-Fakkān.

Khorana, Har Gobind (b. Jan. 9, 1922, Raipur, India), Indian-born U.S. biochemist who shared the Nobel Prize in Physiology or Medicine in 1968 with Marshall W. Nirenberg and Robert W. Holley for research that helped to show how the genetic components of the cell nucleus control the synthesis of proteins.

Khorana's contribution was to synthesize, in the early 1960s, small nucleic acid molecules whose exact structure was known. (Nucleic acids carry the genetic information in the cell.) Combined with the proper materials, his synthetic nucleic acids caused proteins to be synthesized, just as in the cell. Comparing these proteins with the nucleic acid showed which portions of the nucleic acid were the "codes" for each part of the protein.

Khorana continued research on nucleic acid synthesis and in 1970 prepared the first artificial copy of a yeast gene.

Khorana was born into a poor family and attended Punjab University at Lahore and the University of Liverpool, England, on government scholarships. He obtained his Ph.D. at Liverpool in 1948. He began nucleic acid work during a fellowship at Cambridge (1951) under Sir Alexander Todd. He has held fellowships and professorships in Switzerland at the Swiss Federal Institute of Technology and the uni-

versities of British Columbia, Can. (1952–59), and Wisconsin; in 1971 he joined the faculty of the Massachusetts Institute of Technology.

Khorāsān, also spelled KHURASAN, *ostān* (province), northeastern Iran, bounded on the north by the Soviet Union and on the east by Afghanistan. Adjoining Iranian *ostān*s are Māzandarān on the northwest, Semnān on the west-northwest, Eṣfahān and Yazd on the west, Kermān on the south, and Balūchestān va Sīstān on the south-southeast. The capital is Meshed; the area is 120,980 sq mi (313,337 sq km).

In ancient times, Khorāsān (Land of the Rising Sun) signified a vast tract of country comprising lands now lying also within the Soviet Union and Afghanistan. It was an integral part of the Achaemenid (559–330 BC) and Sāsānid (*c.* AD 224–651) empires, and modern Khorāsān roughly corresponds to ancient Parthia (*q.v.*). Conquered by the Arabs in 651–652, it later regained virtual independence until the invasions of Toghril Beg, the Seljuq ruler, in 1038. It was overrun by Genghis Khan (1220) and again by Timur (*c.* 1383); it was occupied by the Afghans from 1722 to 1730. Nāder Shāh, born in Khorāsān, broke the Afghan supremacy and made Meshed the capital of his empire. Ferdowsī, author of the *Shāh-nāmeh* ("Book of Kings"), and Omar Khayyam, the celebrated poet and sage, were born in the region. The province suffered heavily because of an earthquake in 1978 that killed nearly 25,000 people and destroyed the village of Tabas.

The northern part of Khorāsān contains two parallel ranges, an eastern prolongation of the Elburz Mountains and an independent ridge, the Koppeh Dāgh. Limestones and igneous and metamorphic rocks prevail; peaks include Kūh-e Hazār Masjed (10,321 ft [3,146 m]) and Kūh-e Bīnālūd (10,536 ft [3,211 m]). A great salt desert, Dasht-e Kavīr, with quicksand-like marshes, enters Khorāsān from the west. Sand dunes are widespread. The *ostān* has many oases, large and crowded in the north but small and isolated in the south. The climate is cool in the summer and cold in the winter. The north and northwest have sufficient rainfall for grasslands and scrub forests of alder, oak, juniper, and hornbeam; the south has little vegetation. Khorāsān's only permanent rivers are the Atrak, the Kal-e Mūreh, the Rūd-e Shūr, and the Kashaf Rūd, all more or less salty in their lower courses.

Khorāsān contains many ethnic groups: Turkmen in the northwest; Kurds around Bojnūrd and Qūchān; Tīmūrīs and Jamshīdīs (Chahar Aimak) in the east, some of whom are still nomadic; farther southwest, Ḥeydarīs; and southeast, Baluchis. The Kūhestān is peopled by a settled population of old Iranian stock. Other groups include Berberis of Mongol origin, Arabs, Gypsies, and some Jews. The languages spoken are Turkish, Persian, and Kurdish.

Khorāsān is largely agricultural, producing fruits, cereals, cotton, tobacco, oil plants, saffron, and some silk. Livestock are plentiful; wool, lambskins, and goat hair are exported, and poultry is also raised. The mineral products include turquoise, salt, iron, copper, lead, zinc, chromium, magnesite, and coal. Cement, processed foods, ginned cotton, carded wool, sugar, pharmaceuticals, animal fodder, and textiles are the manufactured products. Handicrafts include jewelry, rugs and carpets, furs, dolls, glassware, and handloomed cloth. A railway and roads link Meshed with Tehrān. Pop. (1983 est.) 3,938,000.

Khorāsān carpet, handwoven floor covering made in Khorāsān, the northeastern province of Iran. Herāt carpets are the classic carpets of the district. From the late 18th and early 19th centuries there are carpets in the *herāti* pattern, probably made in villages of the district. A lattice that peeps through a maze of blossoms and leaves, it is a repeat pattern, its characteristic border showing pairs of smoothly curved split arabesques. These carpets are in *joftī* Senna (Sehna) knotting (upon four warps) on a cotton foundation.



Detail of an allover repeat pattern of blossoms and leaves on the ground of a Khorāsān carpet, late 19th century; in a private collection in New Jersey

In a private collection, New Jersey; photograph, Otto E. Nelson—EB Inc.

The designs of room-sized carpets made in Meshed, Bīrjand, and villages nearby are characterized by medallions that are often unusually round, grounds that revive the coiling stems of the Herāt classic carpets, and borders that show an unusual number of narrow stripes. These carpets, too, are *joftī* knotted, except for one quality in which the knots are Turkish. Reds are dyed with cochineal, which, with the significant amount of blue used in the rugs, gives the carpets a purplish cast. The combination of soft wool and the inadequacies of construction has reduced their durability.

Khorat (Thailand): *see* Nakhon Ratchasima.

Khorat Plateau, also spelled KORAT PLATEAU, saucer-shaped tableland of northeastern Thailand; it occupies 60,000 sq mi (155,000 sq km), is situated 300–650 ft (90–200 m) above sea level, and tilts southeastward. The plateau is drained by the Chi and Mun rivers and is bounded by the Mekong River (north and east on the Laos border), the Phetchabun and Phang Hoei ranges (west), and the Phanom Dong Rak Range (south). The interior has low hills and small lakes. The impermeable soils are flooded during the rainy season (April–November) and parched during the dry season. The inhabitants raise cattle, horses, and pigs and cultivate cotton, rice, peanuts (groundnuts), corn (maize), and hemp. The plateau includes the major towns of Nong Khai, Khon Kaen, Nakhon Ratchasima, and Ubon Ratchathani, all of which are linked to Bangkok by rail.

Khorezm, also spelled CHOREZM, *oblast* (administrative region), northwestern Uzbek Soviet Socialist Republic, with an area of 1,750 sq mi (4,550 sq km) in Khorezm oasis on the lower reaches of the Amu Darya (river). The *oblast* is one of the most ancient areas of irrigated agriculture in Central Asia. The sands of the Kara-Kum Desert encroach in the south and west. The climate is continental, and annual precipitation totals only 3–4 in. (75–100 mm). The economy is predominantly agricultural; cotton is the chief crop, though sericulture and Karakul sheep breeding are also important. Apart from cotton ginning, most industry serves local needs. The population in 1982 was almost 80 percent rural, and 93 percent (1979) of Uzbek composition. There are only two cities: Urgench, the administrative centre, and Khiva (*qq.v.*). Pop. (1983 est.) 840,000.

Khorezm-Shāh DYNASTY: *see* Khwārezm-Shāh dynasty.

Khorog, also spelled CHOROG, city and administrative centre of Gorno-Badakhshan autonomous *oblast*, Tadzhik Soviet Socialist Republic. It is situated in the southwestern Pamirs range at an altitude of 7,200 ft (2,200 m) and on the Gunt River where it flows into the Pyandzh. It is linked by road with Osh and Dushanbe and by air with Dushanbe. Originally two villages, it now has a hydroelectric station and factories. The Pamirs Biological Station and the Pamirs Botanical Gardens are nearby. Pop. (1974 est.) 14,000.

Khorram-dīnān (Persian: Glad Religionists), also called KHORRAMĪYEH, esoteric Islāmic religious sect whose leader Bābak led a rebellion in Azerbaijan (now divided between Iran and the Soviet Union) that lasted from 816 until 837.

The doctrinal beliefs of the Khorram-dīnān are not altogether clear. Although the sect accepted the general principles of Islām, its members also believed in transmigration of the soul and placed special emphasis on the Zoroastrian dualism of light and darkness. They differed from Sunnī Muslims (the major branch of Islām) in that they believed in the Shīʿī (the minor branch of Islām) doctrine of the *imāmate* (the belief that the religious community should be led by divinely inspired and hereditary leaders, descended from the union of Fāṭimah, the daughter of the Prophet, and ʿAlī, the Prophet's nephew).

The Khorram-dīnān differed from most Shīʿī in believing that the *imāmate* should be hereditary in the person of Abū Muslim (died 755), who had led a revolutionary movement in Khorāsān. According to some sources, Bābak, spiritual leader of the Khorram-dīnān, claimed, in the early 9th century, to be a descendant of Abū Muslim; other sources, emphasizing the belief in transmigration of souls current among the Khorram-dīnān, maintain that Bābak claimed to possess the soul of Jawizān ibn Sahl, a former leader of the Khorramdīnān. In 816 Bābak, believing that he had a divinely inspired mission to right all the wrongs of the temporal world, led the Khorram-dīnān in open rebellion against the ʿAbbāsid caliphs that ruled from Baghdad. The rebellion lasted 20 years and was only suppressed in 837, when Bābak was captured. Although the rebellion died out with Bābak's execution in 838, the Khorram-dīnān survived as a sect until the 11th century.

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Khorramābād, also spelled KHURRAMĀBĀD, chief city, Lorestān *ostan* (province), western Iran. It commands a river gap in the Lorestān mountains used by the main road from Khūzestān to the highland plateau. A summer market for the nomadic Lur tribes, it has lively bazaars and a strong garrison. On a ridge between town and river stand the ruins of Dez-e Sīāh (Black Fortress), the former seat of the governors of Lorestān, from 1155 to 1600. Pop. (1976) 104,928.

Khorramshahr, formerly MOHAMMERAH, city and port, Khūzestān *ostān* (province), southwestern Iran, on the right bank of the Kārūn River where it enters the Shatt al-Arab, 45 mi (72 km) from the Persian Gulf. The city occupies the site of the ʿAbbāsid port of Mohammerah, but it was in existence at the time of Alexander the Great. During the Seleucid

period, the town was a very properous trading centre, maintaining its prosperity through the Sāsānian and into the Islāmic period.

It is an important commercial port, much improved during World War II by connection with the Trans-Iranian Railway. It handles about 1,400,000 tons of imports and 320,000 tons of exports annually. The city has substantial buildings, and there is extensive date palm cultivation. As Mohammerah, the town was attacked and demolished by the Turks in 1837. In 1847 it was allocated to Persia, though in practice ruled by a local sheikh. In 1924 it came under the central government as Khorramshahr. During the Iran–Iraq confrontation, the city was captured by the Iraqis in 1980. It fell to the Iranian counterattack in 1982. Pop. (1976) 146,709.

Khorsabad (ancient Assyrian city): *see* Dur Sharrukin.

Khosrow, also spelled KHOSRAU, KHOSRU, or KHUSRAU, Greek CHOSROES, Arabic KISRĀ, name of Sāsānian kings of Persia, grouped below chronologically and indicated by the symbol •.

• **Khosrow I,** byname KHOSROW ANŪSHIRVAN (Persian: Khosrow of the Immortal Soul), or KHOSROW THE JUST (d. AD 579), Persian king who ruled the Sāsānian Empire from 531 to 579 and was remembered as a great reformer and patron of the arts and scholarship.

Rise to power. Little is known of the early life of Khosrow beyond legends. One story says



Khosrow I, crystal medallion, 6th century; in the Bibliothèque Nationale, Paris

J.E. Bulloz

that when Khosrow's father, King Kavadh, took refuge with the Hephthalites, eastern neighbours of Iran, on the way (near the town of Nishapur) he married a peasant's daughter, who gave birth to Khosrow. At his father's death Khosrow did not at first succeed him, but in a struggle for the throne he was successful and put to death his brothers. At the end of his father's reign, great social disorders had occurred because of a religious revolution of a sect called the Mazdakites. Khosrow first restored order and then launched reforms to transform the declining Sāsānian Empire.

Reforms. The reform of taxation was the most important of his actions, and it was probably copied from the Roman system inaugurated by Diocletian. Previously in the Sāsānian Empire taxes had been levied on the yield of land; Khosrow established a fixed sum rather than a yearly variation. Other taxes were introduced that brought stability to the income of the state and were also fairer to those who paid the taxes. Khosrow's program of taxes lasted into Islāmic times.

Khosrow also reorganized the Sāsānian bureaucracy, and the system of ministries, or divans, under a prime minister is said to have been initiated by him. He was fortunate during most of his reign in having a capable prime minister called Bozorgmehr, who became famous in story and legend for his wisdom and abilities.

Under Khosrow the process of decentralization of the power of the monarch was reversed, and the lower aristocracy, or knights, called *dihqān*s, grew in importance at the expense of the great feudal lords, who had been more powerful under Khosrow's predecessors. It is difficult to know how many changes really can be attributed to Khosrow's reign and how many are arbitrarily assigned to him because of his place in history. Whether the religiously sanctioned division of society into priests, warriors, bureaucracy, and common folk was codified under his reign, as claimed by some sources, is difficult to determine.

Military campaigns. Khosrow also reorganized the army and appointed four chief commanders to guard the four frontiers of Iran. On the frontier against the Byzantines and their Arab allies in the Syrian Desert, against the peoples of the steppes of southern Russia at the town of Derbent between the Caucasus Mountains and the Caspian Sea, and to the east of the sea in the present Turkmen steppes, Khosrow built defensive walls. The army, however, did not remain on the defensive, for Khosrow's reign is noted for his wars against the Byzantines. In 540 the great city of Antioch was conquered and held for a short time by Khosrow. He brought great numbers of prisoners from Antioch and settled them in a new town near his capital of Ctesiphon, modelled upon old Antioch. In the east, Khosrow, in alliance with the Turks, a new power in Central Asia, crushed the Hephthalites, and he established a hegemony over many of their principalities. The Sāsānian frontier in the east reached the Oxus River during his reign.

He also fought extensively in Armenia and Lazica in the Caucasus. Furthermore, under his reign a Sāsānian army conquered Yemen. Khosrow relied on a professional army more than his predecessors, who had summoned feudal levies when they set out to war.

Patron of culture. Khosrow was also a great patron of culture, and in 529, when the ancient academy of Athens was closed, a number of Greek philosophers migrated to the Sāsānian Empire, where they were well received by the ruler. The later famous medical school of Gondēshāpūr was probably started in Khosrow's reign, and the famous physician Burzoe is supposed to have been sent to India by Khosrow to gather Sanskrit books of learning to be translated into the Middle Persian language. The game of chess reportedly was also brought by him from India. Astronomy and astrology flourished at the court of Khosrow, and one star table (called the *zīj-i Shahriyār*), which was the basis of many later Islāmic tables, is said to have originated during the reign of Khosrow. Several works of Middle Persian, such as the *Book of Deeds of Ardashir* (*Kārnāmak*), are attributed to this period. Likewise, some scholars claim that the codification of the Avesta, the sacred book of the Zoroastrian religion, as well as the creation of a special Avestan alphabet to record the text, took place at the order of Khosrow. Further, it is supposed that the stories and legends of ancient Iran were gathered into a *Khwatāy-nāmak* ("Book of Kings") in the time of Khosrow and thus provided the source for Ferdowsī's immortal epic much later. Some of the names found in Ferdowsī's *Shāh-nāmeh* appear among the royal family of Khosrow, which indicates at the least an interest on the part of the monarch in ancient legends.

Perhaps more than fact, the stories told about Khosrow have made his name famous in history. Almost any pre-Islāmic structure in Iran the origin of which is unknown will be attributed to Khosrow by the simple folk. Undoubtedly he built many bridges, roads, and palaces, but much more is assigned to him in legend. The famous palace with the huge arch, called Ṭāq Kisrā, in Ctesiphon, near modern Baghdad, is said to date from Khosrow I, but this is uncertain. Several collections of wise sayings of this monarch, as well as stories about him, have been preserved in Arabic or New Persian versions. In them his reputation for justice as well as wisdom is constantly cited. The splendour of the court and the glory of his reign provided models for the later ʿAbbāsid court in Baghdad, and many of the institutions established by Khosrow were maintained in Islāmic times, when Khosrow was hailed as the model pre-Islāmic ruler to be emulated by Muslim princes.

(R.N.F.)

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• **Khosrow II,** byname KHOSROW PARVĪZ (Persian: Khosrow the Victorious) (d. AD 628), late Sāsānian king of Persia (reigned 590–628), under whom the empire achieved its greatest expansion. Defeated at last in a war with the



Khosrow II, coin, AD 590–628; in the collection of the American Numismatic Society

By courtesy of the American Numismatic Society

Byzantines, he was deposed in a palace revolution and executed.

Expansion of the empire. The son of Hormizd IV, Khosrow was proclaimed king in AD 590 in turbulent times. Hormizd's general, Bahrām Chūbīn, after defeat by the Byzantine army at Lazica, had been openly insulted by the King. During a subsequent palace revolt led by Bostām and Bindōē (brothers-in-law of Hormizd), which culminated in the King's assassination, Bahrām Chūbīn renounced the allegiance of his army to the monarchy and forced the new king Khosrow to flee to Mesopotamia. Khosrow's pursuers were held off by the military tactics of his uncle Bindōē, until eventually the Byzantine emperor Maurice provided Khosrow with forces to defeat his adversary. Bahrām Chūbīn was subsequently assassinated.

Insecure and unpopular, Khosrow now eliminated those connected with his father's murder, including Bindōē, on whose support he had relied. Although he retained a bodyguard of Byzantine legionaries, he resented the Byzantine presence in Armenia, which he had been forced to cede. Using the murder of Maurice (602) and his replacement as emperor by Phocas as a pretext and encouraged by the fact that Narces, who had commanded the Byzantine force that established Khosrow on the throne, refused to recognize Phocas, Khosrow's armies invaded Armenia and Mesopotamia. The Byzantine forces in Mesopotamia were weak, and the towns of Dara, Amida, and Edessa soon fell (604). Crossing the Euphrates, Khosrow took Hierapolis and Beroea (Aleppo). Internal dissensions made the eastern Byzantine provinces easy prey, and Armenia and central Asia Minor were overrun by the Persians—though apparently not permanently occupied

or administered. Nor was the Persian advance checked when Heraclius became emperor in 610 and sued for peace.

A second invasion of Mesopotamia, by Khosrow's ablest general, Shahrbarāz, took place in 613. Damascus was taken in that year, and in 614 Jerusalem fell. The Holy Sepulchre was destroyed and the True Cross carried to Ctesiphon. Although Khosrow himself was generally tolerant of Christianity, Shahrbarāz permitted thousands of Christian prisoners to be tortured by his Jewish aides. In 616 Alexandria was captured, and in 617 Chalcedon (opposite Byzantium), which had long been under siege by another of Khosrow's generals, Shāhīn, finally fell to the Persians.

This tide of conquest was turned by Heraclius in a series of brilliant campaigns between 622 and 627. Since he retained command of the sea, Heraclius was able to sail to Issus and rout the Persian army near the Armenian border. In alliance with the Khazar kingdom north of the Caucasus, he invaded Armenia again in 623, gaining victory over the King's army near Canzaca. The town and fire temple were destroyed, together with the temple at Lake Urmia, traditionally associated with Zoroaster. The campaigns of 624 and 625 ranged across northern Syria and Mesopotamia and culminated in a reversal for Shahrbarāz' forces on the river Saras.

Khosrow rallied his forces in 626 and, in alliance with the Avars, a people who were also in conflict with Byzantium at this time, sent one army to besiege Constantinople and another to oppose Heraclius. Constantinople held, and Shāhīn was defeated; the Persian second force was outmanoeuvred in 628 by Heraclius' brave dash to Dastagird, the royal residence 70 miles (113 kilometres) north of Ctesiphon. An important but indecisive battle was fought near Nineveh, but, as the Byzantine army reapproached Dastagird, Khosrow fled. His letters calling Shahrbarāz to his aid had been intercepted, and, although his resources were by now drastically reduced, he refused peace terms.

Khosrow's prestige was shattered, and he was now sick. The execution of Shahrbarāz and the desecration of Shāhīn's corpse were followed by revolution in the royal household. Khosrow was condemned to death and executed (628), and his youngest son and heir, Mardānshāh, was murdered before his eyes. His eldest son, Kavadh (Qobad) II, Shērōē, signed the peace.

Cultural and economic influence. Khosrow was a serious patron of the arts; silverworking and carpet weaving reached their peak during his reign. Sources tell of the enormous "Spring of Khosrow," a carpet whose design was a garden. A splendid silver dish in the Bibliothèque Nationale is thought to depict him in the traditional Sāsānian royal hunt. Most authorities attribute to Khosrow II the grottos at Taq-e Bostan (Kermanshah), taking them as evidence of a renaissance of rock sculpture in his reign. The reliefs depict the King in hunting scenes and standing motionless listening to a group of harpists—a reminder of the famous musicians Bārbad and Sarkash, who were kept at Khosrow's court. His architectural work is chiefly known from the ruins of the enormous palace Imirat-e Khosrow near Qasr-e Shīrīn (near Khānaqīn) and at nearby Hawsk-Kuri. A provincial palace exists at Qaṣr al-Mushattā, Jordan.

Booty and taxes brought Khosrow enormous wealth, including thousands of elephants, camels, horses, and women. The 9th-century Arab historian aṭ-Ṭabarī describes his golden throne supported by legs of rubies, as well as such curios as a piece of malleable gold and an asbestos napkin. But, despite widespread trade connections and the amassing of individual fortunes, there is no evidence that the economy flourished. High taxation and the uncertainties of war did nothing for the merchant class. By creating a military aristocracy, Khosrow II had weakened the authority of the king, while his administrative reforms and bureaucratic centralization removed the power of regional dynasties and their feudal armies, which might have resisted the invasion of the Arabs 12 years after Khosrow's death. Already in 611 the Arabs had inflicted a defeat on the Sāsānian army at Dhu-Qar. The destruction by Khosrow II of the Christian Arab states of the Lakhmids and Ghassānids in Syria and western Iraq was a further factor exposing Iran to Arab attack.

The love of Khosrow for his Armenian Christian wife Shīrīn was celebrated by the poets, especially by the 12th-century poet Neẓāmī in *Khosrow-va-Shīrīn.* (W.Cu.)

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Khosrow Carpet, Spring of: *see* Spring of Khosrow Carpet.

Khotan (China): *see* Ho-t'ien.

Khotan rug, floor covering handwoven in or about the ancient city of Khotan (Ho-t'ien) in southern Sinkiang (Chinese Turkistan).



Coffered ground pattern and Chinese wave and fret border patterns, detail of a Khotan rug from Chinese Turkistan, 19th century; in the Textile Museum, Washington, D.C.

Textile Museum Collection, Washington, D.C.; photograph, Otto E. Nelson—EB Inc.

Khotan rugs were once called Samarkand rugs after the Central Asian trading centre. They combine Chinese details with Central Asian design schemes and Western vivid colouring, except where recent fugitive dyes have reduced their effect to washed-out pastels. The technique of all-silk Khotan rugs, some of which have areas of metal-thread brocading, has been influenced to some degree by the earlier Polish carpets of Persia, but the decoration generally consists of lattice designs bearing clusters of rosettes. Similar designs have been used for woollen carpets, together with triple-medallion schemes in blue on red, pomegranate vines that grow from little vases, or perhaps coffered patterns showing chrysanthemum heads locked into squares. The borders may have Chinese wave and fret patterns or flowering vines. *Ṣaffs,* multiple prayer rugs for the use of a group, have been woven in wool and in silk.

Similar rugs with one or more rows of prayer-niche designs have also been made in earlier times at Uṣak, in Mughal India, and even among the Ersaris. Khotan rugs with woollen pile have cotton warp and mixed-colour wool or cotton weft and are usually made with the Senna (Sehna) knot. Field colours may be blue, yellow, or white, as well as the usual red. Hues now very much faded were regarded as shocking when new, especially one aniline red violet.

Khotanese language: *see* Saka language.

Khotchino (Russian S.F.S.R.): *see* Gatchina.

Khouribga, city, provincial capital, and province, Centre region, northwestern Morocco. The city is situated on an infertile, upland plateau (unofficially called the Plateau des Phosphates) west of the Moyen (Middle) Atlas mountains. It owes its growth to the nearby phosphate deposits, first exploited in 1921. The city is connected by road and railway with Casablanca (about 68 mi [110 km] to the northwest).

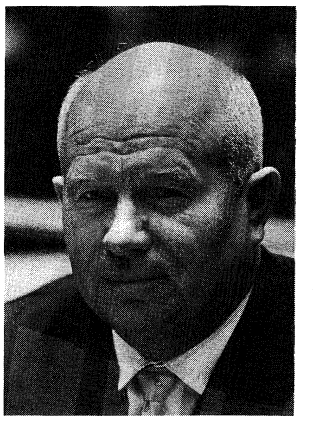
Khouribga province is bounded by the provinces of Khemisset (north), Khenifra (east), Beni Mellal (south), and Settat (west). It embraces an area of 1,641 sq mi (4,250 sq km) and contains one of the world's largest phosphate reserves. The town of Oued Zem, east of Khourigba city, is also a phosphate mining centre; some iron-ore is mined at Aïl Ammar in the northern part of the province. Subsistence agriculture produces cereals (wheat and barley) and sheep and goats are grazed. Jorf Lasfar, an Atlantic port (opened 1982) about 60 mi southwest of Casablanca and specifically designed to handle phosphate exports, receives rail shipments from Khourigba province. Pop. (1971) city, 73,667; (1981 est.) province, 453,-100.

Khrapovitshy, Antony: *see* Antony Khrapovitshy.

Khrebet Kopet-Dag (Iran and U.S.S.R.): *see* Kopet-Dag Range.

Khroumirie (Tunisia): *see* Kroumirie.

Khrushchev, Nikita (Sergeyevich) (b. April 17 [April 5, old style], 1894, Kalinovka, Ukraine, Russian Empire—d. Sept. 11, 1971, Moscow), first secretary of the Communist Party of the Soviet Union (1953–64) and premier of the Soviet Union (1958–64) whose policy of destalinization had widespread reper-



Khrushchev, 1960

Werner Wolf—Black Star

cussions throughout the Communist world. In foreign policy he pursued a policy of "peaceful coexistence."

Early life. Unlike Stalin, Lenin, and most other Soviet leaders, who had generally middle-class backgrounds, Khrushchev was the son of a miner; his grandfather had been a serf who served in the tsarist army. After a village education, Khrushchev went with his family to Yuzovka (later named Stalino, now Donetsk), a mining and industrial centre in the Donets Basin, where he began work as a pipe fitter at the age of 15. Because of his factory employment, he was not conscripted in the tsarist army during World War I. Even before the Russian Revolution of 1917, he had become active in workers' organizations, and in 1918—during the struggle between Reds, Whites, and Ukrainian nationalists for possession of the Ukraine—he became a member of the Russian Communist Party (Bolsheviks).

In January 1919 he joined the Red Army and served as a junior political commissar, ultimately in the campaigns against the Whites and invading Polish armies in 1920. Soon after he was demobilized his wife, Galina, died during a famine. In 1922 Khrushchev secured admission to a new Soviet worker's school in Yuzovka, where he received a secondary education along with additional party instruction. He became a student political leader and was appointed secretary of the Communist Party Committee at the school. There he married his second wife, Nina Petrovna, a schoolteacher, in 1924.

Political career under Stalin. In 1925 Khrushchev went into full-time party work, as party secretary of the Petrovsko-Mariinsk district of Yuzovka. He distinguished himself by his hard work and knowledge of mine and factory conditions. He soon came to the notice of Stalin's close associate, Lazar M. Kaganovich, secretary general of the Ukrainian Party Central Committee, who asked Khrushchev to accompany him as a nonvoting delegate to the 14th Party Congress in Moscow. For the next four years—in Yuzovka, then in Kharkov and Kiev—Khrushchev was active as a party organizer. In 1929 he received permission to go to Moscow to study metallurgy at the Stalin Industrial Academy. There he was appointed secretary of the academy's Party Committee. In 1931 he went back to full-time party work in Moscow. By 1933 he had become second secretary of the Moscow Regional Committee.

During the early 1930s Khrushchev consolidated his hold on the Moscow party cadres. He supervised the completion of the Moscow subway, for which he received the Order of Lenin in 1935. That year he became first secretary of the Moscow party organization—in effect, the mayor of Moscow. In the preceding year, at the 17th Party Congress, he had been elected a full member of the 70-man Central Committee of the Soviet Party.

Khrushchev was a zealous supporter of Stalin in those years and participated in the purges of party leadership. He was one of three provincial secretaries who survived the executions of the *Yezhovshchina,* a period that took its name from the head of the Soviet security forces. He became an alternate member of the ruling Presidium in 1935, a member of the Constitutional Committee in 1936, and a member of the Foreign Affairs Commission of the Supreme Soviet in 1937. A year later Khrushchev was made a candidate member of the Central Committee's Politburo and sent to Kiev as first secretary of the Ukrainian party organization, and in the following year he was made a full member of the Politburo.

In 1940, after Soviet forces had occupied eastern Poland, Khrushchev presided over the "integration" of this area into the Soviet Union. His principal objective was to liquidate both Polish and Ukrainian separatist movements, as well as to restore the Communist Party organization, which had been shattered in the purge. This work was disrupted by the German invasion in June 1941. Khrushchev's first wartime assignment was to evacuate as much of the Ukraine's industry as possible to the east. Thereafter, he was attached to the Soviet Army with the rank of lieutenant general; his principal task was to stimulate the resistance of the civilian population and maintain liaison with Stalin and other members of the Politburo. He was political adviser to Marshal Andrey I. Yeryomenko during the defense of Stalingrad (now Volgograd) and to Lieut. Gen. Nikolay F. Vatutin during the huge tank battles at Kursk.

After the liberation of the Ukraine in 1944, Khrushchev worked to restore the civil administration and to bring that devastated country back to a subsistence level. A famine in 1946 was probably the worst in the Ukraine's history; Khrushchev fought to restore grain production and to distribute food supplies, against Stalin's insistence on greater production from the Ukraine for use in other areas. During this period Khrushchev made firsthand acquaintance with the problems of Soviet agricultural scarcity and planning. In 1949 Stalin called him back to Moscow, where he took over his old job as head of the Moscow City Party and concurrently was appointed secretary of the All-Union Central Committee.

The period 1949–53 was far from pleasant for Khrushchev and other members of the Soviet leadership, who found themselves pawns in Stalin's palace politics. Khrushchev moved more and more into agriculture, where he began his schemes for the *agrogorod* ("farming town") and larger state farms at the expense of the conventional collectives.

Leadership of the Soviet Union. After Stalin's death and the execution of deputy prime minister and state security chief, Lavrenty Beria, Khrushchev engaged in a power struggle with Georgy Malenkov, Stalin's heir apparent, and gained the decisive margin by his control of the party machinery. In September 1953 he replaced Malenkov as first secretary and in 1955 removed Malenkov from the premiership in favour of his handpicked nominee, Marshal Nikolay A. Bulganin.

In May 1955, when Khrushchev made his first trip outside the Soviet Union—to Yugoslavia with Bulganin—he began to show his flexibility; he apologized to Tito for Stalin's denunciation of Yugoslav Communism in 1948. Later, in trips to Geneva, Afghanistan, and India, he began to exhibit a brash, extroverted personal diplomacy that was to become his trademark. Although his attacks on world capitalism were virulent and primitive, his outgoing personality and peasant humour were in sharp contrast to the picture earlier Soviet public figures had cultivated.

On Feb. 24–25, 1956, during the 20th Party Congress in Moscow, Khrushchev delivered his memorable secret speech about the excesses of Stalin's one-man rule, attacking the late Soviet ruler's "intolerance, his brutality, his abuse of power." The spectacle of the First Secretary of the Communist Party exposing the wrongful executions of the Great Purge of the 1930s and the excesses of Soviet police repression, after years of fearful silence, had far-reaching effects that Khrushchev himself could barely have foreseen. The resulting "thaw" in the Soviet Union saw the release of thousands of political prisoners and the "rehabilitation" of many thousands more who had perished.

The destalinization movement had repercussions in the Communist countries of eastern Europe. Poland revolted against its government in October 1956. Hungary followed shortly afterward. Faced with open revolution, Khrushchev flew to Warsaw on October 19 with other Soviet leaders and ultimately acquiesced in the Polish leader Władysław Gomułka's national Communist solution, which allowed the Poles a great deal of freedom. Khrushchev's shared decision to crush the Hungarian Revolution by force came largely because of the Hungarian premier Imre Nagy's decision to withdraw from the Warsaw Pact. With this sanguinary exception, however, Khrushchev allowed a considerable amount of freedom to the European Communist parties.

The stresses in eastern Europe helped crystallize opposition to Khrushchev within the Soviet Party. In June 1957 he was almost overthrown from his position, and, although a vote in the Presidium actually went against him, he managed to reverse this by appealing to the full membership of the party Central Committee. In the end he secured the permanent disgrace of Malenkov, Vyacheslav M. Molotov, and others, who were labelled members of the antiparty group. In October he dismissed Marshal Georgy Zhukov from his post as minister of defense, and in March 1958 he assumed the premiership of the Soviet Union.

Confirmed in power, Khrushchev widely asserted his doctrine of peaceful coexistence, which he had first enunciated in a public speech at the 20th Party Congress. In opposition to old Communist writ, he stated that "war is not fatalistically inevitable." At the 21st Party Congress in 1959 he said: "We offer the capitalist countries peaceful competition." His visit to the United States in 1959, where he toured cities and farms with the ebullience of a politician running for office, was a decided success, and the "spirit of Camp David," in Maryland, where he conferred with Pres. Dwight D. Eisenhower, brought Soviet-American relations to a new high. A long-planned summit conference with Eisenhower in Paris in 1960 broke up, however, with Khrushchev's announcement that a U.S. plane (a U-2 reconnaissance aircraft) had been shot down over the Soviet Union and its pilot captured. In 1961 his Vienna conference with the new U.S. president, John F. Kennedy, led to no agreement on the pressing German question; the Berlin Wall was built shortly thereafter.

Soviet success in lofting the world's first space satellite in 1957 had been followed by increased missile buildups. In 1962 Khrushchev attempted to emplace Soviet medium-range missiles in Cuba. During a tense confrontation in October 1962, when the United States and the Soviet Union apparently stood on the brink of war, Khrushchev agreed to remove the missiles on the promise that the United States would make no further attempt to overthrow Cuba's Communist government. The Soviet Union was attacked by the Chinese Communists for this settlement. The Sino-Soviet split, which began in 1959, reached the stage of public denunciations in 1960. China's ideological insistence on all-out "war against the imperialists" and Mao Tse-tung's annoyance with Khrushchev's coexistence policies were exacerbated by Soviet refusal to assist the Chinese nuclear weapon buildup and to rectify the Russo-Chinese border. The Soviet Nuclear Test-Ban Treaty with the United States in 1963, although generally welcomed throughout the world, intensified Chinese denunciations of Soviet "revisionism."

During Khrushchev's time in office, he had to rudder constantly between popular pressures toward a consumer-oriented society and agitation by intellectuals for greater freedom of expression; these were offset by the growing fear of the Soviet bureaucracy that reform would get out of hand. Khrushchev himself was uneasy with intellectuals, and he sanctioned the repression of Boris Pasternak's *Doctor Zhivago* (1957) within the Soviet Union, culminating in the refusal to allow Pasternak to accept the Nobel Prize in 1958. On the other hand, Khrushchev permitted the 1962 publication of Aleksandr Solzhenitsyn's *One Day in the Life of Ivan Denisovich,* with its sweeping denun-

ciation of Stalinist repression. Meanwhile, for the first time, Soviet tourists were permitted to go overseas, and Khrushchev often seemed amenable to widening exchanges with both Socialist and capitalist countries.

Khrushchev's desire to reduce conventional armaments in favour of nuclear missiles was bitterly resisted by the Soviet military. His often high-handed methods of leadership and his attempted decentralization of the party structure antagonized many of those who had supported his rise to power. The central crisis of Khrushchev's administration, however, was agriculture. An optimist, he based many plans on the bumper crops in 1956 and 1958, which fuelled his repeated promises to overtake the United States in agricultural as well as in industrial production. He opened up more than 70,000,000 acres of virgin land in Siberia and sent thousands of labourers to till them; but his plan was unsuccessful, and the Soviet Union soon again had to import wheat from Canada and the United States.

The failures in agriculture and the China quarrel, added to his arbitrary administrative methods, were the major factors in Khrushchev's downfall. On Oct. 14, 1964, the Central Committee accepted Khrushchev's request to retire from his position as the party's first secretary and chairman of the Council of Ministers of the Soviet Union because of "advanced age and poor health."

Last years. For almost seven years thereafter, Khrushchev lived quietly in Moscow and at his country dacha as a special pensioner of the Soviet government. He was mentioned in the Soviet press occasionally and appeared in public only to vote in Soviet elections. The one break in this ordered obscurity came in 1970 with the publication of his memoirs in the United States and Europe, although not in the Soviet Union.

Almost 48 hours elapsed after his death before it was announced to the Soviet public. He was denied a state funeral and interment in the Kremlin wall, although he was allowed a quiet burial at Novodevichy Convent Cemetery in Moscow.

Assessment. For the Soviet Union and indeed for the entire world Communist movement, Nikita Khrushchev was the great catalyzer of political and social change. In his seven years of power as first secretary and premier, he broke both the fact and the tradition of the Stalin dictatorship and established a basis for liberalizing tendencies within Soviet Communism. Khrushchev was a thoroughgoing political pragmatist who had learned his Marxism by rote, but he never hesitated to adapt his beliefs to the political urgencies of the moment. His experience with international realities confirmed him in his doctrine of peaceful coexistence with the non-Communist world—in itself a drastic break with established Soviet Communist teaching. He publicly recognized the limitations as well as the power of nuclear weapons, and his decision to negotiate with the United States for some form of nuclear-testing control was of vast importance. At the same time, Khrushchev's rough empathy with the Soviet people resulted in concessions to a consumer economy and in a general relaxation of security controls, which had equally far-reaching effects. Despite his repression of the Hungarian uprising in 1956, his acceptance of "different roads to Socialism" led to growing independence among European Communist parties, but his Russian nationalism and his suspicion of Mao Tse-tung's Communism helped create an unexpectedly deep fissure between China and the Soviet Union. By the time he was removed from office, he had set up guidelines for and limitations to Soviet policy that his successors were hard put to alter.

The cautious handling of his death announcement reflected his increasing popularity in his last years, both in the Soviet Union and the outside world, as many contrasted his consistent, if occasionally stormy, peaceful-coexistence diplomacy with the more restricted and conservative policy of his successors. At the time of his death it was widely felt that the basic changes in Soviet life made under his regime would be hard to uproot and might indeed result in ultimate changes in the pattern of Soviet society and world power relationships. Whatever the view of his personal eccentricities, his boisterousness, his vulgarity, and his bewildering shifts, he was accounted a man of stature. As his son Sergey pronounced in a short eulogy at the cemetery, "There were those who loved him, there were those who hated him, but there were few who would pass him by without looking in his direction."

(F.B.G.)

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Khuang Aphaiwong, Aphaiwong also spelled ABHAIWONG (b. May 17, 1902, Bătdâmbâng, Cambodia—d. March 15, 1968, Bangkok), Thai politician who founded and led Thailand's strongest opposition party and was three times premier of Thailand (1944–45, 1946, 1947–48). Khuang was a member of the Khmer family that under Thai auspices ruled western Cambodia from the 18th century and moved to Thailand when the region was transferred to France in 1907. He was educated in Paris and on his return to Thailand joined with Pridi Phanomyong and other former French students in the bloodless coup that overthrew Thailand's absolute monarchy and established a constitutional government in 1932. During World War II (1941–44), Khuang held the post of minister of commerce and communications in the Cabinet of Prime Minister Phibunsongkhram and was one of the few Cabinet members who was not pro-Japanese. He was named prime minister in August 1944 as a result of the political manoeuvering of Pridi, who remained the effective power in the government from behind the scenes. As wartime leader, Khuang appeased the Japanese while encouraging underground operations subverting Japan's war effort.

Resenting Pridi's domination, Khuang resigned in 1946 and led a pro-monarchy conservative government faction, founding the Democrat Party, the first major opposition in Thailand's new parliamentary assembly. From 1946 to 1948 Khuang moved in and out of the premiership two more times, managing to establish a short-lived civilian government, but he was under constant pressure from military factions. Phibunsongkhram finally deposed him in 1948. Khuang remained a popular figure, however, and was a vociferous opponent of Thailand's military regimes until his death.

Khubar, al-, also spelled AL-KHOBAR, oasis and port city, ash-Sharqīyah *minṭaqah* (province) and region, eastern Saudi Arabia, on the Persian Gulf south of ad-Dammām. The city is a commercial and industrial centre lying in a valley on the main road to Jordan. Al-Khubar has good water wells and fertile soil, producing excellent agricultural yield. Crops include dates, watermelon, squash, and other vegetables. The harbour has been enlarged and a sea-water desalinization plant has been constructed. Pop. (1974) 48,817.

Khubilai Khan (Mongol ruler): *see* Kublai Khan.

Khubsugul Dalai (Mongolia): *see* Hövsgöl Nuur.

Khuc Thua Du (fl. early 10th century), Vietnamese ruler in 906–907 whose rise to power, as a result of a successful rebellion in 906, constituted one of the first attempts of the Vietnamese to achieve independence.

A wealthy landowner who, according to the annals of old Vietnam, was "respected for his virtuousness and his charity," Khuc Thua Du led an uprising in 906 against the Chinese governor of the provinces surrounding the Red River Delta, in what is now northern Vietnam. The Chinese were forced to recognize Khuc Thua Du as the new legitimate governor, a position to which his son succeeded upon Khuc Thua Du's death.

Khudai Khitmatgar (Indian history): *see* Red Shirt Movement.

Khuddaka Nikāya (Pāli: "Short Collection"), diverse group of separate Buddhist texts constituting the fifth and last section of the Pāli *Sutta Piṭaka* ("Basket of Discourse"). Although it contains some very early works, as a collection it is later than the other four *Nikāyas* and much more varied in form and content. It contains all the important poetic works in the Pāli canon. The books it includes have not been the same in all times and places; the *Milinda-pañha* ("Questions of Milinda"), for example, is one of four texts that the Burmese tradition adds to those below. The usual list, which obtains in Sri Lanka (Ceylon), follows:

1. *Khuddaka-pāṭha* ("Short Passages"), a compilation of 9 items, including the Buddhist creed, 10 precepts for novices, a hymn of praise to the Buddha, and verses accompanying oblations to departed spirits.
2. *Dhammapada* (*q.v.*), an anthology of ethical teaching.
3. *Udāna* ("Inspired Utterances"), 82 sayings of the Buddha, mostly in verse, each accompanied by the story of what occasioned it.
4. *Itivuttaka* (from the words "Thus it is said," with which each verse begins), a collection, in 112 short *sutta*s, of the Buddha's ethical teachings in prose and verse.
5. *Suttanipāta* (*q.v.*), concerned with the simple faith of a hermit.
6. *Vimānavatthu* ("Stories of Celestial Mansions"), 85 poems on the happiness of persons reborn in heavenly realms and on the worthy deeds that led to this reward.
7. *Petavatthu* ("Stories of Spirits of the Dead"), 51 similar poems on those whose misdeeds have condemned them to a sorrowful fate after death. This and the preceding work are among the latest in the canon.
8. and 9. *Theragāthā*/*Therīgāthā* ("Hymns of the Elders/Senior Nuns"), lyrics in which 264 monks speak of their inner experiences and of nature and some 100 nuns tell of their

daily lives. The latter verses are informative about the position of women in ancient India.

10. *Jātakas* ("Births"), the Buddha's stories of his former lives.

11. *Niddesa* ("Exposition"), a commentary within the canon itself, attributed to Sāriputta (Śāriputra). Its two parts give a philological exegesis of the last two (fourth and fifth) sections of the *Suttanipāta,* discussed earlier.

12. *Paṭisambhidā-magga* ("Way of Analysis"), a late work consisting of 30 chapters of *Abhidhamma,* or scholasticlike analysis, of various doctrinal concepts.

13. *Apadāna* ("Stories"), a collection of legends about Buddhist saints.

14. *Buddhavaṃsa* ("History of the Buddhas"), a narrative in verse in which the Buddha tells of the lives of the preceding 24 Buddhas. (Earlier works know of only the last six of these.) The Buddha himself, in former lives, knew and worshiped each of them, and each foretold his future Buddhahood.

15. *Cariyā Piṭaka* ("Basket of Conduct"), 35 *Jātaka* stories told in verse and emphasizing the *pāramitās* ("perfections") requisite to Buddhahood that the Buddha acquired in former lives.

Khufu, also spelled KHUFWEY, or KHNOM-KHUFWEY, Greek CHEOPS (fl. early 26th century BC), second king of the 4th dynasty (*c.* 2575–*c.* 2465 BC) of Egypt and builder of the Great Pyramid at Giza, the largest single building to that time.

Khufu's reign and that of his son Khafre (Greek: Chephren) were represented by the Greek historian Herodotus as 106 years of oppression and misery, but this was belied by Khufu's posthumous reputation in Egypt as a wise ruler. Herodotus' story of Khufu's prostitution of his daughter in order to raise money for his building projects is clearly scandalmongering legend.



Khufu, ivory statue; in the Egyptian Museum, Cairo

By courtesy of the Egyptian Museum, Cairo; photograph, Hirmer Fotoarchiv, Munchen

Although few written sources remain, it is known that Khufu was the son and successor of King Snefru and his queen Hetepheres and was probably married four times: to Merityetes, who was buried in one of the three small pyramids beside his own; to a second queen, whose name is unknown; to Henutsen, whose small pyramid is the third of the group; and to Nefert-kau, the eldest of Snefru's daughters. Two of his sons, Djedefre (Redjedef) and Khafre, succeeded him in turn.

Khulna, city, southwestern Bangladesh. Khulna lies along the Bhairab River. An important river port and produce collection and trade centre, it is connected by river steamer, road, and rail to the major cities of the southern Gangetic Delta. Shipyards are located 3 miles (5 km) south, on the Kāzibacha River. Forest products from the forests and swamp area known as the Sundarbans supply Khulna's industries, which include jute, oilseed, cotton-textile, paper, and board mills and match and newsprint factories. Khulna was constituted a municipality in 1884 and now houses numerous government colleges affiliated with the University of Rājshāhi.

The surrounding area occupies the south-central portion of the Gangetic Delta between the Hooghly (India) and Meghna estuaries. The alluvial plain is intersected by silted-up rivers and is bordered (east) by the Madhumati River. The chief crops are rice, jute, oilseeds, and pulses; the main industries are fish farming, boatbuilding, and date-molasses manufacture. Pop. (1981) city, 646,359.

Khums, al-, also spelled HOMS, or KHOMS, town, northwestern Libya. It is located on the Mediterranean coast about 60 miles (97 km) southeast of Tripoli. The town was founded by the Turks and gained importance after 1870 by exporting esparto grass (used for cordage, shoes, and paper). Modern economic activities in al-Khums include tuna (tunny) processing, esparto pressing, soap manufacture, and the marketing of dates and olive oil produced in the surrounding area. Al-Khums is also a tourist base for the ancient city of Leptis with its extensive Roman remains (2 miles [3 km] east). It has public gardens, Turkish buildings, and sand beaches. It is linked by the coastal highway that connects Tripoli with Banghāzī and Cairo. Pop. (latest est.) 17,755.

Khurasan (Iran): *see* Khorāsān.

Khuri, Bishara al- (b. Aug. 10, 1890, Beirut—d. Jan. 11, 1964, Beirut), Lebanese statesman, president of Lebanon from 1943 to 1952.

The son of a prominent civil official, Khuri studied law in Paris and there learned to speak French fluently. His thought was rooted in his Arabic cultural heritage, and, being devoted to Lebanon as an independent country, he resisted the calls of Arab nationalists for some kind of federation with the neighbouring Arab countries. He wished, however, to maintain close ties with these countries, and he saw Arab nationalism as something with which Christian Lebanese such as himself should come to terms; from these premises he thought it would be possible to secure the cooperation of Muslim Lebanese in the building of a strong Lebanon.

In February 1920 Khuri became secretary-general to the government of Mount Lebanon, and a few months later he was appointed to the newly formed administrative council. He held this position until 1922, when he returned to a private law practice. Under Prime Minister Adīb he returned to politics in 1926 as minister of the interior. During the next three years, Khuri himself was prime minister on three occasions, holding that office for a total of almost two years. Between 1926 and 1932 the personal rivalry between Khuri and Émile Eddé, another Christian, dominated the internal politics of Lebanon.

During World War II, Khuri cultivated close contacts with the British. In 1943 the French held general elections to implement their earlier grant of Lebanese independence, and Khuri was elected president, although he was temporarily arrested by the French in November 1943, after his government had introduced changes in Lebanon's constitution that eliminated all vestiges of French political influence in the country. In 1948 Khuri had the national legislature amend the constitution to allow him a second term in office. He won the subsequent election, but widespread opposition to the dubious means by which he had obtained the legislature's approval of the amendment, as well as to the corruption and favouritism displayed by him, forced him into retirement in September 1952.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Khurīyā Murīyā, also spelled KURIA MURIA, island group of Oman, in the Arabian Sea, situated 25 miles (40 km) off the country's southeastern coast. The five islands, composed largely of granite and representing the peaks of a submarine ridge, total 28 square miles (73 square km) in area. West to east they are al-Ḥāsikīyah, as-Sawdā', al-Ḥallānīyah, Qarzawīt, and al-Qiblīyah. Al-Ḥallānīyah, the largest of the islands, is the only one inhabited. All of the inhabitants left in 1818 because of pirate raids; later the islands fell under the control of Arabs on the mainland and then of the sultan of Oman. In 1854 he ceded them to the British, who included them in their colony of Aden in 1937. The islands were retroceded to Oman in 1967. The few inhabitants of the island group are mostly fishermen, using inflated skins for craft as in ancient times. Pop. (latest est.) 85.

Khurram, Prince: *see* Shāh Jahān.

Khurramābād (Iran): *see* Khorramābād.

Khurṭūm, al- (The Sudan): *see* Khartoum.

Khurṭūm Baḥrī, al- (Sudan): *see* Khartoum North.

khutbah, also spelled KHUTBA, Arabic KHUṬBAH, in Islām, the sermon, delivered especially at a Friday service, at the religion's two major festivals (*'īds*), at celebrations of saintly birthdays (*mawlids*), and on extraordinary occasions.

The khutbah probably derived, though without a religious context, from the pronouncements of the *khaṭīb,* a prominent tribal spokesman of pre-Islāmic Arabia. The *khaṭīb* expressed himself in beautiful prose that extolled the nobility and achievements of his tribesmen and denigrated the weakness of the tribe's enemies. Even Muḥammad presented himself as a *khaṭīb* after taking Mecca in 630. The first four caliphs, the Umayyad caliphs, and the Umayyad provincial governors all delivered khutbahs in their respective areas, though the content of the speeches was no longer strictly exhortatory but dealt with practical questions of government and on political problems and, on occasion, even included direct orders. Under the 'Abbāsids, the caliphs themselves no longer preached but assigned the function of *khaṭīb* to the religious judges (qadis). The pointed insistence of the 'Abbāsids on clearing Islām of the secularism of the Umayyads probably helped strengthen the religious aspect of the khutbah.

Khuzama, al- (Morocco): *see* Alhucemas.

Khuzdār, also spelled HOZDAR, town, Baluchistan province, southwestern Pakistan. The town is situated on the west bank of the Kolāchi River at the apex of a narrow valley in the Pab (Pubb) Range and lies at an elevation of 4,060 feet (1,237 m) above sea level. It is located on an old caravan route to the Arabian Sea and is surrounded by orchards. The town is a market centre for wool, and deposits of barite are worked nearby. The baked-brick fort in the town was built in 1870 by Khūda Dād Khān, one of the Mirwārī Aḥmadzai khans of the princely state of Kalāt, during a war with the *jām* (chief) of Las Bela. Khuzdār

town is on the main road between Kalāt town and Karāchi.

The surrounding area is mostly mountainous, becoming hilly in the southern part, and is semiarid. The mountain ranges run north–south and are intersected by long, narrow valleys drained by the Kolāchi, Kūd, Arra, Porāli, Nāl, and Mashkai rivers. Population is sparse; the Brahui and Baluchi peoples, mostly pastoral sheep breeders, are the main ethnic groups. Wheat, barley, *jowār* (sorghum), and vegetables are grown; the region also produces apples, almonds, peaches, pomegranates, and dates. Handicrafts include embroidery work and woolen-carpet making. Pop. (1981 prelim.) town, 31,000.

Khūzestān, also spelled KHUZISTAN, formerly ʿARABESTĀN, geographical region in southwestern Iran, lying at the head of the Persian Gulf and bordering Iraq on the west. It is notable for its oil resources.

The area that is now Khūzestān was settled *c.* 6000 BC by a people with affinities to the Sumerians, who came from the Zagros Mountains region. Urban centres appeared there nearly contemporaneously with the first cities in Mesopotamia in the 4th millennium. Khūzestān came to constitute the heart of the Elamite kingdom, with Sūsa as its capital. Beginning with the reign of the legendary Enmebaragesi, *c.* 2700 BC, who (according to a cuneiform inscription) "despoiled the weapons of the land of Elam," Sumerian, Akkadian, Babylonian, Kassite, Neo-Babylonian, and Assyrian invasions periodically crossed Khūzestān in response to Elamite involvement in Babylonian politics; the campaign of Ashurbanipal in 646–639 BC destroyed the Elamite kingdom and its capital, Sūsa. Incorporated into the Assyrian Empire *c.* 639, Khūzestān next passed under Achaemenid control at the collapse of Assyria; and after Cyrus the Great conquered Babylon in 539, it became a satrapy (province) of the Persian Empire, with Sūsa serving as one of the Persians' three great capitals.

Alexander the Great took Sūsa shortly after the Battle of Gaugamela in 331, and from 311 to 148 Khūzestān was a satrapy (named Susiana) of the Seleucid Empire, with its capital at Seleucia on the Eulaeus River. It passed firmly into Parthian control between 148 and 113 and then under Sāsānian rule *c.* AD 226. It was a frontier zone between the Roman-Byzantine and the Parthian–Sāsānian empires and finally was taken by the Arabs *c.* 642. It was part of the Ṣafavid and Qājār dynasties that successively ruled Iran.

In the 20th century the region's prosperity revived with development of oil fields, the building of the Trans-Iranian railway, and the expansion of ports at Abadan and Khorramshahr. In an attempt to annex the oil-rich region while Iran was still disorganized by its Islāmic Revolution, Iraq's armed forces in 1980 invaded and occupied the western half of Khūzestān, including the city of Khorramshahr, and bombed the oil refineries at Abadan. But Iran's resistance quickly stiffened, and the Iranians had recaptured the region by 1982. Abadan and Khorramshahr, however, remained depopulated.

Khūzestān comprises a southeastern extension of the Mesopotamian Plain and includes part of the forested Zagros Mountains to the northeast. These mountains are drained by several rivers, the most important being the Kārūn, which flows into the Shatt al-Arab, and the Karkheh Kūr. These and other rivers have built up large alluvial fans and partially saline mud flats that merge into a zone of tidal marshes near the Persian Gulf. An isolated ridge (Jabal Hamrin) borders the piedmont with its large gravel plains.

The plains of Khūzestān have a desert climate, and they are excessively hot and dry in summer. Rainfall is concentrated in the winter, ranging from 12 to 20 inches (305 to 508 mm) in the plains and increasing in the mountains. The climate allows for the irrigated cultivation of date palms, citrus and other fruit trees, wheat, barley, cotton and rice, sorghum, sesame, melons, and vegetables. Sugarcane, oilseeds, indigo, and pulses were introduced into the region's agriculture in the 1970s.

More than half the population are Arabs who live in the plains; the rest are Bakhtyārīs and other Lurs (peoples of West Persia), with many Persians in the cities. Some of the Bakhtyārīs and Lurs are still nomads.

Oil exploitation in Khūzestān began in 1908, when oil was found at Masjed Soleymān, and it developed into the country's foremost industry under the Pahlavi dynasty. Petroleum production was from seven fields but mainly from Āghā Jārī (Āqājarī). All of the fields were connected with the refinery (which was destroyed in the Iranian–Iraqi War) at Abadan. Khūzestān oil fields contributed more than three-fourths of the total natural-gas production in Iran before the war. Kharg Island off Bushire, the main petroleum export terminal after 1961, was repeatedly damaged in the Iranian–Iraqi War.

A dam was completed in 1962 on the Rūd-e (river) Dez upstream of Dezfūl, and irrigation projects on several other rivers attracted people to Khūzestān from other parts of Iran. The area subsequently experienced a major growth in rural population and in agricultural production near the city of Ahvāz. Industries produce paper, cement, petrochemicals, processed foods, and light engineering products. A road network links Ahvāz with Dezfūl, Khorramshahr, Abadan, Bushire, and Bandar-e Khomeynī (formerly Bandar-e Shāhpūr). A railway line runs through the western part of Khūzestān, linking Ahvāz with Dezfūl and Abadan. Other towns include Dezfūl, Shūshtar, Rāmhormoz, and Behbehān, all markets for the adjacent Bakhtyārī and Lur country. Sūsa and Choga Mish are important archaeological sites.

Khvājeh (caste): *see* Khōjā.

Khvoy, also spelled KHŌĪ, city, Āzārbāijān region, northwestern Iran. The city is well laid out, with cool streams and lines of willows along broad, regular streets. There are several mosques, an extensive brick bazaar, a fine caravansary, and gardens. Khvoy is a trade centre and has been of considerable strategic importance. Fortified in the 19th century, it was occupied by Turkish troops in 1911 and later by Russians, who withdrew in 1917. It was occupied by Soviet troops during World War II and until 1946. The fortifications have been demolished.

The surrounding area consists of a broad, well-drained plain that is highly cultivated under irrigation. Villages flourish and agricultural produce includes cereals and fruit. The surrounding hills are treeless, and planted poplars are used for timber. Pop. (1985 est.) city, 93,500.

Khwae Noi, Mae Nam, English RIVER KWAI, tributary of the Mae Nam (river) Mae Klong, flowing wholly in western Thailand. It rises near Three Pagodas Pass (Phra Chedi Sam Ong) on the mountainous Burma–Thailand border and runs southeast, parallel to the border, to its confluence near Kanchanaburi town with the Mae Klong, which itself empties into the Gulf of Thailand at Samut Songkhram. The river is remembered for a bridge built across it by forced labour during World War II. The Japanese, seeking a railway link from Bangkok to Moulmein, Burma, laid track along the Khwae Noi Valley to Three Pagodas Pass; thousands of British and other Allied prisoners of war died building the railway and the bridge. They are commemorated in a cemetery in Kanchanaburi town and in Pierre Boulle's novel *The Bridge on the River Kwai* and the motion picture of the same name. Most of the railway was dismantled after the war.

Khwāja ʿAbd-uṣ-Ṣamad: *see* ʿAbd-uṣ-Ṣamad, Khwāja.

Khwāndamīr, Ghiyās ad-Dīn Muḥammad, Khwāndamīr also spelled KHONDAMIR (b. *c.* 1475, Herāt, Khorāsān—d. 1534 or 1537; buried in Delhi, India), Persian historian, one of the greatest historians of his time.

Grandson of the Persian historian Mirkhwānd, Khwāndamīr entered the service of Badīʿ al-Zamīn, the oldest son of the Timurid ruler of Herāt, Ḥusayn Baykara. Khwāndamīr was an ambassador to the Uzbek ruler Muḥammad Shaybānī when the latter captured the city of Herāt in 1507; he also witnessed the Iranian monarch Shāh Esmāʿīl I Ṣafavi take the city and defeat the Uzbek ruler in 1510.

Khwāndamīr then retired temporarily and began writing. Except for a brief period spent with the oldest son of his former patron, Khwāndamīr seems to have settled in Herāt until his departure for India in 1528. Reaching Āgra, he entered the service of Bābur, heir to the Timurid tradition and the first of the great Mughal rulers of India, and accompanied him on various missions. After Bābur's death the historian served his son, Humāyūn. Returning from a march on Gujarāt, Khwāndamīr fell ill and died.

A prolific writer, Khwāndamīr's most outstanding works are *Khulāsat al-Akhbār* ("The Perfection of the Narratives"), written in 1499–1500 for the Timurid minister and author Mir Ali Shir Navai; *Habīb al-Siyar* ("The Friend of Biographies"), a general history finished in 1524, the most valuable sections of which deal with the reigns of Sultan Ḥusayn Baykara and Shāh Esmāʿīl I Ṣafavi; the seventh and final volume of the history *Rowḍat al-Safāʾ* ("The Garden of Purity") of his grandfather, Mirkhwānd; and the *Humāyūnnāme* ("The Book of Humāyūn"), in which he describes the buildings and institutions of the great Mughal Empire.

Khwārezm, also spelled KHOREZM, also called CHORASMIA, historic region along the Amu Darya (ancient Oxus River) of Turkistan, in the territories of the present Turkmen and Uzbek Soviet Socialist Republics. Khwārezm formed part of the empire of Achaemenian Persia (6th–4th century BC); the Arabs conquered it and introduced Islām in the 7th century AD. From the late 11th to the early 13th century it was ruled by an independent dynasty, the Khwārezm-Shāhs (*q.v.*), and thereafter it was ruled successively by the Mongols, Timurids, and Shaybānids until the early 16th century, when it became the centre of the Khanate of Khiva under the Uzbek Ilbar dynasty. Khiva repelled invasions from Russia in 1717 and 1839, but in 1873 it was conquered and made a Russian protectorate. After the Russian Revolution of 1917 the khanate was abolished and replaced by the Khorezm People's Soviet Republic (1920–24), which was subsequently dissolved and incorporated into the U.S.S.R.

Khwārezm-Shāh DYNASTY, also spelled KHWĀRAZM-SHĀH, or KHOREZM-SHĀH (*c.* 1077–1231), dynasty that ruled in Central Asia and Iran, first as vassals of the Seljuqs and later as independent rulers.

The founder of the dynasty was Anūştegin Gharachaʾī, a slave who was appointed governor of Khwārezm (*q.v.*) *c.* 1077 by the Seljuq ruler Malik-Shāh. Anūştegin's descendants governed Khwārezm on behalf of the Seljuqs. In 1141, with the defeat of the Seljuq sultan Sanjar by the Karakitai (Qara Khitay)

confederation of northern China, the rulers of Khwārezm were forced to acknowledge the overall sovereignty of the Karakitai.

Following Sanjar's death in 1157, the Khwārezm-Shāh 'Alā' ad-Dīn Tekish was one of many contenders in a struggle for supremacy in Iran. By 1200 the Khwārezm-Shāh had emerged victorious. 'Alā' ad-Dīn Muḥammad (reigned 1200–20), the penultimate Khwārezm-Shāh, created a short-lived empire that stretched from the borders of India to those of Anatolia. The empire did not endure, however; the Mongol army of Genghis Khan conquered Transoxania in 1220. The last Khwārezm-Shāh, Jalāl ad-Dīn Mingburnu (reigned 1220–31), was defeated by the Mongols in 1231 and his territories were taken over by them.

Khwārizmī, al-, in full MUḤAMMAD IBN MŪSĀ AL-KHWĀRIZMĪ (b. *c.* 780, Baghdad—d. *c.* 850), Muslim mathematician and astronomer whose major works introduced Hindu–Arabic numerals and the concepts of algebra into European mathematics. He lived in Baghdad under the caliphates of al-Ma'mūn and al-Mu'taṣim in the first golden age of Islāmic science. His work on elementary mathematics, *Kitab al-jabr wa al-muqābalah* ("The Book of Integration and Equation"), was translated into Latin in the 12th century and originated the term algebra.

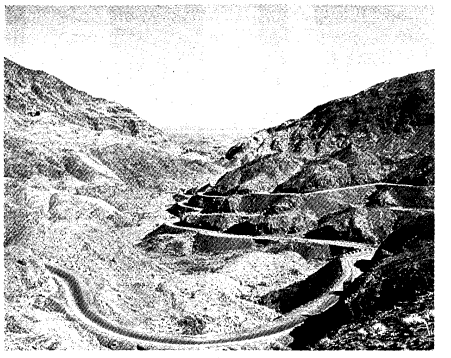
The *Kitab al-jabr* is a compilation of rules for arithmetical solutions of linear and quadratic equations, for elementary geometry, and for inheritance problems concerning the distribution of money according to proportions. The work was based on a long tradition originating in Babylonian mathematics of the early 2nd millennium BC and traceable through Hellenistic, Hebrew, and Hindu treatises. Its elementary and practical nature contributed to its survival when other works on the same subject were lost.

Another work on Hindu–Arabic numerals is preserved only in a Latin translation, *Algoritmi de numero Indorum* ("Al-Khwārizmī Concerning the Hindu Art of Reckoning"). From the title originated the term algorithm. Al-Khwārizmī also compiled a set of astronomical tables, based largely on the *Sindhind,* an Arabic version of the Sanskrit work *Brahma-siddhānta* (7th century AD), but also showing Greek influence.

khyāl, also spelled KHAYĀL, any of several Hindustani folk-dance dramas of Rājasthān, northwestern India. *Khyāl* dances date from the 16th century and use themes taken from folklore and legend. They are performed exclusively by men, are characterized by the powerful body movements of the performers, and include mime and chanting. Percussion and stringed instruments accompany the *khyāl.* The professional dancers of the *khyāl* are known as Bhawni.

Khyber Pass, Khyber also spelled KHAYBAR, or KHAIBAR, most northerly and important of the passes between Afghanistan and Pakistan. The pass connects Kābul with Peshāwar. The pass has historically been the gateway for invasions of the Indian subcontinent from the northwest. The name Khyber is also applied to the range of arid, broken hills through which the pass runs and which form the last spurs of the Spin Ghar (Safīd Kūh) Range. On either side of the connecting ridge are the sources of two small streams, the beds of which form the Khyber gorge. This narrow gorge forms the Khyber Pass; it winds between cliffs of shale and limestone, 600–1,000 feet (180–300 m) high, and enters the Khyber Hills from the Shadi Bagiār opening, a few miles beyond Jamrūd, Pak., and continues northwestward for about 33 miles (53 km). Just beyond the old Afghan fort of Haft Chāh, it opens onto the barren Lowyah Dakkah plain, which stretches to the Kābul River.

After a steep ascent at its southern entrance, the pass rises gradually to Fort Ali Masjid (3,174 feet), where the Khyber River (Khyber Khwār) leaves the pass to the south. For 5 miles from Ali Masjid the pass becomes a defile not more than 600 feet wide, flanked by imposing and precipitous walls. From Zīntara village on northward, the pass becomes a valley a mile or more wide, with forts, villages, and scattered cultivation plots. About 10 miles west of Ali Masjid lies Landi Kotal fort and cantonment



Khyber Pass, Pakistan
EB Inc.

(3,518 feet); this is the highest point in the pass and is also an important market centre with an alternate route back to Peshāwar. There the summit widens out northward for 2 miles. The main pass, however, descends from Landi Kotal through Shinwārī territory to Landi Khāna, where it runs through another gorge and enters Afghanistan territory at Towr Kham (Torkham; 2,300 feet), winding another 10 miles down the valley to Lowyah Dakkah.

The Khyber Pass is threaded by a caravan track and by a good hard-surface road. The railway (opened 1925) through the pass connects Jamrūd with Landi Khāna, near the Afghan frontier; the line, with its 34 tunnels and 94 bridges and culverts, revolutionized transportation in the area. The pass may be skirted by a road fork that enters the hills about 9 miles north of Jamrūd and emerges at Lowyah Dakkah.

Few passes have had such continuing strategic importance or so many historic associations as the Khyber Pass. Through it have passed Persians, Greeks, Mughals, Afghans, and the British, for whom it was the key point in control of the Afghan border. In the 5th century BC Darius I the Great of Persia conquered the country around Kābul and marched through the Khyber Pass to the Indus River. Two centuries later Hephaestion and Perdiccas, generals of Alexander the Great, probably used the pass. Buddhism flourished in and around the Khyber when it was part of Aśoka's kingdom (3rd century BC); Buddhist remains include Kāfir Kot (Citadel of the Kafirs), Shopla *stūpa* (also called the Khyber Top), and the *stūpa* near Ali Masjid. The pass was used by Maḥmūd of Ghazna, Bābur, Nāder Shāh, and Aḥmad Shāh Durrānī and his grandson Shāh Żamān in their invasions of India. Ranjit Singh, the Sikh ruler of the Punjab, extended his kingdom as far as Jamrūd in the early 19th century.

The Pashtun Afrīdī people of the Khyber area always resisted foreign control, and numerous punitive expeditions were undertaken against them by the Mughals and the British. The first British advance northward into the Khyber took place in 1839, and during the First Anglo-Afghan War the pass was the scene of many skirmishes with the Afridis. The Treaty of Gandamak, which was signed during the Second Anglo-Afghan War in 1879, left the Khyber tribes under British control. In 1897 the Afridis seized the pass and held it for several months but were defeated in the Tīrāh expedition of 1897. The British became responsible for the safety of the pass, which is now controlled by the Pakistani Khyber Agency.

Ki Seto ware, yellow-toned ceramic ware made from fine, white clay covered with iron-ash glazes in the Mino area in central Honshu, Japan, from the late Muromachi period (1338–1573) onward. Ki Seto ("Yellow Seto") is divided into two main types: a glossy chartreuse yellow (*guinomi-de,* or *kikuzara-de*), fired at a relatively high temperature, and a soft dull-glazed pure yellow (*ayame-de,* or *aburage-de*), fired at low heat.

The fine Ki Seto wares of the late Muromachi period are believed to have been produced at such kiln sites as Kujiri, Gotomaki, Jorinji, and Akasaba, where *temmoku* glazed bowls were also produced. Later, in the Azuchi-Momoyama period (1574–1600), the intensity of Ki Seto's yellow deepened, achieving the great warmth of tone for which it is known. In addition to tea utensils, various types of plates, bowls, and flower vases were made. A type of decorated ware known as *tampan* was especially popular with tea cult devotees. *Tampan* was painted with pictorial designs executed in a pale-green copper glaze.

Ki Tsurayuki, Ki also spelled KINO (d. *c.* 945), court noble, government official, and noted man of letters in Japan during the Heian period (794–1185).

While serving as chief of the Imperial Documents Division, Tsurayuki took a prominent part in the compilation of the first Imperial poetry anthology, *Kokin-shū* (905). In a prose introduction, Tsurayuki discussed the general nature of poetry and the styles of the poets represented. This introduction, which was written in the newly developed cursive *kana* syllabic alphabet, is regarded as one of the early masterpieces of Japanese prose. Tsurayuki was himself a prolific and highly respected writer of Japanese verse (*uta*), and he ranks among the "36 Japanese poets," the most illustrious of the 8th to the 10th century. In 936 he wrote *Tosa nikki* (*The Tosa Diary*), a travel book composed in the phonetic script instead of the Chinese that was normal for men's diaries.

Few details are available about Tsurayuki's life and character. He appears to have devoted his life chiefly to literature. His son, Ki Tokibumi (or Tokifumi), was one of the five poets (later called the Five Men of the Pear-Jar Room) who in 951 compiled the *Gosen-shū,* the second official poetic anthology.

Kiama, town, Illawara district, eastern New South Wales, Australia. The town is situated near the Minamurra River. Its harbour was visited in 1797 by the British explorer George Bass. Its name is Aboriginal for either "good fishing ground" or "where the sea makes a noise," the latter referring to a local sea cave known as the Blowhole. A former cedar port, it was proclaimed a town in 1839 and became a municipality in 1859 that was enlarged in 1954 by the inclusion of Jamberoo and Gerringong. Situated along the Prince's Highway, 55 miles (88 km) south of Sydney, Kiama serves an area of dairy and mixed farming, coal mining, and blue-metal (basalt) quarrying. Its fine beaches and rocky coast attract tourists. Pop. (1981) 7,717.

Kiamichi River, river in Oklahoma, U.S., rising in Le Flore County, near the Arkansas state line in the Ouachita Mountains. It flows southwest, past Pine Valley and Clayton to Antlers, where it turns southeast and joins the Red River south of Fort Towson in southeast Choctaw County after a course of 165 miles (266 km). The Hugo Reservoir, a flood-control installation, is in the river 7 miles (11 km) east of Hugo. *Kiamichi* probably comes

from a French word for "horned screamer," the name of a local bird.

Kian (China): *see* Chi-an.

kiang, in Tibet, the Asiatic wild ass. *See* ass.

Kiangnan Arsenal, in Shanghai, major Chinese centre during the 1860s and 1870s for the manufacture of modern arms and the study of Western technical literature and Western languages. It was opened in 1865 as part of China's Self-Strengthening movement. Begun as an ironworks base, with machinery purchased from abroad, the arsenal was developed primarily by Tseng Kuo-fan and Li Hung-chang. During the 1860s and 1870s it was the most successful arsenal in East Asia and one of the greatest in the world. Westerners were initially employed to instruct the Chinese labourers in the manufacture and use of the arms. In 1868 the Kiangnan Arsenal produced the first modern Chinese steamship. Its translation bureau, directed by the Englishman John Fryer, translated 173 foreign works into Chinese. The arsenal was managed by Chinese and staffed by some 300 Chinese workmen, who were paid four to eight times better than the average farmer or coolie labourer. In the late 19th century it gradually declined in productivity, chiefly because of apathy and incompetent leadership.

Kiangsi, Wade-Giles romanization CHIANG-HSI, Pinyin JIANGXI, south-central *sheng* (province) of the People's Republic of China, bounded by the provinces of Hupeh and Anhwei on the north, Chekiang and Fukien on the east, Kwangtung on the south, Hunan on the west. The provincial capital is Nan-ch'ang.

A brief treatment of Kiangsi follows. For full treatment, *see* MACROPAEDIA: China.

Kiangsi was ruled by various dynasties from as early as 770 BC. Kiangsi enjoyed prosperity during the Six Dynasties period (AD 220–589), when immigrants from North China brought northern arts, culture, and administrative skills to the province. Under the T'ang dynasty (618–907) the opening of the Grand Canal set Kiangsi on the main trade route between North and South China. The Ch'ing dynasty (1644–1911/12) settled a period of protracted warfare in Kiangsi, but the opening of China's seaports to the Western powers in the mid-19th century diverted trade from the province. Kiangsi was wrested from warlord rule in 1926 by Chiang Kai-shek, but it quickly became a pawn in the violent struggle between the Nationalists and the Communists. It fell under Japanese occupation from 1938 to 1945. Communist forces took possession of the province in 1949.

The population of the province is virtually all Han (Chinese). The language usually spoken is Mandarin, with a marked lower Yangtze accent. Other small population groups include the Miao, Yao, and a few Hui (Chinese Muslims).

Kiangsi corresponds topographically to the drainage basin of the Kan River, which runs northeastward from the southern tip of the province to P'o-yang Lake and the Yangtze River in the north. Hills and mountains rim the province from all sides and rise in disconnected masses, thus containing corridors for interprovincial communication, especially along the Hunan border. Among the more important mountain ranges are: the Hwai-yu to the northeast; the Wu-i to the east; the Chin-lien and Ta-yu to the south; the Chu-kuang, Wan-yang, Yun-hsiao, Wu-kung, and Chin-ling to the west; and the Mu-fou and Lu to the northwest. The province is situated in the subtropics and therefore experiences hot and humid summers; the growing season in most areas is 10 to 11 months. Rainfall is plentiful over the province.

Kiangsi is one of China's richest agricultural provinces. Measures taken to increase agricultural production since 1949 have included reclamation of land, soil treatment and conservation, the construction of large irrigation projects and hydroelectric power stations, and increased use of chemical fertilizers and mechanization. Food crops include rice, sugarcane, fruits, peanuts (groundnuts), and sweet potatoes. Tea, cotton, tobacco, and soybeans are commercial crops. Lush forests occupy a tenth of the province; timber produced here is exported to all parts of China. Water buffalo, pigs, chickens, and ducks are raised. Fishing is a major industry in some cities that lie along P'o-yang Lake.

Important industries include food processing, farm machinery, paper, textiles, chemicals, and electrical supplies. Among Kiangsi's mineral resources are coal, tungsten, iron, and manganese. No account of Kiangsi's economy is complete without reference to its renowned porcelain industry, which dates from the 11th century. While waterways are the most important commercial form of transport, Kiangsi has four railroads, a well-developed highway system, and regular domestic air-travel facilities. Area 63,600 square miles (164,800 square km). Pop. (1988 est.) 35,590,000.

Kiangsi Soviet, also called CHINESE SOVIET REPUBLIC (1931–34), independent government established by the Communist leader Mao Zedong and his comrade Zhu De in Kiangsi province in southeastern China. It was from this small state within a state that Mao gained the experience in guerrilla warfare and peasant organization that he later used to accomplish the Communist conquest of China in the late 1940s.

The Chinese Communist Party was originally an urban-oriented group of intellectuals allied with the Kuomintang (KMT), or Nationalists, until 1927, when Chiang Kai-shek purged the Communists from the KMT. At this time Mao and Zhu De, at the head of a small band of Communist soldiers, retreated into the mountainous countryside along the border of Kiangsi and Hunan provinces. Here, independent from the Moscow-oriented leaders of the party, they began to build their own peasant-oriented government.

In June 1930 they received a temporary setback when they attempted to use their small forces to capture urban centres. They were forced to retreat into the countryside, but they continued their efforts to organize the peasants by developing a land redistribution policy that appealed to the people. In this way they were able to rebuild their base. This soviet, of which Mao was elected chairman, expanded so rapidly that it soon had an area containing several million people under its control. Its success, however, alarmed the Nationalists, and between 1930 and 1933 Chiang Kai-shek launched four massive military campaigns to encircle and annihilate the Kiangsi Soviet, all of which were repulsed by the Communists by means of guerrilla warfare.

In 1933 the Chinese Communist Party's Russian-oriented Central Committee moved its headquarters from its precarious urban base in Shanghai to the Kiangsi Soviet. With support from Moscow, the members of the Central Committee gradually took over the leadership of the soviet from Mao, radicalizing Mao's land-reform policy so that not only large landlords but also rich peasants and small landlords had their possessions confiscated and redistributed. When Chiang Kai-shek launched his fifth military campaign against the Kiangsi Soviet in 1933, the new leadership resorted to a strategy of fixed positional warfare, and the soviet was overwhelmed. On Oct. 15, 1934, the Red Army abandoned its Kiangsi base and began its famous Long March.

Kiangsu, Wade-Giles romanization CHIANG-SU, Pinyin JIANGSU, *sheng* (province) on the east coast of the People's Republic of China. It is bounded by the Yellow Sea and the provinces of Chekiang to the south, Anhwei to the west, and Shantung to the north. The provincial capital is Nanking.

A brief treatment of Kiangsu follows. For full treatment, *see* MACROPAEDIA: China.

Before the Common Era most of the province was a part of the ancient state of Wu. The region went through a golden age of culture during the Six Dynasties period (AD 220–589) and again during the Southern Sung dynasty (1127–1279), when it received great influxes of immigrants from the North. Nanking was the imperial capital under the Ming dynasty until 1421. In 1667 Kiangsu became a separate province. After the Opium Wars of the mid-19th century there was considerable foreign commerical penetration of the province. Kiangsu was an important power base for China's Nationalist Party, which made Nanking the nation's capital from 1928 to 1937 and again from 1946 to 1949. The province was occupied by Japan during the Sino-Japanese War (1937–45) and suffered immense damage, from which it recovered.

The most important physical characteristic of Kiangsu is its wide alluvial plain, which is divided by the estuary of the Yangtze River into two sections, Chiang-nan (south of the river) and Su-pei (northern Kiangsu). Su-pei, north of the river, is relatively poor in comparison with Chiang-nan. Chiang-nan forms a part of the Yangtze River delta and is fertile and well watered, famed for its silk and handicrafts, and very densely populated and industrialized. The famous cities of Su-chou, Nanking, Wu-hsi, and Shanghai (the chief metropolis of China and one of the largest cities in the world) are all located in this region. Shanghai is situated at the mouth of the Yangtze River. Administratively, the Shanghai municipality is not part of Kiangsu province but is controlled by the State Council of the People's Republic of China in Peking.

Most of Kiangsu lies at the low elevation of 150 feet (45 m) above sea level. The Kiangsu lowlands are floodplains formed by the alluvial deposits of the mighty Yangtze, the Huai River, the Huang Ho, and their tributaries. The Yangtze and Huang Ho channels divide these plains into three sections: the Chiang-nan plain south of the Yangtze, characterized by its flatness and forming the major part of the Yangtze River delta; the Yangtze–Huai River plain, lying between the Yangtze and the ancient channel of the Huai River and built up by the alluvium of the two rivers; and the Suchow–Huai River plain, north of the old Huai River channel. Mount Yun-t'ai, near the Yellow Sea, is the highest point in the province, at 2,050 feet (625 m). There are two types of climate in Kiangsu: humid subtropical in the central and southern parts and cool temperate continental in the north.

The extremely dense population patterns of Kiangsu province and Shanghai municipality are inseparable geographically and economically. Population density is higher in northern Kiangsu because its development dates from ancient times and because of the region's importance as a communication link between North China and the lower Yangtze River valley. However, the hilly district in southwestern Kiangsu also has very high population densities. The province's population is entirely Chinese (Han), with the exception of a few Hui (Chinese Muslims).

In Kiangsu are several ancient cities rich in cultural heritage, historic monuments, and famous temples. Most renowned are the simple tombs of the Ming emperors and the magnificent Sun Yat-sen Mausoleum, both in the eastern part of Nanking, at the foot of Tzuchin Shan (Purple and Gold Hill).

Warmth- and moisture-loving fauna characteristic of the monsoon climate of East Asia are found in Kiangsu. Fish, ducks, crab, and

shrimp are important food sources, and aquaculture is highly developed. The province is one of the richest in China, with agriculture improved by multiple cropping, powered irrigation, tractors, and chemical fertilizers. Crops include rice, wheat, cotton, fruit, and tea. Cattle, pigs, poultry, and silkworms are raised. Industries in Kiangsu include the enormous Nanking Motor Works, as well as factories that produce chemical fertilizers, steel, petrochemicals, electronics, and machine tools. Wu-hsi is a textile and tourism centre, and coal and iron deposits at I-hsing have contributed to local iron and steel works. Area 39,600 square miles (102,600 square km). Pop. (1985 est.) 61,710,000.

Kiangsu Provincial Museum, Chinese (Wade–Giles romanization) CHIANG-SU SHENG PO-WU KUAN, Pinyin JIANGSUSHENG BOWUGUAN, in Nanking, China, one of the outstanding provincial museums of China. It contains objects reflecting 5,000 years of Chinese culture. The prehistoric section contains objects found during excavations in 1954 and 1956 in Kiangsu Province, including polished stone tools, gray and red geometrically decorated pottery, and jade jewelry. Other items on display include bronzes from the Shang era, fine Han pottery decorated with arabesque designs, models of machines designed by Huang Dao-po for weaving cotton and dating from the early Ming dynasty, objects from two southern T'ang tombs south of Nanking, and excellent examples of handicrafts from all eras. One room contains furniture from the late Ch'ing dynasty.

kibbutz, plural KIBBUTZIM, Hebrew QIBBUTZ ("gathering," or "collective"), Israeli collective settlement, usually agricultural and often also industrial, in which all wealth is held in common. Profits are reinvested in the settlement after members have been provided with food, clothing, and shelter and with social and medical services. Adults have private quarters, but children are generally housed and cared for as a group. Cooking and dining are in common. The settlements have edged toward greater privacy with regard to person and property since the formation of Israel in 1948. The kibbutzim, which are generally established on land leased from the Jewish National Fund, convene weekly general meetings at which the kibbutz members determine policy and elect their administrative members.

The first kibbutz was founded at Deganya in Palestine in 1909; others were created in the following years, and by the late 20th century there were more than 200 kibbutzim in Israel, having a total population of more than 100,000. The early kibbutzim in Palestine were actually *kevuẓot;* these were relatively small collectives that gradually evolved into the larger and more extended collective community known as the kibbutz. The kibbutzim played an important role in the pioneering of new Jewish settlements in Palestine, and their democratic and egalitarian character had a strong influence on early Israeli society as a whole. The kibbutzim still make contributions to Israel's economy and leadership that are disproportionately large when compared to the kibbutzim's relatively small share of the country's population.

Kibi Makibi, original name SHIMOTSUMICHI MAKIBI (b. *c.* 693, Bitchū, Province, Japan—d. Oct. 31, 775, Nara?), early envoy to China who did much to introduce Chinese culture to the comparatively primitive Japanese state. In 717, when Chinese culture under the great T'ang dynasty (618–907) was at its height, Kibi traveled there as a student. Upon his return to Japan, he received an audience with the empress Kōken and so impressed her with his talent and character that she sent him back to China as a special envoy of the Japanese government. Later, Kibi became an adviser to the empress, helping her prepare new legislation and reforms. He achieved the high post of minister of the right in 766.

kiblah (Islām): *see* qibla.

Kıbrıs: *see* Cyprus.

Kiburg, County of: *see* Kyburg, County of.

Kichibē (Japanese printmaker): *see* Hishikawa Moronobu.

Kichizan, pseudonym of MINCHŌ (b. 1352, Awaji-shima, Japan—d. Sept. 26, 1431, Japan), the last major professional painter of Buddhist iconography in Japan.

He was a priest, associated with the Zen Buddhist Tōfuku-ji (temple) in Kyōto. Of the Buddhist paintings that he did for the temple, the best known is the portrait of Shōichi



Portrait of Daidō Ichii by Kichizan with a laudatory inscription by Shōkai Reiken (not reproduced here), hanging scroll, ink on paper; in the Nara National Museum, Japan

By courtesy of the Nara National Museum, Japan

(1202–80), founder of the temple. The painting is a *chinsō,* an official portrait of a high-ranking ecclesiastic in which emphasis is placed upon the realistic depiction of the face and the robes. It shows to good advantage the heavy curved outlines for which his painting style is famous. He is also believed to be the artist of the oldest ink landscape painting extant in Japan: "The Hut in the Valley" (dated 1413; located in the Konchi-in monastery in Kyōto). The painting reflects the influence of Chinese landscape art and is an early Japanese example of a *shi-ga-jiku,* hanging scroll on which poems commenting upon the painting are inscribed.

Kickapoo, Algonkian-speaking Indians, related to the Sauk and Fox (*qq.v.*), who lived at the portage between the Fox and Wisconsin rivers, probably in present Columbia County, Wis., U.S., when first reported by Europeans in the late 17th century. The Kickapoo were known as formidable warriors whose raids took them over a wide territory, ranging as far as Georgia and Alabama to the southeast; Texas and Mexico to the southwest; and New York and Pennsylvania to the east. Early in the 18th century part of the tribe settled near the Milwaukee River and, after the destruction of the Illinois Indians *c.* 1765, moved south to Peoria. One band extended as far as the Sangamon River and became known as the Prairie band; another pushed east to the Wabash and were called the Vermilion band. In 1809 and 1819, under the pressure of advancing white settlers, the Kickapoo ceded their lands in Illinois to the United States, moving to Missouri and then to Kansas. About 1852 a large group went to Texas, and from there to Mexico, where they were joined by another party in 1863. Some returned to Indian Territory in 1873 and later years. The remainder were granted a reservation in eastern Chihuahua state, in northern Mexico; other Kickapoo reside in Oklahoma and Kansas.

The Kickapoo lived in fixed villages, moving between summer and winter residences; they raised corn (maize), beans, and squash and hunted buffalo on the plains. Their society was divided into several exogamous, named clans based on descent through the paternal line. By the 19th century, as a result of scattering in small villages to prevent attack, central tribal authority had broken down, and chiefs of the various bands had become autonomous. From the beginning of European contact, the Kickapoo resisted acculturation in economic, political, and religious matters, retaining as many of their old ways as possible.

Kicking Horse Pass, pass in the Canadian Rockies at the Alberta–British Columbia border and the Banff–Yoho national parks boundary; it is the highest point on the Canadian Pacific Railway, at an elevation of 5,338 feet (1,627 m). The approach from the east is by way of the Bow Valley; from the west end, two circular tunnels were cut into the valley sides (completed 1911) to reduce the gradient of the railway. It was explored in 1858 by James Hector of Captain John Palliser's expedition. Hector was kicked by his horse while crossing the pass—whence its name. The Trans-Canada Highway came through the pass in the 1960s.

Kidd, William, byname CAPTAIN KIDD (b. *c.* 1645, Greenock, Renfrew, Scot.—d. May 23, 1701, London), 17th-century British privateer and semilegendary pirate who became celebrated in English literature as one of the most colourful outlaws of all time. Fortune seekers have hunted his buried treasure in vain through succeeding centuries.

Kidd's early career is obscure. It is believed he went to sea as a youth. After 1689 he was sailing as a legitimate privateer for Great Britain against the French in the West Indies and off the coast of North America. In 1690 he was an established sea captain and shipowner in New York City, where he owned property; at various times he was dispatched by both New York and Massachusetts to rid the coast of enemy privateers. In London in 1695, he received a royal commission to apprehend pirates who molested the ships of the East India Company in the Red Sea and in the Indian Ocean.

Kidd sailed from Deptford on his ship, the *Adventure Galley,* on Feb. 27, 1696, called at Plymouth, and arrived at New York City on July 4 to take on more men. Avoiding the normal pirate haunts, he arrived by February 1697 at the Comoro Islands off East Africa. It was apparently some time after his arrival there that Kidd, still without having taken a prize ship, decided to turn to piracy. In August 1697 he made an unsuccessful attack on ships sailing with Mocha coffee from Yemen but later took several small ships. His refusal two months later to attack a Dutch ship nearly brought his crew to mutiny, and in an angry exchange Kidd mortally wounded his gunner, William Moore.

Kidd took his most valuable prize, the Armenian ship *Quedagh Merchant,* in January 1698 and scuttled his own unseaworthy *Adventure Galley.* When he reached Anguilla, in the West Indies (April 1699), he learned that he had been denounced as a pirate. He left the *Quedagh Merchant* at the island of Hispaniola (where the ship was possibly scuttled; in any case, it disappeared with its questionable booty) and sailed in a newly purchased ship, the *Antonio,* to New York City, where he tried to persuade the earl of Bellomont, then colonial governor of New York, of his innocence. Bellomont, however, sent him to England for trial, and he was found guilty (May 8 and 9, 1701) of the murder of Moore and on five indictments of piracy. Important evidence concerning two of the piracy cases was suppressed at the trial, and some observers later questioned whether the evidence was sufficient for a guilty verdict.

Kidd was hanged, and some of his treasure was recovered from Gardiners Island off Long Island. Proceeds from his effects and goods taken from the *Antonio* were donated to charity. In years that followed, the name of Captain Kidd has become inseparable from the romanticized concept of the swashbuckling pirate of Western fiction. Among other stories concerning caches of treasure he supposedly buried is Edgar Allan Poe's "The Gold Bug."

Kidder, Alfred V(incent) (b. Oct. 29, 1885, Marquette, Mich., U.S.—d. June 11, 1963, Cambridge, Mass.), foremost American archaeologist of the southwestern United States and Middle America of his day and the force behind the first comprehensive, systematic approach to North American archaeology.

In 1907 Kidder began his career of fieldwork with studies in Utah, Colorado, and New Mexico. He received his Ph.D. from Harvard University (1914) for developing the first effective pottery typology relating to the prehistory of the southwestern United States. During expeditions to Utah and Arizona (1914) and as director (1915–29) of excavations for Phillips Academy, Andover, Mass., at the large pueblo at Pecos, N.M., he did much to further the study of anthropology and archaeology in southwestern universities and to establish scientific societies and museums. With Samuel J. Guernsey he wrote two books on northeastern Arizona (1919 and 1921). His *Introduction to the Study of Southwestern Archaeology* (1924), which became a standard work, details the growth of the prehistoric Basket Maker culture into the Pueblo cultures of historical times. In 1927 he proposed the Pecos archaeological classification system, widely used by later workers in the Pueblo region.

Kidder remained with Phillips Academy until 1935. He was also a member of the Carnegie Institution of Washington, Washington, D.C. (1927–50), and of the faculty of the Peabody Museum of Archaeology and Ethnology, Harvard University (1939–50). For the Carnegie Institution he organized an interdisciplinary program that resulted in a far-reaching survey of cultural history in the Old and New Maya empires of Mexico and Central America, and he frequently worked on sites under investigation, notably at Kaminaljuyú, near Guatemala City.

Kidderminster, town, Wyre Forest district, county of Hereford and Worcester, England. It is situated along the River Stour and the Staffordshire and Worcestershire Canal. Recorded as Stour-in-Usmere in AD 736, it was given to the *comes* (count) Cyneberght by King Aethelbald (reigned 716–757). Later it passed to the bishop of Worcester and thence to Cenwulf, king of Mercia (AD 816), and it remained a royal manor until Henry II's reign (1154–89). The town's once-important cloth trade is first mentioned in 1334; carpet manufacture replaced that of woolen goods in 1735. Pop. (1981) 50,746.

Kiddush, also spelled QIDDUSH (Hebrew: "sanctification"), Jewish benediction and prayer recited over a cup of wine immediately before the meal on the eve of the sabbath or of a festival; the ceremony acknowledges the sanctity of the day that has just begun. Chanting, or recitation, usually performed by the head of the household, may involve several or all members of the family, depending on the custom; each then sips wine from the cup, which was held in the right hand during the benediction. In the Ashkenazi (German) tradition, two covered loaves of bread (halloth) on the table symbolize the double portion of manna gathered before the sabbath by Israelites during their years of wandering in the wilderness. If no wine is available, bread may be used as a substitute.

Following an ancient custom from the days when wayfarers and the poor lodged in synagogues, some congregations recite the Kiddush at the end of the Friday-evening service in the synagogue—except on the eve of the Passover (Pesaḥ), when the recitation is reserved for the Sēder service. The Kiddush that is recited after the morning service of the sabbath and of the festival is preceded by appropriate readings from the Bible.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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Kidepo Valley National Park, national park, northeastern Uganda, East Africa. It occupies an area of 540 square miles (1,399 square km) in wooded grasslands and mountainous scenery in the northeastern corner of the country. It straddles the Kidepo and Larus rivers, which are seasonally dry except for some permanent pools on the Larus. Mount Morungole on the east and the Lotuku Ridge rising in The Sudan to the north dominate the landscape. Established in 1962, it adjoins the frontiers of Kenya and The Sudan.

Kiderlen-Wächter, Alfred von (b. July 10, 1852, Stuttgart, Württemberg—d. Dec. 30, 1912, Stuttgart), German statesman and foreign secretary remembered for his role in the second Moroccan crisis (1911) before World War I.

After service in the Franco-German War (1870–71), Kiderlen studied law and entered the Prussian diplomatic service (1879). He was an exponent of the tough-minded post-Bismarckian German diplomacy and for a time enjoyed the favour of the emperor William II, which his sharp tongue lost him, however, in 1898. He was thereupon sent as minister to Bucharest and for a time served



Kiderlen-Wächter, drawing by Olaf Gulbransson

Archiv fur Kunst und Geschichte, West Berlin

in Constantinople, where he championed the Berlin–Baghdad Railway. In 1908 he was appointed deputy foreign secretary and was instrumental in keeping Russia from aiding Serbia during the crisis following Austria's annexation of Bosnia-Hercegovina. Already at this point Kiderlen advocated a belligerent foreign policy, whose success was purchased at the price of Russia's enmity. In 1910 the new chancellor, Theobald von Bethmann Hollweg, overcame the Kaiser's dislike of Kiderlen and named him secretary of state for foreign affairs.

Kiderlen opposed the attempt of the emperor and Admiral Alfred von Tirpitz to build up the German fleet to parity with the British, preferring to work toward establishing Germany firmly as the leading power in Europe through the Triple Alliance (Germany, Austria-Hungary, and Italy). The climax of his career came in 1911. France had occupied the Moroccan cities of Rabat and Fès. While Kiderlen was not opposed in principle to French supremacy in Morocco, he demanded compensation for Germany. He encouraged German agitation for intervention in western Morocco and, to lend force to his arguments, dispatched the German gunboat *Panther* to Agadir, provoking the so-called Agadir crisis. He refused conciliatory offers by the French government, and his attempt to exclude Great Britain from the negotiations led to threats of British intervention. After the rejection of Kiderlen's demand for the whole of the French Congo in return for a free hand for France in Morocco, an agreement was reached in November 1911 by which Germany received two small strips of territory from the French Congo and France established a protectorate over Morocco. German expansionists sharply denounced the treaty as too lenient; but Kiderlen was able to retain his office. Kiderlen's brusque and forceful posturing during the second Moroccan crisis significantly aggravated the international tensions that were to lead to World War I.

Kidinnu, also spelled KIDENAS, or CIDENAS (fl. *c.* 379 BC, Babylonia), astronomer and mathematician who may have discovered the precession of the equinoxes, the slow rotation of the Earth's axis that results in slight variations in the length of the year. Head of the astronomical school at Sippar, Kidinnu was probably responsible for introducing the 19-year cycle into the Babylonian calendar in 383 BC. In this system each year had 12 lunar months, but 7 extra months were inserted at intervals during the 19-year period. The 19-year cycle of intercalations was adopted by the Jews and has remained in use.

Kidinnu also developed the more refined system (called System B) used by the Babylonians to describe more clearly the motions of the Sun and planets. This system utilized steadily increasing and decreasing values for the planetary positions, sometimes called zigzag functions. Kidinnu's calculation of the length of the synodic month (from New Moon to New Moon) yielded a value of 29.530614 days, which differs by less than one second from the true value.

kidnapping, also spelled KIDNAPING, criminal offense consisting of the unlawful taking and carrying away of a person by force or fraud or the unlawful seizure and detention of a person against his will. The principal motives for kidnapping are to subject the victim to some form of involuntary servitude, to expose him to the commission of some further criminal act against his person, or to obtain ransom for his safe release. More recently, kidnapping for the purpose of extortion has become a tactic of political revolutionaries or terrorists seeking concessions from a government. In all countries it is considered a grave offense punishable by a long prison sentence or death.

In earlier times kidnapping meant carrying a person away to another country for involuntary servitude. It also referred to the practices

of impressing males into military service (also known as crimping) by fraudulent inducement or force and of shanghaiing merchant seamen in port cities.

Abducting young women and selling them for purposes of concubinage or prostitution has also been characterized as a form of kidnapping. In current statutes this is often described as abduction and ordinarily includes the taking or detention of a girl under a designated age for purposes of marriage. In some countries the alienation of a husband from his wife by another woman who entices him away is also delineated as a criminal offense within the meaning of abduction.

Modern kidnapping laws are drawn so as to proscribe the offense of taking a person with the object of extorting large amounts of ransom money or other concessions for his safe return. This became common in the United States during the 1920s and 1930s. The kidnapping in 1932 of the infant son of the internationally known U.S. flyer Col. Charles A. Lindbergh spurred legislation imposing the death penalty for transporting a kidnapped victim across a state line.

In most countries, the offense of kidnapping includes false imprisonment. False imprisonment aggravated by the carrying of the person to some other place is considered a kidnapping, thus inviting a more severe penalty.

kidney, in vertebrates and some invertebrates, organ that maintains water balance and expels metabolic wastes. Primitive and embryonic kidneys consist of two series of specialized tubules that empty into two collecting ducts, the Wolffian ducts (*see* Wolffian duct). The more advanced kidney (metanephros) of adult reptiles, birds, and mammals is a paired compact organ whose functional units, called nephrons, filter initial urine from the blood, reabsorb water and nutrients, and secrete wastes, producing the final urine, which is expelled.

For a depiction of the kidneys in the human anatomy, shown in relation to other parts of the body, *see* the colour Trans-Vision in the PROPAEDIA: Part Four, Section 421.

Reptilian and avian kidneys are made up of many tiny lobules that, in birds, are combined into three or more lobes. Collecting tubules from each lobule empty into a separate branch of the ureter. Reptiles have relatively few nephrons (from 3,000 to 30,000 in lizards), while birds have a great number (around 200,000 in a fowl, twice as many as in a mammal of comparable size).

Mammalian kidneys have a somewhat granular outer section (the cortex), containing the glomeruli and convoluted tubules, and a smooth, somewhat striated inner section (the medulla), containing the loops of Henle and the collecting tubules. As the ureter enters the kidney it enlarges into a cavity, the renal pelvis; urine passes into this pelvis from the collecting tubules. Nephrons are numerous (20,000 in a mouse).

In humans the kidneys are about 10 centimetres long and are located beneath the diaphragm and behind the peritoneum. Each kidney contains 1,000,000–1,250,000 nephrons that filter the entire five-quart water content of the blood every 45 minutes—an equivalent of 160 quarts a day. Of this, only 1½ quarts are excreted; the remainder is reabsorbed by the nephrons.

Damaged kidneys secrete an enzyme called renin that stimulates constriction of the blood vessels. When the damage has been caused initially by high blood pressure, the increase in pressure from the constricted vessels causes more kidney damage.

kidney failure, also called RENAL FAILURE, partial or complete loss of kidney function. Kidney failure is classified as acute (when the onset is sudden) or chronic.

Acute kidney failure results in reduced output of urine, abnormally high levels of nitrogenous substances, potassium, sulfates, and phosphates in the blood, and abnormally low blood levels of sodium, calcium, and carbon dioxide (*see* uremia). Ordinarily the affected person recovers in six weeks or less. Causes of kidney failure include destruction of the tubules in the kidney by drugs or organic solvents such as carbon tetrachloride, acetone, and ethylene glycol; exposure to compounds of metals such as mercury, lead, and uranium; physical injuries or major surgery causing much loss of blood or an increase in blood pressure; severe burns; and incompatible blood transfusions. Renal failure can also result from diseases that destroy the cortex (outer substance) of the kidney; from severe bacterial infections of the kidney; from diabetes that causes destruction of the medulla (the inner substance) of the kidney; and from overabundance of calcium salts in the kidneys. Blockage of the renal arteries, liver diseases, and obstruction of the urinary tract produce acute failure; on rare occasions, kidney failure can occur without apparent symptoms. Complications that arise from kidney failure include heart failure, pulmonary edema, and an overabundance of potassium in the body.

Chronic renal failure is usually the result of prolonged diseases of the kidney. In chronic failure the blood becomes more acidic than normal and there can be loss of calcium from the bones. Nerve degeneration can also occur.

Chronically diseased kidneys can sustain life until about 90 percent of their functioning capacity has been lost. When most of the kidney is diseased, the remaining portion increases its activity to compensate for the loss. If one kidney is removed, the other increases in size and function to handle the overload. Treatment when failure of both kidneys occurs usually requires dialysis by means of an artifical kidney machine. In cases of less severe kidney failure, this process allows the kidney tissue time to rest and repair itself. If adequate recovery does not occur, a kidney transplant may be considered.

kidney function test, any clinical and laboratory procedure designed to evaluate various aspects of renal (kidney) capacity and efficiency and to aid in the diagnosis of kidney disorders. Such tests can be divided into several categories, which include (1) clearance tests that give an estimate of the filtration rate of the glomeruli, the principal filtering structures of the kidneys (*see* inulin clearance), and overall renal blood flow (*see* phenolsulfonphthalein test); (2) concentration and dilution test, whereby the specific gravity of urine is determined at regular time intervals following water restriction or large water intake, to measure the capacity of the kidneys to conserve water; (3) visual and physical examination of the urine, which usually includes the recording of its physical characteristics such as colour, total volume, and specific gravity, as well as checking for the abnormal presence of pus, hyaline casts (precipitation of pure protein from the kidney tubules), and red and white blood cells; proteinuria, the presence of protein in the urine, is often the first abnormal finding indicative of kidney disease; (4) determination of the concentration of various substances in the urine, notably glucose, amino acids, phosphate, sodium, and potassium, to help detect possible impairment of the specific kidney mechanisms normally involved with their reabsorption.

In addition to clinical and laboratory tests, the use of X-rays and radioisotopes is also valuable in the diagnosis of kidney disorders (*see* urography).

kidney stone, also called RENAL CALCULUS, plural RENAL CALCULI, concretion of minerals and organic matter that forms in the kidneys. Such stones may become so large as to impair normal renal function. Urine contains many salts in solution and if the concentration of mineral salts becomes excessive, the excess salt precipitates as solid particles called stones. Kidney stones are classified as primary if they form without apparent cause, such as an infection or obstruction. They are classified as secondary if they develop after a renal infection or disorder.

Certain circumstances increase the likelihood of stone formation. Either a reduction in fluid volume or a surge in mineral concentration can be enough to upset the delicate balance between the liquid and its solutes. Once a stone starts developing, it generally continues to grow. A nucleus for precipitation of urinary salts can be a clump of bacteria, degenerated tissue, sloughed-off cells, or a tiny blood clot. Minerals start collecting around the foreign particle and encrusting it. As the stone increases in size, the surface area available for additional mineral deposition is continually increased.

Kidney stones, if large, can obstruct the outflow of urine, cause infections to begin, and create spasms in the renal tubules, a condition known as renal colic. In renal colic there is generally severe pain leading from the kidneys down through the abdomen and groin. Stones may cause obstruction in the renal pelvis (the funnel-like structure at which the kidney joins the ureter), in a ureter (the tube that carries urine from the kidney to the bladder), or in the bladder.

Many persons with kidney stones fail to show distinct symptoms. Others can have severe kidney pain, infection, and inflammation. In treatment any current infections are dealt with, medications are given in attempts to dissolve the stones, and large stones that fail to dissolve are removed by surgery.

kidney transplant, also called RENAL TRANSPLANT, replacement of a diseased or damaged kidney with a healthy one obtained either from a living relative or a recently deceased person. Although kidney transplants were carried out in the late 1950s, clinically significant transplantation did not begin until around 1963, when the immunosuppressive drug azathioprine was developed to help counteract the rejection of the new organ by the body's immune system. Because a kidney from a related donor is less likely to be rejected by the body, transplants from living relatives are more successful than those from cadavers. Nevertheless, cadavers are today the most common source for transplants because of their greater availability and because they obviate the risk to living donors.

Before transplantation, the immunologic characteristics of the recipient are carefully analyzed and a donor selected whose immunologic profile is matched as closely to the recipient's as possible. Traits used in determining a successful match include blood groups and tissue markers that enable the immune system to distinguish between the body's own tissues and foreign tissue. If the kidney is to come from a live donor, the recipient may undergo dialysis for several weeks before surgery to control existing kidney disease. Because kidneys from cadaver donors survive only a short time after removal, dialysis treatment for the recipient is not always possible. The operation will be cancelled if the recipient has any infection, because of the risk that infection will spread, protected by immunosuppressive medication.

The new kidney is implanted in the iliac fossa, a space in the small of the back; usually a right kidney is placed in the left fossa and vice versa to aid in making new attachments between blood vessels. The renal artery and vein are connected to the iliac artery and vein, and the ureter from the new kidney is

either connected to the existing ureter or attached directly to the bladder. Formerly both of the recipient's kidneys were removed; they are now left in place unless they are infected or are too large to permit the new organ to be implanted.

The rejection rate remains high, especially for cadaver kidneys, and some patients receive two or three kidneys before the body accepts one. Rejection may begin within minutes after the new organ is attached. Acute rejection, in which the tissues of the new kidney are injured by the immune system and the organ suddenly fails to function, can occur up to several years after operation but is most common in the first three months. Chronic rejection, in which deterioration of kidney function is more gradual, also may occur. Large doses of immunosuppressive drugs, along with drugs that retard the formation of blood clots, can halt acute rejection and save the transplant; if the medication does not help, the kidney is usually removed before infection or other complications set in.

Kidneys taken from living donors often begin to function immediately, while those from cadavers may take up to two weeks for tissues to adjust and become functional. If there are no complications from the transplant and no signs of rejection, the recipient can resume a virtually normal life within two months, although he must usually continue taking immunosuppressive drugs for several years. Because these drugs lower resistance to infection, however, other systemic complications may arise with time.

kidney vetch, also called LADIES' FINGERS (species *Anthyllis vulneraria*), perennial herb, of the pea family (Fabaceae), found in meadows, alpine pastures, and dry places of Europe and northern Africa. The low, hairy plant grows to a height of 15–40 cm (6–16 inches) and has narrow leaves 1.4–3.8 cm (0.5–1.5 inches) long and yellow, reddish, or white flowers. It was formerly used as a remedy for kidney disorders but is now frequently cultivated in rock gardens.

Kido Takayoshi, also called KIDO KŌIN, original name KATSURA KOGORŌ (b. Aug. 11, 1833, Chōshū, Nagato province, Japan—d. May 26, 1877, Tokyo), one of the heroes of the Meiji Restoration, the overthrow of the 264-year rule by the Tokugawa family and return of power to the Japanese emperor. After the imperial restoration of 1868, Kido became one of the most effective officials in the new government.

Born into an influential warrior family, Kido early became active in the politics of his *han,* or fief, of Chōshū. As a student of Yoshida Shōin, he was close to the group of Chōshū leaders who were to lead the movement for the overthrow of the Tokugawa. The radical elements in Kido's *han* began to rise in power, and, in 1862, Kido became one of Chōshū's leading officials.

Alarmed by the growing power of the radicals there, the Tokugawa led a punitive expedition against Chōshū in 1865. Kido was ousted from his position, and a conservative government was installed. But the radicals had formed their own military forces, and, after the Tokugawa army withdrew, they again seized command and successfully repulsed a second Tokugawa expedition. As head of the Chōshū government, Kido began to negotiate with radical samurai from Satsuma. Kido, along with Ōkubo Toshimichi and Saigō Takamori of Satsuma, became known as one of the three giants of the Restoration. Together they headed the coup d'état that eventually toppled the shogun and restored the emperor to power.

Kido became one of the most powerful men in the new administration. He was one of those responsible for transferring the imperial capital from Kyōto to Edo (renamed Tokyo) and for persuading the heads of the large *han* to renounce possession of their domains, which were returned to the emperor. The small *han* then followed suit, and Kido helped devise a scheme to redivide the country into prefectures to be governed by officials appointed by the central administration.

Kido, who had accompanied other high government figures on a visit to Europe in 1871, returned in time to block a plan to invade Korea. He retired from the administration when his views opposing an expedition against Taiwan in 1874 were overruled. After the recall of Japan's forces, he returned to office and began to work for the establishment of a Western-style constitution, but ill health forced him to assume a less-active role in government.

Kidston, Robert (b. June 29, 1852, Bishopston House, Renfrewshire, Scot.—d. July 13, 1924, Gilfach Goch, Glamorganshire, Wales), English paleobotanist, noted for his discoveries and descriptions of plant fossils from the Devonian period (408 to 360 million years ago).

Kidston studied botany at the University of Edinburgh, and in 1880 he became honorary paleobotanist to the British Geological Survey. In this first period of his work, which lasted until 1904, he studied the floristic, systemic, and stratigraphical characteristics of Paleozoic fossil plants. The high calibre of his research won him wide recognition. He was engaged to prepare catalogs of Paleozoic plants for various institutions, including the British Museum.

During the second period (1904–22) of his work, Kidston was principally concerned with morphological problems. With William Henry Lang of Victoria University in Manchester, he studied the silicified plants of the Rhynie Chert bed of the Devonian period. Kidston and Lang discovered a new class of vascular cryptogams (plants that do not produce flowers or seeds) and three new genera. This discovery has been called one of the greatest contributions to the knowledge of Devonian plants. Kidston was writing *The Fossil Plants of the Carboniferous Rocks of Great Britain* (6 parts, 1923–25) when he died.

Kiecal, Stanislaus (boxer): *see* Ketchel, Stanley.

Kiefer, Anselm (b. March 8, 1945, Donaueschingen, Ger.), German painter who became one of the most prominent figures in the Neo-Expressionist art movement of the late 20th century.

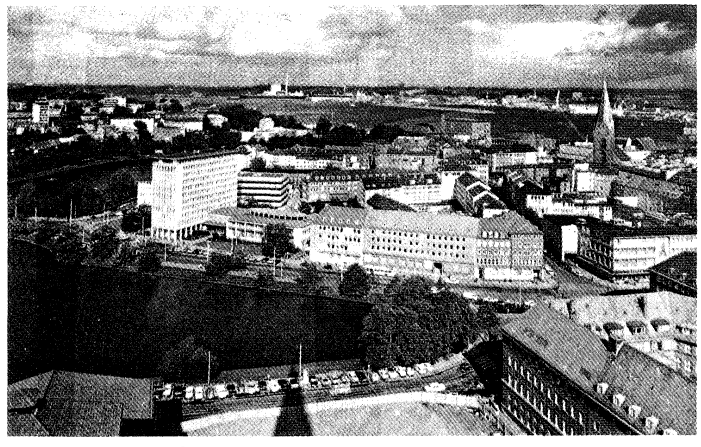
Kiefer abandoned his law studies at the University of Freiburg in 1966 to pursue art. He subsequently studied at art academies in Freiburg, Karlsruhe, and Dusseldorf. In the latter city in 1970 he became a student of the conceptual artist Joseph Beuys, who encouraged Kiefer's early use of symbolic photographic images to deal ironically with 20th-century German history. Beuys also encouraged Kiefer to paint, and in such huge paintings as "Germany's Spiritual Heroes" (1973) and "Operation Sea Lion" (1975) Kiefer was able to develop an array of visual symbols by which he could comment with irony and sarcasm on certain tragic aspects of German history and culture, in particular the Nazi period. These paintings used garish, sombre colours and coarse, naive drawing, but they did achieve powerful effects owing to their imaginative allusions to Nazism. In the 1970s he also painted a series of landscape vistas that capture the rutted and sombre look of the German countryside and that use linear perspective with great dramatic effect.

Kiefer's landscapes and interiors done in the 1980s acquired an intense physical presence by means of perspectival devices and the incorporation of unusual textures on the surface of the painted canvas. Though Kiefer continued to treat Germany's Nazi past in such paintings as "Interiors" (1981), the range of his themes broadened to include references to ancient Hebrew and Egyptian history, as in the large painting "Osiris and Isis" (1985–87).

Kiejstut (Lithuanian ruler): *see* Kęstutis.

Kiel, city, capital (1945) of Schleswig-Holstein *Land* (state), northern Germany. Kiel is a port on both sides of the Kiel Fjord, an inlet of the western Baltic, and lies at the eastern end of the Kiel Canal. The name Kyle ("fjord," or "spring," possibly derived from the Anglo-Saxon *kille:* "a safe place for ships") was used for the settlement as early as the 10th century. The city was founded in 1242, and it adopted the Laws of Lübeck, an agreement for the common defense of trade. It entered the Hanseatic League in 1284 and acquired additional trading privileges in the 14th century. In 1773 Kiel became part of Denmark. That nation ceded Norway to Sweden by the Treaty of Kiel in 1814.

The city passed to Prussia in 1866 along with the rest of Schleswig-Holstein and became the capital of that province in 1917. After 1871 it also became an important naval base; it was the site of the German naval mutiny (1918) and the target of Allied bombing during World War II. The city was largely destroyed in the latter conflict but has since been rebuilt with wide green spaces. Historic landmarks restored after 1945 include St. Nicholas Church (*c.* 1240) and the palace of the dukes of Holstein-Gottorp (*c.* 1280), where the future Tsar Peter III was born. The Christian-Albrechts University of Kiel, founded in 1665, includes a renowned institute of world economics. An art gallery and botanical gardens, the oldest in Germany, are near the old university



Kiel and its harbour, Germany
Hans Huber

grounds. Modern buildings include the town hall (1911), the municipal theatre (1907), the Ostseehalle (exhibition and congress hall; 1950), and the new university buildings.

In addition to the locks of the Kiel Canal, opened in 1895, the city has a magnificent commercial harbour and yachting facilities. Ferryboats ply between Kiel's eastern and western shores and serve adjacent fishing villages and resorts. Shipbuilding and engineering are the main industries. Other industries include printing, metalworking, brewing, and textile manufacturing. The annual Kieler Woche (Kiel Week) in June is an international regatta and cultural festival. Pop. (1989 est.) 240,675.

Kiel, Treaty of (Jan. 14, 1814), the peace treaty ending the hostilities between Denmark and Sweden during the Napoleonic Wars. By the treaty, Denmark ceded Norway to Sweden, thus ending the union initiated in 1380 and further reducing Denmark's status as a Baltic and European power. By the accession of Norway, Sweden was partially compensated for the loss in 1809 of Finland and the Åland Islands to Russia; but Norway, increasingly opposed to the union with Denmark, reacted to being bartered to Sweden by framing a constitution and resisting Swedish incorporation. By its resolve to resist the Kiel treaty with arms, Norway forced Sweden to accept its constitution; the result was a royal union that lasted until 1905. Although Denmark retained the old Norwegian settlements of Greenland, Iceland, and the Faeroe Islands, the loss of Norway had a disruptive effect on its political and economic life.

Kiel Canal, German NORD-OSTSEE-KANAL ("North Sea–Baltic Sea Canal"), waterway extending eastward for 61 miles (98 km) from Brunsbüttelkoog (on the North Sea, at the mouth of the Elbe River) to Holtenau (at Kiel Harbour on the Baltic Sea), in northern Germany. The canal is 338 feet (103 m) wide and 37 feet (11 m) deep and is spanned by seven high-level bridges (about 140 feet high). It constitutes the safest, most convenient, shortest, and cheapest shipping route between the two seas.

The canal, built between 1887 and 1895, initially served German military needs by eliminating the necessity for ships to travel northward around the Danish peninsula. It was enlarged between 1907 and 1914 to accommodate large naval ships. Prior to World War I, the canal (then known as the Kaiser-Wilhelm Canal) was owned by the German government. The Treaty of Versailles (June 28, 1919) laid down regulations that, in effect, internationalized the canal, while leaving it under German administration. Traffic on the canal was subject only to general police, shipping, sanitary, and customs regulations. These provisions were repudiated by Adolf Hitler in 1936. Since World War II, the canal has been in the *Land* (state) of Schleswig-Holstein, and the conditions of the Treaty of Versailles guaranteeing freedom of navigation have again been practiced. The canal remains an important route for Baltic shipping.

Kielce, *województwo* (province), southeastern Poland, established 1975, comprising an area of 3,556 square miles (9,211 square km). It is bordered on the north by Piotrków and Radom provinces, on the east by Tarnobrzeg province, on the south by Tarnów and Kraków (Cracow) provinces, and on the west by Katowice and Częstochowa provinces. Located in the region called the Industrial Basin of Old Poland, Kielce province has iron mines, factories, and chemical plants. The mountainous northern sector of the province includes the ironworking centres of Skarżysko-Kamienna and Ostrowiec Świętokrzyski. In the Góry Świętokrzyskie (Holy Cross Mountain Range) and the Swiętokrzyski Park Narodowy (Holy Cross National Park) of northern Kielce province are Łysa Góra (Bald Mountain; 1,945 feet [593 m]) and Łysica Mountain (2,005 feet [611 m]). The central and southern parts of the province consist of wooded plains and farmland.

Industry in the province includes factories producing building materials, glass, porcelain, paper, textiles, and electrical machinery. Mineral production includes marble, sulfur, copper, lead, and iron. Wheat, rye, and potatoes are grown, and there are food-processing plants in the province.

The Vistula, Nida, and Bobrza rivers flow from south to north through the province; other rivers include the Kamienna and the Czarna. On the riverbanks and in wooded areas are numerous health spas and rest homes. Kielce (*q.v.*) city, the provincial capital, is a railroad and highway centre between Warsaw and Kraków. Three pipelines carry natural gas from the northern part of the province to other Polish industrial centres. Museums contain artifacts from Roman ruins located in Wiślica. Pop. (1988 est.) 1,115,600.

Kielce, city, capital, Kielce *województwo* (province), southeastern Poland, in the Góry Swiętokrzyskie (Holy Cross Mountains). Located on the Warsaw–Kraków rail line, Kielce is a major industrial centre that has metallurgical, machine, and food-production facilities.

First chronicled in the late 11th century, the market town obtained municipal rights in 1360. It developed as an industrial and religious centre for the area, being held as an episcopal property from the 14th to the 16th century. Passing to Austria in 1795, it was freed during the Napoleonic Wars and then came under Russian control; in 1918 it was returned to Poland. During World War II, four German extermination camps were located there. The city contains a Baroque (1637–41) Bishop's Palace, now housing the Museum Świętokrzyskie, and a 17th-century cathedral (built 1632–35; rebuilt 19th century). Pop. (1988 est.) 208,100.

Kielland, Alexander Lange (b. Feb. 18, 1849, Stavanger, Nor.—d. April 6, 1906, Bergen), novelist, short-story writer, and dramatist, one of the "big four" (with Henrik Ibsen, B.M. Bjørnson, and Jonas Lie) of 19th-century Norwegian literature.

The scion of an aristocratic family, Kielland took a law degree in 1871 and purchased a brickyard that he managed for nine years. Discontented, he went to Paris in 1878 and the next year published a collection of his short stories. Kielland had read widely in the literature of 19th-century liberalism, and he dedicated his creative energies to social criticism and reform.

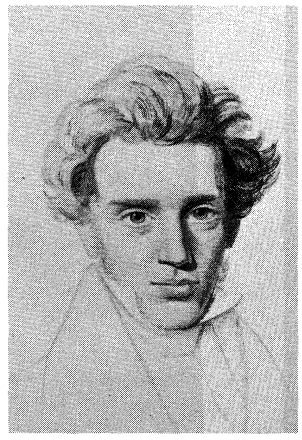
Kielland was perhaps the foremost Norwegian prose stylist of his day, and the witty and ironic temper of his work often took the edge off his biting social criticism. His most important novels are *Garman and Worse* (1880), in which he depicts the life of his native city of Stavanger; *Arbeidsfolk* (1881; "Working People"), in which he attacks Norway's state bureaucracy; *Skipper Worse* (1882), another portrait of his native Stavanger; and *Sankt Hans Fest* (1887; "St. John's Festival"), in which he satirizes the hypocrisy of Norway's clergy. Kielland's hostile attitude toward the church was influenced by the philosopher Søren Kierkegaard; he never attacked Christianity, only the worldliness and dishonesty of its clerical representatives.

After the emergence in the 1890s of the Neo-Romantic movement, which was a revolt against naturalism and the social-reforming novel, Kielland published very little. In 1891 he was elected mayor of his hometown and in 1902 district governor of Romsdal.

Kieran OF CLONMACNOISE, SAINT, also called SAINT KIERAN THE YOUNGER: *see* Ciaran of Clonmacnoise, Saint.

Kierkegaard, Søren (Aabye) (b. May 5, 1813, Copenhagen, Den.—d. Nov. 11, 1855, Copenhagen), Danish religious philosopher and critic of rationalism, regarded as the founder of existentialist philosophy.

Early life. Kierkegaard's father, Michael Pedersen Kierkegaard, who had a great influence on his character, had begun his own career as a poor tenant-farmers' helper in the desolate moorlands of western Jutland. One day, desperate with rage at divine indifference to his sufferings and privations, he stood on a hill



Kierkegaard, drawing by Christian Kierkegaard, *c.* 1840; in a private collection

By courtesy of the Royal Danish Ministry of Foreign Affairs

and solemnly cursed God. Soon after, he was sent to Copenhagen, to an uncle who was a dealer in woolen articles, and from that moment he prospered, ending his life as a rich man—the owner of five houses in the capital that all miraculously escaped destruction during the British bombardment of Copenhagen in 1807. Moreover, having placed his entire fortune in gilt-edged securities, he was among the few who escaped ruin in the state bankruptcy of 1813, the year Søren was born. Thus, at his death in 1838, the old man left Kierkegaard and his brother a considerable fortune that enabled Kierkegaard to spend his life writing, unhampered by financial considerations.

Kierkegaard's psychological heritage was, however, far more important than his financial legacy in its consequences for his development as a man and a writer. His father combined a strict adherence to orthodox Lutheranism with a fondness for the logic of formal argument, and yet the austere religious and intellectual training he devised for the most brilliant of his sons was enlivened by a captivating imagination. Kierkegaard never shook off the influence of his father's overpowering personality nor of the suppressed melancholy that lay so disquietingly below the surface of his father's piety. At an early age, Kierkegaard became aware of the heavy burden of guilt that weighed his father down and later learned, in circumstances the traumatic effect of which he designated as "The Great Earthquake," that the reasons for it lay in the boyhood curse his father had hurled at God. Appalled by the knowledge of his father's sin, he threw himself into a life of dissipation yet remained haunted by the elder Kierkegaard's conviction that God's curse lay on the family, a conviction that the death of Kierkegaard's mother and five of his six brothers and sisters seemed to confirm. He went to the University of Copenhagen to study theology but neglected this in favour of philosophy.

The death of his father in 1838 had a sober-

ing effect on Kierkegaard. He resumed his theological studies and two years later took his master's degree. There was, however, another reason for his renewal of purpose; he had fallen in love with a young girl, Regine Olsen, and become engaged to her. Almost immediately, however, he became aware of the gulf between the young, innocent, inexperienced girl and himself, weighed down as he was by a feeling of guilt and by his unusual consciousness of the complexities of the human mind, which he would never be able to communicate to Regine.

Accordingly, he broke the engagement and fled to Berlin, where he lived for half a year. The little romance, novelettish though it may seem in bare outline, had a profound effect on Kierkegaard and furnished him with material for reflection and comment in several of his books.

First philosophical works. He returned from Berlin with an enormous manuscript in his trunk, *Either/Or: A Fragment of Life* (1843). Nearly all Kierkegaard's books were published pseudonymously, with fictitious names suited to the particular work, a peculiarity intended to persuade the reader that the ideas he proposed were not to be taken as the pronouncements of an authority but presented various modes of life for the reader's judgment and, especially, choice. This is, in fact, the meaning of the title *Either/Or,* which offers the alternatives of an aesthetic or an ethical (or ethico-religious) view of life. Kierkegaard's belief in the necessity—for each individual—of making a fully conscious, responsible choice among the alternatives that life offers has become fundamental in all Existential writing and thought. *Fear and Trembling* and *Repetition,* both of which also were published in 1843, deal with faith and with the idea of sacrifice—leading to the conclusion that faith is essentially paradoxical.

In 1844 *Philosophical Fragments* and *The Concept of Dread* appeared. The former is an attempt to present Christianity as it should be if it is to have any meaning. It aims particularly at presenting Christianity as a form of existence that presupposes free will, without which everything becomes meaningless. This was an attack on the prevailing Hegelian philosophy. Kierkegaard was preparing for a showdown, but, before he did so, he felt the need to extend his ideas concerning the philosophy of freedom into the sphere of psychology. The result was *The Concept of Dread.* Extraordinarily penetrating, it is perhaps the first work of depth psychology in existence.

In 1845 Kierkegaard had a new book ready, *Stages on Life's Way,* a voluminous work and perhaps his most mature artistic achievement. In a way, it reiterates the idea of *Either/Or,* as the two titles indicate, but there is a vital difference—now the religious stage, or sphere, is distinguished not merely from the aesthetic but also from the ethical. This development was, in fact, a logical consequence of the ideas embodied in all the former works, which aimed at exposing the inadequacy of human ethics as a way of life. Accordingly, while in *Either/Or* there were only two spheres, the aesthetic and the ethical, in *Stages on Life's Way* there are three. In the third and last section of the book, "Guilty?"/"Not Guilty?," Kierkegaard dissects the story of his broken engagement from a new angle. On the aesthetic plane, a love tragedy signifies that two lovers cannot be united because an extraneous power prevents them; the story of Romeo and Juliet provides a classic example. On the ethical plane, the obstacle consists in their belonging to different spheres of existence, one interpreting love aesthetically, the other ethically. This obstacle can only be overcome by one elevating the other to his own sphere of existence, a thing that rarely happens. On the religious plane, however, the obstacle lies in the fact that one of the two is constitutionally different, for he conceives his destiny to be one of suffering, and only the acceptance of suffering will enable him to achieve detachment from the here and now and so prepare him for eternity. The aesthetic hero has his opposition outside himself; the religious finds it within. The aesthetic hero becomes great by conquering; the religious hero by suffering. But suffering in the service of "the idea" is precisely the realization of the idea in the religious sphere of existence. This was the argument that Kierkegaard had not himself conceived when he wrote *Either/Or* and for whose sake he had to write the book over again.

It is an argument that evinces an increasingly sombre outlook on life and on humanity as a whole. A number of unpleasant experiences had contributed to his changed mood. Regine had married and thus crushed a romantic illusion about their remaining in a sort of divine marriage, raised above the terrestrial level, only waiting for God to make the impossible possible. This, in fact, was the idea underlying both *Fear and Trembling* and *Repetition.* Now it had all come to nothing, and the disillusionment emerges clearly in the first part of *Stages on Life's Way,* called "In Vino Veritas" or "The Banquet," which is modelled on Plato's *Symposium* and deals with the same subjects—love, eros, sex, woman—and reflects a biting sarcasm and scathing contempt for women in general.

Attack on Hegelianism. Kierkegaard also had other disappointments. He quarrelled with literary critics who did not see the purport of his writings or, even worse, did see it and still tried to make him a laughingstock. From these skirmishes, he emerged victorious but deeply hurt and filled with an enormous disgust for mankind. This bitterness manifests itself in most of what he wrote afterward. But his next book was an exception. It bears the impressive title "*Concluding Unscientific Postscript to the Philosophical Fragments. A Mimic-Pathetic-Dialectic Composition, an Existential Contribution.* By Johannes Climacus. Published by S. Kierkegaard." (1846).

It is typical of Kierkegaard's irony that his most philosophically important work figures as a postscript to a book only about a fifth its size. And by calling his book "an existential contribution," Kierkegaard gives the reader a strong hint of his own philosophical position; his aim is to settle accounts with the predominant philosophy of his time, the Hegelian philosophy, which had swept Europe. Kierkegaard attacked Hegel's attempt to systematize the whole of existence, declaring that a system of existence cannot be constructed, since existence is incomplete and constantly developing. He further drew attention to the logical error that arose from Hegel's attempt to introduce mobility into logic and so revealed the confusion arising from the mixing of categories. Hegel thought he had created the objective theory of knowledge; Kierkegaard put forward the thesis that subjectivity is truth or, to quote his own definition, "the objective uncertainty maintained in the most passionate spirit of dedication is truth, the highest truth for one existing."

These tenets, which have become the foundation stones of modern Existentialism, have not only punctured "the system," as Hegel called his own philosophy, but have made all philosophical systems precarious. The system builder will never understand that it is not possible to understand existence intellectually. Hegel equated existence and thought and thus left no room for faith. Accordingly, Christianity appeared as a mere paragraph in the system, an example of the general, and that, according to Kierkegaard, was the scandal. Kierkegaard did not feel himself called upon to persuade people to become Christians, but he certainly did feel an obligation to let his contemporaries understand what Christianity really is. And more than that, he had a feeling that God had designated him for a special task and that he should give up writing altogether.

Showdown with the church. But Kierkegaard's retirement was not to be. He could not abstain from writing, and now the "mission" was beginning to crystallize. God had appointed him, he thought, to reveal to his contemporaries the true nature of Christianity and to expose the scandal of the established Church of Denmark, the clergy of which had betrayed their religion by making themselves comfortable in secular society, in short, had become civil servants instead of followers of Christ.

It is clear that Kierkegaard was moving in the direction of even greater austerity in his religious thinking, and in the works that he now produced, particularly *Edifying Discourses in Divers Spirits* (1847), *Works of Love* (1847), *Christian Discourses* (1848), *The Sickness unto Death* (1849), and *Training in Christianity* (1850), he depicted a Christianity sterner and more uncompromising than in any of his other writings. The last book was also a disguised attack on the heads of the Danish Church. By 1855 he felt convinced that God had authorized him to attack the established church and its clergy ruthlessly, and he began at once with a great number of small books and pamphlets and even a periodical called *The Moment,* to the 10 numbers of which he was the sole contributor.

The strain of this intensely conducted campaign made grave inroads on his health. After nearly two years of it he collapsed and was brought to a hospital, where he died a month later. By that time he had exhausted his fortune. The 10th number of *The Moment,* which he had sent to the printer before he fell ill, had cost the remainder of his inheritance. The few things of value he possessed he left to Regine, the woman he had loved and who by that time lived in the Danish West Indies, married to the governor.

Influence on modern Existentialism. The virulent attack on the state church that was the culmination of Kierkegaard's oeuvre was a difficult heritage to administer. It did not change the establishment, but it did cause many individual clergymen to revise their attitude toward it and even to disaffiliate.

It was not until later that the philosophical and artistic value of Kierkegaard's work was fully appreciated. The merit for this belongs to the Danish literary critic Georg Brandes (1842–1927), who in 1877 published the first book ever written about Kierkegaard and gave a brilliant analysis of his thought and life. Brandes was a declared atheist and hater of Christianity, and it was part of his strategy to play Kierkegaard off against the church. It is, in fact, characteristic of Kierkegaard's thought that it appeals as much to people who do not subscribe to its Christian tenets as to persons specifically committed to religion. Thus, of the three editors of the first edition of Kierkegaard's works, one was a convinced Christian, the other two, atheists, and one of these was also a declared enemy of the Christian Church.

In Germany interest in Kierkegaard was widespread, and everything of his was translated before World War I. It was not, however, until the years between the two world wars that the knowledge of his work became widespread, partly advanced by Freudian psychoanalysis, which largely deals with the same phenomena as he does; *e.g.,* "sickness unto death." The theology of the Swiss Protestant theologian Karl Barth also contributed to escalate Existentialist thinking, as did the philosophical thought of Karl Jaspers and Martin Heidegger and the Jewish religious thinker Martin Buber.

The crucial understanding of Kierkegaard's writing came in the post-World War II years, which seem to have created a more penetrating realization of such states as *Angst* and suffering. Now the interest in Kierkegaard became universal, reaching both America and Japan, as well as England and France. About a century after his lonely death, Kierkegaard's time had finally come. (P.P.R./Ed.)

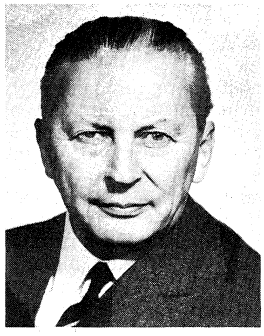
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kieselguhr (filter material): *see* diatomaceous earth.

kieserite, a sulfate mineral, hydrated magnesium sulfate ($MgSO_4 \cdot H_2O$), that is abundant in evaporite deposits. It often occurs as intergrowths with halite or associated with carnallite and other potassium salts. Sites include Stassfurt, Ger.; Ozinki, U.S.S.R.; western Texas; and New Mexico. For detailed physical properties, *see* sulfate mineral (table).

Kiesinger, Kurt Georg (b. April 6, 1904, Ebingen, Ger.—d. March 9, 1988, Tübingen, W.Ger.), conservative politician and chancellor (1966–69) of the Federal Republic of Germany who opposed major conciliatory moves toward the Soviet bloc.



Kiesinger

By courtesy of the Presse- und Informationsamt der Bundesregierung, Bonn

Kiesinger was educated at Berlin and Tübingen, after which he began to practice law. He joined the Nazi Party after Hitler's accession to power in 1933 but remained largely inactive in it and refused to join the National Socialist lawyers' guild in 1938. During World War II he served as assistant chief of the radio propaganda department in the foreign ministry. Interned by U.S. forces after the war, Kiesinger was finally cleared by Allied and German de-Nazification courts. He joined Konrad Adenauer's Christian Democratic Union (CDU) and began his parliamentary career in the newly formed Federal Republic of Germany (1949). From 1949 to 1958 he was a member of the Bundestag (federal lower house), where he served as chairman of the foreign policy committee and defended Adenauer's pro-Western foreign policy as well as his conservative domestic course. From 1958 to 1966 he was minister-president of Baden-Württemberg and from 1962 to 1963 Bundesrat (federal upper house) president.

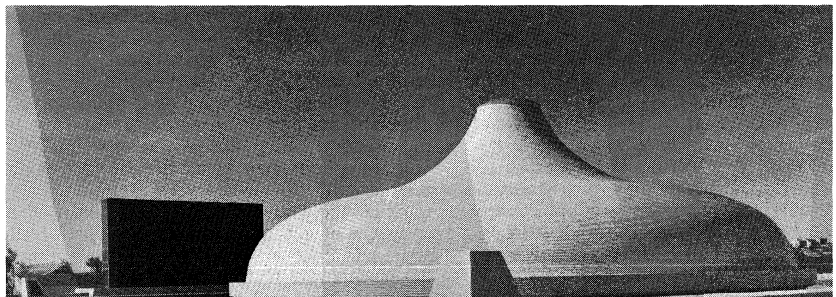
Kiesinger replaced Ludwig Erhard as chancellor on Dec. 1, 1966, after the latter had lost the support of the CDU's coalition partner in the government, the Free Democratic Party. Kiesinger was able to deflect hostile publicity about his former membership in the Nazi Party. His government, a grand coalition between the CDU and the Social Democratic Party (SPD), remained in power for nearly three years, during which time the West German economy improved after it had begun to falter under Erhard. Kiesinger continued a pro-Western foreign policy but to some degree eased tensions with the Soviet bloc. His party fared well in the 1969 election, but the SPD formed a coalition with the Free Democratic Party; Kiesinger resigned on Oct. 20, 1969, and was replaced by Willy Brandt of the SPD.

Kiesler, Frederick John (b. Sept. 22, 1892, Vienna—d. Dec. 27, 1965, New York City), Austrian-born American architect, sculptor, and stage designer, best-known for his "Endless House," a womblike, free-form structure.

After study at the Technical Academy and the Academy of Fine Arts in Vienna, he worked on a slum clearance and rebuilding project in Vienna with Adolf Loos, a pioneer in the modern architectural movement in Europe. In the early 1920s he began to design for the stage. He designed the first theatre-in-the-round when he was architect and director of the International Music Theatre Festival of the City of Vienna, held in 1924. For the festival he worked out an exhibition based on the suspension principle, which he later used to create a "floating city" at the 1925 Paris International Exposition of Modern Decorative and Industrial Arts.

At the invitation of two theatre groups Kiesler went to the United States in 1926. From 1933 to 1957 he was scenic director for the Juilliard School of Music, New York City. His designs for the Metropolitan Opera were notable for their imagination and low cost. From 1936 to 1942 he was director of the design laboratory of the Columbia University school of architecture.

Kiesler's "Endless House" was never built full-scale, but a large concrete model was displayed at the Museum of Modern Art, New York City, in 1960. More sculpture than architecture, the house consisted of a group of joined, rounded, shell structures on piers that could be used as continuous space or as separately defined, closed-off rooms. *Inside the Endless House* (1966), written as a journal, is basically an account of Kiesler's artistic life. His last important work was the Shrine of the Book (1959–65), which houses the Dead Sea Scrolls in Israel.



The Shrine of the Book, designed by Kiesler, 1959–65

© Werner Braun

Kieta, town, southeast coast of Bougainville Island, Papua New Guinea. It is situated on Arawa Bay (Rawa Harbour) and is a port of call with a long wharf for coastal and Australian shipping. The town trades chiefly in copra, cocoa, and small amounts of gold. Two new settlements, Toniva and Nairovi, located just outside of Kieta, are considered part of that town. They grew after an increase of mining activity in the area. Kieta

was formerly the administrative headquarters of Bougainville Island. Pop. (1980) 3,491.

Kiev, Ukrainian KYIV, Russian KIYEV, *oblast* (administrative region), Ukrainian Soviet Socialist Republic. The *oblast* has an area of 11,150 square miles (28,900 square km) and lies astride the Middle Dnepr River, occupying the greater part along the western bank. Most of the *oblast* thus lies on the low, flat plain of the Dnepr and lower Pripyat river courses; the southern part of the west-bank area extends on to the rolling hills of the Dnepr Upland. South of the *oblast* capital, Kiev, the uplands approach the Dnepr to form a steep, high riverbank. The uplands are much-dissected by river valleys and erosion gullies. The course of the Dnepr within the *oblast* began to be transformed in the 1960s into broad reservoirs created by the barrages of the Kiev and Kanyov hydroelectric stations, the latter of which was completed in 1975. The natural vegetation of the *oblast*'s low-lying northern part, known as the Kiev Polesye, is mostly reed or grass marsh or oak and pine forest; the southern upland area is in forest-steppe, with groves of oak. Much of the *oblast*'s natural vegetation has been destroyed by forest clearance, swamp reclamation, and subsequent plowing for agriculture. On the uplands this has seriously accelerated erosion.

Agriculture is well-developed in the *oblast.* In the north, the cultivation of flax and potatoes and dairying prevail. In the south, grains and sugar beets are important, and there are many small sugar refineries. Around Kiev intensive market gardening supplies the city. Although agriculture is significant, the *oblast* and its economy are completely dominated by the presence of the huge capital and industries of the city of Kiev. Many workers commute into Kiev from the adjacent region. Other cities in the *oblast,* apart from the industrial city of Belaya Tserkov, are small centres of agricultural regions and process farm produce. Hydroelectric stations are at Kiev and Tripolye. Pop. (1986 est.) 4,446,000.

Kiev, Ukrainian KYIV, Russian KIYEV, city, capital of the Ukrainian S.S.R. and of Kiev *oblast* (administrative region), Soviet Union. It is located along the Dnepr River just below its confluence with the Desna and 591 miles (952 km) from its mouth in the Black Sea.



St. Andrew's Church, Kiev
Shostal Associates

A brief treatment of Kiev follows. For full treatment, *see* MACROPAEDIA: Kiev.

Kiev was founded in the 8th century. By the late 9th century its princes had established their suzerainty over several other East Slavic principalities and had founded the important Ukrainian-Russian state called Kievan Rus. Throughout the history of Kievan Rus, the city was engaged in ceaseless warfare against the Khazars, Pechenegs, and other nomadic peoples of the steppes. In the late 12th century its power declined in the face of constant nomad attacks and warfare with other Russian princes, and in 1240 the city was completely destroyed by the Tatars of the Golden Horde under Batu, the grandson of Genghis Khan. Thereafter the town passed to the control of Lithuania, of Poland, and then of the Cossacks. In 1793 it was incorporated into Russia, and in 1917 the Ukrainian S.S.R. was formed, with Kiev becoming its capital in 1934. Large sections of the city's central area were destroyed during World War II, but after the war the city was repopulated and fully restored, regaining its position as a major industrial and cultural centre.

Kiev originally occupied the high and steep right (west) bank of the Dnepr, but since World War II rapid growth has extended the city onto the wide, low, flat floodplain on the left bank. The city has moderately cold winters, with snow cover usually from mid-November to the end of March, and warm summers.

As the capital of the Ukraine, Kiev has major administrative functions, and its ministries employ a considerable number of workers. It is also an important industrial centre, producing a wide range of goods. Engineering industries—including the manufacturing of complex machinery, precision tools, and instruments—are of primary importance. The chemical, consumer-goods, food-processing, timber-working, and publishing industries are also significant.

The focus of the contemporary city remains its ancient Upper Town, crowning the high bluff above the Dnepr. Its central area, although largely of postwar construction, contains most of Kiev's surviving historical and architectural monuments. The 11th-century Cathedral of St. Sophia, one of the most beautiful examples of Russo-Byzantine ecclesiastical architecture, and the striking 18th-century Baroque Church of St. Andrew (Andreyevskaya) are both now state museums. Other surviving relics include the ruins of the 11th-century Golden Gate, the 18th-century Zaborovsky Gate, and the 19th-century five-domed Desyatinnaya church, built on the site of a church founded by St. Vladimir in the 10th century. The axis of the centre of the city is the tree-lined Kreshchatik, the main shopping street. Many of the city's museums and theatres are located within and adjacent to the former Old Town.

To the north of the Old Town is the former Jewish and trading quarter, Podol, containing the river port, and to the Old Town's south and along the top of the riverbank is the Perchersky district. This area contains many administrative buildings, notably the glass-domed palace of the Supreme Soviet of the Ukrainian S.S.R. and the 10-story building that houses the Council of Ministers. At the southern end of the district is the 11th-century Pecherskaya Lavra (Monastery of the Caves), where the monk Nestor wrote the earliest surviving Russian chronicle. Beneath the monastery, a system of catacombs stores the mummified bodies of monks and saints, including that of Nestor. Surrounding these central districts and extending to the left bank of the Dnepr are extensive suburbs of factories and residential neighbourhoods.

The most important centre for research and education in the Ukraine, Kiev is the home of a number of universities, colleges, and research institutions, notably the Kiev T.G. Shevchenko State University and the Academy of Sciences of the Ukrainian S.S.R. Russian and Ukrainian drama can be seen at the Shevchenko Theatre of Opera and Ballet, the 12,000-seat Palace of Sport, and open-air theatres. The city has several museums. Musical concerts are given regularly at the Tchaikovsky Conservatory.

Kiev is served by a good transportation network. Trunk railways and all-weather roads link Kiev to Moscow, Kharkov and the Donets Basin, southern and western Ukraine, and Poland. Within Kiev itself there is efficient subway, rail, and bus service. The Dnepr River is navigable about nine months of the year, and Kiev's Borispal airport operates flights to most major Soviet cities and to some in eastern European countries. Area city, 300 square miles (707 square km). Pop. (1986 est.) 2,495,000.

Kigali, city and capital of Rwanda, central Africa, located in the centre of the country on the Ruganwa River. Kigali was a trade centre (after 1895) during the German colonial administration and became a regional centre during the Belgian colonial period (1919–62). It became the capital upon Rwanda's independence in 1962. The fast-growing city includes a Muslim quarter and spreads over four hills. Northeast of the city is a squatters' settlement and southeast is an industrial area. Light industry includes shoe, paint and varnish, radio-assembly, and tanning factories. Cassiterite (tin) mining companies and, from 1977, an organization for joint development of the Kagera River basin by Rwanda, Burundi, and Tanzania have their headquarters in Kigali. The city is connected by roads, including several that are paved, to all four borders of the country. It also has an international airport and a technical college. Pop. (1981 est.) 156,700.

Kigen Dōgen (Buddhist leader): *see* Dōgen.

Kiheiji (Japanese painter): *see* Miyagawa Chōshun.

Kii Peninsula, Japanese KII-HANTŌ, peninsula, on Honshu, Japan, facing the Pacific Ocean (east and south) and the Kii Strait and the Inland Sea (west). The peninsula is composed of the Kii Range, whose mountains end abruptly on the north in a fault scarp that commands the valleys of the Kushida River and the Kino River. In general, the mountains are of strong relief, being broken by deep valleys, sharp ridges, and steep declivities. High altitude is maintained until the coast is approached. At the coast the steep descent of the mountains is continuous to the sea bottom, where there is no continental shelf. The range is regarded as the deepest and darkest block of mountains in Japan.

Geologically the Kii Range consists of Paleozoic, Mesozoic, and Tertiary formations (from 2,500,000 to 570,000,000 years old), which are zonally arranged in chronological order from north to south. The main ridges, however, intersect the formations at right an-

gles, showing meridional arrangement. The flat-topped ridge of Mount Ōdaigahara rises in the east to 5,561 feet (1,695 m), while the Ōmine Mountains, crowned by Mount Hakken (6,283 feet), rises in the centre of the peninsula. The western ridge is lower, attaining 4,403 feet (1,342 m) in Mount Obako.

The Kii Peninsula is located directly in the path of typhoons and weather fronts that bring the *baiu* ("rainy season") and is therefore one of the wettest areas of Japan. Its southern tip near Cape Shiono experiences a mild winter. Banyan trees, hemp palms, and other subtropical plants are mixed with temperate laurel forests. The mountainous interior is a rich source of Japanese cedar.

Many important centres of Buddhism and Shintō—including Kōyasan, Yoshino, and Kumano—are located on the peninsula. Ise, the site of the foremost Shintō shrine of Japan, is near its eastern tip. The Kii Peninsula is included within the *ken* (prefectures) of Wakayama, Nara, and Mie.

Kija, legendary Korean king of Chinese origin whose arrival in Korea with 5,000 rice- and barley-bearing refugees reputedly introduced Chinese civilization (and these new grains) to the Korean people. The band allegedly had fled China in 1111 BC, refusing to serve the new Chou-dynasty ruler who had overthrown Kija's Shang-dynasty relatives. Historical evidence confirms early Chinese influence on Korean culture, but scholars generally prefer a date corresponding to the establishment of four Chinese colonies in northwestern Korea in the 2nd century BC.

Many traditions credit Kija with grand cultural innovations that include a code of law punishing murderers with a death like that which they inflicted on their victims. That Kija also brought with him the art of writing retains a certain credibility inasmuch as writing was already well developed in his native China. Other legends associate Kija's name with sorcery and the fashioning of Korea's flat-topped, wide-brimmed national hat (*kat*).

Kikládhes (Greece): *see* Cyclades.

Kikuchi Kan, also called KIKUCHI HIROSHI (b. Dec. 26, 1888, Takamatsu, Japan—d. March 6, 1948, Tokyo), playwright, novelist, and founder of one of the major publishing companies in Japan.

As a student at the First Higher School in Tokyo, Kikuchi became acquainted with the future novelists Akutagawa Ryūnosuke and Kume Masao. Later, while attending Kyōto Imperial University, he worked with them on the famous literary magazine *Shinshichō* ("New Currents of Thought"). His story "Mumei sakka no nikki" (1918; "Diary of an Unknown Writer") reveals frankly his envy of the success of his former classmates. Although a prolific writer, he wrote much of his best work in the short period between 1917 and 1920. Kikuchi's writing shows little speculative thought; he was more concerned with the direct exposition of a particular moralistic theme, expressed in a realistic and clear style. Another story, "Tadanaokyo gyōjō ki" (1918; "On the Conduct of Lord Tadanao"), attracted great attention. His other well-known works are the plays *Chichi kaeru* (1917; *The Father Returns*) and *Okujō no kyōjin* (1916; *The Madman on the Roof*) and the novel *Shinju Fujin* (1920; "Madame Pearl"). In 1923 he established *Bungei shunjū,* a popular literary magazine that gave rise to a large publishing company. Through the magazine Kikuchi set up two of the most prestigious literary awards given to new Japanese writers, the Akutagawa and Naoki prizes.

Kikutake Kiyonori (b. April 1, 1928, Kurume City, Japan), post-World War II Japanese architect particularly concerned with the problems of a changing world.

After graduating from Waseda University (1950), Kikutake worked for several architectural firms and then opened his own office (1953). The work that first brought him to international notice was Sky House (1957), his own home, a building of one room elevated on four pylons. He became the leader of the Metabolism Group formed by several young Japanese architects at the World Design Conference (1960) in Tokyo and made substantial contributions to architectural theory. One of his most noted designs is for a city with residential towers extending down into the sea from huge concrete rafts. Buildings he has designed include the administration building of the Great Shrine of Izumo (1963), the Hotel Tokoen at Yonago City (1964), the Miyakonojo Civic Centre (1966), the Pacific Hotel at Chigasaki (1967), and the Kurume Civic Centre (1969). His futuristic marine cities were partly realized in the Aquapolis for the Okinawa Exposition (1975).

Kikuyu, also called GIGUYU, GEKOYO, or AGEKOYO, Bantu-speaking people who live in the highland area of south-central Kenya, near Mount Kenya. In the late 20th century the Kikuyu numbered almost 5,000,000 and formed the largest ethnic group in Kenya, approximately 20 percent of the total population. Their own name for themselves is Gekoyo, or Agekoyo.



Young Kikuyu warrior with mud-plaited hair and pierced ears, Kenya
By courtesy of the Musee de l'Homme, Paris

The indigenous economy rested upon intensive hoe cultivation of millet (the staple crop), peas, beans, sorghum, and sweet potatoes. The main modern cash crops are coffee, corn (maize), wattle, and fruits and vegetables. Some groups practiced irrigation and terracing. Animal husbandry provided an important supplement.

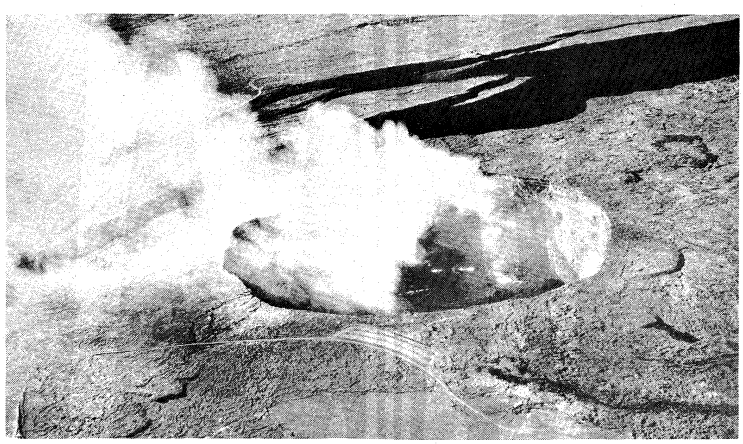
The Kikuyu traditionally lived in separate domestic family homesteads, each surrounded by a hedge or stockade and containing a hut for each wife. During the Mau Mau rebellion of the 1950s, however, the colonial government moved the Kikuyu into villages for reasons of security. The economic advantages of village settlement and land consolidation led many to continue this arrangement after the emergency was ended. The local community unit is the *mbari,* a patrilineal group of males and their wives and children ranging from a few dozen to several hundred persons. Beyond the *mbari,* the people are divided among nine clans and a number of subclans.

Kikuyu also are organized into age sets that have served as the principal political institutions. Groups of boys are initiated each year and ultimately grouped into generation sets that traditionally ruled for 20 to 30 years. Political authority traditionally was vested in a council of elders representing a particular age class during its occupancy of the ruling grade. The Kikuyu maintain a relatively egalitarian social system; they have never kept slaves. They believe in an omnipotent creator god, Ngai, and in the continued spiritual presence of ancestors; both are the objects of prayers and sacrifices.

During the 1950s, the Kikuyu spearheaded the drive toward Kenyan independence. Jomo Kenyatta, a Kikuyu, was the Republic of Kenya's first prime minister (1963–64) and first president (1964–78).

Kikwit, town and river port, southwestern Zaire. It lies along the Kwilu River, which is a tributary of the Kasai River. European settlement of the site began in 1901 and the town became a colonial administrative centre about 1910. Kikwit is now the largest community in the area. The production of palm oil and kernels, cassava, peanuts (groundnuts), and corn (maize) has replaced rubber as the economic base of the region's agriculture. Kikwit has food-processing industries, an airport, and a teachers' training college. Pop. (1984 prelim.) 146,784.

Kilauea, the world's largest active volcanic mass, located on southeastern Hawaii Island, Hawaii, U.S. The central feature of Hawaii Volcanoes National Park, Kilauea ("Much Spreading") is an elongated dome built of lava eruptions from a central crater and from lines of craters extending along east and southwest rifts, or fissures. The volcano's 4,090-foot (1,250-metre) summit has collapsed to form a caldera, a broad shallow depression nearly 3 miles (5 km) long and 2 miles (3.2 km) wide with an area of more than 4 square miles (10 square km). Kilauea's slopes merge with those



Kilauea Crater, Hawaii Island
Ewing Galloway

of the nearby volcano Mauna Loa on the west and north.

During the 19th century, the main floor of Kilauea's caldera went through several periods of lava filling and collapse. By 1919 it assumed its present depth of 500 feet (150 m). The floor, paved with recent lava flows, contains the Halemaumau ("Fern House") Pit, an inner crater that is Kilauea's most active vent. Halemaumau is the legendary home of Pele, the Hawaiian fire goddess. The Hawaiian Volcano Observatory is at Uwekahuna on the western rim of Kilauea, near Halemaumau.

Kilauea's frequent eruptions are usually nonexplosive and are contained within Halemaumau as a boiling lake of active lava, which sometimes rises and overflows along the floor and flanks of the caldera proper. But, in 1790, a paroxysmal steam explosion killed part of a Hawaiian army marching near the caldera. A less-violent eruption in 1924 enlarged the Halemaumau crater to a depth of 1,300 feet (400 m). In 1955, an eruption in the east rift, accompanied by a series of violent quakes, was one of the most destructive in the island's history, with lava pouring from fissures over a period of 88 days, destroying a village and more than 6 square miles (16 square km) of valuable canelands and orchards. A similar but shorter-lived occurrence in 1975 was followed by destructive tidal waves. In a series of eruptions that began in 1983, Kilauea produced a river of flowing lava that reached the sea 30 miles (48 km) south of the volcano.

Kilauea Iki, a crater directly east of Kilauea, erupted spectacularly in 1959, creating a 400-foot- (120-metre-) deep lake of molten lava and Puu Puai (Gushing Hill), a cinder cone near its southern rim. The east rift zone supports numerous pit craters ending in Makaopuhi (depth 1,000 feet). Mauna Iki (3,032 feet [924 m]), situated 6 miles (9.5 km) from Kilauea on the southwest rift zone, is a low volcanic dome in a desert area.

Kilauea is bordered by the volcano of Mauna Loa (west and north), the Kau Desert (southwest), Ainahou Ranch (south), and a tropical fern jungle (north-northeast). The littoral Kau Desert consists of barren lava, crusted volcanic ash, and moving dunes of wind-blown ash and pumice 10–30 feet (3–9 m) high. The Thurston Lava Tube, a 450-foot (135-metre) tunnel east of the caldera, was formed when a lava stream's outer crust hardened while the molten lava continued its flow. Kipuka Puaula (also called Bird Park) to the northwest, a grassy meadow dotted with clumps of koa, ohia, soapberry, kolea, and mamani trees, has a nature trail leading to an open forest with many varieties of native trees.

Kildare, Irish CILL DARA, county in the province of Leinster, east-central Ireland. It comprises part of the lowland west of the Wicklow Mountains and part of the Irish central lowland. With an area of 654 square miles (1,694 square km), it is bounded on the north by County Meath, on the east by Dublin and Wicklow, on the south by Carlow, and on the west by Laoighis and Offaly. The River Liffey forms a gorge at Pollaphuca and runs west into the Kildare lowland, northwest to Newbridge, and northeast to Celbridge and Leixlip. The River Barrow forms much of the county's western boundary. Glacial deposits cover much of the surface of Kildare, and soils are varied; more than four-fifths of the area is farmland.

There is much evidence of ancient settlement, including burial mounds on The Curragh, a large sandy expanse. The town of Kildare, an early Christian site, has a round tower, and remains of others are in Castledermot, Taghadoe, and Old Kilcullen. More than 100 stone or palisaded castles were built in the county in Norman times, and there are also remains of medieval abbeys and churches. Kildare was defined as a county in 1296.

The manors of Naas and Maynooth in Kildare were confirmed to William and Gerald Fitzgerald by Henry II in the 12th century. In 1316 Edward II made John FitzThomas Fitzgerald earl of Kildare. In the later European Middle Ages the holders of the earldoms of Desmond, Ormonde, and Kildare competed to control the Dublin government, and the earls of Kildare became masters of this government at the end of the Middle Ages. From 1477 to his death in 1513, the 8th Earl of Kildare exercised almost kingly power in Ireland. His son Gerald succeeded as 9th earl to his powers and offices but was weakened and ruined by the rebellion of his son Lord Thomas Fitzgerald against the English crown.

Nearly half of the people of Kildare live in towns and villages, including Athy, Naas (*q.v.*), Newbridge, and Kildare; the first two are urban districts. The county council meets at Naas, and Carlow and Kildare share a county manager.

Most of the farms in Kildare are relatively large, usually over 100 acres (40 hectares) in the lowlands but much smaller on the flanks of the Wicklow Mountains. Cattle fattening is a main source of cash for large farms; sheep are also important. Wheat, barley, and oats are the main crops. Allenwood has a peat-fired power station. Kildare's industries include agricultural engineering and textile, carpet, pharmaceutical, metallurgical, and cutlery manufacture. The county is crossed by the Grand Canal and by railways from Dublin to Cork and Galway. Pop. (1986) 116,247.

Kildare, Irish CILL DARA, market and county town (seat) of County Kildare, Ireland. The Protestant cathedral church (1229) is dedicated to St. Brigit of Ireland, who founded a community there in the 5th century. Restoration of the church was begun in 1875. Near the church are an ancient cross and round tower, and there are remains of a 13th-century castle and monastery. The town was incorporated by James II. Pop. (1986) 4,268.

Kildare, Thomas Fitzgerald, 10th Earl of, byname SILKEN THOMAS (b. 1513, London, Eng.—d. Feb. 3, 1537, London), leader of a major Irish rebellion against King Henry VIII of England. The failure of the uprising ended the Fitzgerald family's hereditary viceroyalty of Ireland and led to the tightening of English control over the country.

When his father, the Irish lord deputy Gerald, 9th Earl of Kildare, was called to London in February 1534 to answer charges of disloyalty, Thomas Fitzgerald was left in charge of Ireland. Rumour that his father had been executed caused Fitzgerald to renounce allegiance to Henry VIII and assert allegiance to papal authority in June 1534. (His father was not to die until the following September—of natural causes.) Fitzgerald seized Dublin, and his partisans murdered Archbishop John Alen. Henry had already appointed Sir William Skeffington as lord deputy. Skeffington recaptured Dublin and in March 1535 stormed Fitzgerald's stronghold, Maynooth Castle. Recognizing that he would not receive the aid he had expected from Spain or Scotland, Fitzgerald surrendered in August 1535. After Ireland had been completely pacified 18 months later, he and his five uncles were hanged for treason.

Kildonan, historic district within the city of Winnipeg, southern Manitoba, Canada. Situated on both sides of the Red River, it comprises the former cities of East Kildonan and West Kildonan and the former municipalities of Old Kildonan and North Kildonan. The original colony was one of the historic parishes of the Red River Settlement, founded by the Scottish philanthropist Thomas Douglas, 5th Earl of Selkirk, who named it in 1817 for Kildonan in Sutherland, Scot. All four Kildonans were absorbed into Winnipeg in 1972.

kilesa (Buddhism): *see* āsrāva.

Kilgore, city, on the Gregg–Rusk county line, northeastern Texas, U.S. The city is part of the Longview–Kilgore–Gladewater–Tyler oil complex in the middle of the East Texas oil field. In 1871 Judge C.B. Kilgore settled the site, which was then the terminus of the Missouri Pacific Railroad. Lumber and cotton became the chief sources of income, but, after the discovery of the vast East Texas pool in 1930, Kilgore became an oil-producing and supply centre with more than 1,000 derricks within the city limits. While a petroleum-based economy still prevails, some manufacturing (notably of plumbing fixtures and clothing) has also developed. Kilgore (junior) College (1935) is nationally known for its Rangerette precision drill and dance team. The East Texas Treatment Center for the Physically Handicapped (1962) is on the grounds of the city's Laird Memorial Hospital. Inc. 1931. Pop. (1988 est.) 11,908.

Kili, coral island in the Ralik chain of the Marshall Islands, west-central Pacific Ocean. It is about 230 acres (93 hectares) in area. Islanders from Bikini, site of U.S. atomic-bomb tests, were moved to Kili in 1949. Some of the Bikinians who returned to Bikini in the mid-1970s had to return to Kili in 1978, as their home atoll remained too contaminated by nuclear waste for habitation. Coconuts are grown on the island, and there is a cold-storage facility for fish and a modern port complex. Pop. (1980) 489.

Kilian, SAINT (b. *c.* 640, Mullagh, County Cavan?, Ire.—d. *c.* 689, Würzburg, Franconia [Germany]; feast day July 8), missionary bishop who, with his companions Saints Colman and Totnan, gave his life for the Christianization of Thuringia and eastern Franconia. At Würzburg, in about 689, all three were beheaded by orders of Duke Gozbert of Würzburg, whom Kilian had supposedly converted and baptized. In 752 Bishop Burchard of Würzburg had their relics solemnly transferred to his cathedral. Kilian is a favourite patron in the Würzburg region and is venerated in Vienna and in Ireland.

kilim, pileless floor covering handwoven by tapestry techniques in Anatolia, the Balkans, or parts of Iran. In the rest of Iran, the Cau-



Kilim prayer rug from Anatolia, 19th century; in the collection of Joseph V. McMullan

Collection of Joseph V. McMullan; photograph, Otto E. Nelson—EB Inc.

casus, and Turkistan, the name for similar pieces is *palas*. In most kilims, a slit occurs wherever two colours meet along a vertical line in the pattern, but in a few Karabagh or South Caucasian pieces, interlocking methods are employed in order to minimize these slits. The finest and most beautiful kilims known are silken 16th- and 17th-century pieces from Kāshān; the tightest-woven and most delicate recent kilims come from the Senna (Sehna) neighbourhood.

The Turks have produced the largest kilims, usually in two narrow pieces joined, as well as small ones and a multitude of prayer kilims. As a prayer rug, which is carried about with the worshiper, the light and extremely flexible kilim offers obvious advantages. In Turkish kilims, cotton is often used for the white areas, and small details may be brocaded. The kilims of the southern Balkans began as close copies of Anatolian types but have gradually developed into individual styles, such as the black, red, and white kilims of Pirot. In Romania, also, there are varied local fashions, progressively less Oriental in colour and pattern as the distance from Turkey increases. The name kilim is also given to a variety of brocaded, embroidered, warp-faced, and other flat-woven rugs and bags.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Kilimanjaro, volcanic massif in northeastern Tanzania, near the Kenya border. Its central cone, Kibo, rises to 19,341 feet (5,895 m) and is the highest point in Africa. Kilimanjaro lies about 100 miles (160 km) south of the East African Rift Valley and about 140 miles (225 km) south of Nairobi. The mountain's massif extends approximately east–west for 50 miles (80 km) and consists of three principal extinct volcanoes: Kibo, Mawensi, and Shira. Kibo, the youngest and highest, retains the form of a typical volcanic cone and crater and is linked by a 7-mile (11-kilometre) saddle at about 15,000 feet (4,600 m) with Mawensi (17,564 feet), which is the older core of a former summit. Shira ridge (12,395 feet) is merely a remnant of an earlier crater. Below the saddle, Kilimanjaro's massif slopes in a typical volcanic curve to the plains below, which lie at an elevation of about 3,000 feet (900 m).

Although Kibo appears as a snow-clad dome, it contains a caldera (crater) on its southern side that is 1.2 miles (2 km) across and about 980 feet (300 m) deep. Within this caldera is an inner cone that displays residual volcanic activity. In contrast with Kibo's regular cone, that of Mawensi is highly eroded, jagged, and precipitous and is cleft east and west by gorges. Kibo's ice cap survives as isolated blocks along its rim. The glaciers terminate at 14,000 feet (4,270 m) on Kibo's southwestern slopes and descend only a little below the summit on its northern side. There is no permanent ice and few snow patches on Mawensi.



Crater rim of Mount Kilimanjaro at dawn
Gerald Cubitt

Kilimanjaro has a succession of vegetation zones consisting (from base to summit) of: the semiarid scrub of the surrounding plateau; the massif's cultivated, well-watered southern slopes; dense cloud forest; open moorland; alpine desert; and moss and lichen communities. The massif forms a reserve for big and small game.

Kilimanjaro's slopes receive an average of 70 inches (1,780 mm) of rainfall annually. The streams on the southern and eastern slopes feed the Pangani and Tsavo rivers and Lake Jipe, while those on its northern slopes feed Lake Amboseli and the Tsavo River. The Pare Mountains run southeastward from Mount Kilimanjaro.

The region in which Kilimanjaro is situated is one of Tanzania's leading producers of mild coffee, barley, wheat, and sugar; other crops include sisal, corn (maize), beans, bananas, wattle bark (*Acacia*), cotton, pyrethrum, and potatoes. The region is populated by the Chaga (Chagga), Pare, Kahe, and Mbugu peoples.

The Kilimanjaro formations became known to Europeans when they were reached in 1848 by the German missionaries Johannes Rebmann and Ludwig Krapf, although the news that there were snow-capped mountains so close to the equator (3° south) was not believed until much later. The Kibo summit was first reached in 1889 by the German geographer Hans Meyer and the Austrian mountaineer Ludwig Purtscheller. Mawensi was first climbed by the German geographer Fritz Klute in 1912. The town of Moshi, at the southern foot, is the chief trading centre and base for ascent.

Kilis, town, extreme southern Turkey. It lies near the Syrian border north of Aleppo, Syria. Often identified with the ancient town of Kilisi mentioned in Assyrian records, it was occupied by France after World War I but was returned to Turkey in 1921. The country around Kilis is fertile, producing olives, grapes, and pistachio nuts. The town's major industries are silk and cotton manufacture. Kilis lies on the main highway from Aleppo to Gaziantep and Kahramanmaraş. Pop. (1985) 59,876.

Kilkeel, Irish CILL CHAOIL, fishing port and seaside resort, at the mouth of the River Kilkeel, Newry and Mourne district (established 1973), formerly in County Down, Northern Ireland. It lies at the foot of the Mourne Mountains, and the quarrying and dressing of Mourne granite is a local industry. A good harbour serves a large fishing fleet. The River Kilkeel rises to the north in the Silent Valley, where it has been dammed to form reservoirs for the city of Belfast, 40 miles (64 km) north-northeast. There are remains of a medieval church and a 13th-century Norman keep nearby. Kilkeel is the main market centre for the Mourne Mountains region. Pop. (1981) 6,036.

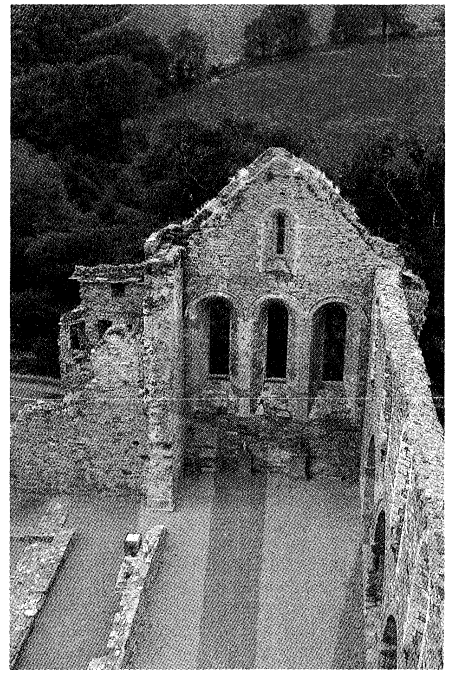
Kilkenny, Irish CILL CHAINNIGH, county, province of Leinster, territory of Ossory, southeastern Ireland. With an area of 796 square miles (2,062 square km), it is bounded by Counties Laoighis (north), Carlow and Wexford (east), Waterford (south), and Tipperary (west). The principal rivers are the Barrow, Suir, and Nore. The climate is mild. The county is well wooded: there are several state forests, and reforestation has been under way for many years.

Among the many prehistoric sites in Kilkenny are Iron Age forts, ancient stones incised with the cryptic ogham script, incised Celtic crosses, and megalithic tombs and underground chambers. At Harristown in the south is one of the largest dolmens (megalithic tombs) in Ireland. The name Kilkenny means "Church [or Cell] of St. Canice," who founded his church on the site of the present cathedral in Kilkenny city in the 6th century.

Kilkenny became one of the counties of Leinster in 1210, but it had been a place of importance for centuries before. Some of the numerous castles in the county were built by the Irish and some by the Anglo-Normans. There are five round towers, one adjacent to St. Canice's Cathedral. Thomastown, founded in the 13th century, has many historic remains, and at Jerpoint Abbey (founded 1158) are some of the finest Cistercian ruins in Ireland. There are remains of Augustinian priories at Inistioge, Callan, and Kells.

Counties Kilkenny and Carlow are linked for representation in the Irish Parliament, but, for local government and all administrative purposes, Kilkenny is a separate entity.

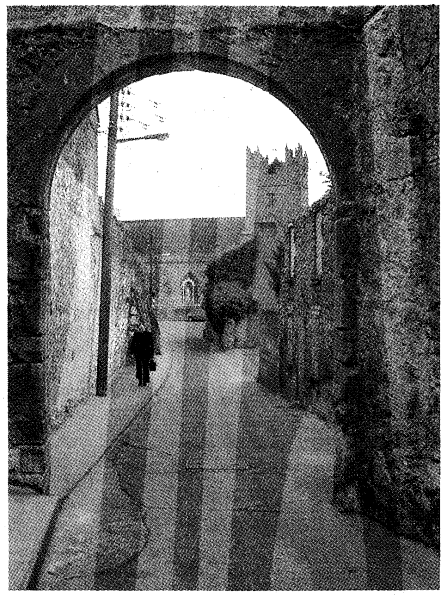
Cereal grains and vegetables are grown in the county, and the southwest part is noted for its apples. Dairying and beef production and the raising of sheep, pigs, and poultry are significant. The woolen trade also is important. The brewing of ale and malting of local barley have been carried on since the 13th century. The county also has various food-processing, agricultural-engineering, clothing, and handicraft industries, and anthracite coal is mined. Pop. (1986) 73,186.



Ruins of Jerpoint Abbey, near Thomastown, County Kilkenny, Ireland
James Fraher

Kilkenny, Irish CILL CHAINNIGH, city, municipal borough, and seat of County Kilkenny, Ireland, on both banks of the River Nore. The ancient capital of the kingdom of Ossory, Kilkenny in Norman times had two townships: Irishtown, which had its charter from the bishops of Ossory, and Englishtown, established by William Marshall, Earl of Pembroke, which was raised to the status of a city in 1609. The two were united in 1843.

The castle stands on an eminence of 100 ft (30 m) overlooking the Nore. It was burned in 1175 but rebuilt about 1192. In 1391 the 3rd Earl of Ormonde bought the castle. Many parliaments were held in Kilkenny from 1293 to 1408. The Confederation of Kilkenny, representing the native Irish and the Anglo-Norman Catholics, functioned for six years as an



Black Freren Gate on Abbey Street and, in the background, the tower of Black Abbey, a Dominican friary, Kilkenny, Ire.
James Fraher

independent Irish parliament, the first meeting being held in 1642. Oliver Cromwell's forces attacked the town in 1650, and it surrendered.

St. Canice's Cathedral, begun *c.* 1192, occupies the site of a 6th-century church founded by St. Canice; the bishop's residence was built about 1360. The Roman Catholic Cathedral of St. Mary (1843–57) is a cruciform building with a 200-ft tower. A Dominican friary, founded in 1225, is still used; and the churches of St. Mary and St. John date from the 13th century. The Tholsel (1761) is used for corporation meetings. Shee's Almshouse dates from 1594, and Grace's Old Castle (1210) is now used as a courthouse. Kilkenny is a market centre and a railhead for rich agricultural country; its industries include brewing, printing, and craft industries. Pop. (1981) 9,466.

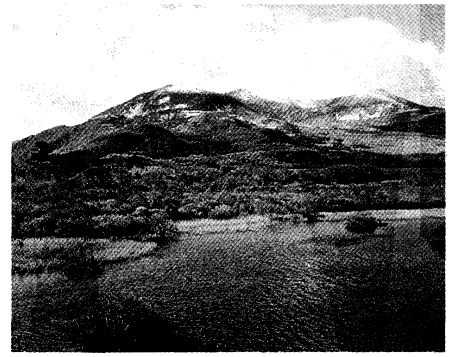
Killaloe, Irish CILL DALUA, town, County Clare, Ireland, on the western bank of the River Shannon, between Slieve (mountain) Bernagh and the Arra Mountains. The town is connected with Ballina, on the opposite bank of the river, by a bridge. St. Flannan's Cathedral (largely 12th-century Church of Ireland) occupies the site of the 6th-century church founded by St. Molua. Killaloe is a centre for hunting, fishing, textile industries, and slate-quarrying. Pop. (1981) 1,022.

Killanin (of Galway), Michael Morris, 3rd Baron (b. July 30, 1914, London), Irish author and businessman who in 1972 succeeded Avery Brundage as president of the International Olympic Committee (IOC), after having served as IOC vice president since 1968.

Morris succeeded his uncle to the title of Baron Killanin in 1927. After attending the Sorbonne (1932) in Paris and Magdalene College in Cambridge (B.A.,1935), Lord Killanin was a war correspondent for the London *Daily Express*, *Daily Mail*, and *Sunday Dispatch*, covering the Sino-Japanese War and writing a political column. When World War II broke out he joined the King's Royal Rifle Corps; he was awarded the Order of the British Empire for his part in the invasion of Normandy. Lord Killanin served on the board of directors for numerous British corporations. He also produced a number of successful motion pictures (*e.g.*, *The Rising of the Moon*, 1957; *The Playboy of the Western World*, 1963) and wrote several books, including *Four Days* (1938), *The Olympic Games* (1976), and *My Olympic Days* (1982).

His association with the Olympic Games was extensive. Lord Killanin was elected president of the Olympic council of Ireland in 1950, a representative from Ireland to the IOC in 1952, and an IOC executive board member in 1967. After Brundage retired, he faced the increasingly difficult job of keeping the Olympic Games as free from politics and international strain as possible. He tried to maintain a more flexible attitude about the definition of amateur athletics than that advocated by Brundage. In 1980 he was made honorary life president of the IOC.

Killarney, Irish CILL AIRNE, market town of County Kerry, Ireland, near the Killarney lakes, famed for their beauty. Industries include the making of ornamental ironwork, cranes, lace, woollen goods, cutting tools, hosiery, and shoes. Mineral water is bottled. The three main lakes are Lough (lake) Leane or Lower Lake; Muckross (Middle) Lake; and Upper Lake. Rising steeply to the west are the Tomies and Purple Mountain (2,739 ft [835 m]); while beyond the Gap of Dunloe are Macgillycuddy's Reeks, the highest range in Ireland. Lower Lake, the northernmost and, at 5,001 ac (2,024 ha), the largest, is separated from Muckross Lake by the Muckross peninsula. Its 30 islands include Inisfallen, with a 9th-century abbey. The remains of Muckross abbey stand just inside Muckross National Park. Connecting Muckross Lake (680 ac, with four islands) with Upper Lake (430 ac, with eight islands) is the Long Range, a broad, wooded channel. The woods around the lakes are mostly of arbutus, with oak, birch, holly, and mountain ash. The limestone of the eastern shores has been eroded into curiously



Lough (lake) Leane and Tomies Mountain, near Killarney, County Kerry
By courtesy of the Tourist Photo Library

shaped caves and indentations. The lakes are drained to the Atlantic Ocean by the River Laune. Pop. (1981) 7,693.

Killarney Provincial Park, wilderness park, southeastern Ontario, Canada, on the northern shore of Georgian Bay of Lake Huron. Established in 1964, it has an area of 132 sq mi (342 sq km), including the Canadian Shield country made famous by the painter A. Y. Jackson and the Group of Seven. Among its attractions are birch and pine forests and the white quartzite rocks of the La Cloche Mountains. The name comes from Killarney village, a former fur-trading centre on the bay.

killdeer (*Charadrius*, sometimes *Oxyechus*, *vociferus*), American bird that frequents grassy mud flats, pastures, and fields. It belongs to the plover family of shorebirds (Charadriidae, order Charadriiformes). The killdeer's name is suggestive of its loud insistent whistle. The bird is about 25 centimetres (10 inches) long, with a brown back and a white belly, and it has two black breast bands (instead of one, as in other ringed plovers). In flight it shows a black and white wing pattern and a brown tail.

Killdeers breed throughout North America and in northwestern South America (and a few regularly visit Iceland and western Europe). They migrate only to escape snow, returning in spring before most songbirds. Killdeers are the ecologic equivalent of the lapwings of Europe. They eat beetles, grasshoppers, dragonflies, and other insects.

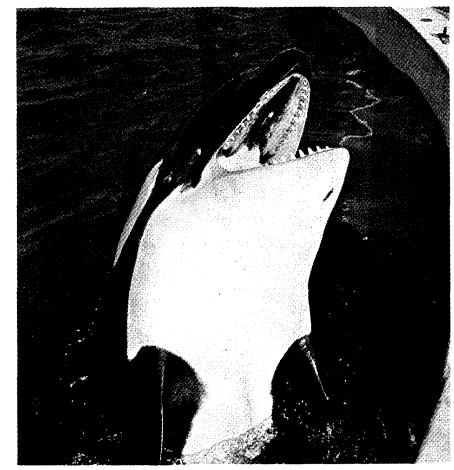


Killdeer (*Charadrius vociferus*)
Michael P. Schultz

The nest is a scrape in the ground lined with pebbles. The male makes several such nests, and the female selects one of them. The eggs are four in number, grayish in colour, with black marks. The parents take turns incubating. Hatching takes place in 24 days. Both parents tend the chicks, which walk and feed themselves soon after hatching. Intruders are lured away from the nesting area by a "broken wing" distraction behaviour, in which a parent bird limps or flutters along the ground, appearing to be injured.

Killeen, city, Bell County, central Texas, U.S., west of Temple, 65 mi (105 km) north of Austin. Laid out (1882) by the Santa Fe Railway and named for Frank P. Killeen, a civil engineer with the line, it remained a small farming and ranching community until Camp Hood (a U.S. military reservation covering a large area of hillock-studded mesa) was established nearby in 1942. Killeen rapidly developed as a service centre for the camp, reestablished in 1951 as Ft. Hood. Robert Gray Army Airfield and West Ft. Hood are immediately west of the city. Killeen is the seat of Central Texas (junior) College (1967) and American Technological University (1973). Inc. 1908. Pop. (1980) city, 46,296; metropolitan area (SMSA), 214,656.

killer whale, also called GRAMPUS (*Orcinus orca*), widely distributed whale of the family

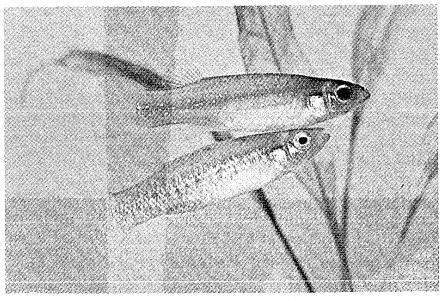


Killer whale (*Orcinus orca*)
Miami Seaquarium

Delphinidae, found in all seas from the Arctic to the Antarctic. The largest of the oceanic dolphins, it attains a maximum length, in the male, of about 9.5 m (31 feet) and a weight of about 5,000 kg (11,000 pounds). The female is usually much smaller. The killer whale is black, with white on the underparts, above each eye, and on each flank. The snout is blunt, and the jaws are equipped with 40 to 50 large, conical teeth. The flippers are rounded and the dorsal fin is triangular. Fin, flippers, and tail flukes enlarge with age in the male, the dorsal fin eventually forming a tall triangle up to 1.8 m (6 feet) high.

The killer whale lives in groups, usually of a few to about 50 individuals. It often swims in formation, either in a line or in rows, and sometimes leaps out of the water. It feeds on fishes, cephalopods, penguins, and such marine mammals as seals, dolphins, and whales. It is well adapted for hunting by virtue of its build, teeth, and strong jaw muscles and its organized behaviour when hunting in packs. It has been kept in captivity and has been trained as an oceanarium performer. There are no recorded instances of killer whales attacking and killing humans.

killifish, also called EGG-LAYING TOPMINNOW, any of a few hundred species of usually elongated fishes of the family Cyprinodontidae (order Atheriniformes), found worldwide,



Killifish (*Fundulus chrysotus*)
Gene Wolfsheimer

especially in the tropics of Africa and the New World. They inhabit brackish, salt, and fresh water, including certain desert hot springs. Killifish grow, at most, to a length of about 15 cm (6 inches); many are much smaller. They are surface feeders, taking either plant or animal material.

All killifish lay eggs, unlike the live-bearing topminnows of the related family Poeciliidae (*see* live-bearer). Certain South American and African killifish live in pools subject to an annual drying out and bury their eggs in the bottom, where they remain dormant until water refills the pond. These fishes are called annual fishes because their life cycle from birth to mating and subsequent death usually does not exceed one year.

Many killifish, including some of the annuals, are attractively coloured and are kept in home aquariums. A number of genera have been popularized, among them *Aphyosemion* (lyretails and others), *Epiplatys,* and *Rivulus.* Killifish are also of value as bait for anglers and as a form of mosquito control because they eat the larvae of these insect pests.

North American killifishes, sometimes called pupfishes (*Cyprinodon*), inhabit the California coastal waters and the perimeters of certain western salt lakes. One well-known species, the tiny (1.5-inch [0.6-centimetre]) Tecopa pupfish (*C. nevadensis*), long-considered endangered, was declared extinct in 1981. Other pupfish are on the official list of endangered species.

Killigrew, Thomas (b. Feb. 7, 1612, London, Eng.—d. March 19, 1683, London), English dramatist and playhouse manager who was better known for his wit than for his plays, although some of the jokes in *The Parson's Wedding* (acted *c.* 1640) were appropriated by the playwright William Congreve.

In 1641 Killigrew published two tragicomedies, *The Prisoners* and *Claracilla,* both probably produced before 1636. In 1647 he followed



Killigrew, detail of an oil painting after Sir Anthony Van Dyck, *c.* 1635; in the National Portrait Gallery, London
By courtesy of the National Portrait Gallery, London

Prince Charles into exile and was favoured with court appointments after the Restoration. In 1660 he received, with Sir William Davenant, a patent for two new playhouses, whose performances did not have to be licensed by the master of the revels, Sir Henry Herbert. A dispute with Herbert resulted, but Killigrew made generous concessions acting independently of Davenant. Killigrew's company became known as the King's Men.

In 1663 Killigrew built the original Theatre Royal in Drury Lane, London. In 1664 his plays were published, and in 1673 he became master of the revels.

Killy, Jean-Claude (b. Aug. 30, 1943, Saint-Cloud, near Paris, Fr.), French skier, a dominant figure in men's international Alpine skiing competitions from 1965 through 1968 and a popular sports personage known for his irreverent behaviour.

A descendant of an Irish mercenary soldier named Kelly, who fought for Napoleon I, Killy was reared at Val-d'Isère, a ski resort in the French Alps. In 1964 he became the leading French male skier, winning national championships in all three divisions of Alpine skiing: downhill, slalom, and giant slalom. He was the European champion for the first time in 1965. In 1966 at Portillo, Chile, he won the world combined championship.

In 1966–67 Killy won every downhill race he entered and achieved the maximum possible score of 225 points, earning the first World Cup for men (awarded by the Fédération Internationale de Ski for finishing among the leaders most consistently in a series of international races). In that year and again in 1967–68, when he repeated his World Cup triumph, he led the French skiers to the world team championship. In the Olympic Winter Games of 1968 at Grenoble, Fr., he won gold medals for the downhill, slalom, and giant slalom races for men, becoming the second skier in Olympic history to sweep the Alpine events. (The first was Toni Sailer of Austria in 1956.)

After his retirement from competitive skiing in April 1968, Killy engaged in a number of activities, including acting and auto racing. He returned to skiing in 1972 as a professional, becoming world champion of professional skiers.

Kilmarnock, industrial town, and seat of the district authority of Kilmarnock and Loudoun district, Strathclyde region, Scotland. It lies along Kilmarnock Water, just south of the metropolitan complex of Glasgow.

Although it became a burgh in 1591, it was not until the 17th century that it became important for its manufacture of "Kilmarnock cowls" (Scottish bonnets). Later it acquired a reputation for carpets, which it still maintains. It is also well known for its engineering industries, whisky blending (established in 1820 by Johnny Walker, a local grocer), and dairy products.

The town still possesses the historic core of "the streets an' neuks of Killie," celebrated by Robert Burns, whose poems were first printed there in 1786. The Burns memorial in Kay Park includes a museum. Pop. (1981) 52,083.

Kilmarnock and Loudoun, district, Strathclyde region, southwestern Scotland. It was created by the reorganization of 1975 from the northeastern part of the former county of Ayr and covers an area of 146 square miles (378 square km). Dairy farming is important over much of the district. Kilmarnock (*q.v.*), the seat of the district authority, is a town with a wide variety of industries including whisky, textiles, and engineering. Knitwear, textiles, and engineering are also important at Stewarton, while the towns of Darvel, Galston, and Newmilns in the upper Irvine valley manufacture lace and synthetic textiles. Pop. (1987 est.) 81,186.

Kilmer, (Alfred) Joyce (b. Dec. 6, 1886, New Brunswick, N.J., U.S.—d. July 30, 1918, near Seringes, Fr.), American poet known chiefly for his 12-line verse entitled "Trees."

He was educated at Rutgers and Columbia universities. His first volume of verse, *Summer of Love* (1911), showed the influence of William Butler Yeats and the Irish poets.



Kilmer, 1917
By courtesy of the Library of Congress, Washington, D.C.; photograph, Underwood & Underwood

After his conversion to Catholicism, Kilmer attempted to model his poetry upon that of Coventry Patmore and the 17th-century Metaphysical poets. His most famous poem, "Trees," appeared in *Poetry* magazine in 1913. Its immediate and continued popularity has been attributed to its combination of sentiment and simple philosophy. His books include *Trees and Other Poems* (1914); *The Circus and Other Essays* (1916); *Main Street and Other Poems* (1917); and *Literature in the Making* (1917), a series of interviews with writers. Kilmer joined the staff of *The New York Times* in 1913. In 1917 he edited *Dreams and Images,* an anthology of modern Catholic poetry. Kilmer was killed in action during World War I and was posthumously awarded the Croix de Guerre.

kiln, oven for firing, drying, baking, hardening, or burning a substance, particularly clay products but originally also grain and meal. The brick kiln was a major advance in ancient technology because it provided a stronger brick than the primitive sun-dried product. Modern kilns are used in ceramics to fire clay and porcelain objects, in metallurgy for roasting iron ores, for burning lime and dolomite, and in making portland cement. They may be lined with firebrick or constructed entirely of heat-resistant alloys. There are two types of kilns: those in which the materials come into contact with the flames and those in which

the furnace is underneath or surrounding the heated enclosure. Lime kilns are of the first group, and brick and pottery kilns are of the second, which also includes places for drying such materials as hops.

kilogram, basic metric unit of mass, equal to the mass of the international prototype of the kilogram, a platinum–iridium cylinder kept at the International Bureau of Weights and Measures laboratory at Sévres, near Paris. A kilogram is very nearly equal (it was originally intended to be exactly equal) to the mass of 1,000 cubic centimetres of water. The pound is now defined as equal to 0.45359237 kilogram, exactly. As originally defined, the kilogram was represented in the late 18th century as a solid cylinder of platinum. Measurements of the mass of a volume of water proved to be imprecise and inconvenient to make, however, and the platinum artifact itself became the standard. It was superseded in 1889 by the present standard kilogram, also a solid cylinder, of height equal to its diameter, made of the same alloy as the standard metre bar then in use. *See also* metric system; International System of Units.

kilometre, also spelled KILOMETER, metric unit of length equal to 1,000 metres (*see* metre).

Kilpi, Volter (b. Dec. 12, 1874, Kustavi, Fin.—d. June 13, 1939, Turku), Finnish novelist, social critic, and prose writer who was an exponent of the modern experimental novel.

Beginning as an "aesthetic" novelist, he turned to descriptions of 19th-century Finnish island life. In his important novel *Alastalon salissa* (1933; "In the Parlour at Alastalo"), a work of more than 900 pages, he used interior monologues, long flashback episodes, and exact, detailed description to give an account of the events in a six-hour period. In this work, a group of peasants are portrayed as functioning on a number of simultaneous levels and their consciousness is meticulously described during their interaction in a parlour. Kilpi uses his experimental technique in a broad, realistic depiction of a timeless, hierarchial social system.

Kilsyth (Scotland): *see* Cumbernauld and Kilsyth.

kilt, knee-length skirtlike garment that is worn by men as a major element of the traditional national garb of Scotland. (The other main component of Highland dress, as the traditional male garb of Scotland is called, is the plaid, which is a rectangular length of cloth worn over the left shoulder.) The kilt is a length of woven wool that is permanently pleated except for sections at each end and wrapped around the wearer's waist in such a way that the pleats are massed at the wearer's back and the flat, unpleated ends overlap to form a double layer at his front. Both kilt and plaid are usually made of cloth woven with a cross-checked repeating pattern known as a tartan (*q.v.*).

The kilt and plaid ensemble developed in 17th-century Scotland from the *féile-breacan,* a long piece of woolen cloth whose pleated first half was wrapped around the wearer's waist, while the (unpleated) second half was then wrapped around the upper body, with a loose end thrown over the left shoulder. In the 17th century two lengths of cloth began to be worn for these purposes, and the kilt and plaid thus came to be separate garments.

The plaid and kilt form the only national costume in the British Isles that is worn for ordinary purposes, rather than merely for special occasions. Highland dress is also the uniform of Scottish regiments in the British army, and kilts have been worn in battle as recently as World War II.

Kilwa, in full KILWA KISIWANI, former Islāmic city-state on an island off the coast of southern Tanzania, East Africa. Founded in the late 10th century by settlers from Arabia and Iran, it became one of the most active commercial centres on the east coast of Africa. Held briefly by the Portuguese (1505–12), it thereafter gradually declined in importance and was finally abandoned. Extensive ruins remain, including mosques, a Portuguese fort, and the great Husuni Kubwa palace (13th–14th century).

Kim Chŏng-hi, also called CH'U-SA, or WAN-DANG (b. 1786, Kyŏngho-ri, Korea [now in South Korea]—d. 1856, Pukch'ŏng [now in North Korea]), the best-known Korean calligrapher of the 19th century.

Kim was born into a family of artists and government officials. As a young man he accompanied his father on a trip to Peking, where he became friendly with many of the leading Chinese scholars of the day. Returning to Korea, he became a high government official, holding many positions. Meanwhile, he continued to improve his artistic talents. From the famous *li shu* calligraphy of Han China, Kim developed a unique style known as the *ch'usa,* which has continued to be one of the major calligraphic styles in Korea.

In 1840 Kim was implicated in a plot against the Korean monarch and exiled to the southern island of Cheju. Hundreds of students and admirers flocked to join him, but in 1851 he was exiled again, this time to the cold northern island of Pukch'ŏng, where he died.

Kim Chong Il, also spelled KIM JONG IL (b. Feb. 16, 1941, Siberia, Russian S.F.S.R.), North Korean politician and the son of the North Korean premier and Korean Workers Party chairman Kim Il-sung.

Kim Chong Il was placed in safety in Manchuria by his father during the Korean War. After attending a pilot's training college in East Germany for two years, he graduated (1963) from Kim Il-sung University. He served in numerous routine posts in the Korean Workers Party until becoming his father's secretary. He worked closely with his father in the 1967 party purge, and then was assigned several important jobs. Kim was appointed in September 1973 to the powerful position of party secretary in charge of organization, propaganda, and agitation.

With the inclusion of Kim in his father's personality cult and with his official designation as his father's successor in October 1980, it seemed that the world's first "communist dynasty" might be in the making. Kim also held high-ranking posts on the Central Committee, the Politburo, the Party Secretariat, and the Military Commission.

Kim Dae-gŏn, BLESSED also called ANDREW KIM (b. Aug. 21, 1821, Korea—d. Sept. 16, 1846, near Seoul, Korea [now in South Korea]; feast day July 5), the first Korean Catholic priest.

The son of Korean converts to Catholicism, Kim received religious training in the Portuguese colony of Macau and was ordained in Shanghai in 1845 by Bishop Jean Ferréol. Much of his short life was spent traveling between China and his homeland for missionary work. In 1846 he was arrested while trying to explore a new sea route for the entrance of missionaries into Korea. His opposition to Korea's closed-door policy brought about his imprisonment and execution. On July 5, 1925, Kim was beatified along with 78 other Korean martyrs. In 1949 the Holy See named him the principal patron of the Roman Catholic clergy in Korea.

Kim Dae Jung (b. Jan. 6, 1924, Hayi-do, Korea [now in South Korea]), South Korean politician who became a prominent opposition leader during the tenure of President Park Chung Hee.

Kim was born into a middle-class farming family. After graduating from high school (1943), he worked as a clerk in a Japanese-owned company. In 1945 he took over the company, eventually becoming a wealthy businessman. During the Korean War he was captured by the communists and sentenced to be shot, but he managed to escape.

He first entered politics in 1954, voicing opposition to the policies of President Syngman Rhee. After five attempts at elective office, Kim finally won a seat on the National Assembly (1961). By the age of 40 Kim had earned a reputation as one of South Korea's most gifted orators and charismatic politicians. He became increasingly critical of Park's policies, and in 1971, a year after becoming president of the Korean Democratic Party, Kim ran against Park in a national presidential election. Kim lost, although winning more than 40 percent of the vote. He was by then an outspoken critic of the repressive policies of the Park government.

In 1973 Kim was kidnapped from his hotel in Tokyo by agents of the Korean Central Intelligence Agency and was returned forcibly to South Korea; this act severely strained relations between Japan and South Korea. In 1976 Kim was again arrested, having agitated for the restoration of democracy. He was released in 1979 just prior to Park's assassination in October of that year. Kim was arrested in May 1980 on charges of sedition and conspiracy and sentenced to death, though Park's successor, President Chun Doo Hwan, commuted the sentence to life imprisonment and later to 20 years. In December 1982 Kim was allowed to leave South Korea for medical treatment in the United States. He was allowed to return to South Korea in 1985 and resumed his role as one of the principal leaders of the political opposition. In 1987 he ran for the presidency and lost after splitting the anti-government vote with rival opposition candidate Kim Young Sam.

Kim Hong-do, also called TANWŎN (Korean: "Sandalwood Garden") (b. 1745?, Korea), one of the first Korean artists to depict the common people in his work.

Born into a family of officials, Kim was early appointed to official rank and made a member of the royal art academy. Nevertheless, he was a spendthrift who was at odds with other officials because of his radical ideas, and he is said to have been constantly in need of funds to support his family. As a painter he became a master of many styles. In his genre paintings he used the ancient linear style, from which he departed, however, in his portrayal of the "Sennin" ("Immortals"), whom he depicts in an unusual heroic style, showing them full figured and robust.

It was in his landscape paintings that Kim excelled. Following a trend that had begun to develop in Korea in the previous century, he depicted the real world of nature. Going further in this trend than most other artists, he developed an interest in the life of people within natural settings. His paintings of commoners often suggest his critical view toward the upper class, best demonstrated in his harvest scenes, in which hardworking farmers are shown in contrast to the lazy landowner.

Kim Il-sung, original name KIM SONG JU (b. April 15, 1912, near P'yŏngyang, Korea [now in North Korea]), longtime communist leader of the Democratic People's Republic of Korea (North Korea). He was the nation's premier from 1948 to 1972 and chairman of its dominant Korean Workers (Communist) Party from 1948. He served as president and head of state of North Korea from 1972 on.

Kim was the son of parents who fled to Manchuria in 1925 to escape the Japanese rule of Korea. He joined the Korean Communist Party in 1931. He participated in the Korean

guerrilla resistance against the Japanese occupation in the 1930s and was noticed by the Soviet military authorities, who sent him to the Soviet Union for military and political training. While there he adopted the name of an earlier legendary Korean guerrilla fighter against the Japanese.

During World War II Kim led a Korean contingent as a major in the Soviet Red Army, and he returned with other Soviet-trained Koreans to establish a communist provisional government under Soviet auspices in North Korea in 1945. He became the first premier of the newly formed Democratic People's Republic of Korea in 1948. In 1950 Kim launched an invasion of South Korea in an unsuccessful attempt to extend his rule there, and then, with Chinese aid, he repelled a subsequent invasion of North Korea by UN and South Korean forces.

After the end of the Korean War in 1953, Kim crushed the remaining domestic opposition and eliminated his last rivals for power within North Korea's Communist party. He became his country's absolute ruler and set about transforming North Korea into an austere, militaristic, and highly regimented society devoted to the twin goals of industrialization and the reunification of the Korean Peninsula under North Korean auspices. He also instituted an extensive personality cult of himself. He cultivated close ties with both the Soviet Union and the People's Republic of China, and he remained consistently hostile to South Korea and the United States.

While retaining control of the Korean Workers Party, Kim relinquished the office of premier and was elected president of North Korea in December 1972. In 1980 he raised his son, Kim Chong Il, to high posts in the party and the military, in effect designating the younger Kim as his heir.

Kim Jae Kyu (b. 1926, North Kyongsang province, Korea [now in South Korea]—d. May 24, 1980, South Korea), South Korean military officer and head of the Korean Central Intelligence Agency (KCIA) who, on Oct. 26, 1979, assassinated the South Korean president, Park Chung Hee.

Kim was the lifelong friend and confidant of Park. They had been in the same class at the Korean Military Academy. Kim rose to the rank of lieutenant general after having been commander of army security and deputy director of the KCIA. After the top KCIA officer in Washington, D.C., defected during an investigation of South Korean influence in Congress, Kim was appointed (1976) the head of the KCIA, an extremely powerful position.

At a private dinner party hosted by Kim for President Park, Kim opened fire, killing Park and Park's chief security officer, Cha Chi Chul. He was arrested soon after the shooting by General Chung Sung Hwa. At first, it was assumed that the shooting had been the result of an emotional outburst, but later an investigation showed it had been a carefully planned assassination. Kim asserted at his trial that he had killed his friend to avert a bloodbath that Park had been planning for his opponents and that only by killing Park could democracy be restored in South Korea. The government investigation, led by General Chun Doo Hwan, contended that Kim shot Park solely to preserve his own power and sentenced him to death. Despite appeals by student groups and religious leaders, Kim and four KCIA aides were hanged.

Kim Jong Il (Korean leader): *see* Kim Chong Il.

Kim Young Sam (b. Dec. 20, 1927, Pusan, Korea [now in South Korea]), South Korean politician and moderate opposition leader.

Kim was educated at Seoul National University and was first elected to the National Assembly in 1954. A centrist liberal, he was successively reelected until 1979, when he was expelled from the Assembly for his opposition to President Park Chung Hee. His expulsion, on October 9, touched off the riots and demonstrations that preceded Park's assassination on October 26. To protest Kim's dismissal, all 66 opposition members of the National Assembly resigned. After Park's death, it was assumed that Kim Young Sam would be a contender in the presidential election. However, Chun Doo Hwan's takeover in May 1980 precluded this possibility. First put under house arrest by Chun (May 1980), Kim was also banned from political activity for eight years in November 1980. His party was also banned.

Kim's house arrest was lifted in June 1983, and he resumed his political activity in 1985. That year he reasserted his leadership of the moderate opposition to President Chun. Kim ran unsuccessfully for the South Korean presidency in 1987, splitting the anti-government vote with the rival opposition leader and presidential candidate Kim Dae Jung. In 1990 Kim Young Sam agreed to merge his Reunification Democratic party with the ruling Democratic Justice Party led by President Roh Tae Woo, thus forming a centre-right party that could dominate Korean politics.

Kimbangu, Simon (b. Sept. 24, 1889?, Nkamba, near Thysville, Congo Free State [now Mbanza-Ngungu, Zaire]—d. Oct. 10, 1951, Élisabethville, Belgian Congo [now Lubumbashi, Zaire]), Congolese religious leader who founded a separatist church known as the Kimbanguist church.

Brought up in the British Baptist Missionary Society's mission, Kimbangu suddenly became famous among the Bakongo people of Lower Congo in April 1921. He was reputed to heal the sick and raise the dead, and thousands of people came to hear his preaching. He was called Ngunza, the Kikongo word for "prophet" in the Baptist translation of the Bible.

Although Kimbangu's preaching had no overtly political content, the Belgian authorities, alarmed by the disturbances that he provoked, arrested him and his immediate followers in September 1921. He was condemned to death, but his sentence was commuted; he spent the rest of his life in prison in Élisabethville. Meanwhile, his followers and imitators diffused "Ngunzism," or, as it came to be called, Kimbanguism, in the Belgian Congo and the neighbouring French Congo and Angola, where it took on an increasingly political character. During the African nationalist ferment of the 1950s, the Kimbanguists from Nkamba, led by the youngest of the prophet's three sons, Joseph Diangienda (Diangienda ku Ntima), founded and, in September 1959, obtained official recognition for the Kimbanguist church.

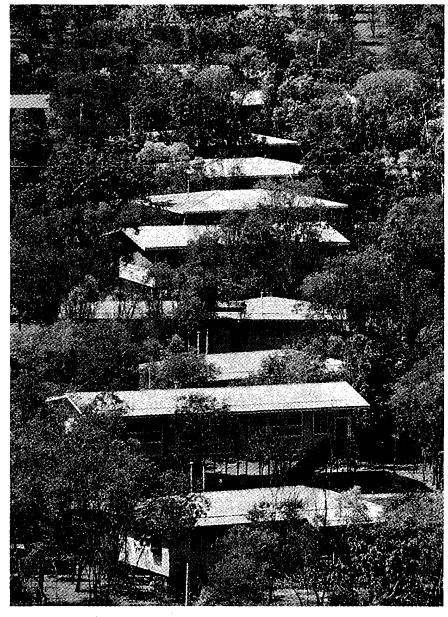
Kimbanguist church, French in full ÉGLISE DE JÉSUS-CHRIST SUR LA TERRE PAR LE PROPHÈTE SIMON KIMBANGU ("Church of Jesus Christ on Earth Through the Prophet Simon Kimbangu"), largest independent African church and the first to be admitted (in 1969) to the World Council of Churches. It takes its name from its founder, Simon Kimbangu, a Baptist mission catechist of the Lower Congo region, who in April 1921 inaugurated a mass movement through his miraculous healings and biblical teaching. In October 1921 Kimbangu was charged with insurrection by the Belgian colonial authorities and imprisoned for life.

In diverse forms the movement continued clandestinely as Ngunzism (Prophetism), and mass deportations during government persecutions only helped to spread it. After toleration in 1957 there emerged the main organized group that was legally recognized in 1959. This church spread widely in Central Africa, transcending class, tribal, and national boundaries, and developed a hierarchical organization under Kimbangu's three sons, with Nkamba, the prophet's birth and final burial place, called the New Jerusalem.

The church eschews politics and embraces a puritan ethic, rejecting the use of violence, polygamy, magic and witchcraft, alcohol, tobacco, and dancing. Its worship is Baptist in form, though the institution of Communion was not introduced until 1971. Extensive social services in agriculture, healing, education, youth work, and cooperatives make it a modernizing agency for a membership variously estimated at from 1,000,000 to 3,000,000. Many other loosely organized groups that also regard Kimbangu as God's special prophet have attempted to preserve the dynamic force that they believe could be weakened by modernization in the Kimbanguist church.

Kimbe, port on the north-central coast of New Britain Island, Papua New Guinea. Located in an area of cones, domes, and alluvial fans of volcanic origin, the town lies along Stettin Bay, an inlet of Kimbe Bay. The main industry is oil palm growing. Palm oil is extracted at a factory near Kimbe and shipped overseas from the town's wharf. Copra and cocoa production and logging are also important. Pop. (1985 est.) 5,600.

Kimberley, also called THE KIMBERLEYS, plateau region of northern Western Australia, extending from a rugged northwest coast south to the Fitzroy River and east to the Ord River. With an area of about 140,000 square miles (360,000 square km), the plateau is composed chiefly of sandstone with patches of basalt (Kimberley Block) and is characterized by deep valleys such as the Geikie and Windjama river gorges. Rainfall, ample in northern West Kimberley, averages only 15 inches (380 mm) per year in southern East Kimberley.



Stilt houses at Kununurra in the Kimberley region, Western Australia

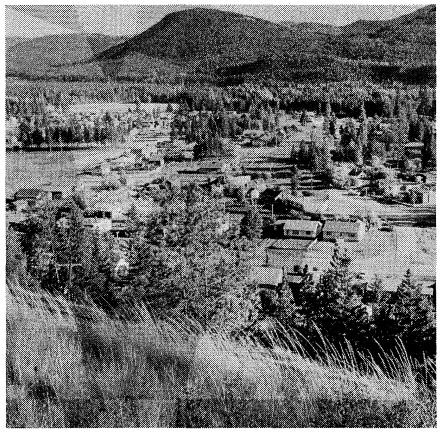
Tor Eigeland—Black Star/EB Inc.

The plateau, named for John Wodehouse, 1st Earl of Kimberley (British colonial secretary; 1870–74, 1880–82), has always been sparsely populated. In 1879 Alexander Forrest's expedition reported the area's suitability for grazing, and this encouraged permanent settlement. Discoveries of gold two years later brought a short-lived gold rush, but herding remained the principal basis of European settlement. Beef cattle are raised in the north and west, and meat is processed at Wyndham

and Derby. Major irrigation projects along the Ord and Fitzroy rivers (*qq.v.*) have made possible the growing of sugarcane, rice, and other semitropical crops. A new community, Kununurra, was built on the Ord in the 1960s as a service centre for development in that area, and the Division of Tropical Crops and Pastures operates the Kimberley Research Station nearby. Some mineral deposits, including Kimberlite (diamond-bearing rock) and traces of oil, have been found on the plateau, and diamonds are now mined at Argyle. Several thousand Aborigines live in the region.

Kimberley is the name of a statistical division that roughly corresponds with the plateau. It comprises four shires: Broome, Halls Creek, West Kimberley, and Wyndham-East Kimberley. Pop. (1981) 19,296.

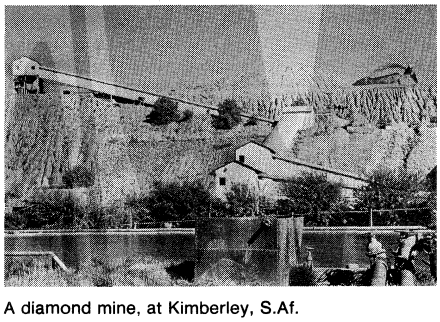
Kimberley, city, East Kootenay District, southeastern British Columbia, Canada, near St. Mary River, just northwest of Cranbrook. Built on the rolling slopes of the Sullivan and North Star hills, it is Canada's highest city (3,662 ft [1,116 m]). The community dates



A residential area of Kimberley, B.C., with the Sullivan and North Star hills in the background
John de Visser

from 1892, when the prospector Pat Sullivan staked his claim, leading to the development of the Sullivan lead–zinc mine, one of the world's largest. The Sullivan ore concentrator, a fertilizer factory, and an iron and steel plant are now the city's main industrial establishments; logging and sawmilling and winter sports facilities provide additional sources of income. Originally known as Mark Creek Crossing, the settlement was renamed Kimberley in 1896 after the South African mining centre. Its downtown buildings have been renovated in Bavarian style. The Kimberley Snow Fiesta is held annually in February. Inc. city, 1944. Pop. (1981) 7,375.

Kimberley, city and diamond mining centre, northeastern Cape Province, South Africa, near the Orange Free State border. Founded after the discovery of diamonds on farms in the area in 1869–71, the mining camp of Kimberley, named (in 1873) after John Wodehouse, 1st earl of Kimberley, then British



A diamond mine, at Kimberley, S.Af.
Photo Research International

colonial secretary, grew as a result of the intensive digging of the diamond-bearing pipe at the hill called Colesberg Koppie. The town of Kimberley was created in 1878 and incorporated into the Cape Colony in 1880. In 1885 the Cape Town Railway reached Kimberley, and during the South African War the town was besieged by the Boers for 126 days until relieved by Gen. John French on Feb. 15, 1900. City status was granted in 1912 with absorption of the mining town of Beaconsfield.

After 1888 the Kimberley Mine at Colesberg Koppie and most other mines in the area were controlled by a trust organized by Cecil Rhodes, with production placed in the hands of De Beers Consolidated Mines Ltd. Kimberley Mine (now called the Big Hole; 0.9 mi [1.5 km] in circumference), long the richest diamond-producing mine in the world, was closed in 1915; but four other mines remain productive, and diamond mining and cutting remain prominent industries.

Kimberley's gardens and squares are dotted with memorials, including an equestrian statue of Rhodes. Important collections of Khoisan artifacts are in the Alexander McGregor Memorial Museum and the Duggan-Cronin Bantu Gallery contains early 20th-century photographs of African miners. The city has Anglican and Catholic cathedrals and Northern Cape Technical College.

Kimberley is the main city of Griqualand West. It is the market and service centre for a prosperous irrigated-farming and cattle-raising area. Iron, salt, and gypsum are also worked in the vicinity. Pop. (1983 est.) mun., 158,195.

kimberlite, also called BLUE GROUND, a dark-coloured, heavy, often altered and brecciated (fragmented), intrusive igneous rock that contains the only diamonds known to occur in the rock matrix where they originally formed. It has a porphyritic texture, with large, often rounded crystals (phenocrysts) surrounded by a fine-grained matrix (groundmass). It is a mica peridotite, and its most abundant mineral constituent is olivine. Other abundant minerals include phlogopite mica; chromium- and pyrope-rich garnet phenocrysts; chrome-bearing diopside, particularly in the African kimberlite; ilmenite; serpentine; calcite; and magnetite.

Kimberlite occurs in the uplifted centres of continental platforms. In the Kimberley district, South Africa, it forms pipes (funnels, more or less oval in cross section, that become narrower with increasing depth) and, occasionally, dikes. Other occurrences include the dikes at Ithaca, N.Y., the Kimberley and Lake Argyle regions of Australia, and the lavas in the Iswisi Hills, Tanzania.

Kimbolton, Edward Montagu, Baron: *see* Manchester, Edward Montagu, 2nd earl of.

Kimbundu (people): *see* Mbundu.

Kimch'aek, formerly SŎNGJIN, city, Hamgyŏng-pukto (North Hamgyŏng Province), eastern North Korea. It is on the estuary of the Namdae-ch'ŏn (river), near the boundary with Hamgyŏng-namdo (South Hamgyŏng Province). Protected by promontories, it has a good natural harbour and is a port city. Formerly a poor fishing village, it began to develop when it became an open port in 1899, exporting agricultural and marine products, oxhide, and forest products. Since the 1930s it has become an industrial city with the exploitation of mineral deposits nearby. Iron industries, magnesium processing, and marble working are carried on. The city's name was changed to Kimch'aek in 1952 in memory of the commander of the North Korean Army who died during the Korean War. Kimch'aek Polytechnical College is located there. Pop. (1980 UN est.) 490,000.

kimchi, also spelled KIMCHEE, spicy, fermented pickle that invariably accompanies a Korean meal. The vegetables most commonly used in its preparation are celery cabbage, Chinese turnip, and cucumber. The prepared vegetables are sliced, highly seasoned with red pepper, onion, and garlic, and fermented in brine in large earthenware jars. Dried and salted shrimp, anchovy paste, and oysters are sometimes used as additional seasonings. During fermentation, which takes approximately one month depending on weather conditions, the *kimchi* jars are stored totally or partially underground in cellars or sheds built expressly for this purpose.

Kimch'ŏn, city, Kyŏngsang-pukto (North Kyŏngsang Province), south central South Korea, 43 mi (69 km) northwest of Taegu. During the Yi dynasty (1392–1910) the city was one of the most important market towns of the country. It has become a service centre for the surrounding area. Kimch'ŏn is also a transportation junction located on the Naktonggang (river) at its intersection with the Kyŏngbuk and Kyongpu rail lines and with roads connecting the surrounding provinces. The highway between Seoul and Pusan also passes through the city. Pop. (1980 prelim.) 72,229.

Kimhi, David, Kimhi also spelled KIMCHI, KIMḤI, or QIMḤI, byname RADAK (acronym of Rabbi David Kimhi), also called MAISTRE PETIT (b. *c.* 1160, Narbonne?, Toulouse, Fr.—d. *c.* 1235, Narbonne?), European scholar of the Hebrew language whose writings on Hebrew lexicography and grammar became standard works in the Middle Ages and whose reputation eclipsed that of both his father, Joseph Kimhi, and his brother, Moses, a grammarian.

As a boy David Kimhi learned his father's teachings under the tutelage of his brother and then began to support himself by teaching children the Talmud, the body of Jewish tradition. His own great work, the *Sefer mikhlol* ("Book of Completeness"), was originally intended to comprise a grammar and a lexicon. The latter, however, appeared as a separate work, *Sefer ha-shorashim* ("Book of the Roots"). (The grammar, edited and translated by William Chamaky, was published in 1933; 2nd ed. 1952.) His work differed from previous grammars in its comprehensive treatment of verbs and covered all the rules of conjugation, punctuation, and accent. Distinguished also by conciseness and clarity, it became the leading grammar for centuries. The lexicon enjoyed a comparable popularity. Although it is based largely on the dictionary of Ibn Janāḥ and the writings of Joseph Kimhi, it remains an original work. Kimhi introduced many new etymologies, made comparisons of Hebrew and Aramaic and of Hebrew and Provençal, and included exegetical notes on the biblical contexts of word roots. Another work, *'Eṭ sofer* ("Pen of the Scribe"), was a manual covering the rules of punctuation and accent for biblical manuscripts.

David Kimhi was also the most important biblical exegete of his family. The importance of his commentaries on Genesis, the Psalms, and other Old Testament books is underscored by their presence, second to those of the great medieval commentator Rashi, in the first printed editions of the Hebrew Bible. (The commentaries were edited and translated into English by various hands and published 1919–35 as part of Columbia University Oriental Studies.) A staunch supporter of the great Jewish philosopher Maimonides, he was also extremely skilled in refuting Christian attacks on Judaism and Jews.

Kimhi, Joseph, Kimhi also spelled KIMCHI, KIMḤI, or QIMḤI, also called MAISTRE PETIT, or RIKHAM (an acronym of Rabbi Joseph Kimhi) (b. *c.* 1105, Spain—d. *c.* 1170, Narbonne?,

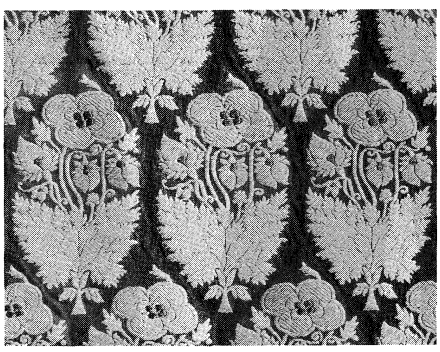
Fr.), European grammarian, biblical exegete, and poet who, with his sons, Moses and David, made fundamental contributions to establishing Hebrew-language studies.

Through his many translations into Hebrew of works written in Arabic by Spanish Jews, Kimhi came to play a principal part in introducing Hebraic studies to the rest of Europe. His acquaintance with Latin grammar led him to divide the previously acknowledged seven Hebrew vowels into five long and five short vowels. His comprehensive grammatical text, *Sefer ha-zikkaron* ("Book of Remembrance"), introduced a classification of verb stems for Hebrew that remains in use. Another work, *Sefer ha-galui* ("Book of the Demonstration"), dealing with lexicography and questions of exegesis, served as a vehicle for criticizing the work of Jacob ben Meir Tam, the leading Talmudic scholar of the time. Among his critical commentaries on various books of the Old Testament, those on Proverbs and Job were published. Those that became lost are known, however, to have had important exegetic worth. Kimhi's work on Jewish apologetics, *Sefer ha-Berit* ("Book of the Covenant"), is important for its historical information on the position of the Jews in Provence. He also established himself as a poet of considerable merit and was frequently quoted by later generations. His *Shekel hakodesh* ("The Holy Shekel") was published with an English translation in 1919.

Kimhi, Moses, Kimhi also spelled KIMCHI, KIMḤI, or QIMḤI, also called REMAK (an acronym of Rabbi Moses Kimhi) (d. *c.* 1190, Narbonne?, Toulouse, Fr.), European author of an influential Hebrew grammar, *Mahalakh shevile ha-da'at* ("Journey on the Paths of Knowledge").

The elder son of the grammarian and biblical exegete Joseph Kimhi and teacher of his more renowned brother, David Kimhi, he shared with them the accomplishment of establishing Hebrew-language studies. His grammar was remarkably brief, which may account for its long popularity. It passed into Latin translation in 1508 and went into many editions for use by Christian Hebraists. He was the first to make the verb *paqad* ("to order") a model for conjugation and introduced the now-usual sequence of stem forms. In the great rabbinical Bibles, his commentaries on Proverbs, Ezra, and Nehemiah are incorrectly attributed to Abraham ibn Ezra, one of the foremost Jewish scholars of medieval Spain.

kimkhwāb, Indian brocade woven of silk and gold or silver thread. The word *kimkhwāb,* derived from the Persian, means "a little dream," a reference perhaps to the intricate patterns employed; *kimkhwāb* also means "woven flower," an interpretation that appears more applicable to the brocade, in view of the floral patterns common to the material. *Kimkhwāb,* known in India from ancient times, was called *hiraṇya,* or cloth of gold, in Vedic literature (*c.* 1500 BC). In the Gupta period (4th–6th century AD) it was known as *puṣpapaṭa,* or cloth with woven flowers. During the Mughal period (1556–1707), when *kimkhwāb* was extremely popular with the rich, the great centres of brocade weaving were Benares (Vārānasi), Ahmādābād, Surat, and Aurangābād. Benares is now the most important centre of *kimkhwāb* production.



Detail of a floral design *kimkhwāb* from Gujarāt, 19th century; in the Prince of Wales Museum of Western India, Bombay

P. Chandra

*Kimkhwāb*s are classified according to the amount of gold and silver thread used: some are woven entirely from the two precious metals; in some, coloured silk thread is used sparingly to accent the design; and in others most of the work is done in silk thread, the gold and silver being sparingly used. The patterns favoured for brocades are floral meanders and sprays, pinecones, rosettes, arabesques (patterns of interlaced lines), and stylized plants such as the poppy.

kimono, garment worn by Japanese men and women from the Early Nara period (645–724) to the present. Derived from the Chinese *p'ao*-style robe, the essential kimono is an ankle-length gown with long, expansive sleeves and a V-neck. It has neither buttons nor ties, being lapped left over right across the chest and secured at the waist by a broad sash known as an obi (*q.v.*).

The short-sleeved kimono (*kosode*), worn by women as an outer garment, was introduced in the Muromachi period (Ashikaga shogunate; 1338–1573). The contemporary wide obi dates only from the 18th century. Although the kimono is not of Japanese origin, as is often supposed, its great beauty is attributable to 17th- and 18th-century Japanese designers, whose decorative styles made it one of the world's most exquisite garments.

Kimry, city and centre of a *rayon* (sector), Kalinin *oblast* (province), western Russian S.F.S.R. The old part of the city, situated on the high left (west) bank of the Volga River, is a centre of traditional handicrafts, especially of leatherworking, shoes, and hosiery. Kimry, a river port, was incorporated in 1917 and has since diversified its industry with machine building. It has a college of machine building and a medical school. Pop. (1987 est.) 61,000.

kin, also called KINSFOLK, persons deemed related through blood or marriage or both. *See* kinship.

Kin DYNASTY: *see* Ch'in dynasty.

Kinabalu, Mount, Malay GUNUNG KINABALU, highest peak in the Malay Archipelago, rising to 13,455 feet (4,101 m) in north-central Sabah (East Malaysia), on the island of Borneo. At the northern end of the Crocker Range, the massif gently emerges from a level plain and abruptly rises from a rocky slope into a great, barren, flat-topped block 0.5 miles (0.8 km) long. Gully-scarred, the plateau block is surrounded by black granite cliffs and precipices thousands of feet high. The lower slopes are farmed up to about 2,000 feet (600 m).

The peak is the spirit homeland for the indigenous Kadazan people, and its name is derived from their term Akinabalu ("Revered Place of the Dead"). Formerly known as St. Peter's Mount, Kinabalu was first climbed by a European; Hugh (later Sir Hugh) Low made the ascent from Tuaran in 1851. Kota Belud ("Hill Fort"), perched on its slopes, is known for its Sunday market and pony races. Kinabalu National Park (288 square miles [745 square km]) encompasses Mount Kinabalu and surrounding parts of the Crocker Range.

Kinabatangan River, longest river in Sabah (East Malaysia), north Borneo. It rises in the eastern Witti Range, where it begins its 350-mile (563-kilometre) northeasterly flow. Traversing for the most part a broad, heavily forested plain, the river culminates in a wide delta at the Sulu Sea between Sandakan and Kampong Tambisan. The Kinabatangan is navigable upstream for approximately 200 miles (320 km). Together with its tributaries, the Kuamut and Lokan, it is the only avenue of communication between the coastal towns and the forested interior.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Kincardine, also called KINCARDINESHIRE, or THE MEARNS, county in northeastern Scotland until the reorganization of 1975. It is now part of Kincardine and Deeside (*q.v.*) district of Grampian (*q.v.*) region.

Kincardine was the southernmost of the three counties that made up the northeastern corner of Scotland. In ancient times it marked the northward limit of the Roman penetration of Britain. It then formed part of the kingdom of the Picts. The Scottish kings subsequently made a stronghold of the ancient burgh of Kincardine, from which the county derived its name. Edward I of England passed through Kincardine in 1296, during the Wars of Independence. The regalia of the Scottish crown were kept for safekeeping at Dunnottar Castle, south of Stonehaven, during the Commonwealth Wars of the 1650s. During the Jacobite rising of 1715, James Edward, the Old Pretender, visited Fetteresso Castle near Stonehaven and was proclaimed King James VIII by his followers.

The valley of the River Dee, in the north of the former county, has many buildings of architectural note, including Dunnottar Castle (*c.* 1392), a number of 17th-century castles, and several ruined churches.

Kincardine, James Bruce, 12th Earl of: *see* Elgin, James Bruce, 8th Earl of.

Kincardine and Deeside, district, Grampian region, northeastern Scotland, created by the reorganization of 1975; it includes the former county of Kincardine and part of the former county of Aberdeen. The district has an area of 985 square miles (2,550 square km). It stretches from the east coast to reach the Grampians and the southern side of the Cairngorms in the west at heights between 3,000 and 4,000 feet (915 and 1,220 m). The district is wild and mountainous. The Grampians present a steep scarp face to the south and a more gradual slope northward to the River Dee, which forms the district's northern boundary. South of The Grampians lies the Howe (hollow) of the Mearns, a sheltered, fertile agricultural vale that is part of Strathmore Valley. Stonehaven replaced Kincardine as the county town in the 17th century and has continued since 1975 as seat of the district authority.

Agriculture is the chief occupation in the fertile mountain valleys and in the Howe of the Mearns. There is much permanent pasture for dairy and beef cattle, and sheep are important on the higher ground. Fishing has declined, and the small fishing villages have turned to tourism; Stonehaven combines both. Manufacturing industries are few. Considerable depopulation of both rural and urban areas has occurred, necessitating the development of new light industries and tourism in an attempt to halt the process. Balmoral, the Scottish Highland residence of the royal family, is in the district. Pop. (1987 est.) 48,402.

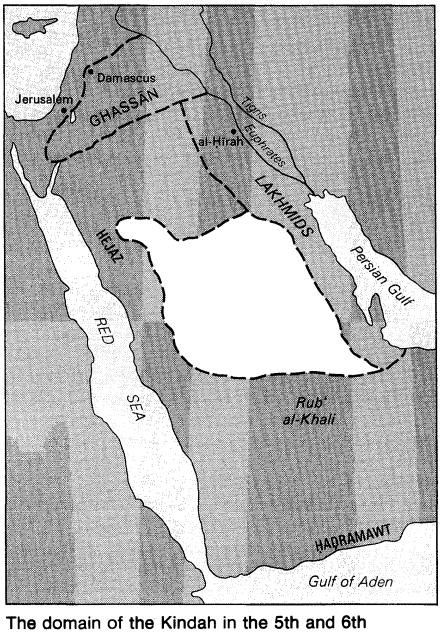
Kinck, Hans E(rnst) (b. Oct. 11, 1865, Øksfjord, Nor.—d. Oct. 13, 1926, Oslo), prolific Norwegian novelist, short-story writer, dramatist, essayist, and Neoromanticist whose works reflect his preoccupation with the past and his lifelong interest in national psychology.

Kinck was educated at King Frederick's Uni-

versity, Kristiania, and was strongly interested in Norwegian folklore. He used philology and history to uncover what he called the hidden forces behind the development of nations. The picture that he gives of Norwegian rural life is rather grim, as evidenced in the volume of short stories *Fra hav til hei* (1897; "From Sea to Mountain"). Kinck's best writing is probably such short stories and those in the more lyrical collection *Flaggermus-vinger* (1895; "Bat's Wings"); but his principal work is the three-volume novel *Sneskavlen brast* (1918–19; "The Avalanche Broke"), dealing with the clash between the peasantry and the professional classes.

Kincsem (foaled 1874), European racehorse whose total of 54 victories (1876–79) without defeat was into the 1980s the best unbeaten record in the history of flat (Thoroughbred) racing. A mare sired by Cambuscan out of Water Nymph (both English-bred horses), she was foaled in Hungary and raced in Austria, England, France, and Germany, as well as in her native country.

Kindah, in full KINDAT AL-MULŪK (Arabic: "The Royal Kindah"), ancient Arabian tribe that was especially prominent during the late



The domain of the Kindah in the 5th and 6th centuries AD

From C. Brockelmann, *A History of the Islamic Peoples*

5th and 6th centuries AD, when it made one of the first attempts in central Arabia to unite various tribes around a central authority. The Kindah originated in the area west of Ḥaḍramawt in southern Arabia. At the end of the 5th century AD, however, they were led by Ḥujr Ākil al-Murār, the traditional founder of the dynasty, into central and northern Arabia. There they successfully united a number of tribes into a loose confederacy. Ḥujr's grandson, al-Ḥārith ibn 'Amr, was the most renowned of the Kindah kings. Al-Ḥārith invaded Iraq and captured al-Ḥīrah, the capital of the Lakhmid king al-Mundhir III. About 529, however, al-Mundhir regained the city and killed al-Ḥārith, together with about 50 other members of the royal family—a devastating blow to Kindah power.

After al-Ḥārith's death the kingdom split up into four tribes—Asad, Taghlib, Qays, and Kinānah—each led by a Kindah prince. The tribes feuded constantly, and, after about the middle of the 6th century, the Kindah princes were forced by the local tribesmen to withdraw once more to southern Arabia.

During Muslim times, descendants of the Royal Kindah continued to hold prominent court positions, and one branch of the tribe gained great influence in Spain. The famous Arabian poet Imru' al-Qays (d. *c.* 540) was from the Kindah tribe.

kindergarten (German: "children's garden"), also called INFANT SCHOOL, educational division, a supplement to elementary school intended to accommodate children between the ages of four and six years. Originating in the early 19th century, the kindergarten was an outgrowth of the ideas and practices of Robert Owen in Great Britain, J.H. Pestalozzi in Switzerland and his pupil Friedrich Froebel in Germany, who coined the term, and Maria Montessori in Italy. It stressed the emotional and spiritual nature of the child, encouraging self-understanding through play activities and greater freedom, rather than the imposition of adult ideas.

In Great Britain the circumstances of the Industrial Revolution tended to encourage the provision of infant schools for young children whose parents and older brothers and sisters were in the factories for long hours. One of the earliest of these schools was founded at New Lanark, Scot., in 1816 by Owen, a cotton-mill industrialist, for the children of his employees. It was based on Owen's two ideals—pleasant, healthful conditions and a life of interesting activity. Later infant schools in England, unlike Owen's, emphasized memory drill and moral training while restricting the children's freedom of action. In 1836, however, the Home and Colonial School Society was founded to train teachers in the methods advanced by Pestalozzi.

In 1837 Froebel opened in Blankenburg, Prussia, "a school for the psychological training of little children by means of play." In applying to it the name *Kindergarten,* he sought to convey the impression of an environment in which children grew freely like plants in a garden. During the 25 years after Froebel's death, kindergartens proliferated throughout Europe, North America, Japan, and elsewhere. In the United States the kindergarten generally became accepted as the first unit of elementary school.

Kinderlieb, Heinrich, also called REIMERICH KINDERLIEB: *see* Hoffmann, Heinrich.

Kindī, Ya'qūb ibn Isḥāq aṣ-Ṣabāḥ, al- (d. *c.* 870), the first outstanding Islāmic philosopher, known as "the philosopher of the Arabs."

Al-Kindī was born of noble Arabic descent and flourished in Iraq under the caliphs al-Ma'mūn (813–833) and al-Mu'taṣim (833–842). He concerned himself not only with those philosophical questions that had been treated by the Aristotelian Neoplatonists of Alexandria but also with such miscellaneous subjects as astrology, medicine, Indian arithmetic, logogriphs, the manufacture of swords, and cooking. He is known to have written more than 270 works (mostly short treatises), a considerable number of which are extant, some in Latin translations.

Kindia, town, western Guinea. It lies on the Conakry–Kankan Railway and at the intersection of roads from Conakry, Mamou, Télimélé, and Makeni (Sierra Leone). Founded in 1904 as a collecting point on the railroad, it is now the chief trading centre for the rice, cattle, bananas, pineapples, citrus fruits, and palm oil and kernels produced in the surrounding area. Fruits and gmelina wood (for matches and boxes) are exported to Conakry, 70 miles (112 km) southwest. The National School of Agriculture (1961) is in the town, and the government's Institute of Fruit Research (1961) and an experimental garden are nearby. Kindia is the site of the Pasteur Institute (1925; medical research) and has a general hospital, a mosque, a Roman Catholic mission (1908), and vocational, teacher-training, and academic secondary schools. The surrounding region is inhabited by the Muslim Susu (Soussou) and Fulani (Peul) peoples. Significant bauxite deposits have been discovered and are now mined near Friguiagbé, about 8 miles (13 km) southwest of Kindia town. Pop. (1983 prelim.) 55,904.

Kindu, formerly KINDU-PORT-EMPAIN, city, east-central Zaire. It lies along the Lualaba River 390 miles (630 km) above (to the south of) Kisangani. Its location at the head of navigation on the Congo River system has long made it important for commercial transport. At one time it was the Arab-occupied transshipment point for caravans carrying goods between the Congo basin and Zanzibar. Today Kindu is the northern terminus of a railway that connects the city with the copper-mining areas to the south. The transfer of cargo between railway cars and river boats is a major economic activity. Kindu has several sawmills as well as a lively agricultural market. Both coffee and rice are grown nearby. In addition to river traffic north and rail traffic south, Kindu has road and air connections with other parts of Zaire. Pop. (1984 prelim.) 68,044.

kinematics, branch of physics and a subdivision of classical mechanics concerned with the geometrically possible motion of a body or system of bodies without consideration of the forces involved (*i.e.,* causes and effects of the motions).

A brief treatment of kinematics follows. For full treatment, *see* MACROPAEDIA: Mechanics.

Kinematics aims to provide a description of the spatial position of bodies or systems of material particles, the rate at which the particles are moving (velocity), and the rate at which their velocity is changing (acceleration). When the causative forces are disregarded, motion descriptions are possible only for particles having constrained motion—*i.e.,* moving on determinate paths. In unconstrained, or free, motion, the forces determine the shape of the path.

For a particle moving on a straight path, a list of positions and corresponding times would constitute a suitable scheme for describing the motion of the particle. A continuous description would require a mathematical formula expressing position in terms of time.

When a particle moves on a curved path, a description of its position becomes more complicated and requires two or three dimensions. In such cases continuous descriptions in the form of a single graph or mathematical formula are not feasible. The position of a particle moving on a circle, for example, can be described by a rotating radius of the circle, like the spoke of a wheel with one end fixed at the centre of the circle and the other end attached to the particle. The rotating radius is known as a position vector for the particle, and, if the angle between it and a fixed radius is known as a function of time, the magnitude of the velocity and acceleration of the particle can be calculated. Velocity and acceleration, however, have direction as well as magnitude; velocity is always tangent to the path, while acceleration has two components, one tangent to the path and the other perpendicular to the tangent.

Kineshma, city, Ivanovo *oblast* (province), western Russian S.F.S.R., on the Volga River. Founded in the 16th century, the city grew rapidly after the October Revolution in 1917 as a river port, handling cotton, petroleum, timber, and grain. The terminus of a railway from Ivanovo, Kineshma is also an important textile, chemical, and machine-building centre. Its satellite towns, Zavolzhsk, across the Volga, and Navoloki, make chemicals and cottons, respectively. Pop. (1989 prelim.) 105,000.

kinetic energy, form of energy that an object or a particle has by reason of its motion. If work, which transfers energy, is done on an object by applying a net force, the object speeds up and thereby gains kinetic energy. Kinetic energy is a property of a moving object or particle and depends not only on its motion but also on its mass. The kind of motion may be translation (or motion along a path from one place to another), rotation about an axis, vibration, or any combination of motions.

Translational kinetic energy of a body is equal to one-half the product of its mass, m, and the square of its velocity, v, or $\frac{1}{2}mv^2$.

This formula is valid only for low to relatively high speeds; for extremely high-speed particles it yields values that are too small. When the speed of an object approaches that of light (3×10^8 metres per second, or 186,000 miles per second), its mass increases, and the laws of relativity must be used. Relativistic kinetic energy is equal to the increase in the mass of a particle over that which it has at rest multiplied by the square of the speed of light.

The unit of energy in the metre-kilogram-second system is the joule. A two-kilogram mass (something weighing 4.4 pounds on Earth) moving at a speed of one metre per second (slightly more than two miles per hour) has a kinetic energy of one joule. In the centimetre-gram-second system the unit of energy is the erg, 10^{-7} joule, equivalent to the kinetic energy of a mosquito in flight. Other units of energy also are used, in specific contexts, such as the still smaller unit, the electron volt, on the atomic and subatomic scale.

For a rotating body, the moment of inertia, I, corresponds to mass, and the angular velocity (omega), ω, corresponds to linear, or translational, velocity. Accordingly, rotational kinetic energy is equal to one-half the product of the moment of inertia and the square of the angular velocity, or $\frac{1}{2}I\omega^2$.

The total kinetic energy of a body or a system is equal to the sum of the kinetic energies resulting from each type of motion.

kinetic sculpture, sculpture in which movement (as of a motor-driven part or a changing electronic image) is a basic element. In the 20th century the use of actual movement, kineticism, became an important aspect of sculpture. Naum Gabo, Marcel Duchamp, László Moholy-Nagy, and Alexander Calder were pioneers of modern kinetic sculpture.

The numerous varieties of the genre include sculptures whose components are moved by air currents, as in the well-known mobiles of Calder; by water; by magnetism, the specialty of Nicholus Takis; by electromechanical devices; or by the participation of the spectator himself. The neo-Dada satiric quality of the kinetic sculpture created during the 1960s is exemplified by the works of Jean Tinguely. His self-destructing "Homage to New York" perfected the concept of a sculpture being both an object and an event, or "happening."

The aim of most kinetic sculptors is to make movement itself an integral part of the design of the sculpture and not merely to impart movement to an already complete static object. Calder's mobiles, for example, depend for their aesthetic effect on constantly changing patterns of relationship taking place through space and time. When liquids and gases are used as components, the shapes and dimensions of the sculpture may undergo continual transformations. The movement of smoke; the diffusion and flow of coloured water, mercury, oil, and so on; pneumatic inflation and deflation; and the movement of masses of bubbles have all served as media for kinetic sculpture. In the complex, electronically controlled "spatio-dynamic" and "lumino-dynamic" constructions of Nicolas Schöffer, the projection of changing patterns of light into space is a major feature.

kinetic theory of gases, a theory based on a simplified molecular or particle description of a gas, from which many gross properties of the gas can be derived.

The British scientist James Clerk Maxwell and the Austrian physicist Ludwig Boltzmann, in the 19th century, led in establishing the theory, which became one of the most important concepts in modern science.

The simplest kinetic model is based on the assumptions that: (1) the gas is composed of a large number of identical molecules moving in random directions, separated by distances that are large compared with their size; (2) the molecules undergo perfectly elastic collisions (no energy loss) with each other and with the walls of the container, but otherwise do not interact; and (3) the transfer of kinetic energy between molecules is heat. These simplifying assumptions bring the characteristics of gases within the range of mathematical treatment.

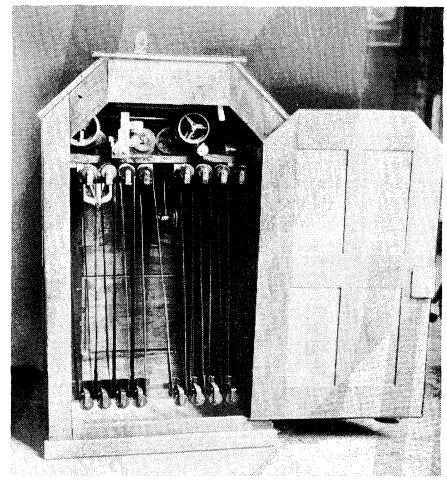
Such a model describes a perfect gas (*q.v.*) and is a reasonable approximation to a real gas, particularly in the limit of extreme dilution and high temperature. Such a simplified description, however, is not sufficiently precise to account for the behaviour of gases at high densities.

Based on the kinetic theory, pressure on the container walls can be quantitatively attributed to random collisions of molecules the average energy of which depends upon the gas temperature. The gas pressure can therefore be related directly to temperature and density. Many other gross properties of the gas can be derived, such as viscosity, thermal and electrical conduction, diffusion, heat capacity, and mobility. In order to explain observed deviations from perfect gas behaviour, such as condensation, the assumptions must be appropriately modified. In doing so, considerable insight has been gained as to the nature of molecular dynamics and interactions.

kinetics, branch of classical mechanics that concerns the effect of forces and torques on the motion of bodies having mass. Authors using the term kinetics apply the nearly synonymous name dynamics (*q.v.*) to the classical mechanics of moving bodies. This is in contrast to statics, which concerns bodies at rest, under equilibrium conditions. They include under dynamics both kinetics and kinematics (the description of motion in terms of position, velocity, and acceleration, apart from the influence of forces, torques, and masses). Authors not using the term kinetics divide classical mechanics into kinematics and dynamics, including statics as a special case of dynamics in which the sum of the forces and the sum of the torques are both zero.

Kinetoplastida, protozoan order, formerly called Protomonadida or Protomastigida, the members of which are sometimes referred to as protomonads. *See* protomonad.

Kinetoscope, forerunner of the motion-picture film projector, invented by Thomas A. Edison and William Dickson of the United States in 1891. In it, a strip of film was passed rapidly between a lens and an electric light bulb while the viewer peered through a peephole. Behind the peephole was a spinning wheel with a narrow slit that acted as a shutter, permitting a momentary view of each of the 46 frames passing in front of the shutter every second. The result was a lifelike representation of persons and objects in motion. At first, Edison regarded his invention as an insignificant toy. He secured a U.S. patent, but neglected to obtain patents in other countries; in 1894, when the Kinetoscope was finally publicly exhibited on Broadway, in New York City, it created an immediate sensation.



Kinetoscope, invented by Thomas A. Edison and William Dickson in 1891
The Bettmann Archive

Several Kinetoscopes sold in Europe formed the basis of the first apparatus used to project motion-picture film. *See also* Cinématographe.

king, feminine QUEEN, a supreme ruler, sovereign over a nation or a territory, of higher rank than any other secular ruler except an emperor, to whom a king may be subject. Kingship, a worldwide phenomenon, can be elective, as in medieval Germany, but is usually hereditary; it may be absolute or constitutional and usually takes the form of a monarchy, although dyarchies have been known, as in ancient Sparta, where two kings ruled jointly. The king has often stood as mediator between his people and their god, or, as in ancient Sumer, as the god's representative.

Sometimes he himself has been regarded as divine and has become the key figure in fertility rituals; such religions often ultimately required the death either of the king himself or of an official substitute as a sacrifice to the gods. The concept of divinity, brought in from Egypt, characterized the Hellenistic Age, and was later revived by the Roman emperors. The Christian Roman emperors assumed authority as representatives of God, and, in medieval political theory, kingship was early regarded as to some extent analogous with the priesthood, the ceremony of anointing at the coronation becoming highly significant.

King, queen
foreign-language equivalents

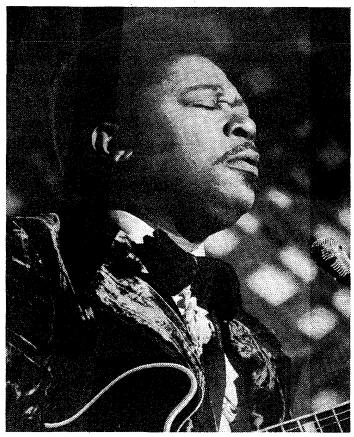
	masculine	feminine
Czech	král	královna
Danish	konge	dronning
Dutch	koning	koningin
French	roi	reine
German	König	Königin
Hungarian	király	királynö
Italian	re	regina
Latin	rex	regina
Norwegian	konge	dronning
Polish	król	królowa
Portuguese	rei	rainha
Romanian	rege	reginä
Russian	korol	koroleva
Serbo-Croatian	kralj	kraljica
Spanish	rey	reina
Swedish	konung	drottning

The absolute monarchies of the 16th to 18th century were often strengthened by the establishment of nationalist churches; but from the 17th century in England and, later, in other countries, kingship was made constitutional, royal power being held to derive from the people rather than from God.

King, B.B., byname of RILEY B. KING (b. Sept. 16, 1925, Itta Bena, near Indianola, Miss.,

U.S.), U.S. blues guitarist who was recognized as a principal figure in the development of rhythm and blues and from whose style the leading popular musicians drew inspiration.

Reared in the Mississippi delta, King grew up with the music of a black church. This gospel–spiritual background was later influenced by country blues men such as Blind Lemon Jefferson and, later, by such jazz guitarists as Django Reinhardt and Charlie Christian. These diverse influences served to mold his unique style characterized by vocal calls balanced against masterfully lyrical guitar responses. He worked for a time as a disk jockey in Memphis, where his radio name, Beale Street Blues Boy, was soon shortened to B.B. In 1949 he made a record (*Three O'Clock in the Morning*) that sold well in the rhythm and blues market; he then appeared for 20 years in black clubs and bars throughout the country, often playing 300 or more one-night stands a year, a practice he continued after he became successful. Unwilling to alter his style to attract the popular audience, he remained an admired performer in an obscure field until the rock guitarists whom he



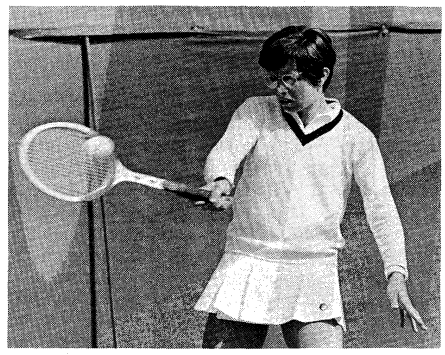
B.B. King, 1972
By courtesy of Sidney A. Seidenberg, Inc.

strongly influenced acknowledged his priority and introduced him to the white public in the late 1960s. His music influenced a number of British rock musicians. King and his red guitar, Lucille, were eagerly accepted by listeners who had never before heard rhythm and blues in other than derivative versions, and he was soon rated at the top of both popular and critics' polls. He performed frequently in prisons. A biography by Charles Sawyer, *The Arrival of B.B. King,* was published in 1980.

King, Billie Jean, *née* MOFFITT (b. Nov. 22, 1943, Long Beach, Calif., U.S.), U.S. tennis player whose influence and playing style elevated the status of women's professional tennis beginning in the late 1960s. For 20 years she was a major figure in tennis and the all-time Wimbledon champion.

King learned to play tennis on public courts; she first attracted international attention in 1961 by winning the Wimbledon doubles championship with Karen Hantz; it was the youngest team to win. She went on to capture a record of 20 Wimbledon titles (singles 1966–68, 1972–73, and 1975; women's doubles 1962, 1967–68, 1970–73, 1979; mixed doubles 1967, 1971, 1973–74), in addition to U.S. singles (1967, 1971–72, 1974), French singles in 1972, and the Australian title in 1968. She was perhaps one of the greatest doubles players in the history of tennis.

Between 1960 and 1979 King (who was married in 1965) was ranked among the top 10 players in the United States 16 times (number one, seven times), making her the major competitor until Chris Evert rose to prominence in 1973, and a perennial threat afterward. King turned professional after 1968 and became the first woman athlete to win more than $100,000 in one season (1971). In 1973 she beat the aging professional Bobby Riggs in a much-publicized "Battle of the Sexes" match, after Riggs had triumphed over Margaret Smith Court. The match set a record for the largest tennis audience and the largest purse awarded up to that time. She pushed relentlessly for the rights of women players, helped to form a separate women's tour, and obtained financial backing from commercial sponsors. She was one of the founders and first president (1974) of the Women's Tennis Association. In the late 1970s King co-founded *Women's Sports* magazine.



Billie Jean King
Colorsport

King, Clarence (b. Jan. 6, 1842, Newport, R.I., U.S.—d. Dec. 24, 1901, Phoenix, Ariz.), U.S. geologist and mining engineer who organized and directed the U.S. Geological Survey of the 40th parallel, an intensive study of the mineral resources along the site of the proposed Union Pacific Railroad. In 1863 he set out from the eastern seaboard, by foot and on horseback, across the continent to San Francisco, where he joined the Geological Survey of California. During the next three years he discovered Mt. Whitney in the southern Sierras and explored the desert regions of southern California and Arizona.

In 1867 King convinced the U.S. government that a geological study should be made for the future development of the mineral resources in the areas that would be served by the Union Pacific Railroad. The resulting 10-year study covered a 100-mile-wide strip along the 40th parallel from eastern Colorado to the California border. King's report, "Systematic Geology" (1878), is considered a masterpiece. During this survey he discovered the first glaciers in the United States while studying the extinct volcanoes Mt. Shasta, Mt. Rainier, and Mt. Hood.

When King learned of a spectacular diamond field in Colorado, he grew concerned because his recent study of that area gave no indication that gemstones might occur there. He visited the site and discovered that it had been salted with second-rate uncut stones. He immediately went to San Francisco and exposed the fraud, thus saving the investing public more than $10,000,000.

Instrumental in reorganizing the western surveys into the U.S. Geological Survey, King agreed to become the first director (1879) only until he could appoint the staff and get the work started. He retired as director in 1881 to devote himself to geological study. He also entered into private practice as a mining engineer and a consultant in mining lawsuits. He wrote occasional magazine articles and the popular *Mountaineering in the Sierra Nevada* (1872).

King, Frank (b. April 9, 1883, Cashton, Wis., U.S.—d. June 24, 1969, Winter Park, Fla.), U.S. comic-strip artist who created "Gasoline Alley," a long-popular comic strip notable for its warmly sympathetic picture of small-town life.

After working as a cartoonist for the *Minneapolis Times* from 1901 to 1905, King moved to Chicago, where he attended the Chicago Academy of Fine Arts and was employed as a cartoonist, first on the *Chicago Examiner* and then on the *Chicago Tribune.* At the *Tribune* he created "Gasoline Alley," so named because it dealt with a group of automobile enthusiasts who met in an alley. The strip appeared first in 1919, and in 1921 it was given a family character by having a newborn infant left on the doorstep of the principal character, Walt Wallet. Walt gave the baby the name Skeezix, and since then the characters have been permitted to grow older, marry, and have children of their own. Skeezix, for instance, went through high school in the 1930s and was middle-aged in the 1960s.

King, Franklin Hiram (b. June 8, 1848, near Whitewater, Wis., U.S.—d. Aug. 4, 1911, Madison, Wis.), U.S. agricultural scientist, inventor of the cylindrical tower silo. He also invented a gravity system of ventilation for dairy barns that was widely used until electrically powered blowers became commonly available.

King worked for the Wisconsin Geological Survey from 1873 to 1876. While teaching at River Falls (Wis.) State Normal School (1878–88), he prepared, with his wife, Carrie H. Baker, some of the first large-scale relief maps for use in physiography and meteorology. For the University of Wisconsin (Madison) College of Agriculture, where he taught from 1888 to 1901, he built (1889) a cylindrical barn, which became the model for tower silos. In the 1920s several European architects, including Walter Gropius, found inspiration in the U.S.-developed silo and grain-elevator forms, which they adapted to other purposes. It has been suggested that Frank Lloyd Wright, who as a youth lived in Madison, may have been influenced in his interest in geometric forms by King's design.

King was head of the U.S. Bureau of Soils, Division of Soil Management, from 1901 to 1904. Among his writings is *The Soil* (1895), which, in translation, was extensively studied in China.

King, Gregory (Dec. 15, 1648, Lichfield, Staffordshire, Eng.—d. Aug. 29, 1712, London), English genealogist, engraver, and statistician, best known for his *Natural and Political Observations and Conclusions upon the State and Condition of England, 1696,* first published in 1801, which gives the best available picture of England's population and wealth at the end of the 17th century. A man of remarkable versatility, he edited the *Book of Roads,* for which he supervised the engravings (executing several himself), assisted in the drawing of the map of London, and constructed the map of Westminster.

King was responsible for the layout of the streets and squares in Soho, London, and for drawing up many of the first building leases in various parts of London. He was also a specialist in heraldry and was employed at coronations and other ceremonials at home and abroad. His autobiography was published posthumously in J. Dallaway's *Science of Heraldry* (1793).

King, Henry (baptized Jan. 16, 1592, Worminghall, Buckinghamshire, Eng.—d. Sept. 30, 1669, Chichester, Sussex), English poet and Anglican bishop whose elegy for his wife is considered one of the best in the English language.

Educated at Oxford, he received numerous and remunerative preferments. A friend and an executor of the estate of John Donne, his poetry was as much influenced by Ben Jonson as by Donne. King became bishop of Chich-

ester in 1642, but his estate was sequestered during the interregnum and he spent the time until the Restoration (1660) in restless retirement with friends and relations. The collection *Poems, Elegies, Paradoxes, and Sonets* (1657), bearing his name, was not prepared by him and included poems of others. The standard modern edition is that of Margaret Crum (1965).

King, Martin Luther, Jr. (b. Jan. 15, 1929, Atlanta, Ga., U.S.—d. April 4, 1968, Memphis, Tenn.), eloquent black Baptist minister, who led the mass civil rights movement in the United States from the mid-1950s until



Martin Luther King, Jr.
Julian Wasser

his death by assassination. He rose to national prominence through the organization of the Southern Christian Leadership Conference, promoting nonviolent tactics such as the massive March on Washington (1963) to achieve civil rights. He was awarded the Nobel Prize for Peace in 1964. The U.S. Congress voted to observe a national holiday in his honour, beginning in 1986, on the third Monday in January.

Early years. King came from a family steeped in the tradition of the Southern black ministry: both his father and maternal grandfather were Baptist preachers. At the age of 15 he entered Morehouse College, Atlanta, under a special program for gifted students, receiving his B.A. in 1948. As an undergraduate his earlier interests in medicine and law were eclipsed by a decision in his senior year to enter the ministry, as his father had urged. Spending the next three years at Crozer Theological Seminary in Chester, Pa. (bachelor of divinity, 1951), King first became acquainted with Mohandas Gandhi's philosophy of nonviolence as well as with the thought of contemporary Protestant theologians. He found himself increasingly dissatisfied with the Social Gospel of Walter Rauschenbusch and yet unable to accept the pessimism of Reinhold Niebuhr's Neo-orthodoxy, which was an attempt to return to the basic theological principles of the 16th century. He was elected president of the student body and was graduated with the highest academic average in his class. From Crozer he went to Boston University (Ph.D., 1955), where, in seeking a firm foundation for his own theological and ethical inclinations, he began to focus his attention on conceptions of the relationship of man to God. In his doctoral dissertation, "A Comparison of the Conceptions of God in the Thinking of Paul Tillich and Henry Nelson Wieman," his conclusions were fairly Niebuhrian. King himself conceived of God as an active, personal entity; man's salvation was to be found neither in the quest for social progress (Rauschenbusch) nor in the unaided power of reason (Wieman); faith in God's guidance was the essential thing.

The Montgomery bus boycott. While in Boston, King met Coretta Scott, a native Alabamian who was studying at the New England Conservatory of Music. They were married in 1953 and had four children. King had been pastor of the Dexter Avenue Baptist Church in Montgomery, Ala., slightly more than a year when the city's small group of civil rights advocates decided to contest racial segregation on the public buses. On Dec. 1, 1955, Rosa Parks had refused to surrender her bus seat to a white passenger and had been arrested for violating the city's segregation law. Black activists formed the Montgomery Improvement Association to boycott the transit system and chose King as their leader. He had the advantage of being a young, well-trained man who was too new in town to have made enemies; he was generally respected, and his family connections and professional standing would enable him to find another pastorate should the boycott fail.

In his first speech to the group as its president, King declared:

> We have no alternative but to protest. For many years we have shown an amazing patience. We have sometimes given our white brothers the feeling that we liked the way we were being treated. But we come here tonight to be saved from that patience that makes us patient with anything less than freedom and justice.

These words introduced to the nation a fresh voice, a skillful rhetoric, an inspiring personality, and in time a dynamic new doctrine of civil struggle. Although King's home was dynamited and his family's safety threatened, he refused to yield his faith in ultimate victory; one year and a few weeks later, the blacks of Montgomery achieved their goal of desegregation of the city's buses.

The Southern Christian Leadership Conference. Recognizing the need for a mass movement to capitalize on the successful Montgomery action, King set about organizing the Southern Christian Leadership Conference (SCLC), which gave him a base of operation throughout the South, as well as a national platform from which to speak. King lectured in all parts of the country, discussed problems of blacks with civil rights and religious leaders at home and abroad, visited Ghana and India, and conferred with heads of state. In February 1959 he and his party were warmly received by India's prime minister Jawaharlal Nehru; as the result of a brief discussion with followers of Gandhi about the Gandhian concepts of *satyāgraha* ("devotion to truth"), King became more convinced than ever that nonviolent resistance was the most potent weapon available to oppressed people in their struggle for freedom.

In 1960 he moved to his native city of Atlanta, where he became copastor with his father of the Ebenezer Baptist Church. At this post he devoted most of his time to the SCLC and the civil rights movement, declaring that the "psychological moment has come when a concentrated drive against injustice can bring great, tangible gains." His thesis was soon tested as he agreed to support the sit-in demonstrations undertaken by local college students. In late October he was arrested with 33 young people protesting segregation at the lunch counter in an Atlanta department store. Charges were dropped, but King was sentenced to Reidsville State Prison Farm on the pretext that he had violated his probation on a minor traffic offense committed several months earlier. The case assumed national proportions, with widespread concern over his safety, outrage at Georgia's flouting of legal forms, and failure of Pres. Dwight Eisenhower to intervene. King was released only upon the intercession of Democratic presidential candidate John F. Kennedy—an action so widely publicized in the black community throughout the nation that it was felt to have contributed substantially to Kennedy's slender election victory eight days later.

In the years from 1960 to 1965 King's influence reached its zenith. The tactics of active nonviolence (sit-ins, protest marches) aroused the devoted allegiance of many blacks and liberal whites in all parts of the country, as well as support from the administrations of presidents Kennedy and Lyndon B. Johnson. There were also notable failures, as at Albany, Ga. (1961–62), when King and his colleagues failed to achieve their desegregation goals for public parks and other facilities.

The letter from the Birmingham jail. In Birmingham, Ala., in the spring of 1963, King's campaign to end segregation at lunch counters and in hiring practices drew nationwide attention when police turned dogs and firehoses on the demonstrators. King was jailed along with large numbers of his supporters, including hundreds of schoolchildren. His supporters did not, however, include all the black clergy of Birmingham, and he was strongly opposed by some of the white clergy who had issued a statement urging the blacks not to support the demonstrations. From the Birmingham jail King wrote a letter of great eloquence in which he spelled out his philosophy of nonviolence:

> You may well ask: "Why direct action? Why sit-ins, marches and so forth? Isn't negotiation a better path?" You are quite right in calling for negotiation. Indeed, this is the very purpose of direct action. Nonviolent direct action seeks to create such a crisis and foster such a tension that a community which has constantly refused to negotiate is forced to confront the issue. It seeks so to dramatize the issue that it can no longer be ignored. . . . We know through painful experience that freedom is never voluntarily given by the oppressor; it must be demanded by the oppressed.

Near the end of the Birmingham campaign, in an effort to draw together the multiple forces for peaceful change and to dramatize to the nation and to the world the importance of solving the U.S. racial problem, King joined other civil rights leaders in organizing the historic March on Washington. On Aug. 28, 1963, an interracial assembly of more than 200,000 gathered peaceably in the shadow of the Lincoln Memorial to demand equal justice for all citizens under the law. Here the crowds were uplifted by the emotional strength and prophetic quality of King's famous "I have a dream" speech, based on biblical phraseology. In emphasizing his faith that all men, someday, would be brothers, the vision of the philosopher, the faith of the Christian, and the rhetoric of the Southern Baptist preacher all conjoined powerfully to inspire his followers throughout the world.

The rising tide of civil rights agitation produced, as King had hoped, a strong effect on national opinion and resulted in the passage of the Civil Rights Act of 1964, authorizing the federal government to enforce desegregation of public accommodations and outlawing discrimination in publicly owned facilities, as well as in employment. That eventful year was climaxed by the award to King of the Nobel Prize for Peace at Oslo in December. He interpreted his role and his times thus:

> I accept the Nobel Prize for Peace at a moment when twenty-two million Negroes of the United States of America are engaged in a creative battle to end the long night of racial injustice. . . . Yet when the years have rolled past . . . men and women will know and children will be taught that we have a finer land, a better people, a more noble civilization—because these humble children of God were willing to suffer for righteousness' sake.

Challenges of the final years. The first signs of opposition to King's tactics from within the civil rights movement surfaced during the March 1965 demonstrations at Selma, Ala., which were aimed at dramatizing the need for

a federal voting rights law. King organized an initial march from Selma to the state capitol building in Montgomery but did not lead it himself; the marchers were turned back by state troopers with nightsticks and tear gas. He determined to lead a second march, despite an injunction by a federal court and efforts from Washington to persuade him to cancel it. Heading a procession of 1,500 marchers, black and white, he set out across Pettus Bridge outside Selma until the group came to a barricade of state troopers. But, instead of going on and forcing a confrontation, he led his followers in kneeling in prayer and then unexpectedly turned back. This decision cost King the support of many young radicals who were already faulting him for being too cautious and mocking him with the title "de Lawd." The suspicion of an "arrangement" with federal and local authorities—vigorously but not entirely convincingly denied—clung to the Selma affair. The country was nevertheless aroused, resulting in the passage of the Voting Rights Act of 1965.

Throughout the nation, impatience with the lack of greater substantive progress encouraged the growth of black militancy. Especially in the slums of the large Northern cities, King's religious philosophy of nonviolence was increasingly questioned. The rioting in the Watts district of Los Angeles (August 1965) demonstrated the depth of the urban race problem. In an effort to meet the challenge of the ghetto, King and his forces initiated a drive against racial discrimination in Chicago at the beginning of the following year. The chief target was to be segregation in housing. After a spring and summer of rallies, marches, and demonstrations, a Summit Agreement was signed between the city and a coalition of blacks, liberals, and labour organizations, calling for various measures to strengthen the enforcement of existing laws and regulations with respect to housing. But this agreement was to have little effect; the impression remained that King's Chicago campaign was nullified partly because of the opposition of the powerful mayor, Richard J. Daley, and partly because of the unexpected complexities of Northern racism. His presence in the Northern city, however, left a long-term legacy of hope among black people, for he inspired the creation of specific institutions (such as the West Side tenants movement and Operation Breadbasket, the economic arm of the SCLC) through which social ills could continue to be attacked even after he was gone.

In Illinois and Mississippi alike, King was now being challenged and even publicly derided by young black power enthusiasts. But he found compassion for his dissatisfied brethren when he considered the great disillusionment attendant upon his "radiant promises of progress," as compared with his inability to deliver on those promises. In the face of mounting criticism, King's response was to broaden his approach to include concerns other than racism that were equally detrimental to his people's progress. On April 4, 1967, at Riverside Church in New York City and again on the 15th at a mammoth peace rally in that city, he committed himself irrevocably to opposition of the war in Vietnam. Once before, in early January 1966, he had condemned the war, but official outrage from Washington and strenuous opposition within the black community itself had caused him to relent. He next sought to widen his base by forming a coalition of the poor of all races that would address itself to such economic problems as poverty and unemployment. It was a species of populism, seeking to enroll janitors, hospital workers, seasonal labourers, and the destitute of Appalachia, along with the student militants and pacifist intellectuals. "For years I laboured with the idea of reforming the existing institutions of society," he confessed, "a little change here, a little change there. Now I feel quite differently. I think you've got to have a reconstruction of the entire society, a revolution of values." His endeavours along these lines, however, did not engender much support in any segment of the population.

His plans for a Poor People's March to Washington were interrupted in the spring of 1968 by a trip to Memphis, Tenn., in support of a strike by city sanitation workers. On April 4 he was killed by a sniper's bullet while standing on the balcony of the motel where he and his associates were staying. On March 10, 1969, the accused white assassin, James Earl Ray, pleaded guilty to the murder and was sentenced to 99 years in prison.

Assessment. The contribution of Martin Luther King to the black freedom movement was that of a leader who was able to turn protests into a crusade, to translate local conflicts into moral issues of nationwide concern. Successful in awakening the black masses and galvanizing them into action, he won his greatest victories by appealing to the consciences of white Americans and thus bringing political leverage to bear on Washington. The strategy that broke the segregation laws of the South, however, was not adequate to solve more complex racial problems elsewhere. King was only 39 at the time of his death—a leader in midpassage who regarded himself as a "drum major" for justice, peace, and righteousness. Although he never wavered in his insistence that nonviolence must remain the essential tactic of the movement nor in his faith that all Americans would some day attain racial and economic justice, he did not take for granted the immediate future either of his own leadership or of the causes for which he fought. "Well, I don't know what will happen now," he said characteristically—and prophetically—in his last address in Memphis, "but it really doesn't matter with me now. Because I've been to the mountaintop. . . . I may not get to the promised land with you, but I want you to know tonight that we as a people will."

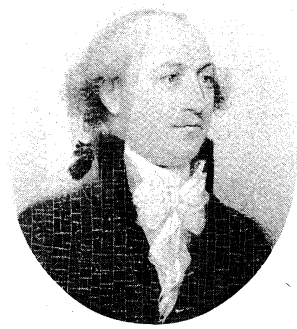
(D.L.Le.)

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King, Rufus (b. March 24, 1755, Scarborough, Mass.—d. April 29, 1827, Jamaica, N.Y., U.S.), a founding father of the United States who helped to frame the federal Constitution and to effect its ratification; an active Federalist senator and able diplomat, he ran unsuccessfully for vice president (1804, 1808) and for president (1816).

Beginning his career in Massachusetts, King served in the state legislature (1783–84) and in the Continental Congress (1784–87), where he introduced the resolution (Feb. 21, 1787) calling for a convention at Philadelphia to draft a new Constitution. An eloquent advocate of a strong central government, he signed the new document and contributed substantially to its acceptance in Massachusetts. In the Continental Congress he introduced a resolution (1785) that would prohibit slavery in the Northwest Territory—a provision included permanently in the Ordinance of 1787, which set the pattern for future standards in the territories.

In 1788 King moved to New York where, after a year in the state assembly, he was elected one of its first U.S. senators (1789–96)

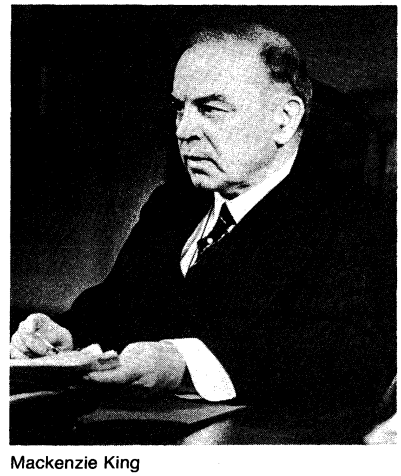


Rufus King, oil painting on wood by John Trumbull, 1792; in the Yale University Art Gallery

By courtesy of the Yale University Art Gallery

and became a recognized Federalist leader in Congress. Sharing the Anglophile sentiments of his party, King went on to represent the new nation with tact yet firmness as ambassador to Great Britain for eight years (1796–1803) and again in 1825–26. During the period of domination by the (Jeffersonian) Republican Party, King served once more in the Senate (1813–25) but received only a modest proportion of electoral votes for the nation's highest offices on three different occasions.

King, W(illiam) L(yon) Mackenzie (b. Dec. 17, 1874, Berlin, Ont., Can.—d. July 22, 1950, Kingsmere, Que.), prime minister of Canada (1921–26, 1926–30, 1935–48) and leader of the Liberal Party, who helped preserve the unity of the English and French populations of Canada.



Mackenzie King

National Film Board of Canada Phototheque

Education. Mackenzie King, as he is usually called, was the son of John King and Isabel Grace Mackenzie, daughter of William Lyon Mackenzie, a leader of the Rebellion of 1837 aimed at establishing self-government in Upper Canada. Isabel, born while Mackenzie was in exile after the Rebellion, taught her son from childhood that it was his destiny to vindicate his grandfather. King had an outstanding academic career at Toronto, Chicago, and Harvard universities, broadened by travel in England and Germany. In Chicago (where he stayed at Jane Addams' Hull House) and in London, he engaged in social settlement work that profoundly influenced his later life. He was among the first Canadian politicians

to show an active interest in the workers in industry.

Early career. In 1900 King declined an academic post at Harvard to take a civil service post as deputy minister of labour in the newly formed government department at Ottawa. In his new position he edited the *Labour Gazette* and showed a remarkable capacity for conciliating industrial disputes. His work brought him favourably to the attention of the Liberal prime minister Sir Wilfrid Laurier. Although King was by nature impetuous, his Presbyterian upbringing and diffident manner gave him an appearance of modesty and a veneer of prudence that became almost second nature. At decisive moments, however, he would overcome his caution and take great risks to further the destiny in which he increasingly believed. Such a risk was his resignation in 1908 from the civil service to stand as the Liberal candidate for Parliament for his native county, North Waterloo, a Conservative stronghold. Elected in 1908, he joined the Laurier government in 1909 as the first full-time minister of labour in Canada. King lost his seat when the government was defeated in 1911. For the next three years he occupied himself with party publicity and organization while seeking vainly an opportunity to return to Parliament. In 1914 he accepted a post with the Rockefeller Foundation to investigate industrial relations in the United States, resulting in 1918 in the publication of *Industry and Humanity.* When he accepted the Rockefeller post, King had insisted on residing in Canada, and, in the 1917 election, he unsuccessfully contested North York as a Laurier Liberal.

Liberal leader. After Laurier's death in 1919, King became leader of the Liberal Party. His loyalty to Laurier in 1917 was probably the decisive factor in the leadership contest, though his advocacy of social reform without socialism appealed to many of the younger party members. Leadership of the Liberal Party in 1919 was no assurance of political success. During World War I the party had split over conscription mainly along English–French lines, and several leading Liberals had joined the Conservatives in a Union Government. Moreover, the western base of the party had been sapped by the rise of an agrarian party, the Progressives.

After the defeat of the Union Government in the election of 1921, King became prime minister on December 29, although his party was just short of a majority in Parliament. The future of King and his party was far from secure. In the election of 1925, he made an appeal for a majority but emerged with fewer seats in Parliament than the Conservatives. Despite this apparent Liberal defeat, the Conservatives also lacked a majority. Instead of resigning, King met with Parliament, where, with the support of Progressive and Independent members, his government won a vote of confidence. The government carried on in 1926 for six months, but, with the emergence of a scandal in the customs department, support in Parliament declined. King decided to end the uncertainty and advised the governor general to dissolve Parliament. When his advice was not taken, he resigned. The Conservative leader, Arthur Meighen, formed a government that was defeated in Parliament two days later. Meighen was given the dissolution that King had been refused. The 1926 election was fought on the constitutional issue. Because of alliances between Liberals and Progressives in many constituencies, King found himself for the first time with a decisive majority in Parliament. He became prime minister again on September 25. Late in 1926, at the Imperial Conference in London, King's was probably the determining voice in securing the declaration of equality of status of the self-governing nations of the empire, thereafter styled the Commonwealth.

Wartime leadership. King's government lost the election of 1930, and he led the opposition through the worst years of the Great Depression and won an overwhelming victory in the election of 1935. From then until his retirement in 1948, King was prime minister and the dominant personality in Canadian public life. It was his leadership of the country through six years of war and three years of postwar reconstruction that gave King a commanding place in Canadian history. During those years, he led a country, long divided over external policy, unitedly into war in 1939; surmounted two political crises over conscription, one nearly fatal to his government; and won the postwar election. The government he led organized a tremendous military, industrial, and financial contribution to the war and at the same time prepared for a smooth and rapid advance in economic development and social welfare afterward. When King retired, his successor, Louis St. Laurent, took over a strong government, a united and effective political party, and a rapidly growing and self-confident country.

This remarkable record was achieved by a lonely bachelor, lacking in popular appeal, political eloquence, or the trappings of strong leadership. His success was a compound of acute intuitions of the public mood and a superb capacity for the management of men. He died a year and a half after leaving office.

(Jo.W.P.)

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King, William (Maori chief): *see* Kingi, Wiremu.

King, William Rufus de Vane (b. April 7, 1786, Sampson County, N.C., U.S.—d. April 18, 1853, Cahaba, Ala.), politician who concluded a long career by being elected—but never actually serving as—vice president of the United States.

After being graduated from the University of North Carolina (Chapel Hill) in 1803, King studied law and was admitted to the bar in 1806. He turned almost immediately to politics, serving in the state legislature and later in the U.S. House of Representatives. In the House he was part of the War Hawk faction.

King resigned from the House in 1816 to serve as secretary of legation to William Pinkney, the U.S. minister plenipotentiary to Russia. When he returned in 1818, he moved to Alabama. Again he entered politics, serving in Alabama's first constitutional convention and later becoming one of the state's first U.S. senators. In 1836–41, he was president pro tempore of the Senate, and he remained a senator until 1844.

In April of that year, Pres. John Tyler appointed King U.S. minister to France. His mission was to keep France from interfering with U.S. annexation of Texas from Mexico. France did not interfere, and in 1846 King was again in the United States. He ran for the Senate once again but was defeated. Appointed in 1848 to fill an unexpired term in the Senate, he remained in office until 1852.

At the Democratic Party convention that year, King was the beneficiary of Franklin Pierce's victory over James Buchanan for the presidential nomination. King, a Buchanan backer, was offered the vice-presidential nomination in an effort to placate Buchanan's supporters. The Pierce–King ticket won the election, but King was too ill with tuberculosis to attend the inauguration in March 1853. He took the oath of office in Cuba, where he had gone in search of a cure. He returned to Alabama a few weeks later, determined to assume his responsibilities, but died the day after he reached his plantation.

King Cotton, phrase frequently used by Southern politicians and authors prior to the U.S. Civil War, indicating the high economic and political esteem in which cotton production was held. After the invention of the cotton gin (1793), cotton surpassed tobacco as the dominant cash crop in the agricultural economy of the South, soon comprising more than half the total U.S. exports.

The concept of "King Cotton" was first suggested in David Christy's book *Cotton Is King* (1855). Convinced of the supremacy of its commodity at home and abroad, the South was confident of success if secession from the Union should lead to war. On the floor of the U.S. Senate, Sen. James H. Hammond declaimed (March 4, 1858): "You dare not make war upon cotton! No power on earth dares make war upon it. Cotton is king."

The South was wrong. Skillful diplomacy by the North, coupled with English Abolitionist allegiances and Confederate military failure at crucial stages of the war, kept Britain from intervening. Rather than enter the war on the side of the slave states, Britain developed alternate sources of cotton cultivation elsewhere in the empire. To the detriment of the entire region, the South continued after the war to be a one-crop economy until the 20th century, when the New Deal and World War II encouraged diversification and industrialization. *See* Confederate States of America; South, The.

King Country, also called WESTERN UPLANDS, geographical region in North Island, New Zealand. Lying west of Lake Taupo and south of Hamilton, it embraces an area of 7,000 sq mi (18,000 sq km). It is bordered by the Waikato River (northeast), the Tasman Sea (west), the Ohura River (southwest), and by the Kaimanawa Mountains (southeast). The terrain is highly dissected, with several low mountain ranges and river valleys. The Rangitoto and the Hauhungaroa ranges, which extend through the central part of the region are the source of the headwaters of the Mangatutu, Waipa, Mangaokewa, Ongarue, and other rivers. Three volcanic peaks, Tongariro (6,457 ft [1,968 m]), Ngauruhoe (7,513 ft [2,290 m]), and the Ruapehu (9,176 ft [2,797 m]), form part of Tongariro National Park, located within the region.

The infertile soil is not very useful for agriculture, although livestock raising and dairying are pursued; logging is also important. The Taranaki iron sands still await development as an exploitable resource.

Europeans called the area "King Country" because it was here that Tawhiao, a Maori king, sought refuge in 1865, following the Maori Wars. The region remained under Maori control until 1881, when it was surrendered to the government.

Important towns are Te Kuiti, Taumarunui, and Turangi. Several roads cross the region from the coastal areas in the west to the interior in the northeast and southeast.

king crab, also called ALASKAN KING CRAB, or JAPANESE CRAB (*Paralithodes camtschatica*), marine crustacean of the order Decapoda. This edible crab is found in the shallow waters off Japan and along the coast of Alaska. It also inhabits the Bering Sea. The king crab is one of the largest crabs, weighing 5 kilograms (11 pounds) or more. Its size and tasty flesh make it a valued food, and large numbers are commercially fished each year.

The name king crab is also used for members of the arthropod subclass Xiphosura, which is commonly called horseshoe crab (*q.v.*).

King–Crane Commission (1919), commission appointed at the request of U.S. President Woodrow Wilson during the Paris Peace Conference of 1919 to determine the attitudes of the inhabitants of Syria and Palestine toward the post-World War I settlement of their territories. The commission, formed when attempts at creating an Anglo-French group failed, was headed by Oberlin (Ohio) College president Henry C. King and Chicago businessman Charles R. Crane. Touring Syria and Palestine between June 10 and July 21, 1919, and soliciting petitions from local inhabitants, the commission found that a vast majority of Arabs favoured an independent Syria, free of any French mandate, and that, of about 1,875 petitions received, 72 percent were hostile to the Zionist plan for a Jewish national home in Palestine. Such findings, coupled with Zionist talk of dispossession of the Arabs, led the commission to advise a serious modification of the Zionist immigration program in Palestine.

King George Sound, formerly KING GEORGE III SOUND, one of the finest natural harbours of Western Australia's south coast. An inlet of the Indian Ocean, the sound, with a surface area of 35 square miles (91 square km), has an entrance 5 miles (8 km) wide flanked by Bald Head on the southwest and Cape Vancouver on the northeast. Its shores are generally steep and rocky. Breaksea and Michaelmas islands lie within the sound, which has two extensions, Oyster Harbour (north) and Princess Royal Harbour (west), the site of the port for the city of Albany. The inlet, charted (1791) by Captain George Vancouver and named by him after the reigning English king, was used as a whaling base as early as 1801. The King George III Sound settlement, predecessor of Albany, was founded in 1826. During World War II, the inlet was used as a U.S. naval base.

King George's War (1744–48), American phase of the War of the Austrian Succession, third and inconclusive struggle between France and Great Britain for mastery of the North American continent.

Though technically at peace between 1713 and 1744, the two colonial powers experienced continual differences over boundaries of Acadia (Nova Scotia) and northern New England as well as control of the Ohio Valley. The war was characterized by bloody border raids by both sides with the aid of their Indian allies. The only important victory was the New Englanders' capture of Louisbourg, Cape Breton Island, on June 15, 1745. Despite ambitious plans, there was little effective military aid from either mother country. Tired of costly and vain struggle, the warring parties signed the Peace of Aix-la-Chapelle (1748), mutually restoring conquered territory but failing to solve important colonial questions.

King Island, island in Bass Strait, 50 miles (80 km) off the northwestern coast of Tasmania, Australia. About 40 miles by 15 miles (64 km by 24 km), with an area of 424 square miles (1,098 square km), it has a gently rolling surface rising to Mount Stanley (700 feet [213 m]). The island was sighted in 1798 by a Captain Reed and was claimed for Great Britain in 1802 to prevent the French from taking possession. Named in 1801 for Philip Gidley King, third governor of New South Wales, and first settled in 1855, it now constitutes a municipality. Mixed livestock farming (dairy and beef cattle) and pea growing are pursued on a broad central and narrower northern belt. Scheelite (tungsten ore), mined sporadically at Grassy since 1917, is sent to the chief town and harbour of Currie on the west coast. There are also mineral sand deposits. Pop. (1981) 2,592.

King James Version, also called AUTHORIZED VERSION, English translation of the Bible published in 1611 under the auspices of James I of England. Of 54 scholars approved by James, 47 laboured in six groups at three locations for seven years, utilizing previous English translations and texts in the original languages. The resulting translation had a marked influence on English style and was generally accepted as the standard English Bible for more than three centuries.

King Khālid Military City, city, northeastern Saudi Arabia. The city, under construction in the early 1980s, was being built by U.S. Army engineers after developing the nearby port of Ra's al-Mish'ab on the Persian Gulf to handle the materiel brought in for the King Khālid Military City project. The city, built to provide lodging for several brigades of Saudi Arabia's troops, is located 46 miles (75 km) south of al-Qayṣūmah and 155 miles (249 km) west of Ra's al-Mish'ab. The new city is located in a sparsely populated desert.

King Leopold Ranges, mountain chain of northern Western Australia, forming the southwestern edge of the Kimberley Plateau. It comprises a well-dissected escarpment extending from Collier Bay southeast for 150 miles (240 km). Averaging 2,000 feet (600 m) in height, the ranges rise to just over 3,000 feet (about 915 m) at Mounts Ord and Broome. Rivers such as the Isdel, Adcock, Lennard, and Fitzroy cut the scrub-covered escarpment into several steep-sided segments, the peaks of which are generally level. The ranges were sighted in 1879 by Alexander Forrest, who named them after Leopold II, king of the Belgians.

King Philip's War (1675–76), in British-American colonial history, war between Indians and English settlers, the bloodiest conflict in 17th-century New England, temporarily devastating the frontier communities but eventually eradicating native resistance to the white man's westward thrust in that region. For years, mutual helpfulness and trade were fostered by both the early Massachusetts colonists and the Indian leader Massasoit, grand sachem of the Wampanoags. The peace was first shattered by the Pequot War in 1637. By the 1660s settlers had outgrown their dependence on the Indians for wilderness survival techniques and had substituted fishing and commerce for the earlier lucrative fur trade. From 1640 to 1675 new waves of land-hungry settlers pushed into Indian territory, particularly in Massachusetts, Connecticut, and Rhode Island. Tribes had to fight to protect their homelands; otherwise they would become "white men's vassals," subject to alien law, humiliating limitations on personal freedom, usurpation of favourite hunting grounds, and regulation by a strict Christian morality.

Upon Massasoit's death (1661) his successor and second son, King Philip (Indian name Metacom; *q.v.*), vowed to resist further English expansion and attempted to organize a federation of tribes; eventually Philip won support from the powerful Narraganset and almost all of the other New England tribes. When three Wampanoags were executed (June 1675) for the murder of an informer, John Sassamon, King Philip could no longer hold his young warriors in check, and bloodshed erupted before either side could coordinate campaign plans. The war actually resolved itself into a series of ruthless Indian raids on frontier settlements from the Connecticut River to Massachusetts and Narragansett Bay, followed by brutal retaliatory assaults on Indian villages by the colonial militia. By the end of 1675 many frontier towns had been devastated, and the Narraganset had been wiped out in the Great Swamp Fight (December). The Indians maintained a distinct advantage in the fighting until the spring of 1676, when their morale was undermined by the threat of starvation after the destruction of their crops and when the English finally agreed to use "Praying Indians" (those who had been converted to Christianity) as scouts. Following Philip's death in August, Indian resistance collapsed, although Articles of Peace were not signed for two years.

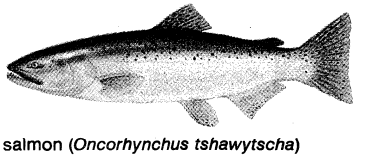
King Philip's War was one of the costliest confrontations in colonial history: Edward Randolph, an agent of the crown, estimated that some 600 settlers and 3,000 Indians lost their lives. It is believed that more than half of the 90 settlements in the region had been attacked and a dozen destroyed. Whole Indian villages were massacred and entire tribes decimated; scattered remnants fled westward and northward. Thereafter settlers felt free to expand without fear into former Indian territory across southern New England.

King Ranch, largest ranch in the continental United States, composed of a group of four tracts of land in southeastern Texas, totaling approximately 825,000 acres (333,800 hectares).

The King Ranch was established by Richard King, a steamboat captain born in 1825 in Orange County, N.Y. Drawn to Texas by the Mexican War (1846–48), King piloted a steamer on the Rio Grande. After the war he bought his own steamer and went into partnership with Captain Mifflin Kenedy, who had been his commander. King purchased the 75,000-acre (30,350-hectare) Spanish land grant known as Santa Gertrudis in 1852. The King–Kenedy partnership dissolved in 1868. King eventually accumulated more than 1,250,000 acres (505,875 hectares) of land, supporting chiefly cattle, sheep, and horses.

After King's death in 1885, the King Ranch continued to deal in cattle and horses, as well as in sorghum and wheat. Beginning in about 1910, the ranch began to develop the breed of beef cattle known as Santa Gertrudis, which is part Brahman and part Shorthorn. Oil and gas leases, first contracted in the 1940s, provided additional income. By the mid-1970s, the ranch owned millions of acres of land in such countries as Australia, Argentina, Brazil, Venezuela, and Morocco; falling market prices caused them to sell off much of this land in the 1980s.

king salmon, also called CHINOOK SALMON, SPRING SALMON, QUINNAT, or TYEE (*Oncorhynchus tshawytscha*), prized North Pacific food and sport fish of the family Salmonidae. It weighs about 10 kg (22 pounds) to twice



King salmon (*Oncorhynchus tshawytscha*)

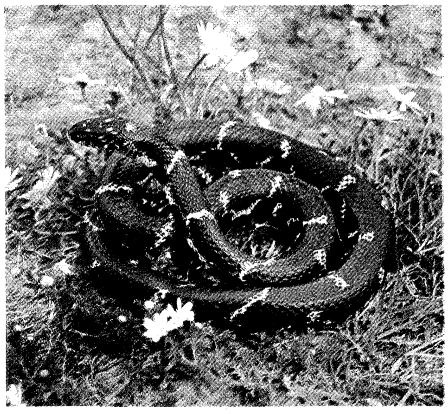
Painted especially for *Encyclopaedia Britannica* by Tom Dolan, under the supervision of Loren P. Woods, Chicago Natural History Museum

that and is silvery with round black spots. Spawning runs occur in spring, adults swimming as far as 3,200 km (2,000 miles) up the Yukon. Young king salmon do not enter the sea until they are one to three years old. The king salmon was introduced into Lake Michigan of the U.S. Great Lakes with conspicuous success, creating a new sport fishery there after the virtual elimination of lake trout by sea lampreys.

king snake (*Lampropeltis*), any of seven species belonging to the family Colubridae. They occur in numerous habitats from southeastern Canada to Ecuador. King snakes are so called because they eat other snakes, including venomous ones; they kill by constriction and are largely immune to pit-viper venoms. They also take small mammals, am-

phibians, birds, and birds' eggs. King snakes are mainly terrestrial and rather slow-moving, lay about 10 eggs at a time, and fight when cornered but soon become gentle. They are strikingly marked, smooth-scaled snakes, usually less than 1.2 m (about 4 feet) long, with small heads and tails.

The common king snake (*Lampropeltis getulus*) is found throughout the United States and in northern Mexico. It is usually black or dark



Common king snake (*Lampropeltis getulus*)
Jack Dermid

brown, variously blotched, ringed, or speckled with yellow or white; some specimens are nearly 2.1 m (nearly 7 feet) long. The common milk snake (*L. triangulatum,* sometimes *doliata*) occurs over most of the range of the genus. It is less than 1.3 m (less than 4.5 feet) long and has black-bordered brownish rings or saddles separated by white or yellow. It often enters barns and cellars to catch mice; hence another name, house snake. It is said to milk cows in pasture—a worldwide folktale attached to several kinds of snakes. The scarlet king snake (*L. elapsoides;* by some considered a race of the milk snake) is a small species of the southeastern United States. Several species (*e.g.,* the Arizona mountain king snake *Lampropeltis pyromelana*) are sometimes called false coral snakes because of their red, yellow, and black rings.

King Sound, inlet of the Indian Ocean, northern Western Australia, measuring 90 miles by 35 miles (145 km by 56 km). Its entrance is flanked by Cape Leveque to the west and the four island clusters of the Buccaneer Archipelago in Yampi Sound to the east. The mouths of the Fitzroy, Meda, Lennard, May, and Robinson rivers are along its shores. A peninsula that divides the inner section of the inlet has the port of Derby on its western shore. A 35-foot (11-metre) tidal range poses a challenge to navigators, as does the presence of many shoals and reefs. The sound was explored in 1838 by John Stokes and John Wickham, captains of the ship HMS *Beagle,* who named it after the surveyor Phillip Parker King.

King William Island, island, in the Canadian Arctic Archipelago, central Northwest Territories, between Victoria Island and Boothia Peninsula. The island is separated from the mainland (Adelaide Peninsula) by Simpson Strait. King William Island is about 110 miles (175 km) long and 100 miles (160 km) wide and has an area of 5,062 square miles (13,111 square km). The terrain is comparatively flat, with an average elevation of 300 feet (91 m), rising to 450 feet (137 m) at Mount Matheson. The coastline is irregular. Gjoa Haven on the southeast coast, where Roald Amundsen wintered in 1903–05, is the only trading post. Discovered in 1830 by Commander James Ross, it was named for the reigning British monarch, William IV.

King William's Town, town, eastern Cape Province, South Africa, west of East London, immediately adjacent to Ciskei (recognized as a republic only by South Africa) on the west. Founded as a missionary station in 1826, King William's Town later (after 1835) served as a military headquarters for British Kaffraria and as a centre for German settlement, before officially becoming a town in 1861. It was named for the British king William IV. The town is now a major industrial employer for commuter workers from Ciskei. It has a large textile mill and tannery and is nationally known for its many excellent schools. The Kaffrarian Museum is considered to have the best display of African mammals in the world. Pop. (1985) 16,123.

King William's War (1689–97), North American extension of the War of the Grand Alliance, waged by William III of Great Britain and the League of Augsburg against France under Louis XIV. Canadian and New England colonists divided in support of their mother countries and, together with their respective Indian allies, assumed primary responsibility for their own defense. The British, led by Sir William Phips, captured Port Royal, Acadia (later Nova Scotia), but failed to take Quebec. The French and Indians under the Count de Frontenac carried out successful attacks on Schenectady, N.Y., Salmon Falls (in present New Hampshire), and Casco Bay (in present Maine) but failed against their main target—Boston. The protracted war ended with the Treaty of Rijswijk (1697). Because of the importance of Indian participation, it is also known as the first of the four French and Indian Wars.

Kingaroy, town, southeastern Queensland, Australia, in the South Burnett area. It originated in 1886 as Kingaroy Paddock, deriving its name from the Aboriginal term *kingerroy,* meaning "red ant," and was proclaimed a shire in 1912. The area's rich, red soils yield an important peanut (groundnut) crop, and the state peanut-marketing board is in Kingaroy. Other local products are grains, soybeans, dairy foods, and beef cattle. Agricultural machinery is made in Kingaroy, which is linked to Brisbane (100 miles [160 km] southeast) by rail and air and by the Bunya Highway. The nearby Bunya Mountains, which rise to 3,727 feet (1,136 m) at Mount Kiangarow, were important to the Aborigines as a source of bunya pine nuts and have now been included within Bunya Mountains National Park. Pop. (1981) 5,134.

kingbird, any of nine species of birds of the genus *Tyrannus* (family Tyrannidae) noted for their pugnacity. Although only about 20 cm (8 inches) long, a kingbird will chase birds as large as a crow or a hawk; it will even ride on the larger bird's back and peck at its head. Kingbirds are gray above and white, gray, or yellow below. All have a concealed but erectile crest of red, orange, or yellow. The genus is widely distributed from Canada to Argentina. Among species breeding in North America is



Eastern kingbird (*Tyrannus tyrannus*)
David G. Allen—Bird Photographs, Inc.

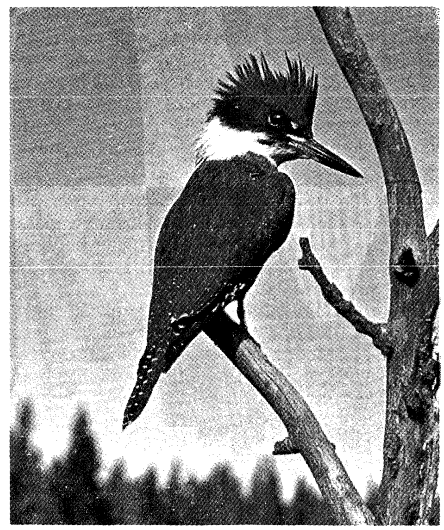
the eastern kingbird (*T. tyrannus*), ranging to the Rockies; it is dark slate gray above and white below, with white tail tip. Common along roads in open country, it may raid apiaries; hence its local name, bee bird, or beemartin. The western, or Arkansas, kingbird (*T. verticalis*), found westward from the Great Plains, is light gray above and yellow below, with whitish edges on the outermost tail feathers. Both species have a red spot (usually concealed) on the crown.

Kingdom of God, also called KINGDOM OF HEAVEN: *see* God, Kingdom of.

kingfish, any of various fishes, among them certain species of mackerel (*q.v.*) and a drum (*q.v.*) of the genus *Menticirrhus.*

kingfisher, family name ALCEDINIDAE, any of about 90 species of large-billed birds (order Coraciiformes), many of whom fish for their food. They range in length from 10 to 45 cm (4 to 18 inches). Most are compact birds with bright plumage in bold patterns; many are crested. The feet are small, and, with a few exceptions, the tail is short or medium in length. Kingfishers are solitary birds that utter rattling or piping calls. The usual nest is a burrow in a sandbank, but some tropical species burrow in termite mounds.

Kingfishers of the subfamily Alcedininae have narrow bills and plunge into the water for small fish, many also feeding on other small aquatic animals. Members of the subfamily Daceloninae, including the well-known



Belted kingfisher (*Megaceryle alcyon*)
Annan Photo Features

kookaburra (*q.v.*) of Australia, have broader bills and are less closely associated with water.

Kingi, Wiremu, also called TE RANGITAKE, or WILLIAM KING (b. *c.* 1795, Manukorihi, N.Z.—d. Jan. 13, 1882, Kaingaru), Maori chief whose opposition to the colonial government's purchase of tribal lands led to the First Taranaki War (1860–61) and inspired the Maoris' resistance throughout the 1860s to European colonization of New Zealand's fertile North Island.

After leading his Te Atiawa tribe from its native North Island province of Taranaki to a place near Wellington in 1833, Kingi was converted to Christianity by the English missionary Octavius Hadfield and was initially friendly toward Europeans. He supported Hadfield against the aggressive Maori chiefs Te Rauparaha and Te Rangihaeata. In 1847, however, Kingi refused to abandon his land claims in the Waitara district of Taranaki province to the governor, Sir George Grey, and led his people back to settle on their ancestral lands. War broke out in Taranaki in 1860, when Governor Gore Browne purchased

the tribal Waitara land block over Kingi's objection and in ignorance of Maori land customs. Kingi aligned himself with Potatau I (Te Wherowhero), leader of the militant Maori King Movement (a loose federation of tribes opposed to further land sales to colonists), and, in the course of the fighting, withdrew to the Waikato, the movement's heartland.

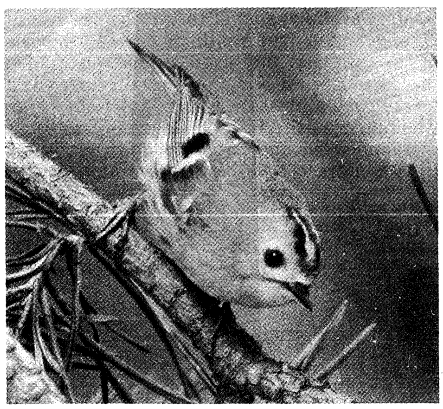
Kingi led his people in the Waikato War (1863–64) with colonial troops and did not submit to colonial authority until 1872. The legitimacy of Kingi's Waitara land claims was recognized in 1863, and in 1926 the New Zealand government awarded the Taranaki tribes an annual grant of £5,000 in compensation for their confiscated lands.

Kingis Quair, The (*c.* 1423; "The King's Book"), love-dream allegory written in Early Scots and attributed to James I of Scotland. It marks the beginning of the golden age of Scottish literature. Sometimes called the first "Scottish Chaucerian" poem, it reflects and acknowledges Chaucer's influence.

The story parallels the life of James I, who was captured and imprisoned for 18 years in England, where he met and married Joan Beaufort. Claims for the king's authorship are supported both by the appearance of his name on the manuscript and by the poet's acquaintance with English literature at a time when it was generally unknown in Scotland.

kinglet, any of about four species of the genus *Regulus,* of the songbird family Sylviidae; some consider them a separate subfamily Regulinae. These round-bodied, short-billed little birds are usually found in coniferous woodlands. They make a high-hanging nest of moss, bound with cobweb, so small that the 5 to 10 eggs may lie in two layers. Kinglets are about 9 cm (3.5 inches) long, with greenish gray body plumage and bright crown marks.

The golden-crowned kinglet (*R. satrapa*) of North America is often considered the same species as the goldcrest (*R. regulus*) of Eurasia; both have the crown patch—red in males, yellow in females—strikingly bordered with black. The firecrest (*R. ignicapillus*) of Europe resembles the goldcrest but has a white eyeline; and the yellow-rumped kinglet (*R. goodfellowi*) of Taiwan is sometimes considered a subspecies of the firecrest. In the ruby-crowned kinglet (*R. calendula*) of North America the crown mark is a mere tick of red, worn by the male only and usually concealed.



Goldcrest (*Regulus regulus*)
Ardea Photographics

Kingmaker, the: *see* Warwick, Richard Neville, earl of.

Kingman, city, seat of Mohave county, since 1882 the shopping and shipping centre for the sparsely settled northwestern area of Arizona, U.S. The city was named for Lewis Kingman, a locating engineer for the railroad constructed there in the 1880s. Kingman was incorporated as a city on Jan. 21, 1952. Ghost towns in the area attest to the lode mines that once yielded many millions of dollars in gold. Coppermining is a leading industry now. Mohave County has more than 300,000 acres (121,400 hectares) of grazing land but derives its principal income from tourists. Kingman is 25 miles (40 km) east of Lake Mead and also has access to Lakes Mohave and Havasu. East of the city is the million-acre Hualapai Indian Reservation. The Mohave Museum of History and Arts in Kingman depicts the history of northwest Arizona. Mohave Community College is in Kingman. Pop. (1987 est.) 11,231.

Kingman Reef, reef, unincorporated territory of the United States in the Northern Line Islands in the west-central Pacific Ocean, 920 miles (1,480 km) south of Honolulu. A barren atoll with a deep lagoon (5 miles by 8 miles [9 km by 15 km], it has a land area of 0.01 square mile (0.03 square km). It was sighted in 1798 by an American, Edmund Fanning. Formally annexed by the United States in 1922, it became a U.S. naval reservation in 1934. Pan American World Airways used the lagoon just before World War II as a station for seaplanes flying between Hawaii and Samoa. Kingman Reef is uninhabited.

Kingo, Thomas (b. Dec. 15, 1634, Slangerup, Den.—d. Oct. 14, 1703, Odense), clergyman and poet whose works are considered the high point of Danish Baroque poetry.

His grandfather had come from Scotland, and his father was a weaver. In his youth, he wrote a series of poems picturing humorous scenes in village life and a pastoral poem, "Chrysillis." After graduating in theology, he taught briefly. In 1677 King Frederick III made Kingo bishop of Fyn. Thereafter, he wrote only occasional poetry in honour of the royal family besides his hymns and religious poems. The latter were collected in two volumes, *Aandeligt sjungekor* (1674 and 1681; "Spiritual Chorus"). The best-known are the morning and evening songs ("sighs," Kingo called them) and "Far, Verden, Farvel" ("Fare, World, Farewell"). He is remembered today mainly for what is popularly known as Kingo's hymnbook, a collection that appeared in 1699 and contained at least 85 of his own poems.



Kingo, oil painting by an unknown artist; in the Nationalhistoriske Museum på Frederiksborg, Den.
By courtesy of the Nationalhistoriske Museum, Frederiksborg, Den.

Kings, books of, two books of the Hebrew Bible or the Protestant Old Testament that, along with Deuteronomy, Joshua, Judges, and I and II Samuel, belong to the group of historical books (Deuteronomic history) written during the Babylonian Exile (*c.* 550 BC). (In most Roman Catholic versions, I and II Samuel are called the first and second books of Kings, and the two Protestant books of Kings are called the third and fourth books of Kings.)

The two Hebrew and Protestant books of Kings recount the fate of the monarchy in Israel after the death of David. Many old traditions have been preserved in the books, but they have been reworked by the historian. The first two chapters of I Kings complete the story of David, begun in the preceding books of Samuel, and tell of the accession of his son Solomon. The reign of Solomon is treated in I Kings 3–11, followed by the reigns of kings of Judah and Israel from the beginning of the divided monarchy (*c.* 930 BC) until the fall of the kingdom of Israel in 721 BC. II Kings tells of the reigns of kings of the surviving southern kingdom of Judah until its eventual collapse in 586 BC.

The text is pervaded by themes that are cultic and theological. The performance of each king, in fact, is judged not on political accomplishments but on theological criteria. All of the kings of the northern kingdom are consequently presented in a bad light because they did not recognize the exclusive legitimacy of the cult in Jerusalem. By attending northern centres of worship established by Jeroboam I, they were all made to share in the sin of Jeroboam.

Of the southern kings only Hezekiah and Josiah receive unqualified approval. By instituting cultic reforms that upheld the requirements of the Covenant as set down in Deuteronomy, they merited high praise in the eyes of the historian.

The author uses traditional materials freely to construct a unified presentation reflecting his personal views, interweaving materials from north and south to emphasize the unity of the people, elaborating prophetic oracles with his own words, expanding the presentation at various points to emphasize the importance of various ideas, institutions, or practices, and at times offering his own reflections on the course of events. The books of Kings are thus very much the work of an individual.

The author's concern in part is to explain the fate of the Israelite people. Though their fall is directly related to their apostasy, the author is hopeful that his people will be restored to the glory of the days when David ruled over all the Israelite people.

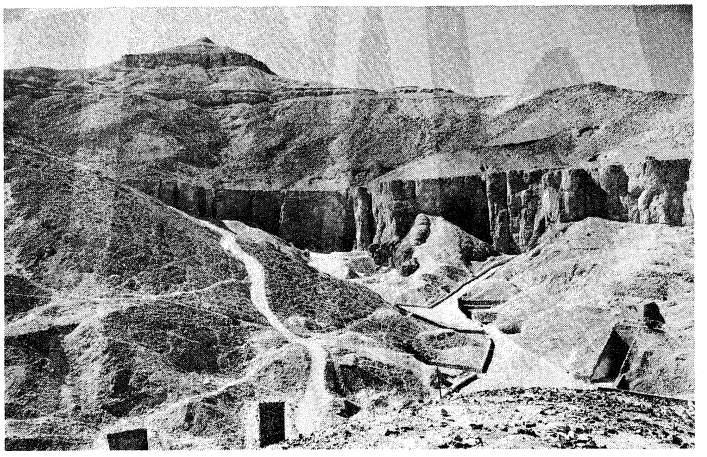
kings, divine right of: *see* divine right of kings.

Kings, Valley of the, also called VALLEY OF THE TOMBS OF THE KINGS, Arabic BĪBĀN AL-MULŪK ("Valley of the Tombs of the Kings"), long, narrow defile in western Thebes, Egypt, burial site of almost all the pharaohs of the 18th, 19th, and 20th dynasties (1539–1075 BC), from Thutmose I to Ramses XI. Located in the hills behind Dayr al-Baḥrī, the 60 known tombs exhibit variety both in plan and in decoration.

The kings of the New Kingdom, fearing for the safety of their rich burials, adopted a new plan of concealing their tombs in a lonely valley in the western hills behind Dayr al-Bahrī. Here, in tombs sunk deep into the heart of the mountain, the pharaohs of the 18th, 19th, and 20th dynasties from Thutmose I onward were interred, as well as were one or two queens and officials of high rank. The plan of the tombs varies considerably but consists essentially of a series of descending corridors interrupted by deep shafts to baffle robbers and by pillared chambers or vestibules; at the farther end is the burial chamber with a stone sarcophagus in which the royal mummy was laid and store chambers around which furniture and equipment were stacked for the king's use in the next world. The walls were in many cases covered with sculptured and painted scenes depicting the dead king in the presence of deities, especially the gods of the underworld, and with illustrated magical texts similar to those found in funerary papyri, designed to help him on his journey through the nether regions. There were a number of these texts; they represent differing but not necessarily conflicting views of the afterlife in which the king had to undergo trials and surmount perils. In the *Book of That Which Is in the*

Underworld, for instance, he travels in the boat of the sun god through 12 caverns that represent the 12 hours of the night. In the *Book of Gates*, giant serpents guard the portals through which the sun has to pass, and strange jinns and demons help or hinder the boat on its way. Astronomical figures often decorated the ceilings of the burial chambers, and the sky-goddess Nut herself is sometimes painted across the firmament of stars.

There are some 60 tombs in the valley, almost all of which were robbed in antiquity, many of them during the lifetime of the successors or of near descendants of the owners. In the time of Strabo, Greek travellers were able to visit 40. Only the little tomb of Tutankhamen on the floor of the valley, protected by a pile of rock chippings thrown down from a later Ramesside tomb, escaped pillage. The wonderful treasures exhumed from Tutankhamen's



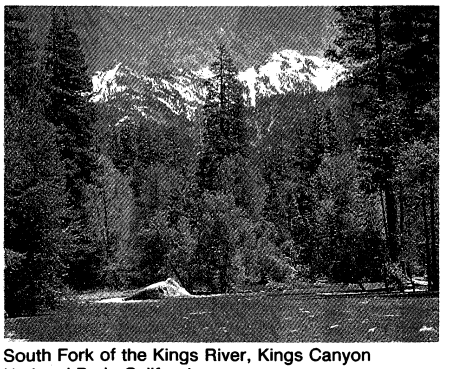
Valley of the Kings, western Thebes, Egypt
Hirmer Fotoarchiv, Munchen

tomb, now in the Cairo museum, vividly indicate how rich the burial of a great pharaoh of the empire's heyday must have been. The longest tomb is Number 20, that of Queen Hatshepsut, whose burial chamber is nearly 700 feet from the entrance and descends 320 feet into the rock.

Kings Bay (Norway): *see* Kongsfjorden.

King's Bench, Court of (England): *see* Queen's Bench, Court of.

Kings Canyon National Park, scenic area in Sierra Nevada, California, U.S., adjacent to Sequoia National Park. It contains groves of giant sequoia (redwood) trees and its most



South Fork of the Kings River, Kings Canyon National Park, California
Josef Muench

spectacular feature is Kings Canyon on the Kings River, carved by glacial action.

Kings County, southeastern New York, U.S., coextensive with the Borough of Brooklyn (*q.v.*), New York City. It was formed in 1683, has an area of 71 sq mi (184 sq km), and was named to honour King Charles II of England. Pop. (1980) 2,230,936.

king's evil, a name applied to scrofula (*q.v.*), or struma, a tuberculous swelling of the lymph glands, once popularly supposed to be curable by the touch of royalty. The custom of touching was first adopted in England by Edward the Confessor and in France by Philip I. In England the practice was attended with great ceremony; and from the time of Henry VII sufferers were presented with especially touched coins to be worn as amulets or charms. The custom reached its zenith during the Restoration: Charles II is said to have touched more than 90,000 victims between 1660 and 1682. The last royal healer in England was Queen Anne, who touched 200 victims in 1712. In France the ceremony persisted for another century and was even briefly revived by Charles X between 1824 and 1830.

King's Lynn, town and seaport, King's Lynn and West Norfolk district, county of Norfolk, England, on the estuary of the Great Ouse as it enters The Wash, a shallow North Sea inlet.

In 1204 a royal charter established Lynn as a free borough. Henry VIII granted it two charters, in 1524 and in 1537, the latter changing its name to King's Lynn. On the land side the town was formerly defended by a fosse (moat), and there are remains of the old wall, including the 15th-century South Gate. The Customs House (1683), Guildhall, and several merchants' homes are reminders of the town's commercial history and former prosperity.

As a market and service centre the modern town serves an extensive and rich farming district, and it still functions as a small port dealing with traffic from Baltic and North Sea ports. Its main industries are fertilizer manufacturing, beet sugar refining, fruit and vegetable canning, and light engineering. Pop. (1981 prelim.) 33,340.

King's Lynn and West Norfolk, formerly WEST NORFOLK, district (borough), county of Norfolk, eastern England, occupying an area of 551 sq mi (1,426 sq km) bordering the North Sea on the north and its shallow bay, The Wash, on the northwest. King's Lynn and West Norfolk district is a low-lying area straddling on the west a small part of the Fens, a vast, fertile, reclaimed marshland, and on the east a generally infertile heathland (located across an ascending chalk ridge); the latter is sometimes made productive through modern agricultural techniques. Sand dunes subject to accretion are commonplace the length of the district's northern coastline. The marginally productive sandy soils of the southeastern heathland are often planted in pine forests. Carstone, a cemented sandstone found in the northeastern heathland, is quarried near Snettisham.

The ancient port of King's Lynn at the edge of the Fens and near the mouth of the Great Ouse River contains many architectural examples of its commercial history including St. George's Guildhall (1406), one of the largest and oldest examples of a merchant guildhall in England. The parish (town) of Downham Market is an agricultural market centre for both the Fens and the heathland and is the district seat. Many greystone, 12th- to 14th-century village churches in the Fens (such as those at Emneth, Walsoken, and West Walton) are notable for their carvings and roofs and for their grandeur, attesting to the historic agricultural prosperity of this section of the Fens. Hunstanton, 20 mi (32 km) north of King's Lynn, is a popular coastal resort. Sandringham, the royal mansion where George VI died in 1952, is located between these towns.

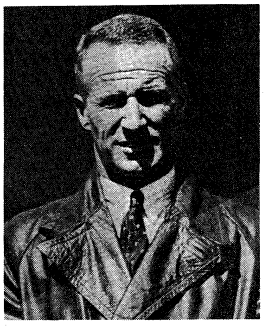
A wide variety of produce, including cereals, sugar beets, assorted fruits and vegetables, and flowers, is grown, especially in the Fens; King's Lynn and Downham Market have many food processing industries. Pop. (1982 est.) 121,400.

King's Men, an English theatre company known by that name after it came under royal patronage in 1603. It had previously been known as the Lord Chamberlain's Men. Shakespeare was its leading dramatist and Richard Burbage its principal actor. *See* Chamberlain's Men.

Kings Mountain, Battle of (Oct. 7, 1780), in U.S. War of Independence, American victory over a Loyalist detachment in South Carolina during the British campaign in the South. To stem the British advance into North Carolina, a force of about 2,000 colonial frontiersmen had been gathered from neighbouring states to replace the Continental forces that had been lost in South Carolina at the battles of Charleston (May 1780) and Camden (August 1780). The frontiersmen felt particularly bitter against the 1,100 soldiers, under Maj. Patrick Ferguson, who were mostly New Yorkers and South Carolinians loyal to the British. About a mile and a half south of the North Carolina boundary, the frontiersmen surrounded the Loyalists on Kings Mountain and killed or captured almost the entire force. The battle was noted as the first of a series of setbacks that ended in the eventual collapse of the British effort to hold North America.

Kings Peak, highest point (13,528 ft [4,123 m]) in Utah, U.S., located 80 mi (130 km) east of Salt Lake City in the Uinta Mountains (segment of the American Rockies) and the Ashley National Forest. It was named for Clarence King, 19th-century geologist and head of the Fortieth Parallel Survey.

Kingsford Smith, Sir Charles Edward (b. Feb. 9, 1897, Hamilton, Victoria, Australia—d. Nov. 8?, 1935, at sea en route to Australia), pilot who, with a three-man crew, flew the



Kingsford Smith
By courtesy of the Australian Information Service

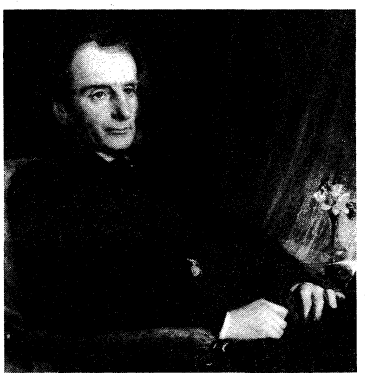
Atlantic from Portmarnock, Ire., to Harbour Grace, Nfd., June 24–25, 1930. He was also the first to cross the mid-Pacific by air.

Smith was educated at Sydney Cathedral School and Sydney Technical College and became an engineering apprentice. He served in World War I, from 1917, in the Royal Flying Corps. After being wounded he served as an instructor in the Royal Air Force. In 1924 he became chief pilot for West Australian Airways. In 1926 he founded his own Interstate Services, and in 1927, with Charles T.P. Ulm, he flew around Australia in less than 11 days. In 1928 the two men flew with a crew of two from Oakland, Calif., to Brisbane, Australia, by way of Honolulu and Fiji. In October 1933 Kingsford Smith completed a solo flight from England to Australia in seven days and five hours, and in 1934 he flew with P.G. Taylor from Brisbane to San Francisco. He was knighted in 1932.

Kingsford Smith disappeared in 1935 with Australian Thomas Pethybridge after passing over Calcutta during a flight from London to Australia. The two were presumed lost.

Kingsford Smith wrote *Story of "Southern Cross" Trans-Pacific Flight* (1928; coauthored by Ulm) and *My Flying Life* (1937).

Kingsley, Charles (b. June 12, 1819, Holne Vicarage, Devon, Eng.—d. Jan. 23, 1875, Eversley, Hampshire), Anglican clergyman,



Charles Kingsley, detail of an oil painting by L. Dickinson, 1862; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

teacher, and writer whose novels, widely read in the Victorian era, influenced social developments in Britain. He was one of the first churchmen to support Charles Darwin's theories and to seek a reconciliation between modern science and Christian doctrine.

The son of a clergyman, he grew up in the country, where he developed an interest in nature study and geology. After graduating from Magdalene College, Cambridge, he was ordained in 1842 as curate of Eversley and two years later became parish priest there. He became a founding member of the Christian Socialist movement, which sought to correct the evils of industrialism through measures based on Christian ethics. His first novel, *Yeast* (printed in *Fraser's Magazine*, 1848; in book form, 1851), deals with the relations of the landed gentry to the rural poor. His second, the much superior *Alton Locke* (1850), is the story of a tailor-poet who rebels against the ignominy of sweated labour and becomes a leader of the Chartist movement. Written with heat and indignation and passionate sympathy for the poor, Kingsley's social novels were frankly didactic and were intended to awaken members of his class to their responsibilities to the workers. He advocated adult education, improved sanitation, and the growth of the cooperative movement, rather than political change, for the amelioration of social problems. In his messages to the workers, he advised them to seek spiritual as well as material gains and to look to "something nobler" than acts of Parliament as a cure-all for their sufferings.

Kingsley soon turned to writing his immensely more popular historical novels: *Hypatia* (1853), a story of 5th-century Alexandria; *Westward Ho!* (1855), an anti-Catholic adventure story set in the Elizabethan period; and *Hereward the Wake* (1866), a story of Anglo-Saxon England and the Norman Conquest, also with an anti-Catholic slant. Kingsley's fear of the trend within the church toward Roman Catholicism, growing out of the Oxford Movement, led to a notorious controversy with John Henry (later Cardinal) Newman. It was in answer to an attack by Kingsley that Newman wrote his *Apologia pro Vita Sua* (1864), the history of his religious development. Kingsley was never robust, and in his later years his capacity for hard work, wide interests, and ardent support of causes was exhausted. He became chaplain to Queen Victoria (1859), professor of modern history at Cambridge (1860–69), and in 1873 canon of Westminster.

The valuable inspiration he contributed to the development of democracy and social welfare was undermined by his intellectual limitations, by the inconsistencies of his class prejudices, and by his aggressive patriotism. Only in one direction does his subsequent influence remain important. He was one of the few clergymen to accept wholeheartedly Darwin's theories of evolution and natural selection and to devote himself to the spread of the new knowledge of nature. His long-popular children's book, *The Water-Babies* (1863), was inspired by his thoughts on evolution, and he did much to encourage an interest in nature among the working people.

Kingsley, Henry (b. Jan. 2, 1830, Barnack, Northamptonshire, Eng.—d. May 24, 1876, Cuckfield, Sussex), English novelist whose books were popular for half a century and who is best known for *Ravenshoe* (1861) and *The Hillyars and the Burtons* (1865).

After leaving Oxford University, he set out for the Australian goldfields but was unsuccessful and returned to England after five years to write *The Recollections of Geoffrey Hamlyn* (1859), a novel of Australian life. He edited the *Edinburgh Review* for a time and was its war correspondent during the Franco-German War of 1870–71.

Kingsley, Mary Henrietta (b. Nov. 13, 1862, London—d. June 3, 1900, Simonstown, near Cape Town), English traveler who, disregarding the conventions of her time, journeyed through western and equatorial Africa and became the first European to enter parts of Gabon.

A niece of the clergyman and author Charles Kingsley, she led a secluded life until she was about 30, when she decided to go to West Africa to study African religion and law, with a view to completing a book left unfinished by her deceased father, George Henry Kingsley. During 1893 and 1894 she visited Cabinda, the coastal enclave of Angola lying today between Zaire and the Congo; Old Calabar in southeast Nigeria; and the island of Fernando Po, now part of Equatorial Guinea, near the Cameroon coast. Around the lower Congo River she collected specimens of beetles and freshwater fishes for the British Museum. Returning to Africa in December 1894, she visited the French Congo and, in Gabon, ascended the Ogooué River through the country of the Fang, a tribe with a reputation for cannibalism. On this journey she had many harrowing adventures and narrow escapes. She then visited Corisco Island, off Gabon, and also climbed Mt. Cameroon.



Mary Kingsley

By courtesy of the Royal Geographical Society, London

After returning to England with valuable natural history collections, she lectured widely throughout the country about her travels (1896–99). Her writings, which express her strong sympathies for black Africans, include *Travels in West Africa* (1897) and *West African Studies* (1899). She died while nursing sick prisoners during the Boer War.

Kingsport, city, Sullivan and Hawkins counties, northeastern Tennessee, U.S., on the Holston River, near the Virginia border, 90 mi (145 km) northeast of Knoxville. The first settlement there developed in about 1750, and Ft. Robinson was built there in 1759. The settlement became a boat landing, and the site was variously called Island Flats, Boat Yard, and Christiansville. In 1774 Col. James King established a mill at the mouth of Reedy Creek, and the place became known as King's Mill Station and subsequently King's Port. King later built an ironworks and a nail factory there. The railroad did not arrive until 1909. After 1915 Kingsport achieved a reputation as a pioneer in planned industrial development through the designs of John Nolan, a professional city planner. Its industry is now well diversified. Kingsport Press is one of the largest book plants in the United States, and Tennessee Eastman Company (synthetics for home and business) is in the city. Other manufactures include bricks, paper, explosives, glass, leather, textiles, and machinery. Nearby mountains and Tennessee Valley Authority lakes provide recreational facilities. Inc. 1917. Pop. (1982 est.) 31,959.

Kingston, town, southeastern Tasmania, Australia, lying on the Browns River, which flows into the estuary of the Derwent River. First settled in 1804, the area was known as Brown's River. By the time the town was proclaimed in 1866, the name Kingston was in general use, the change to Kingston being formalized in 1882. The service centre for an area producing apples and berries, Kingston is also a major tourist resort, offering swimming, angling, and golf. It serves as a dormitory town for the state capital, Hobart, 8 mi (13 km) to the north. Pop. (1981) 8,556.

Kingston, city, seat (1792) of Frontenac County, southeastern Ontario, Canada, on the north shore of Lake Ontario, at the point where it joins the St. Lawrence River, 135 mi (220 km) northeast of Toronto. Founded in 1673 by Louis de Buade, the comte de Frontenac and governor of New France in the late 17th century, on the site of the Indian settlement of Cataraqui, it served as a fur-trading post and military fort until destroyed by the British in 1758. The site was resettled in 1783 by United Empire Loyalists, who probably named it for King George III. The city soon became the chief naval base of Lake Ontario, and from 1841 until 1844, it was the seat of government for the united provinces of Upper and Lower Canada. Now a busy port at the head of the St. Lawrence River and

the Rideau Canal (from Ottawa, 90 mi northeast), Kingston is also heavily industrialized; manufactures include aluminum products, diesel locomotives and engines, ships, mining equipment, and ceramics. The city is the site of Queen's University (founded in 1841), the



Royal Military College of Canada, Kingston, Ont.
Horizons Photograph

cathedrals of St. George and St. Mary, the International Hockey Hall of Fame, and the Royal Military College of Canada (1876), National Defence College, and Canadian Army Staff College. The massive Ft. Henry, built during the War of 1812 and rebuilt in the 1830s, is a military museum. Inc. town, 1838; city, 1846. Pop. (1981) 52,616.

Kingston, capital and chief port of Jamaica, sprawling along the southeastern coast of the island, backed by the Blue Mountains. It is famous for its fine natural harbour, protected by the Palisadoes, a narrow peninsula that has been developed as a recreational and tourist resort.



Rockfort, a moated fortress at Kingston, Jam.
J. Allen Cash—EB Inc.

Kingston was founded in 1692 after Port Royal at the mouth of the harbour was destroyed by an earthquake. The core of the old city is a consciously planned rectangle with streets in a grid pattern. In 1703 the city became the commercial and, in 1872, the political capital of Jamaica. On several occasions it was almost destroyed by fire, and in January 1907 it suffered a violent earthquake.

In the main streets of the city, modern buildings contrast sharply with the decaying architectural relics of former centuries. The Church of St. Thomas, on King Street, the chief thoroughfare, was first built before 1699 but was rebuilt after the earthquake in 1907. At the eastern limits of the town stands Rockfort, a moated fortress, dating from the late 17th century and last manned in 1865. On Duke Street stands Headquarters House (formerly the seat of government), built by Thomas Hibbert, an 18th-century merchant; it is one of the few remaining architectural showpieces of a city once renowned for its fine houses. The Institute of Jamaica on East Street maintains a public library, museum, and art gallery especially devoted to local interests. The University of the West Indies (incorporated 1962) is at Mona, 5 mi (8 km) from Kingston. The famous Royal Botanical Gardens are at nearby Hope.

By the 1980s most of the old wharves had been demolished and the entire waterfront redeveloped with hotels, shops, offices, a cultural centre, and cruise and cargo ship facilities. The airport at Palisadoes has domestic and international service. A government-owned railway runs from Kingston to most of Jamaica's 14 parishes over 210 mi of track. Since 1923 the small (10 sq mi [26 sq km]) parish of the original Kingston has merged physically and administratively with St. Andrew parish. More than one-quarter of the population of the whole country lives within the boundaries of this Kingston and St. Andrew corporation. It is the largest urban conglomeration in the Commonwealth Caribbean. Pop. (1982 prelim.) 100,637.

Kingston, city, seat (1683) of Ulster County, New York, U.S., on the west bank of the Hudson River (there bridged), at the mouth of Rondout Creek, 54 mi (87 km) south of Albany. A fur-trading post was established on the site about 1610. The first permanent settlement, called Esopus, was made by the Dutch in 1652. Gov. Peter Stuyvesant fortified it (1658) and issued a charter in 1661 renaming it Wiltwyck. With British control its name was changed to Kingston (1669) for the English family estate of Gov. Francis Lovelace, although during a brief Dutch reoccupation (1673–74) it was called Swanenburgh. The year 1777 was a year of historic firsts for Kingston. In that year it was chosen as the first state capital; the state's first legislature, senate, and supreme court (under John Jay) convened there; the first state constitution was adopted there; and George Clinton was inaugurated there as New York's first governor. Burned by the British on Oct. 16, 1777, the community survived and was incorporated as a village in 1805. In 1872 Kingston absorbed the adjacent villages of Rondout, Wiltwyck, and Wilbur and became a city.

Growth during the 19th century was stimulated by completion (1828) of the Delaware and Hudson Canal (providing a link with the Pennsylvania coalfields) and the arrival of the railroads in the 1860s. Boatbuilding, limestone quarrying, and the manufacture of cement products were early enterprises. The city later acquired diversified industry, notably the manufacture of computer equipment, machine tools, clothing, and furniture. It is surrounded by fruit lands and is a tourist base for the nearby Catskill resort areas.

The old Senate House (1676) is preserved as a museum and state historic site and contains paintings by John Vanderlyn, who was born in Kingston. The city's Old Dutch Church originated in 1659. Ulster County Community College was opened (1963) at nearby Stone Ridge. Ashokan Reservoir, with numerous aeration fountains and part of the New York City water supply system, is 5 mi northwest. Pop. (1980) 24,481.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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Kingston, village in South Kingstown (*q.v.*), Washington County, southern Rhode Island, U.S. It developed after 1700 at the crossroads of the Pequot Indian Trail and the road to Tower Hill settlement and served as the county seat from 1752 to 1800. Until 1885 it was known as Little Rest. Kingston was untouched by the Industrial Revolution and remains a virtually unspoiled 18th-century village, with most of its buildings predating 1840. In 1892 the Rhode Island College of Agriculture and Mechanic Arts (now the University of Rhode Island) was founded on the outskirts of the village to which it gave new life. Pop. (1980) 5,479.

Kingston upon Hull, also called HULL, district (city), county of Humberside, England. Its area is 27 sq mi (71 sq km).

Hull had a west-bank medieval wool port, which passed from the monks of Meaux Abbey to Edward I, king of England, in 1293. For more than 400 years it was the chief seaport for shipping that used inland waterways converging on the Humber Estuary. It was confined to its medieval site until the late 18th century, when rapid expansion generated development to the north and west and, more recently, to the east.

Granted city status in 1897, Hull is a major national seaport, with 7 mi (11 km) of modern docks along the Humber Estuary. The smaller docks, including St. Andrews Dock, have been closed, forcing the fishing fleet long based there to use the nearby Albert Dock, with a riverside quay west of the River Hull. The newer, larger docks east of the River Hull, built 1886–1970, accommodate large ocean-going vessels with inbound cargoes of timber, grain, oilseeds, foodstuffs, and wool and exports of manufactured goods. Port-based industries, chemicals, timber, and food and drink processing are concentrated in the older docks area, but light industry utilizes open land in the north of the district.

The medieval city retains a number of historic buildings, including the large parish church of Holy Trinity, Wilberforce House (birthplace of William Wilberforce, the emancipator), and Trinity House (a navigation school). Museums, an art gallery, a theatre, and an arts centre are in close proximity to the old town, and a college of higher education overlooks the Queen's Gardens (site of the first dock built in 1778), while the university occupies a more open site in the north of the district.

Inadequate communications in the past prevented an extension of Hull's influence in South Humberside, but the opening in July 1981 of the Humber Bridge west of the city's boundary enhanced its status as a provincial capital. Pop. (1982 est.) 271,100.

Kingston upon Thames, royal borough of Greater London, covering an area of 15 sq mi (38 sq km). It owes its original settlement to the fact that the River Thames was fordable there. A Saxon council met there in 838, and 30 royal charters were granted to the town between 1200 and 1685. Seven Anglo-Saxon kings were crowned at Kingston, and the coronation stone of grey sandstone now stands in the grounds of the modern Guildhall. Kingston was designated "royal" by grant of Elizabeth II (crowned 1952).

Kingston is mainly residential but also contains one of outer London's major shopping centres. Local industries include light engineering and manufacturing. There is a polytechnic college and also colleges of art and of continuing education.

Older buildings stand alongside modern commercial and administrative buildings. The present Thames Bridge, built in 1828, replaced earlier bridges dating from the 13th century. The modern borough extends away from the riverside to include the suburban areas of Malden, Surbiton, and Chessington, traversed by the Kingston bypass, first of Britain's motor roads.

Southborough House, Surbiton, was designed by the architect John Nash in 1808. Fanny Burney, the 18th- and 19th-century novelist, often stayed at Chessington, which also has an ancient church. Coombe was the birthplace of John Galsworthy, the 20th-century playwright and novelist. Edward Gibbon, the 18th-century historian, attended school at Kingston, and the 19th-century artists William Holman Hunt and Sir John Millais had associations with Surbiton and its neighbourhood. Pop. (1982 est.) 133,700.

Kingstown, capital and chief port of Saint Vincent Island of Saint Vincent and the Grenadines, in the eastern Caribbean Sea. Located on the southwestern end of the island, the town overlooks Kingstown Harbour and is sheltered by Berkshire Hill on the north and Cane Garden Point on the south. Kingstown is relatively unvisited by tourists. Exports from its port include bananas, arrowroot, coconuts, and cotton. The Kingstown Free Library has Carib relics, and the Botanic Gardens (1763), the oldest in the West Indies, received the first breadfruit trees brought from the Pacific in 1793 by Captain William Bligh (of the earlier HMS *Bounty* mutiny). There is an airport with interisland flights. Pop. (1987 est.) 18,830.

Kingsville, city, seat (1913) of Kleberg county, southern Texas, U.S. It lies along the coastal plain, 32 miles (51 km) southwest of Corpus Christi. It was laid out on the King Ranch (the land deeded by Mrs. Henrietta King) in 1903 to be the headquarters of the St. Louis, Brownsville, and Mexico Railroad (later the Missouri Pacific). As seat of the King Ranch, the city became a ranching capital. From an original 15,500 acres (6,300 hectares) purchased in 1853 for less than two cents per acre, Richard King, an early steamboat captain, and his heirs built a cattle empire of nearly 1,000,000 acres (400,000 hectares) spreading over Kleberg, Nueces, Kenedy, and Willacy counties. The ranch has pioneered in livestock and agricultural research. Its Santa Gertrudis breed, a Brahman–Shorthorn cross, was the first true breed of beef cattle to be developed in the Western Hemisphere.

Kingsville is also a petroleum centre with a large natural-gas works and a petrochemical plant. A U.S. naval air station and Texas A&I University (1925) are nearby. Inc. 1911. Pop. (1988 est.) 28,164.

Kingswood, district, county of Avon, England, situated east of the city of Bristol. It has an area of 18 square miles (48 square km). Kingswood was closely associated with the 18th-century Methodist leaders George Whitefield and John Wesley. The town of Kingswood was formerly a dormitory community for colliers employed on the Somerset coalfield. Industry includes printing, light engineering, and the manufacture of brushes. Pop. (1986 est.) district, 88,500.

Kinguélé, waterfall and site of a hydroelectric complex on the Mbei River of Gabon. Kinguélé is situated near Kango and is about 95 miles (150 km) by road east of Libreville, the national capital. There are actually two sets of waterfalls. The upper Kinguélé falls drop a total of 115 feet (35 m) in three consecutive leaps. The larger, lower falls drop 148 feet (45 m). Below the lower falls, the Mbei River continues to rush in cascades for another mile and a half.

The Kinguélé dam and electric-power station, Gabon's first hydroelectric complex, were constructed (1969–73) at the lower falls by Gabon with assistance from France. Two turbo-alternators began operation in 1973, and a third was added shortly afterward. The complex supplies electrical power for the Gabon Estuary region, including a paper-pulp factory at Kango and the expanding industries of Libreville and Owendo.

Kinik (Turkey): *see* Xanthus.

kinkajou (*Potos flavus*), member of the raccoon family (Procyonidae), native to forests of Central and parts of South America. Distinguished by its long, prehensile tail, the kinkajou is a soft-furred, brownish animal with a small, round face, large eyes, and low-set, rounded ears. It has sharp, curved claws and a thick covering of short hair on the soles of the feet. It is 42–58 cm (17–23 inches) long, excluding its 40–55-centimetre tail. It weighs



Kinkajou (*Potos flavus*)
Tierbilder Okapia—Frankfurt am Main

from 1.5 to 2.5 kg (3.3 to 5.5 pounds). Nocturnal and arboreal, it generally lives alone or in pairs and rarely leaves the trees. It feeds on fruit, honey, insects, and small birds and mammals. A litter consists of one or two young, born in spring or summer. The kinkajou is often kept as a pet and is commonly known as a "honey bear"; it is a good pet if treated gently, but when angered or frightened it can deliver a sharp bite.

Kinkel, Gottfried (b. Aug. 11, 1815, Oberkassel, near Bonn [Germany]—d. Nov. 13, 1882, Zürich, Switz.), German poet who owes his reputation chiefly to his sympathy with the Revolutions of 1848.

In 1843 Kinkel married the liberal writer Johanna Matthieux. The same year, his *Gedichte* ("Poems") appeared and was favourably received. One of Kinkel's poetic epics, *Otto der Schütz* (1846; "Otto the Marksman"), which has been considered a forerunner of Viktor von Scheffel's *Der Trompeter von Säckingen,* was published in more than 70 editions and was mainly responsible for his influence on his contemporaries. His poetry is characterized by a sentimentality that is often found in German literature after 1848.

In 1845 he became a professor of art and cultural history in Bonn, and in 1848 he turned to journalism, founding the newspaper *Demokratischer Verein* ("Democratic Union"). Kinkel took an active part in the uprising in Baden in 1849 and was sentenced to imprisonment for life. Through the help of Carl Schurz, however, he escaped to London, where he became a professor. His journalism in London was marked by a tendency toward compromise that was mocked by the revolutionary philosopher Friedrich Engels. In 1866 Kinkel became a professor of archaeology and art history in Zürich.

Kinki, *chihō* (region), west-central Honshu, Japan. It includes the *ken* (prefectures) of Hyōgo, Nara, Shiga, Wakayama, and Mie and the *fu* (urban prefectures) of Kyōto and Ōsaka. Its name is derived from the Japanese terms *kin* ("proximity") and *ki* ("imperial capital") and refers to the land near the former imperial capital of Kyōto. Kinki occupies an area of 12,770 square miles (33,074 square km). The region's major physical features include the Tamba Uplands, the eastern extension of the Chūgoku Mountains, Lake Biwa, and also the Kii Peninsula.

Kinki region constitutes one of the major demographic and economic cores of Japan and has been the heartland of Japanese culture since historic times. The harmonious blending of old and new is conspicuously manifested in the region. The myriad of old temples and shrines in Kyōto stand in contrast with the huge Ōsaka-Kōbe urban-industrial complex. The Shinkansen (New Trunk Line) railway service connects Kinki with Tokyo to the northeast and Fukuoka to the southwest. Pop. (1988 est.) 22,104,000.

Kinnersley, Ebenezer (b. Nov. 30, 1711, Gloucester, Gloucestershire, Eng.—d. July 4, 1778, Philadelphia, Pa., U.S.), British colonial contemporary of Benjamin Franklin in the investigation of electricity and inventor of an electrical air thermometer (*c.* 1755). He also sought to find ways in which to protect buildings from lightning.

Brought to North America at the age of three, Kinnersley studied with his father, a Baptist minister, and was ordained (1743) but never had a congregation. Kinnersley taught English and oratory and was chief master at the College of Philadelphia (1753–73), from which he received his M.A. degree (1757).

kinnikinnick (shrub): *see* bearberry.

Kinnock, Neil (Gordon) (b. March 28, 1942, Tredegar, Monmouthshire, Eng.), British politician who in 1983 became the youngest man ever elected leader of the Labour Party.

The son of a miner, Kinnock was educated at University College, Cardiff, and was then for four years an organizer and tutor in industrial and trade-union studies at the Workers' Educational Association. In 1970 he was elected to Parliament for the seat of Bedwellty. He soon began a rapid rise in party ranks, owing to his gift for oratory and to the patronage of party leader Michael Foot. In 1974–75 he served as parliamentary private secretary to the secretary of state for employment, and in 1978 he was named to the Labour party's national executive committee. During this period he authored two books, *Wales and the Common Market* (1971) and *As Nye Said* (1980).

Following the election of 1983, in which Labour suffered its heaviest defeat in 65 years, the search began for a leader to replace Foot, who had proved unable to unify the party's factions. Although a relative newcomer who had never held even a junior ministerial post, Kinnock was favoured from the beginning, and in October 1983 he was elected leader of the Labour Party at its annual conference. Kinnock initially supported the party's policy calling for the unilateral nuclear disarmament of Britain and the removal of all U.S. nuclear weapons and bases from British soil. Labour lost the 1987 general election to the Conservative Party, though it managed to increase its parliamentary representation somewhat. By 1989 Kinnock had persuaded his party to abandon its radical policies on disarmament and large-scale nationalization.

kinnor, ancient Hebrew lyre, the musical instrument of King David. According to the Roman Jewish historian Josephus (1st century AD), it resembled the Greek kithara (*i.e.,* having broad arms of a piece with the boxlike neck), and *kinnor* was translated as "kithara" in both the Greek Old Testament and the Latin Bible. Medieval writers often mistakenly called it a harp.

The *kinnor* had from 3 to 12 gut strings, in late antiquity usually 10. It was played with a plectrum when accompanying singing or dancing but was apparently plucked with the fingers when used as a solo instrument. The term sometimes referred generically to stringed instruments.

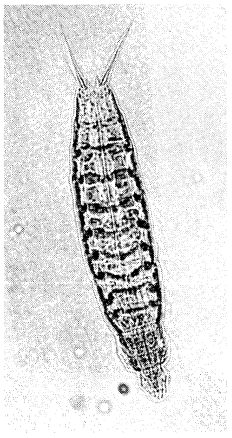
Kino, Eusebio (Francisco), original name EUSEBIO FRANCESCO CHINO, Chino also spelled CHINI, or KÜHN (b. Aug. 10, 1645, Segno, Tirol [now in Italy]—d. March 15, 1711, Magdalena, Mex.), Jesuit missionary and explorer in Spanish service, founder of numerous missions in the Pimería Alta region, now divided

between the Mexican state of Sonora and the U.S. state of Arizona.

Educated in Germany in mathematics and astronomy, he entered the Society of Jesus in 1665 and was sent as a missionary to Mexico City in 1681. In March 1687 he established his first mission among rural Indian peoples, Nuestra Señora de los Dolores, in what is now Sonora. In 1691 he made the first of about 40 expeditions into Arizona, and he is said to have explored the sources of the Rio Grande and the Colorado and Gila rivers. He helped the Pima Indians to diversify their agriculture, and he opposed the enslavement of Indians in the northern Mexican silver mines. His *Favores celestiales* (1708) was translated into English as *Kino's Historical Memoir of Pimería Alta,* 2 vol. (1919, reissued 1948).

Kino Tsurayuki: *see* Ki Tsurayuki.

kinorhynch, any of the approximately 100 species of microscopic marine invertebrates of the class Kinorhyncha (Echinodera; phylum Aschelminthes), widely distributed in the world's oceans. Kinorhynchs live mostly in the muddy bottoms of shallow seas and in the sand of seacoasts. They are rather bristly or spiny and range in length from 0.2 mm (0.008 inch) to 1 mm (0.04 inch). The yellowish or brownish jointed body consists of 13 or 14 segments. The first segment, which is enlarged and bears a conspicuous crown of curved spines, is called the head and bears the creature's mouth. When at rest, a kinorhynch withdraws its head into the front end of its body. The alternate thrusting forward and withdrawing of the head produces a squirming movement by means of which the animal burrows through mud or sand. Kinorhynchs feed on diatoms, certain protozoans, and fine organic debris. The sexes are separate.



Kinorhynch (*Echinoderes remanei*)
Walter Dawn

Kinoshita Junji (b. Aug. 2, 1914, Tokyo, Japan), playwright, a leader in the attempt to revitalize the post-World War II Japanese theatre.

Kinoshita graduated from the English literature department of Tokyo University in 1939. His first play, *Fūrō* ("Wind and Waves"), which he began to write that year, was a historical drama of the Meiji Restoration, but it was not published until 1947. As wartime censorship grew in rigidity, he turned from contemporary or historical themes to folklore and created his own unique genre of "folk plays." *Yūzuru* (1949; *Twilight Crane*) is an outstanding example and the play with which Kinoshita is most closely identified. After the war he returned to his historical interests and investigated the role of guilt, especially war guilt, and responsibility in human actions in such plays as *Kaeru shōten* (1951; "Ascension of the Frog"), *Okinawa* (1961), and *Shimpan* (1970; *The Judgment*). A later play, *Shigosen no matsuri* (1977; "The Dirge of the Meridian"), is a historical play whose protagonist represents Kinoshita's ideas on the dramatic hero. In addition to his plays, he is noted for his studies of the Japanese language, translations of Western playwrights, including Shakespeare, and essays on the theatre.

Kinoshita Keisuke, original name KINOSHITA SHŌKICHI (b. Dec. 5, 1912, Hamamatsu, Shizuoka prefecture, Japan), one of Japan's most popular motion-picture directors, known for satirical social comedies.

A motion-picture enthusiast from boyhood, Kinoshita attended Hamamatsu Technology School and Oriental Photography School. He became an assistant cameraman at the Shochiku Motion Picture Company in 1933, studied scenario writing, and in 1936 became an assistant director. *Hanasaku minato* (1943; *The Blossoming Port*), his first independently directed film, was a major success. Three years later, *Osone-ke no asa* (1946; *A Morning with the Osone Family*) established his reputation as one of the most talented postwar directors. In two of his most popular films, *Karumen kokyō ni kaeru* (1951; *Carmen Comes Home*), the first Japanese colour film, and *Karumen junjōsu* (1952; *Carmen's Pure Love*), he made use of a comic figure to satirize social stratification.

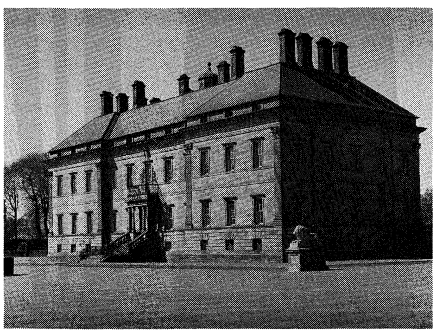
Each of Kinoshita's feature films is considered a masterpiece of technical craftsmanship. *Nihon no higeki* (1953; *A Japanese Tragedy*), a film examining the weakened Japanese family structure, is skillfully constructed by cross-cutting between stories and by the effective incorporation of flashbacks. *Narayama-bushi kō* (1958; *Ballad of Narayama*) is praised for the technical excellence with which Kinoshita used colour and the wide screen within the traditional structure of the period film.

Nijushi no hitomi (1954; *Twenty-four Eyes*) brought Kinoshita international recognition, as did *Nogiku no botoko Kimi Nariki* (1955; *She Was Like a Wild Chrysanthemum*).

Kinosternidae, family of turtles, sometimes considered a subfamily of the family Chelydridae (snapping turtles). *See also* mud turtle; musk turtle.

Kinross, also called KINROSS-SHIRE, former county in central Scotland, since the reorganization of 1975 in Perth and Kinross (*q.v.*) district, of Tayside region. Before 1975 Kinross was the second smallest county in Scotland. It was long a poor farming region until the 19th century, when modern farming methods improved the productivity of its cropland. Kinross, the principal town, lies along the lake known as Loch Leven. Many historical events in medieval and Elizabethan times centred on Lochleven Castle, which is situated on an island in the lake.

Kinross, small burgh, Perth and Kinross district, Tayside region, Scotland, located along Loch Leven. The town, connected by road and rail to Edinburgh, 30 miles (50 km) to the south, is a local agricultural market centre and has some woolen and linen mills. Lochleven Castle, on an island in the lake, was the scene of the imprisonment (1567–68) of Mary, Queen of Scots. Kinross House (1685–92), designed by Sir William Bruce, is situated on the peninsula east of the town. Pop. (1981) 3,496.



Kinross House, near Kinross burgh, by Sir William Bruce, 1685–92
W. Suschitzky

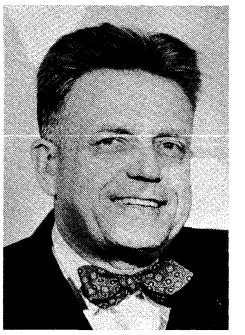
Kinsale, Irish CIONN tSAILE, market town and seaport of County Cork, Ireland. It is situated on Kinsale Harbour, at the estuary of the River Bandon. The present town dates mainly to the 18th century, but at an earlier period it belonged to the De Courcis family, who built the castle. It received a charter of incorporation from Edward III (reigned 1327–77). Kinsale was captured by the Spaniards and retaken by the English in 1601. William Penn, English Quaker and founder of Pennsylvania, and his father held office in the town. With the neighbouring villages of Scilly and Summer Cove, it is much frequented by visitors and hosts an annual regatta. It has a fishery pier and a harbour and is a sport-fishing centre. Manufactures include sheet steel, electrical components, and yacht equipment. Natural gas is also produced. Pop. (1986) 1,811.

Kinsella, Thomas (b. May 4, 1928, Dublin, Ire.), Irish poet whose sensitive lyrics deal with primal aspects of the human experience.

After attending University College in Dublin, Kinsella served in the Irish civil service from 1948 to 1965. He taught at Southern Illinois University, Carbondale (1965–70) and then at Temple University in Philadelphia. He founded his own publishing company, Peppercanister, in Dublin.

His early volumes, *Poems* (1956) and *Another September* (1958; rev. ed. 1962), established him as a poet of note. Such later volumes as *Downstream* (1962) often focus on war and the political and social disruption of modern Ireland. Kinsella's translation of the ancient Gaelic saga *The Cattle Raid of Cooley* (*Táin Bó Cuailnge*) was published in 1969. *New Poems 1956–73* (1973) and *One and Other Poems* (1979) skillfully extend the themes of love, death, and rejuvenation.

Kinsey, Alfred Charles (b. June 23, 1894, Hoboken, N.J., U.S.—d. Aug. 25, 1956, Bloomington, Ind.), American zoologist and student of human sexual behaviour.



Kinsey
By courtesy of the News Bureau, Indiana University, Bloomington

Kinsey, a graduate of Bowdoin College, Brunswick, Maine (B.S., 1916), and of Harvard (doctor of science, 1920), taught zoology and botany at Harvard before joining the faculty of Indiana University as an assistant professor of zoology in 1920. He became full professor in 1929 and director of the university's Institute for Sex Research in 1942. The latter was sponsored jointly with the university by the Rockefeller Foundation (until 1954) and the National Research Council.

His inquiries into human sex life led him to found the institute and to publish *Sexual Be-*

havior in the Human Male (1948) and *Sexual Behavior in the Human Female* (1953). These reports, based on 18,500 personal interviews, indicated a wide variation in behaviour. Although interviews were carefully conducted and certain statistical criteria met, the studies were criticized because of irregularities in sampling and the general unreliability of personal communication.

Kinsha Kiang (China): *see* Chin-sha River.

Kinshasa, formerly (until 1966) LÉOPOLDVILLE, largest city and capital of the Republic of Zaire, situated on the southern bank of the Congo River, approximately 320 miles (515 km) upstream from the Atlantic Ocean. The city faces the Malebo Pool (formerly Stanley Pool), a widening of the Congo River. Sir Henry Morton Stanley established Léopoldville as a depot in 1881. The town grew rapidly after the railway from downstream Matadi was completed in 1898, and it emerged as the largest city in sub-Saharan Africa after World War II.

A brief treatment of Kinshasa follows. For full treatment, *see* MACROPAEDIA: Kinshasa.

Kinshasa lies on a plain at an elevation of 1,066 feet (325 m) and is partly rimmed by higher ground. It extends for about 7 miles (11 km) southward from its location along a 12-mile (19-kilometre) stretch of Malebo Pool's southwestern shore. Farms in the rain-forested countryside produce crops of cassava, sugarcane, oil palms, plantains, corn (maize), and beans. The tropical climate is hot and damp for most of the year, with an annual mean rainfall amounting to 60 inches (1,524 mm). The driest period is from May to September. There is little annual temperature variation.

Although it is the financial, commercial, and industrial hub of the nation, Kinshasa has a surplus of unskilled labour, and unemployment and underemployment are widespread. Commercial and administrative services employ two-thirds of Kinshasa's work force. Manufacturing industries employ one-fifth of the city's workers and use raw materials transported by river to the port of Kinshasa. Light industries predominate and produce confectioneries, beer, soft drinks, textiles, tires, metalwork, paper, packing cases, and various chemicals.

The city has the nation's largest college campus, the Université de Kinshasa, as well as a teacher-training college and schools of administration and law, telecommunications, and fine arts. The university has an archaeological museum, and there are ethnographical and geological museums.

Kinshasa is the transportation centre of the nation. Most of the country's imports reach the city via the rail line from Matadi, and most export products destined for Matadi first reach Kinshasa by water. The city is well-served by roads, and air services are provided by Ndjili International Airport and a smaller airport at Ndolo. Area 3,848 square miles (9,965 square km). Pop. (1984) 2,653,558.

Consult the INDEX *first*

kinship, the socially recognized relationship between people in a culture who are or are held to be biologically related or who are given the status of relatives by marriage, adoption, or other ritual.

A brief treatment of kinship follows. For full treatment, *see* MACROPAEDIA: Family and Kinship.

Kinship is the broad-ranging term for all the relationships that people are born into or create later in life and that are considered binding in the eyes of their society. Although customs vary as to which bonds are accorded greater weight, their very acknowledgment defines individuals and the roles that society expects them to play.

All cultures recognize the significance of the nuclear family unit: the man and woman whose sexual relationship has been legitimized (a married couple) and their unmarried offspring. New families are formed or established families are augmented depending upon whether the newly married couple sets up a new household or remains with close kin of the bride or groom. Different arrangements along these lines form different kinds of families. A "stem" family is one in which only one child stays at home after marriage to care for the elderly parents and to work the land. This type was especially common in Japan, where farms were too small to be divided among numerous offspring. An extended family is formed when married sons and daughters remain at home or when others are brought into the family unit and made kin through adoption. A married couple may also adopt children, who then assume the societal position of their adoptive parents.

Every person belongs to a family of orientation: mother, father, and full brothers and sisters. Most persons in addition belong to a family of procreation, or reorientation, consisting of the person and his or her spouse (or spouses) and their children, if any. Although the nuclear family unit is no doubt the oldest form of societal organization, a domestic family can be any group of kinsmen and spouses who share food and usually a common roof.

Familial bonds may be traced through a genealogy, which is a written or oral statement of the names of individuals and their kin relations to one another. Genealogical knowledge may be disclosed in several ways, depending upon the emphasis that a given society places on one branch of a family over another. Patrifiliation identifies an individual with the father's side of the family, and matrifiliation is identification with one's mother. The terms connoting descent—patrilineal and matrilineal—derive from the same concept, with either the father or the mother acting as the primary ancestor. In a cognatic society, people acknowledge an equal responsibility to both sides of the family. All the persons connected to an individual through parent–child progressions are considered lineal ancestors (*e.g.,* grandparents and great-grandparents). Those linked less directly through blood (*e.g.,* a parent's sibling or a sibling's child) are consanguineal kin. Cousins, aunts, uncles, nieces, and nephews fall into this category.

The nature of kinship is not limited to blood ties, however, so a genealogy will not recognize all important kin relationships. Some notable omissions are fictive, or ritual, kin relationships, which include ritual coparenthood (the Christian tradition of godparents); blood brotherhood, which is a forged bond of mutual trust and cooperation; and a Japanese custom known as *oyako-kankei,* or *oyabun-kobun,* which sets up an interdependency between those in need of economic aid and wealthy patrons. While motherhood can never be disputed, certain primitive societies recognize three kinds of fatherhood: the genetic father; the "pater," who is usually the mother's husband and also the genetic father, who gives the child its position in society; and the "genitor," who is a person believed to have contributed to the growth of the fetus in the womb.

The common thread that links all these relationships together under the umbrella term of "kinship" is societal recognition, so they are all subject in some degree to societal scrutiny, expectations, and control—particularly in sexual relationships. Some marriages are arranged, others are entered into after a culturally shaped courtship. Monogamy, an exclusive sexual relationship between a man and a woman, is practiced in most areas. Polygyny, in which one man is married to several women at once, is practiced in some areas. Polyandry, seldom practiced, is the marriage of one woman and several men. The nearest approach to a universal rule found in all cultures is the incest taboo: the prohibition of sexual intercourse between a man and his mother, sister, daughter, or other specified kin. So, although most cultures require that immediate kin approve a proposed marriage, men and women must look outside the immediate family for a spouse. Marriage, therefore, not only unites two individuals, it unites their two families as well, making it the perfect vehicle for political alliances and guarantees of inheritance and succession. By tending to promote marriage between the members of different lineages, the incest taboo also minimizes the possibility of inbreeding, with all of its deleterious genetic consequences.

Inheritance refers to a transfer of tangible assets: money, land, and possessions. Heirs may be treated alike, or some may be favoured, as in parts of Europe and Asia, where property is inherited strictly across sex lines. In the event that an individual dies childless, some other relative will become heir. Succession is a transmission of power and position in society, which can only sometimes be legitimately passed on to kin. Royal families have specified lines of succession that follow genealogy; most types of employment do not. Still, one of the most common problems in many societies is nepotism, the favouring of kin to succeed to a position that should have been filled on the basis of merit alone. The frequency of the problem only underscores the powerful role that kinship plays.

kinship terminology, in anthropology, the system of names applied to categories of kin standing in relationship to one another. The possibilities for such nomenclature would seem limitless, but anthropologists have identified a small number of basic systems, or variants, which are found in all world societies. Six of these systems use the criterion of classification of kin in the same generation as "ego" (a given individual designated as the starting point in genealogical reckoning). Four terminological systems that focus on ego's parental generation have also been identified.

Historically, the systematic study of kinship terminology began with the American ethnologist Lewis Henry Morgan, whose pioneering work, *Systems of Consanguinity and Affinity of the Human Family,* was published in 1871. An important element in Morgan's formulation was the distinction between classificatory and descriptive systems of kinship. In a classificatory system some collateral kin—relatives not in ego's direct line of descent—are placed in the same terminological grouping as lineal kin—relatives in ego's direct line of descent. Classificatory systems such as that of the Iroquois designate the father and the mother's brother by the same term. In many societies with unilineal descent systems (*i.e.,* matrilineal or patrilineal), ego uses one set of terms to refer to his brothers, sisters, and parallel cousins (those whose genealogical ties are traced through a related parent of the same sex, *i.e.,* father's brother or mother's sister), while another set of terms is employed for cross-cousins (offspring of father's sister or mother's brother). This arrangement emphasizes the fact that cross-cousins do not belong to the lineage with ego, ego's siblings, and ego's parallel cousins.

Descriptive terminology, in contrast to classificatory terminology, maintains a separation between lineal and collateral kin. Such systems are sometimes called "Eskimo," after the people among whom it was first identified. The standard European and American system of kinship is a variant of the Eskimo type. Descriptive systems are typically found wherever the nuclear family operates as a relatively

autonomous unit economically and socially; they are rare in ethnographic literature.

The distinction between descriptive and classificatory kinship systems is not absolute. In contemporary U.S. social organization, for example, kinship terminology distinguishes lineal siblings from collateral cousins, but groups all uncles together, so that mother's brother, mother's sister's husband, father's brother, and father's sister's husband are all referred to by the term uncle. Hence, U.S. kinship terminology embraces aspects of both classificatory and descriptive systems.

Kinship systems convey important social information, although within anthropology there is disagreement on the general theoretical model, as well as on specific analyses. The problem of the actual meaning and correct translation of kinship terminology has proven to be intractable. In some systems, for example, all men of ego's parental generation are called by one term, but should not be thought of as "fathers" in the nuclear-family sense. Thus, it cannot be assumed that persons brought together terminologically are socially indistinguishable. Likewise, kinship terminology may or may not correspond to rules of social obligation, depending on the system and situation in question. One method used by anthropologists to avoid bias is the development of a precise descriptive language. For example, when father and his brother are coterminous, the anthropologist may express the position of brother as "a male agnatic relative of the ascending generation."

After Morgan's initial examination of the existence of kinship terminology, anthropological interest was, for several decades, spurred by the prospect of using the terminology to establish a framework for comparative analyses. Later, under the influence of Alfred Kroeber, kinship terminology was viewed as a key to logical principles of social organization. More recently, the formal analysis of kinship into its component parts, building on Kroeber's work, has become a focus of anthropological investigation in its own right.

Kinston, city, seat of Lenoir County, east central North Carolina, U.S., head of navigation on the Neuse River. Settled as a planters' trading post in 1740 by William Heritage, it was incorporated as Kingston in 1762. When reincorporated in 1784, zealous patriots dropped the *g* from its name. Richard Caswell, the first governor of North Carolina, lived there and was one of its original trustees. Kinston was the construction site of the Confederate ram "Neuse," an ironclad gunboat sunk by its crew in 1865; its hull, salvaged (1963), lies on the river bank, which has been designated a state historic site. An important tobacco market and shipping point for farm products, Kinston also has diversified manufactures, including textiles and chemicals. Lenoir Community College was opened there (1958). Pop. (1980) 25,234.

Kinta Valley, southeastern Perak, West Malaysia (Malaya), one of the most productive and easily worked tin regions in the world. Formed by the Sungai (River) Kinta (a tributary of the Sungai Perak), the valley lies between the Keledang (formerly Kledang [west]) and Main (east) ranges. It forms the largest field along the western Malayan tin belt and has been mined since the 1880s. The river and its tributaries have laid down the cassiterite- (tin-ore-) rich alluvium. The ore is scattered as black, sandy grains through a surface now extensively mined. Older mines, largely Chinese operated and of the shallow, open-pit type, have given rise to the towns of Gopeng, Batu Gajah, Kampar, and Ipoh (*q.v.*; the state capital). South of Ipoh the ores lie deeper, down to 200 ft (60 m) in wetter ground, where dredges are used. Limestone occurs beneath the gravels and in the 2,000-ft hills to the east. The river's course has been greatly modified by heavily loaded outwash from the mines, and large swamps occur in the south near the Kinta's confluence with the Perak.

Kinugasa Teinosuke (b. Jan. 1, 1896, Kameyama, Mie Prefecture, Japan—d. Feb. 26, 1982, Kyōto), first Japanese motion-picture director to present his story from the point of view of one of the characters and thus create a subjective world in a film. He also pioneered in the use of flashbacks and in the creation of visual atmospheric effect.

From 1917 to 1922 Kinugasa was an *oyama,* a male actor who played female roles. He directed his first picture in 1922. Five years later, he scored a commercial success with *Kurutta ippeiji* (1926; *A Crazy Page*). Because Kinugasa limited the point of view, the audience saw the insane asylum through the eyes of the hero. *Jūjiro* (1928; *Crossways*), was the most famous Japanese silent film. Kinugasa dispensed with chronological construction, using flashbacks to simulate the state of mind of the hero. The picture is also exceptional because of the gloominess of the drab gray setting and the experimental camera technique which focussed attention on one significant detail at a time, such as a hand.

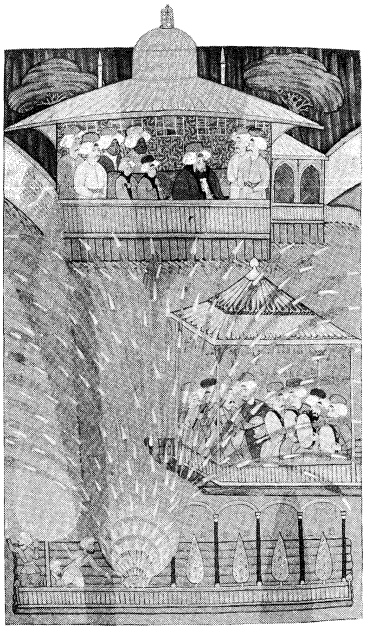
Kinugasa's most popular features, two of which were *Chūshingura* (1932; *The Loyal Forty-seven Rōnin*) and *Futatsu tōro* (1933; *Two Stone Lanterns*), were traditional period films. His early sound films in this genre were praised for their skillful cutting as well as for the effective use of sound. The later *Jigokumon* (1953; *Gate of Hell*), one of the most internationally famous of all Japanese films, exemplified Kinugasa's mastery of the period film in its meticulous reproduction of a historical period. He won the 1955 Academy Award for best foreign film.

Kioga, Lake (East Africa): *see* Kyoga, Lake.

Kionga (Mozambique): *see* Quionga.

kiosk, originally, in Islāmic architecture, an open circular pavilion consisting of a roof supported by pillars. The word has been applied to a wide variety of architectural elements. The summer palaces of the sultans of Turkey were called kiosks. A type of early Persian mosque, having a domed central area, is known as the kiosk mosque.

In the United States the kiosk is often found in public parks, where it may function as a bandstand, and in private gardens, as a gazebo or summerhouse. The name is also applied to subway entrances, telephone booths, newsstands, information booths, public toilets, and (perhaps most familiar) the free-standing, solid, cylindrical structures upon which advertisements are posted in European cities.



"Nocturnal Party on the Sea of Marmara, September 1720," Ottoman Turkish miniature from the *Surname-i Vehbi* showing a circular kiosk on the shore (top) and a square kiosk floating on a raft (centre right); in the Topkapı Sarayı Müzesi, Istanbul

By courtesy of the Topkapi Sarayi Muzesi, Istanbul

Kiowa, North American Indian people of Kiowa-Tanoan linguistic stock who lived on the southern Great Plains; they were one of the last of the Plains tribes to capitulate to the U.S. Including the Kiowa Apache, they numbered about 3,000 in the late 20th century; estimates of their population in 1780 approximate the same number. Accounts dating from the 18th century appear to place them northwest of their present location in south-



Apiatan, or Wooden Lance, Kiowa delegate to Washington, 1894; photograph by John K. Hillers

By courtesy of the Smithsonian Institution National Anthropological Archives, Washington, D.C.

west Oklahoma, where since 1868 they have shared a reservation with the Comanche (*q.v.*) between the Washita and Red rivers, centring on Anadarko. The Kiowa were divided into seven bands (one, the Kuato, now extinct), including the Kiowa Apache, a small southern Athabascan band or tribelet speaking an Apachean language.

The Kiowa were typical of nomadic Plains tribes. After acquiring horses from the Spanish, they hunted buffalo on horseback, had no agriculture, and lived in large three-poled skin tepees. They had warrior societies, the members of which attained rank according to their exploits in war—including not only killing an enemy but also touching his body during combat.

The Kiowa believed that dreams and visions gave them supernatural power in war, hunting, and healing. Ten medicine bundles were believed to protect the tribe and became central in the Kiowan sun dance. With the Comanche they were instrumental in spreading the peyote religion that involved use of a hallucinogenic cactus. The Kiowa were also notable for their pictographic portrayals—done twice a year—of important tribal events. Each summer and winter from 1832 to 1939, these "calendar histories" were painted on skins by an artist of the tribe.

Kiparissía, Gulf of, Modern Greek KÓLPOS KIPARISSIAKÓS, broad inlet of the Ionian Sea of the western Peloponnese, Greece, about 35 mi (55 km) in width. Flanking the shallow estuary of the Alpheius, the chief river of the Peloponnese, a series of large lagoons extend southward 15 mi along the shore.

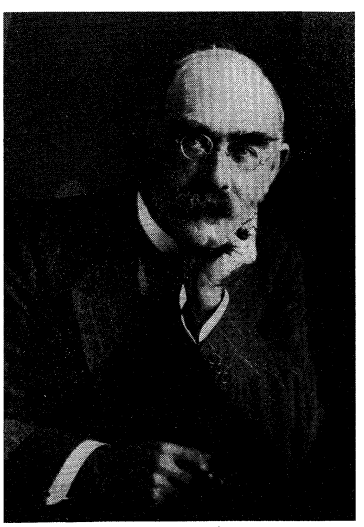
Farther south, the mouth of the Nédha Potamós (river) divides the bay shore unequally between the *nomós* (department) of Ilía on the north and Messenia on the south. In the latter, the town of Kiparissía lies just inland from its harbour, Paralía. The agricultural centre has access to the railway following the shore that links Kalámai and Pátrai. Revived in the 4th century BC by the Theban leader Epaminondas as the port for his famous capital, Messene, Kiparissía and its gulf were both called Arcadia in the Middle Ages.

Articles are alphabetized word by word, not letter by letter

Kipchak, Russian POLOVTSY, Byzantine KUMANS, tribal confederation, which, by the middle of the 11th century, occupied a vast, sprawling territory in the Euro-Asian steppe, stretching from north of the Aral Sea westward to the region north of the Black Sea. Some tribes of the Kipchak confederation probably originated near the Chinese borders and, after having moved into western Siberia, were joined by the Mongol-speaking Karakitai (9th century). From Siberia they migrated to southern Russia, where they battled either along with or against the Byzantines, Pechenegs, Russians, and the Hungarians.

In 1237 Mongol invaders killed Bachman, chief of the eastern Kipchak tribes, and the confederation was destroyed. Most of its lands and people were incorporated into the Golden Horde, (*q.v.*), the westernmost division of the Mongol Empire. The western tribes (the Kumans) fled to Hungary.

Kipling, (Joseph) Rudyard (b. Dec. 30, 1865, Bombay—d. Jan. 18, 1936, London), English novelist, short-story writer, and poet chiefly remembered for his celebration of British imperialism, his tales and poems of British soldiers in India and Burma, and his



Kipling
Elliott and Fry

tales for children. He received the Nobel Prize for Literature in 1907.

Life. Kipling's father, John Lockwood Kipling, was an artist and scholar who had considerable influence on his son's work, became curator of the Lahore museum, and is described presiding over this "wonder house" in the first chapter of *Kim,* Rudyard's most famous novel. His mother was Alice Macdonald, two of whose sisters married the highly successful 19th-century painters Sir Edward Burne-Jones and Sir Edward Poynter, while a third married Alfred Baldwin and became the mother of Stanley Baldwin, later prime minister. These connections were of lifelong importance to Kipling.

Much of his childhood was unhappy. Kipling was taken to England by his parents at the age of six and was left for five years at a foster home at Southsea, the horrors of which he described in the story "Baa Baa, Black Sheep" (1888). He then went on to the United Services College at Westward Ho, north Devon, a new, inexpensive, and inferior boarding school. It haunted Kipling for the rest of his life—but always as the glorious place celebrated in *Stalky & Co.* (1899) and related stories: an unruly paradise in which the highest goals of English education are met amid a tumult of teasing, bullying, and beating. The Stalky saga is one of Kipling's great imaginative achievements. Readers repelled by a strain of brutality—even of cruelty—in his writings should remember the sensitive and shortsighted boy who was brought to terms with the ethos of this deplorable establishment through the demands of self-preservation.

Kipling returned to India in 1882 and worked for seven years as a journalist. His parents, although not officially important, belonged to the highest Anglo-Indian society, and Rudyard thus had opportunities for exploring the whole range of that life. All the while he had remained keenly observant of the thronging spectacle of native India, which had engaged his interest and affection from earliest childhood. He was quickly filling the journals he worked for with prose sketches and light verse. He published *Departmental Ditties* in 1886, *Plain Tales from the Hills* in 1888, and between 1887 and 1889 he brought out six paper-covered volumes of short stories. When he returned to England in 1889, his reputation had preceded him, and within a year he was acclaimed as one of the most brilliant prose writers of his time. His fame was redoubled upon the publication of *Barrack-Room Ballads* in 1892. Not since the English poet Lord Byron had such a reputation been achieved so rapidly. When the poet laureate Alfred, Lord Tennyson died in 1892, it may be said that Kipling took his place in popular estimation.

In 1892 Kipling married Caroline Balestier, the sister of Wolcott Balestier, an American publisher and writer with whom he had collaborated in *The Naulahka* (1892), a facile and unsuccessful romance. The young couple moved to the United States and settled on Mrs. Kipling's property in Vermont, but their manners and attitudes were considered objectionable by their neighbours. Unable or unwilling to adjust to life in America, the Kiplings eventually returned to England. Ever after Kipling remained very aware that Americans were "foreigners," and he extended to them, as to the French, no more than a semiexemption from his proposition that only "lesser breeds" are born beyond the English Channel.

During his years in America, however, he published *The Light That Failed* (1890), the story of a painter going blind and spurned by the woman he loved; *Captains Courageous* (1897), which, in spite of its sense of adventure, is often considered a poor novel because of the excessive descriptive writing; *Kim* (1901), which, although essentially a children's book, must be considered a classic; and *The Jungle Books* (1894 and 1895), stylistically superb and further proof that Kipling was best at telling a story but inconsistent in producing balanced, cohesive novels.

In 1902 Kipling bought a house at Burwash, Sussex, which remained his home until his death. Sussex was the background of much of his later writing—especially in *Puck of Pook's Hill* (1906) and *Rewards and Fairies* (1910), two volumes that, although devoted to simple dramatic presentations of English history, embodied some of his deepest intuitions. In 1907 he received the Nobel Prize for Literature. In South Africa, where he spent much time, he was given a house by Cecil Rhodes, the diamond magnate and South African statesman. This association fostered Kipling's imperialist persuasions, which were to grow stronger with the years. These convictions are not to be dismissed in a word; they were bound up with a genuine sense of a civilizing mission that required every Englishman, or, more broadly, every white man, to bring European culture to the heathen natives of the uncivilized world. Kipling's ideas were not in accord with much that was liberal in the thought of the age, and as he became older he was an increasingly isolated figure. When he died, two days before King George V, he must have seemed to many a far less representative Englishman than his sovereign.

Kipling is said to have twice declined the Order of Merit, one of the highest distinctions that can be conferred upon a British subject, and also to have intimated, in 1895, that he would decline the poet laureateship, should it be offered to him.

Assessment. As a poet Kipling scarcely ranks high, although his rehabilitation has been attempted by so distinguished a critic as T.S. Eliot. His verse is indeed vigorous, and in dealing with the lives of soldiers and sailors in particular it breaks new ground. But balladry, music-hall song, and popular hymnology provide its unassuming basis; and even at its most serious—as in "Recessional" (1897) and similar pieces in which Kipling addressed himself to his fellow countrymen in times of crisis—the effect is rhetorical rather than imaginative. But it is otherwise with Kipling's prose. In the whole sweep of his adult storytelling, he displays a steadily developing art. While his later stories cannot exactly be called better than the earlier ones, they are as good—and they bring a subtler if less dazzling technical proficiency to the exploration of deeper though sometimes more perplexing themes. There is much in Kipling's later art to curtail its popular appeal. It is compressed and elliptical in manner and sombre in many of its themes. But that his reputation among informed critics should have declined steadily during his lifetime can scarcely be accounted for except in terms of political prejudice.

(J.I.M.S.)

MAJOR WORKS. *Short stories. Plain Tales from the Hills* (1888), 40 stories, enlarged in later editions; *Soldiers Three* (1888); *Wee Willie Winkie* (1888), including "Baa Baa, Black Sheep"; later revised editions include also "Under the Deodars," "The Phantom Rickshaw," and "The Man Who Would Be King"; *Life's Handicap* (1891), including "The Man Who Was," "Without Benefit of Clergy," and "The Mark of the Beast"; later revised editions include also "The City of Dreadful Night" and "The Courting of Dinah Shadd"; *Many Inventions* (1893), including "My Lord the Elephant," "His Private Honour," and "Love o' Women"; later revised editions include also "The Finest Story in the World"; *The Jungle Book* (1894) and *The Second Jungle Book* (1895), stories linked by poems for children; *The Day's Work* (1898), including "The Bridge-Builders," "The Ship That Found Herself," "The Tomb of His Ancestors," ".007," "William the Conqueror," "The Maltese Cat," and "The Brushwood Boy"; *Stalky & Co.* (1899), nine school stories, with prefatory poem; *The Complete Stalky & Co.* (1929), adds five stories and a concluding poem; *Just So Stories* (1902), animal fables linked by poems for young children; *Traffics and Discoveries* (1904), stories linked by poems, including "The Bones of Discipline," "Their Lawful Occasions," "They," and "Mrs. Bathurst"; *Puck of Pook's Hill* (1906) and *Rewards and Fairies* (1910), the two volumes combined in *All the Puck Stories* (1935), stories, with accompanying poems, on episodes in English history for children; *Actions and Reactions* (1909), stories linked by poems, including "An Habitation Enforced," "The Puzzler," and "Little Foxes"; *A Diversity of Creatures* (1917), stories linked by poems, including "The Village

That Voted the Earth Was Flat" and "My Son's Wife"; *Debits and Credits* (1926), stories linked by poems, including "The United Idolaters," "The Janeites," "In the Interests of the Brethren," and "A Madonna of the Trenches"; *Limits and Renewals* (1932), stories linked by poems, including "The Woman in His Life," "The Church That Was at Antioch," "Beauty Spots," "Aunt Ellen," and "Uncovenanted Mercies."

Novels. The Light That Failed (1890), version with happy ending serialized in 12 chapters, version with unhappy ending as a book in 14 chapters, revised in 15 chapters 1891, later further revised; *Kim* (1901), for children.

Verse. Departmental Ditties and Other Verses (1886, later enlarged); *Departmental Ditties, Barrack-Room Ballads, and Other Verses* (1890); enlarged edition of *Barrack-Room Ballads and Other Verses* (1892); *The Seven Seas* (1896); *Recessional and Other Poems* (1899); *Songs from Books* (1912, enlarged 1913), collects and revises prefatory and interspersed poems from prose volumes; *The Years Between* (1919).

Other works. From Sea to Sea, 2 vol. (1899), sketches and travel pieces; *Letters of Travel* (1920), letters and sketches, 1892–1913; *Something of Myself, for My Friends Known and Unknown* (posthumously 1936, dated 1937), unfinished.

BIBLIOGRAPHY. The standard bibliographical work is F.V. Livingstone, *Bibliography of the Works of Rudyard Kipling* (1927), together with its supplement (1938). The only substantial biography, Charles E. Carrington, *Rudyard Kipling: His Life and Work* (1955), is judicious and sympathetic and benefits from a thorough knowledge of Kipling's background in three continents. A work by Angus Wilson (1978) is a critical biography. Three of the best short critical discussions of Kipling's work are those of Bonamy Dobree in *The Lamp and the Lute* (1929); Edmund Wilson in *The Wound and the Bow* (1941); and T.S. Eliot in *A Choice of Kipling's Verse* (1941). Among longer studies two are outstanding: J.M.S. Tompkins, *The Art of Rudyard Kipling* (1959); and Bonamy Dobree, *Rudyard Kipling: Realist and Fabulist* (1967). The first of these, which deals mainly with the prose fiction, is at once enthusiastic and discriminating; the second is a penetrating examination of the philosophical basis of Kipling's work. In *Kipling's Mind and Art* (1964), Andrew Rutherford has brought together an excellent selection of essays by various hands. R. Lancelyn Green (ed.), *Kipling: The Critical Heritage* (1971), affords a valuable conspectus of the development of Kipling's reputation.

Kipping, Frederic Stanley (b. Aug. 16, 1863, Manchester—d. May 1, 1949, Criccieth, Caernarvonshire, Wales), British chemist who pioneered in the chemistry of silicones, organic derivatives of silicon.

Kipping became chief demonstrator in chemistry at the City and Guilds of London Institute in 1890 and seven years later was appointed professor of chemistry at University College, Nottingham. His research on optically active compounds led him to study organic silicon compounds from 1900. His findings were published in a series of 51 papers. Because of their exceptional water resistance and high temperature stability, silicones eventually found nearly universal applications as synthetic rubber, water repellents, hydraulic fluids, and greases.

Kípros: *see* Cyprus.

Kipsikis, also spelled KIPSIKI, or KIPSIGI, erroneously called LUMBWA, largest tribal group of the Southern Nilotic (Nandi) language group who occupy the highlands around the town of Kericho in the southwestern corner of Kenya. Like other Nandi speakers, they originated in the highlands north of Lake Rudolf (Lake Turkana) and moved southward at least 1,000 years ago.

Shortly after the turn of the century, British settlers took over large tracts of Kipsikis lands; Kipsikis were encouraged to stay as resident labourers in exchange for obliged, paid labour. Some sought work on white-owned plantations elsewhere in Kenya. In later colonial times Kipsikis turned from traditional farming and communal herding to individual land tenure; cash-crop cultivation of tea, pyrethrum, corn (maize), and some coffee; and the sale of milk and other cattle products.

Cattle are the main interest of the Kipsikis. Cattle are milked twice daily, and they are bled with a blocked arrow; the blood is then mixed with milk for human consumption. Herds are divided among kinsmen, ostensibly to protect them from disease and raiding, but also to reinforce the social bonds between lenders and borrowers.

Kipsikis do not live in villages but rather are organized in hamlets of adjacent homesteads, called *kakuet*, that serve as both political and economic units. Through the *kakuet* farming activities are coordinated, although each family also has its own plots. Community leadership is provided by a council of elders, with members assuming particular responsibilities. British colonizers obliged the acephalous, traditionally stateless Kipsikis to accept chiefs chosen from among them and introduced a system of courts.

Men and women participate in several age sets throughout life; sexual prerogatives and various responsibilities are associated with each. Clans and subclans are based on patrilineal descent, although maternal kin are important in many circumstances, such as in obtaining bridewealth for marriage. Military units once existed that cut across other social groupings, and the title *arap* that was once given to warriors now indicates the attainment of adulthood.

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kipuka, area of land ranging from several square metres to several square kilometres where existing rock of either volcanic or nonvolcanic origin has been completely surrounded, but not covered, by later lava flows. Surface features of this type are common in Hawaii. A kipuka that protrudes above the surrounding lava field is classified as a steptoe (*q.v.*); it results from the branching of a lava stream around a topographic rise. This kind of kipuka can be easily distinguished from the adjacent lava flow because it has vegetation growing on it. A kipuka that is lower than the surrounding lava field forms as a result of irregular lava flow or the union of lava flows from two distinct streams. Such a kipuka is usually devoid of any plant life. Kipukas provide readily accessible information about the older rock buried beneath the lava flow.

Kirby, Rollin (b. Sept. 4, 1875, Galva, Ill., U.S.—d. May 8, 1952, New York City), U.S. political cartoonist who gave modern cartooning decisive impetus in the direction of graphic simplicity and high symbolic value.

Kirby studied painting in New York City and Paris as a young man but switched to magazine illustrating and then cartooning. Kirby made his reputation during the 18 years (1913 to 1931) he spent on the *New York World,* where he won three Pulitzer Prizes for cartooning (1921, 1924, 1928). He stayed with the paper when it merged with *The World Telegram* in 1931; and in 1939 he went to the *New York Post,* where he remained until 1942. His cartoons later appeared in *Look* magazine and *The New York Times Sunday Magazine.* He criticized Wall Street, New York's political bossism, imperialism, fascism, and the Ku Klux Klan and crusaded for civil liberties, woman suffrage, and the New Deal. He invented the long-nosed, sour Mr. Dry, who became widely known as the symbol of Prohibition. Although his drawing was outstanding, he considered the idea behind a cartoon far more important than the way it was drawn. In addition to his cartoon work, Kirby wrote verse, short plays, articles, editorials, and book reviews for various newspapers and magazines.

Kirby, William (b. Oct. 13, 1817, Kingston upon Hull, Yorkshire, Eng.—d. June 23, 1906, Niagara, Ont., Can.), writer whose historical novel *The Golden Dog* (1877, authorized version 1896) is a classic of Canadian literature.

Kirby moved in 1832 to the U.S. and in 1839 to Canada, where he settled in Niagara and became editor of the Niagara *Mail* (1850–71) and collector of customs from 1871 to 1895.

Kirby was a fervent Loyalist (favouring retention of Canada as part of the British Empire) and in the 1840s wrote several works intensely pro-British in sentiment. Topical history was treated in his *Annals of Niagara* (1896), a solid historical work, and in his verse epic *The U.E.: A Tale of Upper Canada in XII Cantos* (1859). Kirby also corresponded with many prominent literary and political figures in England and Canada.

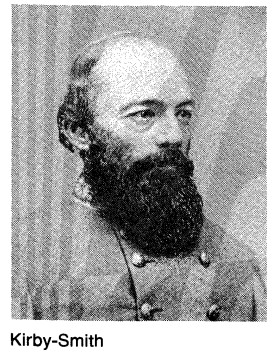


William Kirby
By courtesy of the Public Archives of Canada

His masterpiece, *The Golden Dog,* contains good characterization and detailed description of rural and urban locations. Historical information and materials from French-Canadian legend are fused into a skillful plot dealing with British ascendancy in Quebec at the time of Louis XV. It was translated into French in 1884.

Kirby-Smith, E(dmund) (b. May 16, 1824, St. Augustine, Fla., U.S.—d. March 28, 1893, Sewanee, Tenn.), Confederate general during the American Civil War (1861–65) who controlled the area west of the Mississippi River for the Confederacy for almost two years after it had been severed from the rest of the South.

Born Edmund Kirby Smith, he later signed his name E. Kirby Smith; the hyphenated form of the name was adopted by his family after his death. Graduated from the U.S. Military Academy, West Point, N.Y., in 1845, Kirby-Smith fought in the Mexican War (1846–48) and in Indian warfare on the frontier before he reached the rank of major in 1860. When Florida seceded from the Union (January 1861), he entered the Confederate Army and was made a brigadier general in



Kirby-Smith
By courtesy of the University of the South, Sewanee, Tennessee

June. Commanding a brigade at the First Battle of Bull Run (First Manassas; July 1861), he was seriously wounded. In 1862 he led the advance in the Kentucky campaign, defeated the Union forces at Richmond, Ky., and fought at Perryville, Ky., and Stones River (Murfreesboro) in Tennessee. He was promoted to lieutenant general in October and the following February was given command of the Trans-Mississippi Department.

Cut off from the East by the fall of Vicksburg (July 1863), Kirby-Smith exercised both civil and military powers and made his section self-supporting. In April 1864 he met and defeated the Federal Red River expedition. On June 2, 1865, he formally surrendered the last armed Confederate force at Galveston, Texas.

After the war Kirby-Smith headed a military academy until 1870, when he became president of the University of Nashville. He resigned in 1875 to teach mathematics at the University of the South.

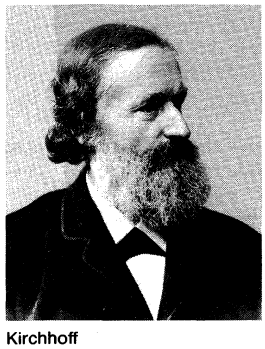
Kircher, Athanasius (b. May 2, 1601, Geisa, Abbacy of Fulda [Thuringia]—d. Nov. 27, 1680, Rome), Jesuit priest and scholar, sometimes called the last Renaissance man, important for his prodigious activity in disseminating knowledge.

Kircher learned Greek and Hebrew at the Jesuit school in Fulda, pursued scientific and humanistic studies at Paderborn, Cologne, and Koblenz, and in 1628 was ordained at Mainz. He fled the increasing factional and dynastic fighting in Germany (part of the Thirty Years' War) and, after occupying various academic positions at Avignon, settled in 1634 in Rome. There he remained for most of his life, functioning as a kind of one-man intellectual clearinghouse for cultural and scientific information gleaned not only from European sources but also from the far-flung network of Jesuit missionaries.

Kircher's research encompassed a variety of disciplines including geography, astronomy, mathematics, language, medicine, and music, bringing to each a rigorous scientific curiosity girded in a mystical conception of natural laws and forces. His methods ranged from the traditionally scholastic to the boldly experimental—he once had himself lowered into the crater of Vesuvius to observe its features soon after an eruption.

Kircher is not now considered to have made any significant original contributions, although a number of discoveries and inventions (*e.g.*, the magic lantern) have sometimes been mistakenly attributed to him. Rather, it is his extensive reporting activity that secures his place in intellectual history. He wrote some 44 books, and over 2,000 of his manuscripts and letters survive. In addition, he assembled one of the first natural history collections, long housed in a museum that bore his name, the Museo Kircheriano at Rome; this legacy was later dispersed among a number of institutions.

Kirchhoff, Gustav Robert (b. March 12, 1824, Königsberg, Prussia—d. Oct. 17, 1887, Berlin), German physicist who, with the chemist Robert Bunsen, firmly established the theory of spectrum analysis (a technique for chemical analysis by analyzing the light emitted by a heated material), which Kirchhoff applied to determine the composition of the Sun.



Kirchhoff
Historia-Photo

In 1845 Kirchhoff first announced Kirchhoff's laws, which allow calculation of the currents, voltages, and resistances of electrical networks. Extending the theory of the German physicist Georg Simon Ohm, he generalized the equations describing current flow to the case of electrical conductors in three dimensions. In further studies he demonstrated that current flows through a conductor at the speed of light.

In 1847 Kirchhoff became *Privatdozent* (unsalaried lecturer) at the University of Berlin and three years later accepted the post of extraordinary professor of physics at the University of Breslau. In 1854 he was appointed professor of physics at the University of Heidelberg, where he joined forces with Bunsen and founded spectrum analysis. They demonstrated that every element gives off a characteristic coloured light when heated to incandescence. This light, when separated by a prism, has a pattern of individual wavelengths specific for each element. Applying this new research tool, they discovered two new elements, cesium (1860) and rubidium (1861).

Kirchhoff went further to apply spectrum analysis to study the composition of the Sun. He found that when light passes through a gas, the gas absorbs those wavelengths that it would emit if heated. He used this principle to explain the numerous dark lines (Fraunhofer lines) in the Sun's spectrum. That discovery marked the beginning of a new era in astronomy.

In 1875 Kirchhoff was appointed to the chair of mathematical physics at the University of Berlin. Most notable of his published works are *Vorlesungen über mathematische Physik* (4 vol., 1876–94; "Lectures on Mathematical Physics") and *Gesammelte Abhandlungen* (1882; supplement, 1891; "Collected Essays").

Kirchhoff's circuit rules, two statements about multi-loop electric circuits that embody the laws of conservation of electric charge and energy and that are used to determine the value of the electric current in each branch of the circuit.

The first rule, the junction theorem, states that the sum of the currents into a specific junction in the circuit equals the sum of the currents out of the same junction. Electric charge is conserved: it does not suddenly appear or disappear; it does not pile up at one point and thin out at another.

The second rule, the loop equation, states that around each loop in an electric circuit the sum of the emf 's (electromotive forces, or voltages, of energy sources such as batteries and generators) is equal to the sum of the potential drops, or voltages across each of the resistances, in the same loop. All the energy imparted by the energy sources to the charged particles that carry the current is just equivalent to that lost by the charge carriers in useful work and heat dissipation around each loop of the circuit.

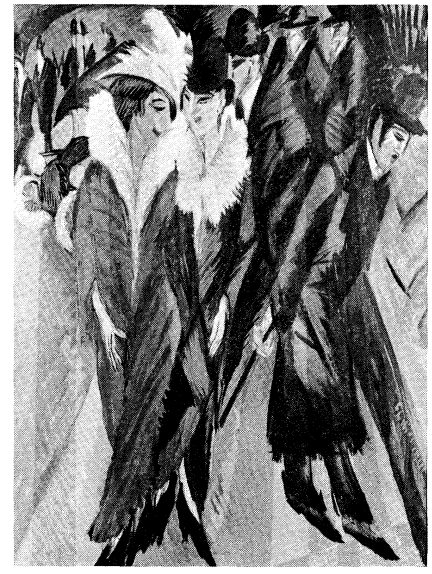
On the basis of Kirchhoff's two circuit rules, a sufficient number of equations can be written involving each of the currents so that their values may be determined by an algebraic solution.

Kirchhoff's circuit rules are also applicable to complex alternating-current circuits and with modifications to complex magnetic circuits.

Kirchmann, Jacob: *see* Kirkman, Jacob.

Kirchner, Ernst Ludwig (b. May 6, 1880, Aschaffenberg, Bavaria—d. June 15, 1938, near Davos, Switz.), German painter and printmaker, one of the leaders of a group of Expressionist artists known as Die Brücke ("The Bridge"; *see* Brücke, Die). His mature style was highly personal, notable for its psychological tension and eroticism.

In 1898 Kirchner was impressed by the graphic art of the German late Gothic artists, especially Dürer, whose influence on Kirchner was lifelong. But exposure to the Jugendstil movement and the dynamic art of the Norwegian Expressionist painter Edvard Munch led Kirchner to simplify his forms and brighten his colours—a development aided by his discovery in 1904 of African and Polynesian art.



"Street, Berlin," oil on canvas by Ernst Ludwig Kirchner, 1913; in the Museum of Modern Art, New York City
By courtesy of the Museum of Modern Art, New York City

Kirchner studied architecture intermittently in Dresden between 1901 and 1905. But he continued to be obsessed with painting, and in 1905 he founded Die Brücke with Erich Heckel and Karl Schmidt-Rottluff. Other artists, including Emil Nolde, joined the group subsequently. For Kirchner, art was properly an immediate, powerful translation of inner conflict into visual terms. He cited the emotive work of van Gogh and Munch as artistic touchstones.

Kirchner's use of colour for visual impact may be seen in "Girl Under Japanese Umbrella" (1906; Kunstsammlung Nordrhein-Westfalen, Düsseldorf, Ger.) and "Artist and His Model" (1907, Kunsthalle, Hamburg), works showing a superficial affinity with the paintings of Matisse and the Fauves in France. But the jagged outlines of Kirchner's forms and the wary expressions of the faces create a threatening mood that is absent in Fauvist works.

Much of Kirchner's work exhibits his preoccupation with malevolence and eroticism. In "Street, Berlin" (1907; Museum of Modern Art, New York City), the curvilinear rhythms of fashionable women on promenade reflect their genteel grace, yet also accentuate the primitive sensuousness hidden beneath the panoply of fashion and propriety—a sensuousness rendered ominous by the savage, dark outlines of their figures and their masklike faces. His second version of "Street, Berlin" (1913, Museum of Modern Art, New York City) reinforces his sardonic view of Berlin's jaded society. His studies of the nude, such as "Bathers at Moritzburg" (1908; F. Bauer Collection, Etoy, Switz.), are often explicitly erotic, and in his lithograph "Head of a Man with a Nude" (1908), his fantasy of sexual aggression reaches nightmare intensity.

In 1911 the members of Die Brücke moved to Berlin, where Kirchner produced masterful woodcuts for *Der Sturm,* Germany's leading avant-garde periodical before World War I. His illustrations for Adelbert von Chamisso's novel *Peter Schlemihls wundersame Geschichte* (1915) and the poem "Umbra Vitae" (1924) by the Expressionist poet Georg Heym are considered among the finest engravings of the 20th century.

After a mental and physical breakdown, Kirchner moved to Switzerland. His late landscapes are often allegorical, showing man unencumbered by civilization and at peace with nature. Kirchner endured long periods of depression, and when the Nazis declared his work "decadent," he committed suicide.

Kireyevsky, Ivan Vasilyevich, Kireyevsky also spelled KIREEVSKY (b. March 22 [March 10, Old Style], 1806, Dolbino, Russia—d. June 11 [May 30], 1856, St. Petersburg [now Leningrad]), philosopher, critic, and writer who was one of the leading ideologists of the Slavophile intellectual movement in Russia.

Born into an aristocratic family, Kireyevsky studied metaphysics in Germany in 1830. Upon his return to Russia he founded in 1832 a literary journal called *Yevropeyets* ("European"), which was banned by the government after two issues. In the ensuing half decade he was converted to Orthodox Christianity and lost much of the Western outlook of his youth. In 1845 he served as editor of the journal *Moskvityanin* ("Muscovite") for three issues.

Together with A.S. Khomyakov, Kireyevsky in the early 1840s articulated the classic arguments of Slavophilism. He asserted that the Russian way of life was superior to that of the West and that Russia should follow its own path of development based on the monarchy, the communal spirit of medieval Russian society, and the sacred traditions of the Russian Orthodox church. Kireyevsky criticized the secular humanism of the West as having led to class conflict, social revolution, and a corrupt materialism. He developed these comparative criticisms of Russian and Western civilization in several important journal articles, notably "On the Character of the Culture of Europe and Its Relationship to the Culture of Russia," published in 1852 in the journal *Moskovsky sbornik* ("Moscow Miscellany"). The Slavophilic doctrines that he helped enunciate had a long and pervasive influence on Russian thought.

Kirgiz, also spelled KIRGHIZ, Turkic-speaking people of central Asia, most of whom live in the Kirgiz Soviet Socialist Republic of the U.S.S.R. There were about 2,000,000 Kirgiz in the Soviet Union in the late 20th century, and small minorities resided in western China, in the Kazakh, Uzbek, and Tadzhik republics of the Soviet Union, and in Afghanistan. The Kirgiz language belongs to the northwestern, or Kipchak, group of the Turkic languages. The people are Muslim in religion.

Like other Central Asian peoples, the Kirgiz were traditionally nomadic and pastoral. During the second half of the 19th century, Kirgiziya became a major area of Russian colonization, and much of the best land was given to Russian settlers. This was a major cause of the revolt of 1916, in the suppression of which the Kirgiz suffered very heavily; whole villages were put to the torch, and nearly a third of the Kirgiz fled to China. After the October Revolution, Kirgiziya was the scene of much guerrilla opposition to the Soviet regime. From 1926 to 1959 there was a heavy influx of Russians and Ukrainians into the area, and the proportion of Kirgiz in the total population fell from about 66 percent to 40 percent. The development of agriculture and heavy industry, along with the growth of cities, has done much to change the traditional Kirgiz way of life.

Kirgiz language, also spelled KIRGHIZ, member of the Turkic language group (a subfamily of the Altaic languages). Kirgiz is spoken in Kirgiziya (U.S.S.R.) and in the Pamir Mountains on the border between Tadzhikistan (U.S.S.R.), Afghanistan, and China. The language belongs to the northwestern, or Kipchak, division of the Turkic languages, closely related to Kazakh, Kara-Kalpak, and Nogay.

Kirgiz, Yenisey Kirgiz, or Kirkiz is also the name given to a language spoken along the Yenisey River in the Soviet Union. Although a Turkic language, it is not certain that Yenisey Kirgiz is closely related to Central Asian Kirgiz; the two are, however, frequently confused. Yenisey Kirgiz speakers are supposed to have been of a distinct ethnic stock from the speakers of Central Asian Kirgiz, and the language is thought by some scholars originally to have been of Paleosiberian Samoyedic stock, more closely related to the Uralic languages than to Altaic. The language later became assimilated into the Turkic group, or "Turkicized." *See also* Turkic languages.

Kirgiziya, officially KIRGIZ SOVIET SOCIALIST REPUBLIC, Russian KIRGIZIYA, or KIRGIZSKAYA SOVETSKAYA SOTSIALISTICHESKAYA RESPUBLIKA, Akademiya Nauk transliteration KIRGIZIJA, or KIRGIZSKAJA SOVETSKAJA SOCIALISTIČESKAJA RESPUBLIKA, historic region and one of the union republics of the Soviet Union.

A brief treatment of Kirgiziya follows. For full treatment, *see* MACROPAEDIA: Union of Soviet Socialist Republics.

Physical and human geography. Its capital is Frunze, formerly Pishpek. Kirgiziya is bounded by Kazakhstan on the north and northwest, Uzbekistan on the southwest, and Tadzhikistan on the south. On the southeast, the Kokshaalatau Range, part of the Tien Shan (mountains), forms the border with China. Kirgiziya is, above all, a mountainous country. On the Chinese border are Victory (Pobedy) Peak and Khan Tengri Peak, two of the highest peaks in the Soviet Union. This region is the core of the massive Tien Shan system. The crests of the ranges are mantled in perpetual ice and snow. Many short rivers with rapids cascade down the mountains.

The remoteness of Kirgiziya from the oceans and the sharp change of elevation from neighbouring plains are two important influences on the climate. Its lower reaches lie in belts of hot desert winds. At the higher elevations there is a cold desert. Between them is a transitional zone where westward and northward slopes receive more moisture. Except at the highest elevations, alpine and subalpine meadows abound. The lower valleys and the north-facing slopes are forested and support a mixture of European and Asian animal life. This includes the brown bear, wild pig, lynx, gray wolf, ermine, mountain sheep and goat, deer, and snow leopard.

The first Kirgiz clans settled in the Tien Shan region in ancient times and were one of the great nomadic groups of Central Asia. Since the advent of Soviet power and the development of the country, the nomadic life has been almost completely abandoned. The Kirgiz have been moved into agricultural settlements, but only a small number have adopted industrial employment.

Kirgiziya was at one time wholly agricultural, but by the 1970s the republic was also a source of nonferrous metals such as antimony and mercury ores. Coal mining continues to be important, and lead, zinc, and other metals have been discovered in the mountains. The republic is also a producer of machinery, hydroelectric power, and food products, and there are light industries such as textiles, clothing, and footwear. Industrialization has stimulated the mechanization of agriculture, which is dominated by livestock raising and the cultivation of cotton, sugar beets, tobacco, and opium poppies. The breeding of racehorses, the raising of swine and rabbits, and beekeeping are pursued in the mountain regions; hunting and fishing are carried on in the interior.

The highest state power is the Supreme Soviet, whose members are elected from a single slate for a four-year term after selection by the Communist Party of Kirgiziya. The Supreme Soviet then elects its Presidium and a Council of Ministers (cabinet).

Kirgiziya's population is made up principally of Kirgiz and Russians, with minorities of Uzbeks, Ukrainians, and Germans deported from western Russia in 1941.

There are several institutions of higher education. The Academy of Sciences has about a dozen research institutes, and there are many other research centres.

Medical care is free, and the republic has an excellent ratio of doctors to population for a developing Asian region.

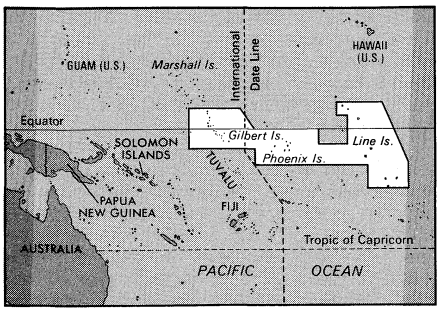
Kirgiz cultural life has been influenced by a rich tradition of oral literature. Folk legacies have been handed on by the bards, who recite such poems as the long verse epic *Manas,* expressing the fiercely independent outlook of the Kirgiz. Newspapers and magazines are published in both Kirgiz and Russian and are strictly controlled by the state, as are the broadcast media. A leading literary figure is the Kirgiz writer Chingiz Aytmatov.

In music, earlier traditions are represented in ensembles of the three-stringed *komuz,* which is plucked like a lute; there is a Kirgiz symphony orchestra. There are vigorous folk-dance groups, and theatres perform plays in Kirgiz and Russian. The Kirgiz motion-picture studio, established since 1942, produces feature films as well as newsreels and popular science films.

History. The origins of the Kirgiz people are uncertain. Soviet ethnographers believe that they arrived in the region with the Khara-Khitais of Mongolia in the 12th century. Like Kazakhstan and other union republics, Kirgiziya was largely nomadic before Russian invasion; it, too, was heavily settled by Russians in an attempt to suppress the nationalist movement. Kirgiziya became an autonomous *oblast* (province) in 1924, and it was declared the Kirgiz Soviet Socialist Republic in 1936. Area 76,600 square miles (198,500 square km). Pop. (1988 est.) 4,238,000.

Kiriath-sepher, also called DEBIR, or LODEBAR, modern TALL BAYT MIRSHAM, ancient town of Palestine, located near Hebron (in the Israeli-occupied West Bank). According to the Bible, the town was taken from the Canaanites either by Caleb's son-in-law Othniel or by Joshua himself. Tall Bayt Mirsham (Tell Beit Mirsim) was excavated (1926–32) by W.F. Albright, who uncovered exceptionally clear stratification from which he was able to give the first comprehensive description of Palestinian pottery sequences between about 2300 and 588 BC. Excavations showed that the Canaanite town of the 14th–13th century had been destroyed by the Israelites toward the end of the 13th century and that the town was finally devastated by the Babylonians about 588.

Kiribati, in full REPUBLIC OF KIRIBATI, formerly GILBERT ISLANDS, independent republic within the Commonwealth, composed of three island groups in the central Pacific Ocean. The island groups, from west to east, are the Gilbert, Phoenix, and Line islands (excluding three of the Northern Line group, which are territories of the United States). Banaba (formerly Ocean Island), an outlier from the Gilbert Islands, is also part of Kiribati. The republic's 33 constituent islands have a total land area of 328 square miles (849 square km). The capital of Kiribati is Bairiki islet on



Kiribati

Tarawa Atoll in the northern Gilberts. Formerly part of the British colony of Gilbert and Ellice Islands, which separated into two parts in 1975, the Gilberts achieved full independence as Kiribati in 1979. (The Ellice Islands became independent as Tuvalu in 1978.) The population of Kiribati in 1988 was estimated at 68,200. *See also* Pacific Islands.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. With the exception of Banaba, all the islands of Kiribati are low-lying coral atolls built on a submerged volcanic chain and encircled by reefs; none of the atolls rises to more than 25 feet (8 m) above sea level. Banaba is a coral island rising to an elevation of about 265 feet (81 m) and formerly covered with a rich layer of phosphate. With a north–south extent of more than 1,000 miles (1,600 km) and an east–west span of more than 2,000 miles, Kiribati encompasses 2,000,000 square miles (5,180,000 square km) of the equatorial Pacific, including a vast area that is rich in fishing resources. The nearest neighbours are Nauru (west) and Tuvalu and Tokelau (south).

Kiribati's climate is pleasant from April to October, when northeasterly trade winds predominate. During the rest of the year westerly gales occasionally bring heavy rains. The rainfall, however, varies considerably. Average annual rainfall in the Gilbert group ranges from 120 inches (3,000 mm) in the north to 20 inches (500 mm) in the south. Despite the moderate-to-heavy rainfall, there are occasional severe droughts, attributable primarily to the islands' extremely low elevations. Temperatures normally range between 72° F and 91° F (22° C and 33° C), although much higher temperatures have been recorded. The saline, infertile soil does not support many types of vegetation. Coconut and pandanus palms and breadfruit trees are the most common plant life.

The people. The Phoenix islands are almost completely uninhabited; only 20 of the remaining atolls are inhabited. The native people of Kiribati are mostly Micronesians, together with small minorities of Polynesians and non-Pacific Islanders. More than 95 percent live in the Gilbert Islands, and one-third live on the atoll of Tarawa, which has a very high population density. Some urbanization has developed on the islet of Bairiki on Tarawa, but most of the people of Kiribati live in traditional villages and rely on canoes as a primary means of local transport. The birth and death rates are relatively high; two-fifths of the total population is less than 15 years old.

The people are predominantly Christian, of which half are Roman Catholic and two-fifths are Congregational Protestant, with an additional small percentage of Bahā'ī. Their languages are Gilbertese (I-Kiribati) and English, the official language. English, however, is seldom used on the outer islands away from Tarawa Atoll.

The economy. Kiribati has a developing free-enterprise economy based mainly on subsistence farming and fishing. The country's gross national product (GNP) per capita is low in comparison with other countries in the world. The people maintain themselves by intensive exploitation of the sea and the limited resources of their infertile atolls. Coconut, taro, breadfruit, yams, and bananas are major foods; pandanus leaves are used for thatching of traditional huts and meetinghouses. Pigs and poultry are also raised. Employment in the copra plantations on the Line Islands (Teraina [Washington], Tabuaeran [Fanning], and Kiritimati [Christmas]), in the phosphate industry on the island republic of Nauru, and on overseas ships provides some sources of wage income. Copra exports, mainly to the United Kingdom, and revenue from the sale of fishing rights, mostly to Japan, are important sources of national income. Phosphate, formerly the chief export and largest revenue producer, has been depleted on Banaba, and mining was discontinued in 1979. Before the cessation of phosphate mining a large reserve fund was accumulated; the interest now contributes to government revenue. Imports, mostly from Australia and Japan, include rice and flour, tobacco, and manufactured goods such as cotton cloth and bicycles. The islands rely heavily on foreign aid, with the United Kingdom as the major contributor.

Most transportation between the atolls, difficult because of the vast distances over which the island groups are scattered, is by boat or air, but some of the neighbouring atolls are connected by causeways. The main port is on Tarawa, and Kiribati has international air service operating through Tarawa.

Government and social conditions. Under the constitution promulgated in 1979, Kiribati's president (the *beretitenti*), who is both head of state and head of government, is elected by universal adult suffrage. The unicameral legislature has 39 elected members who serve four-year terms. One additional member is appointed to represent the Banaban people, who were resettled on the island of Rabi (Fiji) because of expanded phosphate mining (on Banaba); they have, however, been guaranteed the right to return to their home island. The judiciary is modeled on the British system and consists of a high court and a court of appeal, as well as magistrates' courts on each inhabited island. Local government is carried out by elected island councils established on all permanently inhabited islands.

Medical service, maintained by the government, is free. There are two hospitals on Tarawa, and each atoll has a clinic with a nursing officer or medical assistant in charge. Tuberculosis, infantile diarrhea, and bacillary dysentery are among the major health problems. Life expectancy at birth is about 53 years.

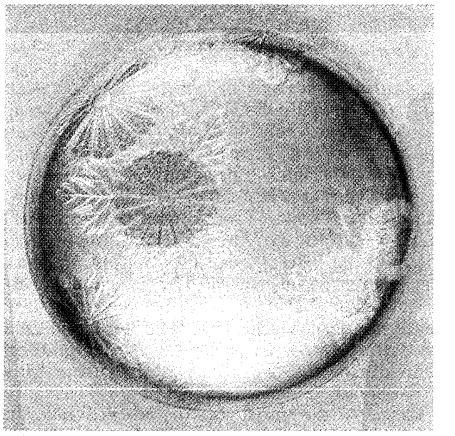
Every inhabited atoll has at least one primary school, some of them run by churches. Kiribati also has several secondary schools, as well as teacher-training, technical, and marine-training schools. Kiribati participates in the University of the South Pacific, headquartered at Suva, Fiji. Radio Tarawa broadcasts in Gilbertese and English, and Kiribati has a telephone system.

History. According to archaeological discoveries, the islands that now constitute Kiribati were first settled by early Austronesian-speaking peoples long before the 1st century AD. Fijians and Tongans arrived about the 14th century AD and subsequently merged with the older groups to form the traditional I-Kiribati Micronesian society and culture.

Spanish explorers may have sighted some of the islands as early as the 16th century. In 1765 the British commodore John Bryon discovered Nikunau; in 1788 Captain Thomas Gilbert sighted Tarawa, and Captain John Marshall sighted Aranuka. Europeans and Americans came upon the remaining islands between 1798 and 1826. They were named the Gilbert Islands in the 1820s. The waters around the Gilbert Islands were a favourite sperm-whaling ground for American and British vessels from the early 1800s until the 1870s. The first permanent European settler arrived in 1837, and the first Christian mission was established on Abaiang in 1857. The main trading commodity of the islands was coconut oil, until it was replaced by copra in the late 1800s.

The British made the Gilbert and the Ellice Islands a protectorate in 1892 and annexed Banaba in 1900 following the discovery of phosphate on the island. In 1916 the islands became a crown colony. Kiritimati (Christmas) Atoll became a part of the colony in 1919. The Phoenix Islands, contested with the United States until 1979, became a part of the colony in 1937. During World War II the colony was invaded by the Japanese (1942–43), and some of the fiercest U.S.–Japanese fighting of the war took place on Tarawa. In 1972 all the Line Islands except the three U.S.-owned islands joined the colony, but in 1976 the Ellice Islands, whose inhabitants are Polynesians, were separated to form the independent country of Tuvalu. In 1977 the colony became self-governing and on July 12, 1979, became the independent nation of Kiribati.

kirikane, in Japanese art, decorative technique used for Buddhist paintings and wooden statues and for lacquerwork. The technique used for paintings and statues employs gold or silver foil cut into thin strips or minute triangular or square pieces, which are laid on designs painted in with glue. The designs consist of straight or curved lines, a wavy vertical stripe pattern (*tate-waku*), or small flowers. *Kirikane* was imported from China


Kōgō (incense case) with a design of stylized chrysanthemums done in inlaid gold and silver *kirikane* on a gold *fundame* ground, signed Shirayama Shosai (1853–1923)

From Melvin and Betty Janss, *Inro and Other Miniature Forms of Japanese Lacquer Art;* Charles E. Tuttle, Inc.

during the T'ang dynasty (618–907). The earliest extant examples are the wooden Shi Tennō ("Four Guardian Gods") of the Kondō, Hōryū Temple near Nara, thought to be works of the late Asuka (552–645) or early Hakuhō (645–724) period. It was from the Late Heian period (897–1185) that this technique flourished, however. The paintings of the Jūni-ten ("Twelve Guardian Gods") in the Kyōōgokoku Temple, Kyōto, are regarded as typical examples.

Kirikane is employed also in decorating lacquer ware. In the somewhat modified technique, small squares of thin silver or gold plate are arranged on lacquer to represent clouds, mist, riverbanks, or moss.

Kırıkkale, town, central Turkey, on the Ankara–Kayseri railway near the Kızıl River. Formerly a village, it owes its rapid rise in

population primarily to the establishment of steel mills in the 1950s. These works, among the largest in the country, specialize in the production of high-quality alloy steel and machinery. In the 1960s chemical plants were added, and in the early 1980s plans were developed for the construction of an oil refinery. Electricity is provided by a generating plant that is linked to larger hydroelectric plants in Hırfanlı and Keşikköprü. The town is also a local market for the cereals and livestock products of the Kızıl River valley. Pop. (1980) town, 178,401; *ilçe*, 222,893.

Kirin, Wade-Giles romanization CHI-LIN, Pinyin JILIN, *sheng* (province) of the central (Northeast Manchuria) region of northeastern China, bordered by the Primorsky Kray (Maritime Province) of the Soviet Union to the east, North Korea to the southeast, the Chinese provinces of Liaoning to the south and Heilungkiang to the north, and the Inner Mongolian Autonomous Region to the west.

The article that follows is a summary of the significant detail about the Chinese province of Kirin; for additional detail about its geography, history, economy, and culture, *see* MACROPAEDIA: China.

Kirin was created a province in 1907, near the end of the Manchu dynasty, and was occupied by the Japanese Army in 1931, becoming a part of the puppet state of Manchukuo (1932–45). Just before Japan's surrender to the Allies in August 1945, Soviet forces entered the region, dismantled key industrial installations, and removed them to the Soviet Union. Following the withdrawal of Soviet troops, Chinese Nationalists moved in, but by 1948 they had been driven out by Chinese Communist forces. Since 1954, the capital of Kirin has been Ch'ang-ch'un.

The province may be divided into three parts: the eastern mountains, the western plains, and a transitional zone of rolling hills between them. The Yalu and Tumen rivers, flowing in opposite directions along the Sino-Korean border, are of great strategic importance, guarding the land approaches to northeastern China from the Korean peninsula. The Sungari River, flowing for almost 500 mi (800 km) within the province and draining an area greater than 30,000 sq mi (48,000 sq km), is Kirin's major stream. The province forms a transitional climate zone between northern and southern Manchuria. The winter is cold and long; most of the annual precipitation falls during the five warm months from May to September.

Kirin is the most urbanized province in China. Ch'ang-ch'un and Chi-lin (Kirin) are the two largest cities. The province has experienced a rapid population increase, partly due to a mass immigration of farmers and partly to a natural increase during several decades of peace and order. Kirin's inhabitants are predominantly Chinese, with the exception of some Koreans and Manchus.

The natural vegetation of the province is prairie grass in the western plains and mixed conifer and broadleaf deciduous forest in the western mountainous area. Found in these forests are such valuable wild animals as the Manchurian hare, valued for its fur, and certain snakes used to eliminate harmful garden and orchard rodents.

Ch'ang-ch'un and Chi-lin serve as major administrative, cultural, educational, commercial, and manufacturing centres. Rapid industrial development began only after World War II and the revolution. Ch'ang-ch'un has long been a food-processing centre for the rich agricultural region of the Sungari Valley, where wheat, rice, corn (maize), soybeans, *kaoliang* (sorghum), and millet are grown and livestock raised. Lumbering is also important. The province is served by extensive rail and highway networks. The Sungari is the main artery of inland navigation. Large and small steamers as well as wooden vessels use the waterway. Area 72,200 sq mi. Pop. (1983 prelim.) 22,580,000.

Kirin (China): *see* Chi-lin.

Kirínia (Cyprus): *see* Kyrenia.

Kirishitan (Japanese, from Portuguese *cristão,* Christian), Japanese Christian or Christianity, specifically Roman Catholic missionaries and converts in 16th- and 17th-century Japan. Modern Japanese Christianity is known as Kirisuto-kyō.

Christian missionaries led by Francis Xavier entered Japan in 1549, only six years after the first Portuguese traders, and over the next century converted hundreds of thousands of



Image of the Virgin Mary in the form of the Buddhist goddess Kannon

By courtesy of the International Society for Educational Information, Tokyo

Japanese—perhaps half a million—to Christianity. The influence of the Jesuits, and later, Franciscans, was enormous and the growth of the new sect raised political fears that helped fuel Japan's decision to exclude all foreign traders but the Dutch, the Chinese, and the Koreans.

Oda Nobunaga (1534–82) had taken his first step toward uniting Japan as the first missionaries landed, and as his power increased he encouraged the growing Kirishitan movement as a means of subverting the great political strength of Buddhism. Oppressed peasants welcomed the gospel of salvation, but merchants and trade-conscious *daimyos* saw Christianity as an important link with valuable European trade. Oda's successor Toyotomi Hideyoshi (1537–98) was much cooler toward the alien religion. The Japanese were becoming aware of competition between the Jesuits and the Franciscans, and between Spanish and Portuguese trading interests. Toyotomi questioned the reliability of subjects with some allegiance to the foreign power at the Vatican. In 1587 he ordered all foreign missionaries to leave Japan but did not enforce the edict harshly until a decade later, when nine missionaries and 17 native Kirishitan were martyred.

After Toyotomi's death and the brief regency of his adopted child, the pressures relaxed. However, Tokugawa Ieyasu, who founded the great Tokugawa Shogunate (1603–1867) gradually came to see the foreign missionaries as a threat to political stability. By 1614, through his son and successor, Tokugawa Hidetada, he banned Kirishitan and ordered the missionaries expelled. Severe persecution continued for a generation under his son and grandson. Kirishitan were required to renounce their faith on pain of exile or torture. Every family was required to belong to a Buddhist temple, and periodic reports on them were expected from the temple priests.

The rebellion in 1637–38 of a community of Kirishitan in the Shimabara Peninsula (*see* Shimabara Revolt) was put down only with difficulty, and its eventual failure intensified efforts to root out the faith. By 1650 all known Kirishitan had been exiled or executed. Undetected survivors were driven underground into a secret movement that came to be known as Kakure Kirishitan (Hidden Christians), existing mainly in western Kyushu Island around Nagasaki and Shimabara. To avoid detection they were obliged to practice deceptions such as using images of the Virgin Mary disguised as the popular and merciful Bōsatsu (*bodhisattva*) Kannon, whose gender is ambiguous and whom carvers often render as female.

The populace at large remained unaware that the Kakure Kirishitan managed to survive for two centuries, and when the prohibition against Catholics began to ease again in the mid-19th century, arriving European priests were told there were no Japanese Christians left. A Catholic church set up in Nagasaki in 1865 was dedicated to the 26 martyrs of 1597, and within the year 20,000 Kakure Kirishitan dropped their disguise and openly professed their Christian faith. They faced some repression during the waning years of the Tokugawa Shogunate, but early in the reforms of the emperor Meiji (reigned 1867–1912) the Kirishitan won the right to declare their faith and worship publicly.

About 14,000 of the long-hidden Christians established relations with the European priests and found their way into the Roman Catholic Church, but a large remainder would not abandon various Buddhist and other non-Christian elements that had crept into Kakure Kirishitan tradition during two centuries of isolation. These, hidden no longer, came to be known as Hanare Kirishitan, or Separate Christians.

Kiritimati Atoll, also called CHRISTMAS ATOLL, largest (150 sq mi [388 sq km]) island of purely coral formation in the world; it is in the Northern Line Islands, part of Kiribati, in the west central Pacific Ocean. About 100 mi (160 km) in circumference, it was sighted on Christmas Eve in 1777 by the English navigator Capt. James Cook. Although claimed by the U.S. under the Guano Act of 1856, the atoll was annexed by Britain in 1888 and was incorporated into the Gilbert and Ellice Islands Colony in 1919. British sovereignty was challenged by the U.S. in 1936, and ownership remained in dispute until 1979, when Kiritimati became a part of independent Kiribati. The atoll has port facilities, an airfield, and a large government-owned copra plantation. After 1956 it was an operational base for both U.S. and British nuclear weapons tests. Pop. (1978) 1,265.

Kirk, Alan G(oodrich) (b. Oct. 30, 1888, Philadelphia—d. Oct. 15, 1963, New York



Alan G. Kirk, 1954

By courtesy of the U.S. Navy

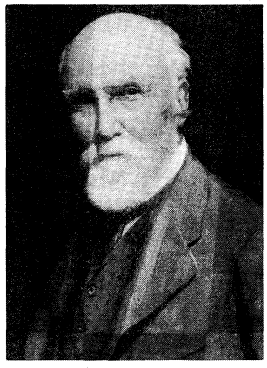
City), U.S. naval officer who commanded successful amphibious landings in Sicily and Normandy during World War II; he later served in important diplomatic posts.

Early in World War II, Kirk, a graduate (1909) of the U.S. Naval Academy at Annapolis, Md., became chief of staff for the commander of U.S. naval forces in Europe. In 1943 he trained and led a task force that put an infantry division ashore in the invasion of Sicily. In June 1944 Kirk commanded nearly 1,000 ships of the Western Naval Task Force that landed U.S. troops and supplies at the Omaha and Utah beaches of Normandy.

After retiring from the navy with the rank of admiral in 1946, Kirk served as U.S. ambassador to Belgium (1946–49), the Soviet Union (1949–52), and the Republic of China (1962). He was forced to return from Taiwan in less than a year because of ill health.

Kirk, Sir John (b. Dec. 19, 1832, Barry, near Arbroath, Angus, Scot.—d. Jan. 15, 1922, Sevenoaks, Kent, Eng.), Scottish physician, naturalist, and British administrator in Zanzibar.

Kirk accompanied David Livingstone's expeditions into central Africa from 1858 to



Sir John Kirk, watercolour by A.H. Kirk, 1915; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

1863 and in 1866 was appointed acting surgeon to the Zanzibari political agency, where he rose to the rank of consul general and agent (1873). He strove to uphold the interests of Sultan Mājid and his successor, Barghash, with whom he concluded an antislavery treaty in 1873. Although he induced the British government to discourage Egyptian expansion along the East African coast (1875), he could not persuade it to defend the sultan against the German pressure for a protectorate in the early 1880s. Kirk was knighted in 1881 and retired in 1887.

Kirk, Norman Eric (b. Jan. 6, 1923, Waimate, N.Z.—d. Aug. 31, 1974, Wellington), leader of the New Zealand Labour Party from 1964 and prime minister and minister of foreign affairs of New Zealand (1972–74). As prime minister, Kirk stressed the need for regional economic development and affirmed New Zealand's solidarity with Australia in adopting a foreign policy more independent of the United States. In 1973 he strongly opposed French nuclear tests in the Pacific.

Kirk Range, plateau in southwestern Malawi, extending in a north–south direction and skirting the southwestern shore of Lake Nyasa and the western border of the Shire River valley. The northern scarp overlooks the Central Region Plateau, while the southern limits merge into the lower Shire Highlands. The plateau's height decreases in a southerly direction, from 5,500 feet (1,676 m) at Dedza to 1,400 feet (425 m) in the Blantyre area. The plateau is dotted with residuals of former erosion, such as Dedza Mountain (7,120 feet [2,170 m]) and the hills of Chirobwe and Mvai. The Kirk Range forms the watershed boundary between Lake Nyasa and Mozambique.

Largely uninhabited in the 18th century, the plateau attracted Ngoni settlers after 1850 and later supported a moderate population because of its perennial water supply. The main cash crop is potatoes, and coffee is grown in sections of the range. Kyanite (an aluminum silicate) was found near Ntcheu town, and there are forest reserves at Mvai and Dedza.

Kirkcaldy, district, Fife region, eastern Scotland. Created by the reorganization of 1975, it is part of the former county of Fife (*q.v.*). The district, with an area 96 square miles (248 square km), is the heart of the East Fife coalfield. The growing of cereals and potatoes and stock raising are the chief agricultural pursuits. Kirkcaldy is the seat of the district authority; Burntisland refines aluminum ore. Pop. (1987 est.) 147,963.

Kirkcaldy, royal burgh (1450), industrial town, seaport, and the seat of the administrative authority for Kirkcaldy district, Fife region, Scotland. It is situated on the north shore of the Firth of Forth.

First developed by Dunfermline Abbey nearby, Kirkcaldy was a flourishing port during the later Middle Ages. The salt trade of the district (centred on nearby Dysart) was then the largest in Scotland. A group of Flemish-style buildings of this period survive near the harbour.

After a decline in the 18th century, Kirkcaldy's fortunes revived with the establishment of the linen industry in the early 19th century and reached another peak after the notable development of its famous linoleum industry. Large areas of 19th-century factories and warehouses left by its decline have now been cleared and redeveloped for housing. Kirkcaldy's other industries include malting, linen weaving, rope and twine making, furniture manufacturing, and light electrical engineering. Kirkcaldy was the birthplace of the great economist Adam Smith. Pop. (1981) 46,520.

Kirkcaldy (of Grange), Sir William, Kirkcaldy also spelled KIRKALDY (b. *c.* 1520—d. Aug. 3, 1573), Scottish soldier noted for his tactical skill and bravery. He was a leader of Scotland's Protestants in their struggle against the Roman Catholic queen Mary Stuart, but he upheld the queen's cause after she fled to England in 1568.

Kirkcaldy was one of the Protestant conspirators who murdered the powerful cardinal David Beaton at St. Andrews Castle in May 1546. From 1550 to 1556 he served in France as a secret agent for England. He returned to Scotland in 1557 and two years later joined the Protestant lords against the Catholic Mary of Lorraine (Mary of Guise), mother of and queen regent for Mary Stuart. After Mary Stuart assumed control of the government in 1561, Kirkcaldy at first cooperated with her regime. His opposition to her marriage to Henry Stewart, Earl of Darnley (July 1565), however, caused him to join an abortive Protestant uprising against the queen. Pardoned for this offense, Kirkcaldy participated in the murder of Mary's Italian secretary, David Riccio, in March 1566; nevertheless, he played no part in the murder of Darnley in February 1567.

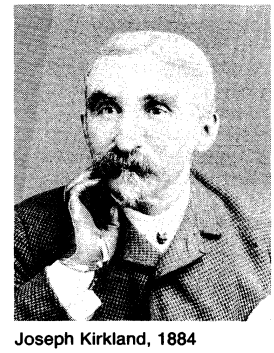
When the queen married James Hepburn, 4th Earl of Bothwell, who was the suspected murderer of Darnley, Kirkcaldy joined with the Protestant lords against the ruling couple. He received Mary's surrender at Carberry Hill outside Edinburgh in June 1567 and—following her escape from confinement—his tactical skill brought about her forces' defeat at Langside near Glasgow in May 1568. Mary agreed to divorce Bothwell, and Kirkcaldy led her supporters in holding Edinburgh Castle against the partisans of her young son, King James VI. The stronghold surrendered in May 1573, and three months later Kirkcaldy was hanged. King Henry II of France called him "one of the most valiant men of our time."

Kirkcudbright, also called KIRKCUDBRIGHTSHIRE, formerly EAST GALLOWAY, a county in southwestern Scotland until the reorganization of 1975. It is now largely in Stewartry, Nithsdale, and Wigtown (*qq.v.*) districts, of Dumfries and Galloway (*q.v.*) region.

The county of Kirkcudbright formed the eastern portion of the historic province of Galloway and was bounded on the east by the River Nith and on the west by the River Cree. After the departure of the Romans from the area in ancient times, it was subject to invasions by Britons, Irish-Scots, Angles, Norwegians, and Danes. The Norsemen ruled the region for 300 years after they invaded it in about AD 800. Unlike the rest of Scotland, Galloway subsequently retained its own code of laws until the late 14th century, a fact that vested great power in the region's feudal barons. In 1245 John de Balliol became overlord of Kirkcudbright through the inheritance of his wife, Devorgilla, daughter of Alan, lord of Galloway. The Balliols, who owned great estates in England and France, brought the best of Norman civilization to the county. Kirkcudbright also became the home of two large Cistercian abbeys, one at Sweetheart (1273–1605) that was endowed by Devorgilla, and one at Dundrennan (1142–1605), both of which are now impressive ruins. Kirkcudbright was the site of bitter religious controversy during the Scottish Reformation in the mid-16th century. The royal burgh and former county town of Kirkcudbright, along the estuary of the River Dee, remains the principal town in the area, along with Castle Douglas and Dalbeattie.

Kirkland, Joseph (b. Jan. 7, 1830, Geneva, N.Y., U.S.—d. April 29, 1894, Chicago, Ill.), novelist whose only work, a trilogy of Midwestern pioneer life, contributed to the development of realistic fiction in the United States.

Kirkland, who readily acknowledged his indebtedness to the English realist Thomas Hardy, was also affected by his own personal experiences as a publisher's clerk, railroad auditor, soldier, coal-mine operator, and lawyer. He was also influenced by his mother, Caroline Kirkland, whose realistic accounts of the family's life in backwoods Michigan were published in the 1840s. He began writing late in life and was 57 when *Zury: The Meanest Man in Spring County* was published in 1887. The first book of the trilogy, it was praised



Joseph Kirkland, 1884

By courtesy of the Library of Congress, Washington, D.C.

for its portrait of the farmer Zury Prouder. *The McVeys* (1888), depicting village life, and *The Captain of Company K* (1891), about the Civil War, complete the trilogy.

Kirkland, (Joseph) Lane (b. March 12, 1922, Camden, S.C., U.S.), American labour

leader who was president of the American Federation of Labor–Congress of Industrial Organizations (AFL–CIO) from 1979.

Kirkland graduated from the United States Merchant Marine Academy in 1942 and then was an officer on American merchant ships throughout World War II. He settled in Washington, D.C., and, after earning a bachelor's degree from Georgetown University's School of Foreign Service in 1948, he became a staff researcher for the American Federation of Labor. He rose through the administrative ranks of the AFL, and in 1960 he became an executive assistant to the AFL–CIO's president, George Meany. Kirkland was elected secretary-treasurer of the AFL–CIO in 1969, and when Meany retired in 1979, Kirkland succeeded him as president of the labour federation.

Kirkland, Samuel (b. Dec. 1, 1741, Norwich, Conn. [United States]—d. Feb. 28, 1808, Clinton, N.Y., U.S.), Congregational minister to the Indians of the Six Nations (the Iroquois League) and negotiator of the Oneida Alliance with the colonists during the U.S. War of Independence (1775–83).

While still a student at Princeton, Kirkland began his wilderness treks on snowshoes to preach to the Indians. Gradually he mastered several Indian languages and became a trusted friend of the Tuscarora and the Oneida Indians. During the war he served as chaplain to colonial troops and was commended by General George Washington for his diplomacy with the Indians. He was rewarded for these services by a congressional land grant (1785), augmented in 1788 by a joint grant from the Indians and the state of New York, where he founded the Hamilton Oneida Academy for young Indian and white men in the new town of Kirkland. (In 1812 the school became Hamilton College.) In 1791 he conducted an Indian delegation to Congress in Philadelphia to discuss the problems of integration.

Kirkland Lake, town, Timiskaming district, eastern Ontario, Canada. It is situated 125 miles (200 km) north-northwest of North Bay. Since the discovery of gold in the vicinity in 1911, at the time of the construction of the Ontario Northland Railway, the town has grown to become one of Canada's largest gold producers. During the bonanza years of 1927–28 dozens of mines sprang up along its "Golden Mile," including Kirkland Lake, Teck-Hughes, Lake Shore, Wright-Hargreaves, Sylvanite, Macassa, Toburn, and Golden Gate. Tourism has become increasingly important. Pop. (1986) 11,604.

Kırklareli, city, northwestern (European) Turkey, in the foothills of Istranca Mountains. Formerly called Kırk Kılıse ("Forty Churches"), it developed chiefly because of its position on the shortest route over the mountains from the north to Istanbul, 100 miles (160 km) southeast. The city has numerous Ottoman monuments, including the 15th-century Mosque of Hızır Bey. An important trade centre (chiefly in dairy products, cereals, and tobacco), it is linked by a branch line with the Edirne–Istanbul railway.

The area in which Kırklareli lies is bordered on the north by Bulgaria and on the east by the Black Sea. It is drained by the Ergene River. The area north of Kırklareli contains dense, deciduous forests, a major source of Turkey's timber industry. The section south of the city produces wheat, barley, sugar beets, vines, and tobacco. Stock raising is important in these regions, and dairy products are exported to Istanbul and other cities. South of Kırklareli, on the Edirne–Istanbul route, is Lüleburgaz (ancient Arcadiopolis), site of some noteworthy Ottoman buildings, including a 16th-century mosque built by the famous architect Sinan. Pop. (1985) city, 40,881.

Kirklees, district (borough), metropolitan area of West Yorkshire, England. It has an area of 158 square miles (410 square km). The district takes its name from Kirklees Hall (17th century) on the site of a small Cistercian priory (1155), the traditional grave of Robin Hood. The district extends from flat-topped and heather-clad gritstone moorland to more open, industrialized valleys that have both woolen and worsted industries. From Huddersfield, in the Colne valley, a conurbation sprawls into the Calder valley and north and east into the Spen valley; it includes Mirfield, Heckmondwike, Cleckheaton, Dewsbury, and Batley. Dewsbury specializes in "shoddy," reusing rag fibres, and, like Huddersfield, also has ancillary engineering trades. Pop. (1986 est.) 376,600.

Kirkman, Jacob, Kirkman also spelled KIRCHMANN, or KIRCKMANN (b. March 4, 1710, Bischweiler, Alsace [now Bischwiller, Fr.]—d. May 1792, London, Eng.), Alsatian-born British harpsichord maker and member of a large family of instrument builders active into the 19th century.

Kirkman was trained as a cabinetmaker and went to England in the early 1730s to work for an obscure immigrant Flemish harpsichord maker in London. He eventually became harpsichord maker to the queen (1763) and gained a wide reputation for the excellence of his instruments. Having no children, he entered into partnership with his nephew Abraham Kirkman (*c.* 1772) and began building pianofortes to accommodate a growing demand for that instrument. The last Kirkman harpsichords were constructed early in the 19th century by Abraham's son and grandson, both named Joseph.

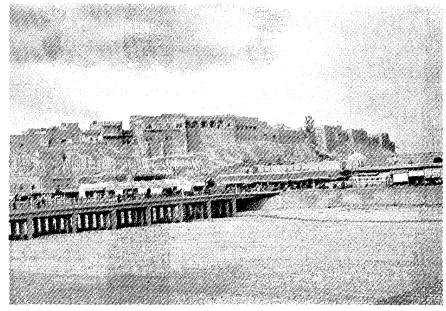
More than 100 Kirkman harpsichords survive, many in excellent condition. Some are lavishly marquetried (decorated with inlaid veneer), and the majority have three sets of strings operated by either one or two keyboards. With his competitor Burkat Shudi (Burkhardt Tschudi), founder of the Broadwood firm of instrument makers, Kirkman was responsible for producing a majority of the best harpsichords in England.

Kirkpatrick, Ralph (Leonard) (b. June 10, 1911, Leominster, Mass., U.S.—d. April 13, 1984, Guilford, Conn.), American musicologist who won regard as one of the most influential harpsichordists of the 20th century.

Kirkpatrick studied the piano from the age of six and began to play the harpsichord in 1930. He graduated from Harvard University in 1931 and thereafter went to Paris to continue his studies. His teachers included Wanda Landowska, the French conductor and teacher Nadia Boulanger, and the British early-music specialist Arnold Dolmetsch. Kirkpatrick taught at Yale University from 1940 until 1976. Although he was especially known for his performances of the harpsichord music of J.S. Bach and the Italian-Spanish composer Domenico Scarlatti, he also performed on the clavichord and (particularly the music of Wolfgang Amadeus Mozart) on the early pianoforte. His greatest scholarly achievements were his exhaustive biography, *Domenico Scarlatti* (1953), and an 18-volume facsimile edition of Scarlatti's complete keyboard sonatas (1971).

Kirksville, city, seat of Adair county, northeastern Missouri, U.S., near the Chariton River. Founded in about 1841 as the county seat, it was known as Long Point and Hopkinsville before being renamed for Jesse Kirk, an early resident. A minor American Civil War battle was fought (1862) nearby. Kirksville is a trading and shipping centre for a grain and livestock area. The city's light manufactures include electrical items and clothing. Northeast Missouri State University (1867) and the Kirksville College of Osteopathic Medicine (the birthplace of osteopathy in the United States, founded by A.T. Still in 1892) are in the city. Thousand Hills State Park is nearby. Inc. town, 1857; city, 1873. Pop. (1988 est.) 15,855.

Kirkūk, city, northeastern Iraq. The city is 145 miles (233 km) north of Baghdad, the national capital, with which it is linked by road and railway. Kirkūk is located near the foot



The old part of Kirkūk, Iraq, seen from across the bed of the dried-up Qaḍā' River

Diane Rawson—Photo Researchers/EB Inc.

of the Zagros Mountains in the Kurdistan region of Iraq. During the period of Assyrian prominence (9th–10th century BC) the city was called Arrapha. The Nabī Dāniāl mosque (6th century AD) stands in the old quarter. Most of the town's population is of Turkmen stock, and it also has a number of Christians. Kirkūk is a trade and export centre for the surrounding area's agricultural produce and cattle; textiles are manufactured there. It is also a major centre of Iraq's petroleum industry, with oil pipeline connections to Tripoli, Lebanon, and to Yumurtalik, on the Turkish Mediterranean coast. The crude oil production has stimulated sustained expansion in the city. Pop. (latest est.) 207,852.

Kirkwall, royal burgh (1486), seaport, and capital of the Orkney Islands (*q.v.*), off the northern tip of Scotland. Early Norse influence persisted as late as the building of the 12th-century red sandstone cathedral of St. Magnus, a dominant feature of the present town, where the ruins of the Earl's Palace and 17th-century houses standing gable-end to the narrow paved streets present a picturesque appearance. Kirkwall has few manufacturing industries apart from boat building and the processing of local agricultural produce—whisky distilling, egg packing, creameries, and cheesemaking. The exploitation of North Sea oil and the building of a landfall terminal at Flotta in Scapa Flow, 12 miles (19 km) to the southwest, has led to some development of offshore servicing and supply for the oil industry at Kirkwall. The town functions mainly as a service centre for the Orkney Islands and is the seat of the administrative authority of the islands' area council. Pop. (1981) 6,826.

Kirkwood gaps, interruptions that appear in the distribution of asteroids where the orbital period of any small body present would be a simple fraction of that of Jupiter. Several zones of low density in the minor planet population were noticed about 1860, by Daniel Kirkwood, an American mathematician and astronomer, who explained the gaps as resulting from perturbations by Jupiter. An object revolving in one of the gaps would be disturbed regularly by the planet's gravitational pull and eventually would be moved to another orbit.

Kirmān (Iran): *see* Kermān.

Kirmān carpet: *see* Kermān carpet.

Kirov, *oblast* (province), western Russian S.F.S.R. The *oblast* covers an area of 46,650

square miles (120,800 square km) and occupies almost the entire basin of the Vyatka River. It is a rolling morainic plain rising from the broad, central valley of the Vyatka to the dissected limestone uplands of the Severnye Hills in the north and the Vyatsky Hills and Verkhne (Upper) Kama upland in the east. Nearly all the *oblast* lies in swampy forest, or taiga, of pine, fir, spruce, and birch; in the extreme south deciduous species such as oak begin to appear. There are extensive areas of peat bog and swamp. Most of the population live in the Vyatka River valley. Timber working is a major element in the economy; iron deposits near Omutninsk, which have been worked since the 18th century, are the base, together with Urals ore, for metallurgical industries. Phosphorite is mined at Rudnichny. Agriculture is poor and relatively unimportant, and a heavy emigration of rural population has continued since the 1930s. Kirov city is the administrative centre. Pop. (1989 prelim.) 1,694,000.

Kirov, formerly (until 1934) VYATKA, or VIATKA, city and administrative centre of Kirov *oblast* (province), northwestern Russian S.F.S.R., on the Vyatka River. The city was founded as Khlynov in 1181 by traders from Novgorod and became the centre of the "Vyatka Lands," settled by Russians in the 14th to the 15th century. In 1489 it was captured by Moscow. Renamed Vyatka in 1780, it became a provincial seat, but development was slow, and it was used as a place of exile. In 1934 the city was renamed for the Soviet official Sergey M. Kirov. Today, railways radiate to Perm, Kotlas, Vologda, and Gorky. The city's once-renowned handicraft industries have been replaced by large-scale, modern industries, particularly nonferrous metalworking, engineering, tire making, and timber working. There are teacher-training and agricultural institutes and a library founded by the Russian revolutionary leader and writer A.I. Herzen during his exile there in the 1840s. Pop. (1989 prelim.) 441,000.

Kirov, Sergey Mironovich, original name SERGEY MIRONOVICH KOSTRIKOV (b. March 27 [March 15, Old Style], 1886, Urzhum, Vyatka province, Russia—d. Dec. 1, 1934, Leningrad), Russian Communist leader whose assassination marked the beginning of the Great Purge in the Soviet Union (1934–38).

A Bolshevik Party member and organizer, Kirov was arrested several times for his revolutionary activities before the October Revolution (1917) placed the Bolsheviks in power in central Russia. Kirov worked to extend their control in Transcaucasia; in 1921 he was appointed first secretary of the Azerbaijan party organization and subsequently helped organize the Transcaucasian Soviet Federated Socialist Republic (March 1922), which at the end of 1922 was incorporated into Soviet Russia to form the Union of Soviet Socialist Republics.

In 1926 Joseph Stalin, the general secretary of the party, transferred Kirov to Leningrad to head the Leningrad party organization. Kirov was also made a candidate member of the Politburo in 1926, and, after loyally supporting Stalin against his right-wing opponents, he was elected to full membership in the Politburo (1930). As party boss of Leningrad, he spurred the expansion and modernization of that city's industries. Although Kirov's official image remained that of a staunch Stalinist, in the early 1930s he demonstrated increasing independence in directing the activities of his Leningrad organization and gradually began to assume a position of power nearly rivaling that of Stalin. On Dec. 1, 1934, Kirov was assassinated at the Communist Party headquarters in Leningrad by a youthful party member, Leonid Nikolayev. Nikolayev and 13 suspected accomplices were shot. Subsequently, Stalin claimed to have discovered a widespread conspiracy of anti-Stalinist Communists who were planning to assassinate the entire Soviet leadership; he therefore launched an intense purge, executing hundreds of Leningrad citizens and sending thousands more to forced-labour camps for their alleged complicity in the plot. Later, Nikita Khrushchev in his "secret speech" (Feb. 25, 1956) strongly implied that Stalin himself engineered Kirov's assassination.

Kirov Ballet, Russian BALET IMENI KIROVA, prominent Soviet ballet company, part of the Kirov State Academic Theatre of Opera and Ballet in Leningrad. Its traditions, deriving from its predecessor, the Imperial Russian Ballet, are based on the work of such leading 19th-century choreographers as Jules Perrot, Arthur Saint-Léon, and Marius Petipa and such dancers as Marie Taglioni, Olga Preobrajenska, Mathilde Kschessinskaya, Anna Pavlova, Vaslav Nijinsky, Tamara Karsavina, Michel Fokine, George Balanchine, and Maria Danilova.

The company began as a dancing academy founded in St. Petersburg in 1735 and was the centre of Russian ballet until the October Revolution of 1917. After the revolution the company lost 40 percent of its personnel but maintained its repertoire and its technical proficiency under the teacher Agrippina Vaganova and artistic director Konstantin Sergeyev. The company produced new works on heroic themes, as well as such experimental works as Igor Belsky's *The Coast of Hope* (1959). After 1961 the company toured western Europe, the United States, and Canada.

Kirovabad (Azerbaijan S.S.R.): *see* Gyandzha.

Kirovakan, formerly (until 1935) KARAKLIS, city, Armenian S.S.R. It lies at the confluence of the Pambak, Tandzut, and Vanadzoriget rivers. In 1826 the villages of Bolshoy and Maly Karaklis were merged into the town of Karaklis. Construction of the Tiflis–Karaklis–Alexandropol railway at the end of the 19th century speeded the town's development. In 1935 the name of Karaklis was officially changed to Kirovakan to honour the Soviet official Sergey Kirov. A monument to him stands in Kirov Square in the centre of the city. Electricity from a nearby hydroelectric station on the Pambak River serves Kirovakan's chemical industries, which produce carbide, ammonia, acetate silk, synthetic corundum, and plastic resin. Other industries include the production of precision tools, chemical machinery, textiles, and foodstuffs. Kirovakan was one of several Armenian cities devastated by an earthquake in 1988. Pop. (1987 est.) 169,000.

Kirovograd, *oblast* (province), Ukrainian S.S.R. It has an area of 9,500 square miles (24,600 square km) and extends from the Dnepr River in the northeast across the rolling hills of the Dnepr Upland to the basin of the Yuzhny ("Southern") Bug River in the southwest. The *oblast*'s natural vegetation of grass steppe on fertile soils has been almost wholly plowed up, and unsound practices have resulted in serious and widespread erosion. The *oblast*'s economy is dominated by agriculture, chiefly the cultivation of wheat, corn (maize), sunflowers, sugar beets, and flax; many beef and dairy cattle are kept. Over half the population is urban; communities, apart from Kirovograd, the capital, are small and serve chiefly to collect and process farm produce. Some lignite is mined by opencut methods at Dimitrovo and graphite at Zavalye. Pop. (1989 prelim.) 1,240,000.

Kirovograd, formerly YELIZAVETGRAD, or ELIZAVETGRAD, city and administrative centre of Kirovograd *oblast* (province), Ukrainian S.S.R. It lies along the upper Ingul River where the latter is crossed by the Kremenchug–Odessa railway. Founded as a fortress in 1754, it was made a city, Yelizavetgrad, in 1765 and developed as the centre of a rich agricultural area. Yelizavetgrad was renamed Zinovyevsk in 1924, Kirovo in 1936, and Kirovograd in 1939. It retains its function as an agricultural centre: in addition to food-processing industries, it has one of the most important agricultural-machinery works in the Soviet Union. There are also machine-building and light industries. Kirovograd has a teacher-training institute. Pop. (1989 prelim.) 269,000.

Kirovsk, formerly (until 1934) KHIBINOGORSK, city, Murmansk *oblast* (province), northwestern Russian S.F.S.R., at the edge of the Khibiny Mountains. Until the opening of apatite and nephelinite mines in the region in 1929, Kirovsk was merely open tundra peopled by reindeer herders. It soon became a booming mining city and was incorporated in 1931. In addition to wood-using industries, Kirovsk has the Kola branch of the Academy of Sciences of the U.S.S.R., a botanical garden of the academy, and mining and medical schools. Pop. (latest census) 38,484.

Kırşehir, city, central Turkey. It lies along a tributary of the Kızıl River at an elevation of 3,248 feet (990 m). It may have been Justinianopolis (Mocissus), which, under the Byzantine emperor Justinian (AD 527–565), was a major town in the ancient district of Cappadocia. From the 14th to 18th century, Kırşehir was the stronghold of the influential Ahi brotherhood, a religious fraternity developed by the 14th-century leader Ahi Avran out of a medieval craftsmen's guild. The Cacabey Cami, a 12th-century Seljuq observatory converted into a mosque, the Alâeddin Cami (13th century), and the mausoleum of the poet Aşık Paşa are all standing. Kırşehir is linked by road with Ankara (90 miles [145 km] northwest) and Nevşehir (46 miles [74 km] southeast).

The surrounding region is drained by the Kızıl and Delice rivers. Its agricultural products include cereals and fruits, and carpet making is a major activity. Pop. (1985) city, 64,754.

Kirshehr rug, handwoven floor covering, usually in a prayer design and made in



Kirshehr prayer rug from Anatolia, about 1900; in a private collection in New Jersey

In a private collection, New Jersey; photograph, Otto E. Nelson—EB Inc.

Kırşehir (Kirshehr), a town between Ankara and Kayseri in central Anatolia. The typical Kirshehr prayer rug of the 19th century has an elaborately stepped arch (to indicate the direction of Mecca, the Holy City) above a prayer-niche design that might be fringed with tiny carnations in profile and contain a smaller, concentric niche similarly outlined but having a contrasting colour. The colour scheme is remarkably rich, with such hues as cherry red, yellow, violet, light blue, prominent greens, terra-cotta, and black brown. Some of the later rugs show influence of the French Empire style, and the palette eventually degenerates into flaring aniline dyes.

Kirstein, Lincoln (b. May 4, 1907, Rochester, N.Y., U.S.), American dance authority, impresario, writer, and businessman who collaborated with George Balanchine to found and direct the various ballet companies that eventually became the world-renowned New York City Ballet (directed by Kirstein from 1948). Kirstein also helped establish the School of American Ballet, which was directed by him from 1940.

Kirstein was born into a wealthy family. His aesthetic leanings were displayed early. While a student at Harvard University (B.S., 1930), he founded and edited (1927–34) a literary magazine, *Hound and Horn,* whose contributors included T.S. Eliot, Ezra Pound, and e.e. cummings. Financially independent, Kirstein decided to devote his life to the support and promotion of the arts.

His artistic interests, always diverse, soon focused on ballet. He helped Romola Nijinsky write the biography of her famous husband, and it was he who, in 1933, persuaded a young member of Diaghilev's Ballets Russes, George Balanchine, to come to the United States, thus beginning an artistic collaboration that ended only with Balanchine's death (1983). In 1934 Kirstein and Balanchine founded the School of American Ballet, with Balanchine as artistic director and Kirstein as director of theatrical sciences; in 1940 Kirstein became the school's director. During the next decade the two founded several ballet companies that, while short-lived, had a profound effect on ballet in the United States. In 1934 they founded the American Ballet, with Balanchine as choreographer. Kirstein, an established author, wrote the librettos for several ballets (*e.g., Transcendence* and *Billy the Kid*). He also founded (1936) and directed Ballet Caravan, an ensemble of dancers recruited from the American Ballet and the school, which functioned primarily as a showcase for young talent. In 1941 the Ballet Caravan merged briefly with the American Ballet, and then the combined company disbanded.

After serving in World War II, Kirstein returned to New York City and cofounded another dance troupe, Ballet Society, with Balanchine as artistic director. In 1948 this troupe gave the premiere of Stravinsky's *Orpheus* (choreography by Balanchine), considered a landmark of modern dance. Kirstein and Balanchine then transformed the Ballet Society into the New York City Ballet, which became one of the world's leading ballet companies. From its founding (1948), Balanchine was its artistic director (1948–83) and Kirstein its general director.

Kirstein's literary output was prolific and eclectic. His books include *Dance* (1935), a standard reference work; *The Classic Ballet* (1952; with Muriel Stuart); *Movement and Metaphor* (1970); *The New York City Ballet* (1974); *Nijinsky Dancing* (1975); and *Thirty Years with the New York City Ballet* (1978). From 1942 to 1948 he edited *Dance Index,* a magazine that published scholarly, illustrated, and annotated monographs on the entire spectrum of dance topics. In bound form (seven volumes), *Dance Index* became a major reference work for dance scholars.

kīrtana, form of musical worship or group devotion particularly enjoyed by Vaiṣṇava sects (followers of the god Vishnu) of Bengal. *Kīrtana* usually consists of a verse sung by a soloist and then repeated by a chorus, to the accompaniment of percussion instruments. Sometimes the singing gives way to the recitation of a religious poem, the repetition of God's name (*nāma-kīrtana*), or dancing. Frequently the *kīrtana* songs describe the relationship between the human soul and God in terms of the love of the divine cowherder Krishna and his favourite, Rādhā (a type of song termed *līlā-kīrtana,* the "*kīrtana* of [Krishna's divine] sport"). An evening of *kīrtana* may last for several hours, often bringing about in the participants a state of religious exaltation. *Kīrtana* as a form of worship was popularized by the 15th–16th-century Bengal mystic Caitanya, who continually strove for more direct emotional experience of God.

Kīrthar Range, hill region in Pakistan, extending southward for about 190 miles (300 km) from the debouchment of the Mūla River in east Kalāt (Baluchistan) to Rās Muāri (Cape Monze) west of Karāchi on the Arabian Sea. It forms the boundary between the Lower Indus Plain and southern Baluchistan. A series of parallel, rock hill ridges rising from 4,000 feet (1,200 m) in the south to nearly 8,000 feet in the north, it is broken by only a few gorges and is drained in the north by the Kolāchi River and in the south by the Hab and Lyāri rivers, which flow to the Arabian Sea near Karāchi. The inhabitants of the region, chiefly Baluchi, Jāṭ, and Brahui tribes, subsist by flock grazing. The hills give their name to the Kīrthar geological group of extinct shell-bearing limestones found on their crests.

Kiruna, city in the *län* (county) of Norrbotten, northern Sweden. It is situated north of the Arctic Circle on the east bank of Lake Luossa and between the rich iron-ore Kiruna and Luossa mountains. Kiruna was founded in 1899 with the extension of the railroad from Gällivare, and in 1908 it became a municipality. Having incorporated more than 7,980 square miles (20,669 square km) in 1948, it claimed to be the world's largest city in area. Mining, the principal industry, developed rapidly after a railroad linked Kiruna with the port of Narvik, Nor., in 1902. Inhabited in part by Lapps, the area has a church (1912) that is shaped like a large Lapp hut. Pop. (1985 est.) mun., 27,220.

Kirwan, Richard (b. Aug. 1, 1733, Cloughballymore, County Galway, Ireland—d. June 1, 1812, Dublin), Irish chemist known for his contributions in several areas of science.

Kirwan, who was born a Catholic, attended the University of Poitiers from about 1750 to 1754. He entered the Jesuit novitiate at Saint-Omer, Fr., that same year; but when his elder brother (and the heir to the family estates) was killed in a duel in 1755, Kirwan left Saint-Omer and returned to Ireland. He had a brief career as a lawyer, soon finding the profession unsuitable.

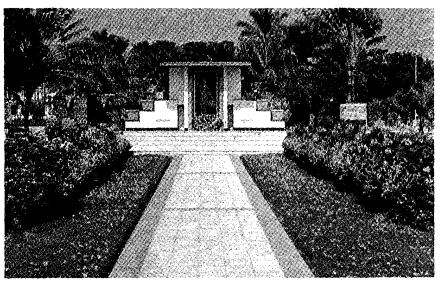
From 1777 to 1787 Kirwan lived in London. While there, he was elected to the Royal Society (1780) and wrote a series of papers on chemical affinity, in addition to the volume *Elements of Mineralogy* (1784) and his best known book, *Essay on Phlogiston* (1787).

Having moved to Dublin in 1787, Kirwan helped to found the Royal Irish Society, in 1799 becoming its president. In addition to his papers and books on chemistry, Kirwan wrote *Geological Essays* (1799), a controversial response to the pioneering work of geologist James Hutton; a work on comparative climatology; a two-volume work on logic; and a volume of essays on metaphysics.

Kiryū, city, Gumma Prefecture (*ken*), Honshu, Japan, on the edge of the Kantō Plain, northwest of Tokyo. In the 17th century fine Kiryū silks were worn by samurai and court nobles. In the 20th century the city became a major production centre for brocades, satins, and other fine silks for export. After World War II the textile industry was expanded to include the manufacture of rayon. Kiryū has not been influenced by neighbouring cities' industrialization. Pop. (1985) 131,268.

Kisangani, formerly (until 1966) STANLEYVILLE, city, northeastern Zaire, central Africa. The city is situated on the Congo (Zaïre) River, just below Boyoma (formerly Stanley) Falls. It is the nation's major inland port after Kinshasa. Above Kisangani, falls on the Congo River impede river navigation for about 56 miles (90 km); a short railroad carries river freight between Kisangani and the port of Ubundu, above the falls.

The city was established in 1883 by Europeans and was known first as Falls Station and



Memorial in Kisangani to Patrice Lumumba, first prime minister of the Democratic Republic of the Congo (now Zaire)

Tomas D.W. Friedmann—Photo Researchers

then as Stanleyville (for Sir Henry Morton Stanley). It has been the major centre of the northern Congo since the late 19th century. Between 1964 and 1967 its population and activities declined because of political instability, but after 1967 it underwent considerable commercial and industrial growth. Industries include brewing, furniture and clothing making, and printing. The surrounding region is predominantly agricultural, yielding primarily palm, rice, cotton products, coffee, cocoa, rubber, timber, and quinine; livestock is raised in the east, around Bunia. On the outskirts of the city, villagers fish with nets at the Wagenia Falls. A hydroelectric dam is at the falls of the nearby Tshopo River, a Congo tributary. The former Free University of the Congo (1963) was reorganized in 1971 as the Kisangani campus of the National University of Zaire. The city also has a teacher-training school and an agricultural school and research institute. An international airfield was opened in 1974. Pop. (1984 prelim.) 282,650.

Kisarazu, city, Chiba Prefecture (*ken*), Honshu, Japan, on the west coast of the Bōsō Peninsula. Located in the delta of the Obitsu River, it prospered as an early regional commercial and post town. During the Kamakura period (1192–1333), the town lay on the sea route to Kamakura, and during the Tokugawa period (1603–1867), Kisarazu obtained the exclusive right of sea traffic between the western Bōsō Peninsula and Edo (now Tokyo).

In the late 19th century Kisarazu declined with the introduction of the steamship and the opening of a railway from Tokyo along the coast of the Bōsō Peninsula. The expansion of the Keiyo (Tokyo–Chiba) Industrial Region on reclaimed lands had reached the city, however, by the early 1970s. Chemicals, iron, steel, and electrical machinery are produced there. Pop. (1985) 120,201.

Kiselyov, Pavel Dmitriyevich, Kiselyov also spelled KISELEV (b. Jan. 19 [Jan. 8, old style], 1788, Moscow—d. Nov. 26 [Nov. 14,

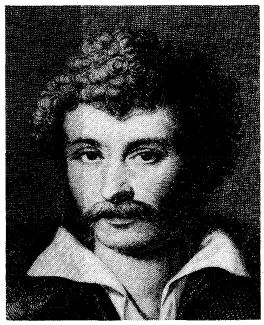
old style], 1872, Paris), Russian general, statesman, and progressive administrator during the reign of Tsar Nicholas I (1825–55).

Kiselyov fought in the war against Napoleon in 1812 and in 1814 became an aide-de-camp to Alexander I, after which his rise was rapid. He served as chief of staff of the Second Army in the Ukraine (1819–29) and then carried out a number of progressive reforms as administrator of Moldavia and Walachia (1829–34). He was promoted to full general and became a member of the State Council in 1834. For the next two decades he was one of Tsar Nicholas' principal advisers as well as a leading participant in government administration of the peasantry. He helped draft plans for the government regulation of land allocation to the serfs after their projected emancipation, and in 1837 he became minister of state properties and reformed the regulations concerning state peasants. Schools he had established for children of government peasants became known as Kiselyov schools. Under Tsar Alexander II Kiselyov served as ambassador to Paris from 1856 to 1862.

Kiselyovsk, also spelled KISEL'OVSK, or KISELEVSK, city, Kemerovo *oblast* (province), central Russian Soviet Federated Socialist Republic. It developed in the 1930s as an industrial and coal-mining centre. Much of the coal is used for coking. Kiselyovsk's engineering industries produce drilling equipment and trucks and mechanical horses for underground coal trains. Pop. (1986 est.) 127,000.

To make the best use of the Britannica, consult the INDEX *first*

Kisfaludy, Károly (b. Feb. 6, 1788, Tét, Hung.—d. Nov. 21, 1830, Pest), Romantic dramatist, the first Hungarian playwright to achieve considerable popular success.



Kisfaludy, detail of an engraving after a drawing by H. Pecz, 1893

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

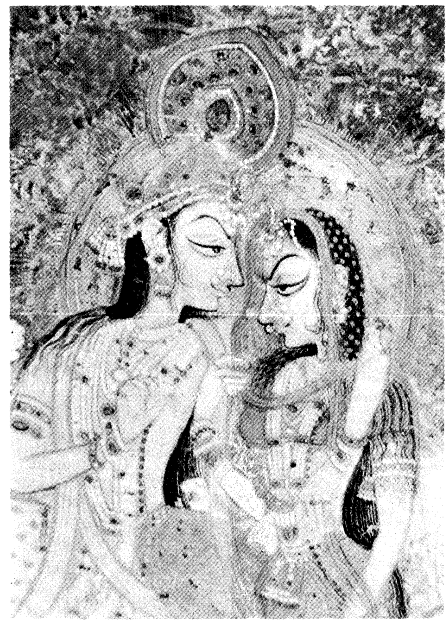
Kisfaludy left school at 16 to become a soldier and fought in the Napoleonic Wars. In 1811, while leading a precarious existence as a painter in Vienna, he tried his hand at a historical drama, *A tatárok Magyarországon* ("The Tartars in Hungary"). The play remained unknown until eight years later, when it was performed by a repertory company in a provincial town; they repeated their performance in Pest, making Kisfaludy famous overnight.

Among Kisfaludy's most important works are the tragedy *Iréne* (1820) and the comedy *A kérők* (1817; "The Suitors"). He stepped into the literary leadership left vacant by Ferenc Kazinczy's gradual withdrawal from his active career, and, in 1822, Kisfaludy began to publish his literary almanac, *Aurora,* which became the chief literary vehicle of the coming generation of Hungarian Romantics: József Bajza, Mihály Vörösmarty, and Ferenc Kölcsey.

Kish, modern TALL AL-UHAIMER, ancient Mesopotamian city-state located east of Babylon in what is now south-central Iraq. According to ancient Sumerian sources it was the seat of the first postdiluvian dynasty; most scholars believe that the dynasty was at least partly historical. A king of Kish, Mesilim, is known to have been the author of the earliest extant royal inscription, in which he recorded his arbitration of a boundary dispute between the south Babylonian cities of Lagash and Umma. The dynasty ended when its last king, Agga, was defeated about 2660 by Gilgamesh, king of the first dynasty of Uruk. Although Kish continued to be important throughout most of ancient Mesopotamian history, it was never able to regain its earlier prominence.

Kishangarh, also spelled KISHENGARH, town, central Rājasthān state, northwestern India. It is situated about 50 miles (80 km) southwest of Jaipur on the banks of Lake Gūndalāo. The town, with its fort and palace, was founded in 1611 by Kishan Singh, a Rājput (one of the warrior rulers of the historic region of Rājputāna), and it was the capital of the former princely state of Kishangarh, which became part of the state of Rājasthān in 1948. A trade centre for cotton fabrics and agricultural produce, Kishangarh is connected by road and rail with Ajmer and Jaipur. Soap, woolen carpets, and shawls are manufactured in the town. Handloom weaving, cloth dyeing, and precious-stone cutting are local cottage industries. The town's public buildings include a hospital and a government college affiliated with the University of Rājasthān. Pop. (1981) 62,032.

Kishangarh painting, 18th-century school of the Rājasthanī style of Indian painting that arose in the princely state of Kishangarh (central Rājasthān state). The school is clearly distinguished by its individualistic facial type and its religious intensity. The sensitive, refined features of the men and women are drawn with pointed noses and chins, deeply curved



Rādhā and Krishna, detail of a Kishangarh painting, mid-18th century; in a private collection

P. Chandra

eyes, and serpentine locks of hair. Their action is frequently shown to occur in large panoramic landscapes.

Though competent paintings similar in style to late Mughal art were perhaps being done in Kishangarh at the end of the 17th century, the brilliant series of paintings on the Rādhā–Krishna theme were due largely to the inspiration of Raja Sāvant Singh (reigned 1748–57). He was a poet, also, who wrote under the name of Nagari Dās, as well as a devout member of the Vallabhācārya sect, which worships the lord in his appearance on Earth as Krishna, the divine lover. Sāvant Singh fell in love with a singer in the employ of his stepmother called Bani Thani ("Lady of Fashion"), and it is speculated that her features may have been the model for the Kishangarh facial type. The master artist largely responsible for transmitting the romantic and religious passions of his patron into new and fresh visual images was Nihal Chand.

Kishar (Mesopotamian mythology): *see* Anshar and Kishar.

Kishi-mojin (Buddhist mythology): *see* Hārītī.

Kishi Nobusuke, original name SATŌ NOBUSUKE (b. Nov. 13, 1896, Yamaguchi Prefecture, Japan—d. Aug. 7, 1987, Tokyo), statesman whose term as prime minister of Japan (1957–60) was marked by a turbulent opposition campaign against a new U.S.–Japan security treaty agreed to by his government.

Born Satō Nobusuke, an older brother of future prime minister Satō Eisaku, he was adopted by a paternal uncle bearing the Kishi name. He graduated from the Tokyo Imperial law department (1920) and began a successful civil service career. In 1936 he became a vice minister of the Manchukuo government's industrial department and helped to promote the industrialization of Japanese-occupied Manchuria and China. On his return to Japan (1940) he contributed to wartime economic organization as vice minister of commerce and industry. He resigned when frustrated in his attempts to impose government control of the *zaibatsu* (industrial combines) but returned to government in 1941 as commerce and industry minister in the Cabinet of Tōjō Hideki. In April 1942 he won a seat in the House of Representatives. Subsequently he served as Tōjō's vice minister of munitions but increasingly opposed Tōjō's policy of continuing the war at all costs; Kishi's opposition contributed to the fall of the Tōjō Cabinet in 1944. Although imprisoned in 1945 by the Allied Occupation authorities, Kishi was released (1948) without trial.

After reestablishing himself as a businessman, Kishi resumed his political activities. He was elected to the House of Representatives in 1953 and then helped to organize the Japan Democratic Party, which he was instrumental in merging with other conservative factions to form the Liberal-Democratic Party in 1955. The following year he became foreign minister in the Cabinet of Ishibashi Tanzan. When Ishibashi fell ill, Kishi succeeded him as prime minister in February 1957.

As prime minister Kishi emphasized Japan's special relationship with the United States and sought to ease tensions with the nations of Southeast and South Asia, visiting them in 1957 to promote reparations agreeements and economic cooperation. In 1959 he traveled to western Europe and Latin America. Kishi had visited Washington, D.C., in 1957, and he returned in January 1960 to sign a revised U.S.–Japan security treaty intended to put the relationship between the two nations on an equal basis and to restore independent diplomacy for Japan. To implement this policy he initiated an official study of the controversial postwar constitution, which outlawed war, and he encouraged Japanese self-reliance in national defense.

Kishi used his conservative parliamentary majority to ratify the revised treaty while the opposition parties were boycotting the Diet session. This was viewed as high-handed and undemocratic and provoked large-scale public demonstrations against Kishi; the protests led to the cancellation of a scheduled visit

to Japan by U.S. President Dwight D. Eisenhower.

In the aftermath, Kishi resigned, to be succeeded by Ikeda Hayato. Although the section of the constitution outlawing the "potential to make war" was not altered, Kishi initiated a policy of interpreting this clause liberally, allowing the Self-Defense forces more armaments. He remained an active member of the Liberal-Democratic Party.

Kishinyov, also spelled KISHINEV, or KIŠIN'OV, city and capital, Moldavian S.S.R., situated along the Byk River. The first documentary reference to Kishinyov dates from 1466, when it was under the rule of the Moldavian prince Stefan III. After Stefan's death the city fell under the control of Turkey. Gradually Kishinyov's trading importance increased, though the city suffered severe destruction in the Russo-Turkish War of 1788. In 1812 Kishinyov was ceded to Russia with the rest of Bessarabia. The poet Aleksandr Pushkin was sent there in exile. Following World War I it was included in Romania, but it was ceded back to the Soviet Union in 1940 and became the capital of the Moldavian S.S.R. Heavy damage was inflicted in World War II, but after the war Kishinyov was rebuilt. Newer parts of the city lie on terraces along the Byk; parts of the old town, however, are still subject to flooding.

Kishinyov is the major industrial centre of Moldavia and is especially important for light engineering and the manufacture of measuring equipment, machine tools, tractors, pumps, refrigerators, washing machines, and insulated wiring. Wine making, flour milling, and tobacco processing are notable among the city's wide range of agriculture-related industries. There are also clothing and footwear factories. The city is the cultural centre of Moldavia, with an academy of sciences, a university (1945), other institutions of higher education, and several scientific-research establishments—notably for viticulture and wine making. Pop. (1989 prelim.) 665,000.

Kishiwada, city, Ōsaka *fu* (urban prefecture), Honshu, Japan, facing Ōsaka Bay. The city developed around the castle founded by the Wada family in the 14th century. It passed into the possession of the Okabe daimyo family in the 17th century and became a major port by the early 1800s. Kishiwada's traditional industry of tile manufacture was supplemented after World War II by the lumber, textile, and metal industries. Local agricultural products include rice, onions, and flowers. Pop. (1988 est.) 187,948.

Kishon River (Israel): *see* Qishon River.

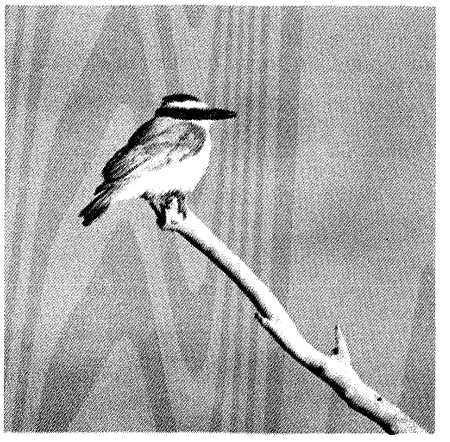
Kishorganj, town, east-central Bangladesh. It lies along the Kundāli Khāl River, which is navigable during the rains. Formerly noted for muslin manufacture, it was the site of a factory (trading post) of the British East India Company. Kishorganj was constituted a municipality in 1869. It now contains sugar and paper mills and is connected by road and rail with Mymensingh and Bhairab Bāzār. Pop. (1981) 52,302.

Kisi (people): *see* Kissi.

Kisii (people): *see* Gusii.

Kisin (Mayan god): *see* Cizin.

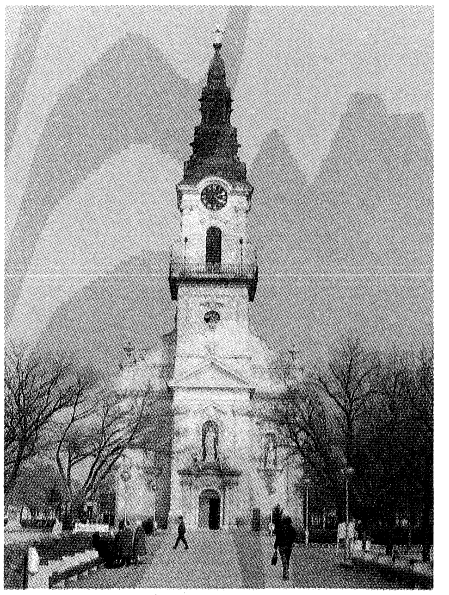
kiskadee (genus *Pitangus*), either of two similar New World bird species of flycatchers (family Tyrannidae, order Passeriformes), named for the call of the great kiskadee, or derby flycatcher (*P. sulphuratus*). The great kiskadee is reddish brown on the back, wings, and tail. The throat is white, the crown and sides of the head are black, and a white band surrounds the crown, which is surmounted by a yellow crown patch. The lesser kiskadee (*P. lictor*) is smaller but has similar markings.



Great kiskadee, or derby flycatcher (*Pitangus sulphuratus*)
M.P. Kahl

The aggressive great kiskadee, 23 cm (9 inches) in length, is found in woodland, savannah, and wet areas from Texas and Louisiana to Argentina. Shrikelike, it drops from a perch onto such prey as frogs and insects. It also eats fruit and is known to make shallow dives for fish. Its grass nest has a domed roof. The lesser kiskadee, 19 cm (7.5 inches) long, lives from Panama to Bolivia, always along waterways. Its call is a nondescript whistle.

Kiskunfélegyháza, town, Bács-Kiskun *megye* (county), central Hungary. It is in the region between the Danube and the Tisza rivers, formerly known as Kiskunság (Little Kumania, from the immigrant Cuman [Kipchak] settlements of the 14th century), of which it was the capital. Little Kumania enjoyed considerable local autonomy before an administrative reorganization in 1876. The region is still an important agricultural centre (grain, tobacco, fruit, and wine) with some industry (brickworks, mining machinery). The town itself was destroyed by the Turks in the 16th century; its restoration as a Magyar town dates from the mid-18th century. The Ó-templom is a Baroque church (1744–52), and the main square is an example of a Hungarian type of Art Nouveau current at the end of the 19th century. The town lies on the main road and rail lines from Budapest to Szeged and is an important transport junction. Pop. (1989 est.) 35,000.



Ó-templom in Kiskunfélegyháza, Hung.
Copyright by INTERFOTO MTI, Hungary; photograph, Béla Ilovszky

Kislovodsk, city, Stavropol *kray* (region), southwestern Russian S.F.S.R. It lies along the Podkumok River in the Caucasus foothills just southwest of Pyatigorsk. Founded in 1803 as a spa based on abundant local mineral springs, Kislovodsk has become one of the largest health resorts in the U.S.S.R., with seven springs and more than 40 sanitoriums and rest homes. The climate is mild and sunny. The carbonaceous mineral water, *narzan,* is bottled and distributed throughout the Soviet Union. Kislovodsk is the birthplace of the Russian writer Aleksandr Solzhenitsyn. Pop. (1989 prelim.) 114,000.

Kismaayo, also spelled CHISIMAYU, or KISMAYU, Italian CHISIMAIO, seaport, southern Somalia. It lies along the Indian Ocean, near the mouth of the Jubba River. Founded in 1872 by the sultan of Zanzibar, the town was taken by the British in 1887; it later became a part of Jubaland and was within Italian Somaliland (1927–41). In the 1960s its harbour facilities, mainly used in the banana export industry, were improved with U.S. aid. The town has a meat-processing plant. Pop. (1981 est.) 70,000.

Kissavos (Greece): *see* Ossa.

Kissi, also spelled KISI, people inhabiting a belt of hills covered by wooded savannas where Guinea, Sierra Leone, and Liberia meet; they speak a language of the West Atlantic branch of the Niger-Congo family. This region seems to have taken in refugees, and Kissi show traits of Sudanese and Guinean origin.



Kissi statue of a kneeling female figure with bared teeth, Sierra Leone; in Musée de l'Homme, Paris
By courtesy of Musee de l'Homme, Paris

Rice, cultivated in marshes, is the staple of the Kissi diet; other foods include yams, sweet potatoes, and taro. Coffee and kola are grown for external trade. Agriculture is the primary occupation; there are few craft specialists.

Kissi villages are built of round clay huts with conical roofs, situated in clearings in the forest. Rarely containing more than 150 persons, they are composed of several exogamous patrilineages that may occupy distinct quarters. Each lineage is headed by its senior member, who serves as the priest of the ancestor cult and the intermediary between the living and the dead family members. The priest also settles internal disputes and represents the lineage to outside authorities.

Kissi religion includes agricultural, ancestral, and other cults. Small stone statuettes (*kissi*), made by former inhabitants of the area, are

used to represent the ancestors, who provide the only means of communication with the creator god.

Kissidougou, town and administrative capital of Kissidougou region, southeastern Guinea, West Africa. It is located at the intersection of roads from Faranah, Guéckédou, and Kankan. The town was founded in the 1890s as a French outpost in the campaigns against



Village market near Kissidougou, Guinea
Photo Research International

Samory Touré, the Malinke warrior-leader. The chief trading centre (rice, cassava, livestock, and palm oil and kernels) for the Kissi people of the Guinea Highlands, it is also the major collecting point for the forested Kissidougou region (area 3,424 sq mi [8,868 sq km]), which exports coffee and kola nuts. Kissidougou has a sawmill and a soft drink enterprise; it has also been a centre for alluvial diamond mining since the 1930s. It is the site of a hospital, a secondary school, and a Roman Catholic mission. Pop. (1977 prelim.) region, 160,000.

Kissinger, Henry A(lfred) (b. May 27, 1923, Fürth, Ger.), U.S. political scientist, who, as adviser for national security affairs and secretary of state, was a major influence in the shaping of foreign policy from 1969 to 1976 under Presidents Richard M. Nixon and Gerald R. Ford.

Kissinger's family immigrated to the United States in 1938 to escape the Nazi persecution of Jews. He became a naturalized citizen in 1943. After studying accounting at City College, New York, he served in the U.S. Army during World War II and in the postwar U.S. military government of Germany. He received his Ph.D. in 1954 from Harvard and then joined the faculty as instructor, becoming professor of government in 1962 and director of the Defense Studies Program from 1959 to 1969. He also served as a consultant on security matters to various U.S. agencies from 1955 to 1968, spanning the administrations of Dwight D. Eisenhower, John F. Kennedy, and Lyndon B. Johnson. Kissinger's *Nuclear Weapons and Foreign Policy* (1957) established him as a leading authority on U.S. strategic policy. He opposed Secretary of State John Foster Dulles' policy of planning nuclear "massive retaliation" to Soviet attack, advocating instead a "flexible response" combining the use of tactical nuclear weapons and conventional forces, as well as the development of weapons technology in accordance with strategic requirements. That book and *The Necessity for Choice* (1960), in which Kissinger limited his concept of flexible response to conventional forces and warned of a "missile gap" between the Soviet Union and the United States, had a significant impact on the activities of the Kennedy administration.

Kissinger's reputation as a political scientist led to his appointment by President Nixon as assistant for national security affairs in December 1968. He eventually came to serve as head of the National Security Council (1969–75) and as secretary of state (September 1973–Jan. 20, 1977).

Kissinger soon emerged as an influential figure in the Nixon administration. His major diplomatic achievements involved China, the Soviet Union, Vietnam, and the Middle East. He developed a policy of warmer U.S. relations with the Soviet Union, détente, which led to the strategic arms limitation talks (SALT) in 1969. He established the pro-Pakistan policy in the India–Pakistan war of late 1971, helped negotiate the SALT I arms agreement with the Soviet Union (signed 1972), and developed a rapprochement between the United States and the People's Republic of China (1972), the first official U.S. contact with that nation since the Chinese Communists had come to power.

Although he originally advocated a hard-line policy in Vietnam and helped engineer the U.S. bombing of Cambodia (1969–70), Kissinger later played a major role in Nixon's Vietnamization policy—the disengagement of U.S. troops from South Vietnam and their replacement by South Vietnamese forces. On Jan. 23, 1973, after months of negotiations with the North Vietnamese government in Paris, he initialled a cease-fire agreement that both provided for the withdrawal of U.S. troops and outlined the machinery for a permanent peace settlement between the two Vietnams. For this apparent resolution of the Vietnam conflict, Kissinger shared the 1973 Nobel Prize for Peace with the North Vietnamese negotiator, Le Duc Tho (who refused the honour).

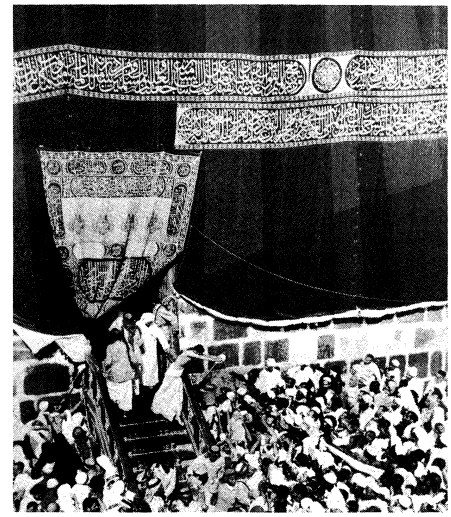
After the Arab–Israeli war of 1973, Kissinger used what came to be called shuttle diplomacy in disengaging the opposing armies and promoting a truce between the belligerents. He was responsible for the resumption of diplomatic relations between Egypt and the United States, severed since 1967. He remained in office after Nixon's resignation in 1974, directing the conduct of foreign affairs under President Ford. After leaving office in 1977, Kissinger became an international consultant, writer, and lecturer. In 1983 Pres. Ronald W. Reagan appointed him to head a national commission on Central America.

Kissinger's later books include *American Foreign Policy* (1969), *The White House Years* (1979), and *For the Record* (1981). Biographies of Kissinger include Marvin and Bernard Kalb's *Kissinger* (1974) and Seymour Hersh's *The Price of Power* (1983), a critical view of his activities in office.

Kistna (India): *see* Krishna River.

Kisumu, town, capital of Nyanza Province, Kenya, East Africa, on the northeastern shore of Lake Victoria. It is the commercial, industrial, and transportation centre of western Kenya, serving a hinterland populated by almost 4,000,000 people. Kisumu is an important link in the Lake Victoria–Mombasa trade because of its water and rail connections. It is also the chief terminus for the agricultural produce of the Nyanza and Western provinces. In 1979 a brewery and a plant to convert molasses to power alcohol were under construction. Kisumu is Kenya's third largest city. Asians once constituted more than a quarter of the population, but this segment has declined since independence in 1963. Pop. (1983 est.) 167,100.

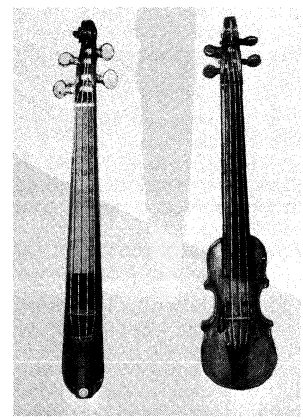
kiswah, black brocade cloth that covers the most sacred shrine of Islām, the Ka'bah (*q.v.*) in Mecca. A new *kiswah* is made in Egypt every year and carried to Mecca by pilgrims. On it is embroidered in gold the Muslim profession of faith (*shahādah*) and a gold band of ornamental calligraphy carrying Qur'ānic verses. Each year during the major pilgrimage (*ḥajj*), the *kiswah* is replaced with a white cloth that corresponds to the white ceremonial robes of the pilgrims and signifies entrance into a sacred state (*iḥrām*). At the end of the *ḥajj,* the new *kiswah* is put in place, and the old one is cut into small relics that are sold to pilgrims. The custom of covering the Ka'bah is pre-Islāmic; the yearly renewal of the covering is an innovation that is said to have begun during the caliphate of 'Umar I, when



The *kiswah* is pulled aside as the washing of the Ka'bah begins
Middle East Features—Black Star/EB Inc.

the Ka'bah almost collapsed under the weight of too many *kiswah*s.

kit, small fiddle with a muted tone, carried by dancing masters in their pockets in the 16th–18th century. A last descendant of the medieval rebec, the kit evolved as a narrow, boat-shaped instrument with usually three or four strings. Later, narrow, violin-shaped kits



Rebec- and (right) violin-shaped kits; in the Museum of Fine Arts, Boston
Leslie Lindsay Mason Collection of Musical Instruments (formerly the Galpin Collection), Museum of Fine Arts, Boston

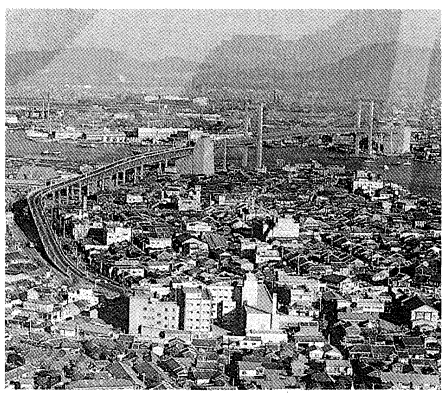
were also built. Dancing masters used it to play the dance melody and rhythm while teaching the steps.

The instruments were often elaborately carved or inlaid with ivory, tortoiseshell, or gems. A frequent tuning was c′–g′–d″, beginning with middle C.

Kita-Ibaraki, city, northern Ibaraki Prefecture (*ken*), Honshu, Japan, facing the Pacific Ocean. The western part of the city occupies hills that slope toward the rest of the city on the coast. Agriculture (rice) and fishing (sardines, mackerel) are important. Because of the closing of all but one of the coal mines in the area, the city's population was decreasing throughout the 1970s. Kita-Ibaraki is renowned for the Japan Art Institute, established in the former villa of the late 19th- and early 20th-century artists Okakura Tenshin and Yokoyama Taikan. Pop. (1980) 47,670.

Kita-Kyūshū (Japanese: North Kyushu), city, Fukuoka Prefecture (*ken*), Kyushu, Japan, on the Shimonoseki and Tsushima straits. It was created in 1963 by the amalgamation of the cities of Wakamatsu, Yawata (Yahata), Tobata, Kokura, and Moji, which now form the five wards of the 180-sq-mi (466-sq-km) city. Part of its long coastline is included in the Inland Sea National Park.

Kita-Kyūshū is one of Japan's leading manufacturing centres and is the one in which heavy industry is most prominent. The industrial nucleus, Yawata, specializes in iron and steel, heavy chemicals, cement, and glass. Wakamatsu produces metals, machinery, ships, and



Wakato Grand Bridge spanning an inlet of the Hibiki Sea between Tobata and Wakamatsu, two of the five wards of Kita-Kyūshū, Japan

Shostal—EB Inc.

chemicals and is a major coal port for northern Kyushu. Tobata is one of the main deep-sea fishing bases of western Japan, has a large output of cotton textiles, and contains numerous metal industries. Kokura, a former arsenal town, specializes in iron and steel and machinery. Moji contains the city's major port facilities; it is a coal-shipping and fishing port and has oil-storage facilities.

Most of Kita-Kyūshū's urbanized area is on reclaimed coastland. Two undersea tunnels link the city with Shimonoseki, Honshu. The Wakato Grand Bridge spans the central industrial zone. Pop. (1983 est.) 1,063,600.

Kitabatake Chikafusa (b. 1293, Japan—d. May 10, 1354, Anō, Yamato Province, Japan), Japanese warrior, statesman, and author of the influential politico-historical treatise *Jinnō shōtōki* ("Record of the Legitimate Succession of the Divine Emperors"), which set forth the mystic and nationalist doctrine that Japan had a unique superiority among nations because of its unbroken succession of divine rulers.

Kitabatake served as adviser to the emperor Go-Daigo when that monarch returned from exile in 1333 to reclaim the throne he had lost to a warring feudal faction. Go-Daigo's brief restoration ended with a revolt against the throne and the establishment of two courts, the northern court at Kyōto and the southern court of Go-Daigo at Yoshino.

This situation led to the writing of Kitabatake's *Jinnō shōtōki*, which attempted to prove that Go-Daigo and his line were the legitimate heirs to the Japanese throne. Written in 1339 and published in 1369, this book influenced the revival in later centuries of the nationalistic Shintō religion and was of seminal importance in the rise of modern Japanese nationalism. In his own time Kitabatake was considered the chief military and administrative supporter of the southern court and a model of loyalty as well.

Kitahara Hakushū, original name KITAHARA RYŪKICHI (b. Jan. 25, 1885, Fukuoka, Japan—d. Nov. 2, 1942, Tokyo), Japanese poet who was a major influence in modern Japanese poetry with his aesthetic and symbolic style.

In 1906 he joined the Shinshisha (New Poetry Association) and published poems in its magazine *Myōjō* that brought him instant fame as a rising young poet. In 1909 he founded the Pan no Kai in opposition to the Naturalism that dominated literary circles at that time.

His first collection of poems, *Jashūmon* (1909; "Heretics"), which depicted the Christian missionaries in 16th-century Japan, won him much praise for the exotic and sensuous beauty of his writing. In 1911 the collection of his lyric poems, *Omoide* ("Recollection"), was published and also received great praise. Kitahara introduced a new symbolic, decadent style into the genre of the traditional 31-syllable tanka and organized the Tama Tanka Group.

Kitaj, R(onald) B(rooks) (b. Oct. 29, 1932, Chagrin Falls, near Cleveland, Ohio, U.S.), U.S.-born painter noted for his eclectic and original contributions to Pop Art.

Kitaj studied art at the Cooper Union in New York City and at the Academy of Fine Arts in Vienna. After working as a merchant seaman and serving in the U.S. Army (1955–57), he settled in England and studied at the Ruskin School of Drawing and Fine Arts and at the Royal College of Art in London. Kitaj was associated with the beginnings of the Pop Art movement in Great Britain in the early 1960s. His works mingled the impersonal finish characteristic of Pop canvases with the loose, painterly brushwork of Abstract Expressionism but differed from the work of his Pop contemporaries in their complex and allusive figurative imagery. Kitaj's semi-abstract paintings featured brightly coloured and imaginatively interpreted human figures portrayed in puzzling and ambiguous relation to one another. His work was highly intellectual in its wealth of pictorial references to historical, artistic, and literary topics. Kitaj continued to exhibit widely throughout the 1960s and '70s while teaching painting at various British fine arts schools.

Kitakami-sammyaku (Japanese: Kitakami Range), mountain range, in northeastern Honshu, Japan, paralleling the Pacific coast and extending for about 155 mi (250 km) from southern Aomori Prefecture, through Iwate and Miyagi prefectures, to terminate in the Ojika Peninsula. The range has a maximum breadth of 50 mi and is nearly wedge shaped. The highest peak, Hayachine-san, rises to an elevation of 6,280 ft (1,914 m) in the centre of the range.

The mountains of the Kitakami-sammyaku are generally regarded as dissected erosion surfaces in step formation, the highest step level being 2,950 ft. Hayachine-san and other protruding peaks support some alpine vegetation.

The western margin of the range descends to the valley of the Kitakami-gawa (Kitakami River), which flows longitudinally between the Kitakami-sammyaku and the Ōu-sammyaku. The eastern side of the Kitakami-sammyaku presents two main configurations: in the north the mountains are fringed by 980-ft-high marine terraces, while in the south the mountains have been drowned to form a greatly embayed coast. The southern coast is liable to severe damage by tsunamis (tidal waves).

The Kitakami-sammyaku region is often referred to as the "Tibet of Japan" and is regarded as one of the pioneer fringes of Honshu. Until the mid-20th century, relics of old agricultural practices survived, including the serf system known as Nago. Rice has now replaced millet as the major crop, and the valleys are used for breeding dairy cattle. The southern part of the range is crossed by two railways running from the Pacific coast to the rail line in the Kitakami-gawa valley.

Kitami, city, northeastern Hokkaido, Japan, facing the Sea of Okhotsk at the confluence of the Tokoro-gawa (Tokoro River) and the Muka-gawa. It occupies 163 sq mi (421 sq km) on the railway between Asahigawa and Abashiri. Originally an Ainu settlement known as Nokkeushi (Edge of a Field), it was first settled by Japanese immigrants in 1897. The town was made a municipality in 1942 and renamed Kitami. The surrounding Kitami Valley produces beans, potatoes, sugar beets, and peppermint; the peppermint refinery in Kitami is one of the largest in Japan. Other industries produce lumber, paper, iron, and steel products. Pop. (1983 est.) 105,428.

Kitami-sammyaku (Japanese: Kitami Range), mountain range, northeastern Hokkaido, Japan, extending 180 mi (290 km) along the coast of the Sea of Okhotsk. The range is basically an upwarped block except in the west, where it drops abruptly to the Teshio-gawa (Teshio River) valley. Elevations are generally between 2,500 and 3,100 ft (750 and 950 m). In the south central part of the range, however, the Wenshiri horst (block of the Earth's crust set off by faults) protrudes above the surrounding area and is crowned by Teshio-dake (Mt. Teshio; 5,115 ft).

The highest elevations occur in the southwest, where the erosion remnant of Ishikari-dake reaches 6,500 ft. Recent volcanoes that rest upon the mountains west of Ishikari-dake include Asahi-dake (7,510 ft), the highest peak in Hokkaido. The volcanic group and Ishikari-dake give rise to the headwaters of the Ishikari-gawa, which flows to the Sea of Japan, and the Tokachi-gawa, which flows to the Pacific. Unlike most other mountains in Japan, the Kitami-sammyaku displays a subdued form characterized by coarse-textured slopes and wide, open valleys. Many erosion surfaces are developed in step formation, as are those of Teshio-dake.

Kitasato Shibasaburo (b. Dec. 20, 1852, Oguni, Kyushu, Japan—d. June 13, 1931, Nakanocho), Japanese physician and bacteriologist who in 1894, during an epidemic in Hong Kong, discovered almost simultaneously with the French bacteriologist Alexandre Yersin the bacillus *Pasteurella pestis*, the infectious agent of bubonic plague.

From 1885 to 1891 Kitasato studied in Robert Koch's laboratory in Berlin, where, with Emil von Behring, he studied tetanus and diphtheria bacilli. In 1889 Kitasato became the first to obtain a pure culture of the tetanus bacillus. In 1890 he and Behring demonstrated



Kitasato, *c.* 1928

Archiv fur Kunst und Geschichte, West Berlin

the value of antitoxin in preventing disease by producing a passive immunity to tetanus in an animal that received graded injections of blood serum from another animal infected with the disease.

Returning to Japan in 1892, Kitasato founded near Tokyo a laboratory that in 1899 was incorporated as the Imperial Japanese Institute for the Study of Infectious Diseases, and showed with his associates (among them, August von Wassermann) how dead cultures

can be used in vaccination. He also studied the mode of infection in tuberculosis. In 1914 he resigned the directorship of the Imperial Institute and founded the Kitasato Institute.

Kitay-gorod, district (*rayon*) of the city of Moscow, bordering the Kremlin on the east, the Staraya and Novaya squares on the west, and the Moskva River on the south, and including the area known as Red Square (*q.v.*). Settlement in Kitay-gorod began in the 11th century. As a suburb of Moscow, it became a centre of trade in the 14th century under the name of Bolshoi Posad ("large merchants' quarter"). With the growth of Moscow, the quarter prospered and became the hub of the powerful merchant class. The name Kitay-gorod dates only from the 16th century and is probably derived from the Russian word *kita* ("several poles tied together"), referring to the form of construction used in building the 1.6-mi- (2.5-km-) long brick wall (connected to the Kremlin) around Kitay-gorod during the 1530s. Another interpretation attributes the origin of the name to the Tartar word *kitay* ("fortress," or "centre"). Although ravaged by fire in 1610 and again in 1812, Kitay-gorod continued to be the commercial centre of Moscow. Modern Kitay-gorod, one of Moscow's major tourist sites, is a nonresidential district comprising commercial and governmental offices as well as GUM, the State Department Store (1889–93); the eight-towered St. Basil's Cathedral (originally Cathedral of the Intercession), built 1555–60; and the Church of the Trinity (1628–34). Only small sections of the original Kitay-gorod wall have been preserved, including one section east of the Rossiya Hotel and another section with a tower, in the northeast near Marx Prospekt.

kitchen midden (anthropology): *see* shell mound.

Kitchener, city, Regional Municipality of Waterloo, southeastern Ontario, Canada, situated in the Grand River Valley, 60 mi (95 km) west-southwest of Toronto. Founded by Bishop Benjamin Eby and settled by German immigrants in about 1807, the community was known successively as Sand Hill, Ebytown, and Berlin before being renamed after British Field Marshal Lord Kitchener in 1916. It is an important industrial, financial, and distributing centre in one of Canada's most densely populated areas. Economic activities include meat-packing, brewing and distilling, tanning, furniture making, and the manufacture of textiles, shoes, rubber products, and appliances. The closely knit cultural unit of Kitchener–Waterloo supports a symphony orchestra, philharmonic choir, little theatre, and art society. The boyhood home of Mackenzie King, former Canadian prime minister, is preserved in Woodside National Historic Park. Inc. village, 1854; town, 1870; city, 1912. Pop. (1981) city, 139,734; (1985 est.) metropolitan area, 322,000.

Kitchener (of Khartoum and of Broome), Horatio Herbert Kitchener, 1st Earl, VISCOUNT BROOME OF BROOME, BARON DENTON OF DENTON, also called from 1898 BARON KITCHENER OF KHARTOUM AND OF ASPALL, and (from 1902) VISCOUNT KITCHENER OF KHARTOUM, OF THE VAAL, AND OF ASPALL (b. June 24, 1850, near Listowel, County Kerry, Ire.—d. June 5, 1916, at sea off Orkney Islands), British field marshal, imperial administrator, conqueror of the Sudan, commander in chief during the South African War, and (perhaps his most important role) secretary of state for war at the beginning of World War I. At that time he organized armies on a scale unprecedented in British history and became a symbol of the national will to victory.

Educated at the Royal Military Academy, Woolwich, Kitchener was commissioned in the Royal Engineers, and from 1874 he served



Kitchener
BBC Hulton Picture Library

in the Middle East. In 1886 he was appointed governor (at Suakin [Sawākin], Sudan) of the British Red Sea territories and subsequently was assigned to Egypt as adjutant general in Cairo. His energy and thoroughness led to his appointment as sirdar (commander in chief) of the Egyptian Army in 1892. On Sept. 2, 1898, he crushed the religious and politically separatist Sudanese forces of al-Mahdī in the savage Battle of Omdurman and then occupied the nearby city of Khartoum, which he rebuilt as the centre of Anglo-Egyptian government in the Sudan. (*See* Omdurman, Battle of.) His reputation in Great Britain was enhanced by his firm, tactful, and successful handling (from Sept. 18, 1898) of an explosive situation at Fashoda (now Kodok), where Jean-Baptiste Marchand's expeditionary force was trying to establish French sovereignty over parts of the Sudan. (*See* Fashoda Incident.) He was created Baron Kitchener in 1898.

After a year as governor general of the Sudan, Kitchener entered the South African War (Boer War) in December 1899 as chief of staff to Field Marshal Sir Frederick Sleigh Roberts, whom he succeeded as commander in chief in November 1900. During the last 18 months of the war Kitchener combatted guerrilla resistance by such methods as burning Boer farms and herding Boer women and children into concentration camps.

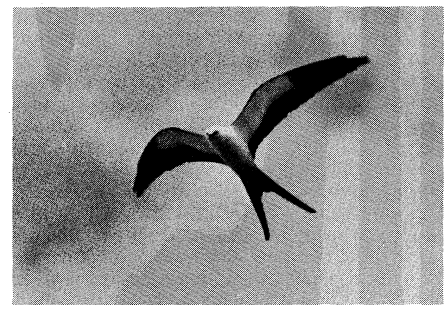
On returning to England after the British victory in the war, he was created Viscount Kitchener (July 1902) and was sent as commander in chief to India, where he reorganized the army in order to meet possible external aggression rather than internal rebellion, which previously had been the primary concern. His quarrel with the viceroy of India, Lord George Curzon, over control of the army in India ended in 1905 when the British Cabinet upheld Kitchener and Curzon resigned. Remaining in India until 1909, Kitchener was bitterly disappointed at not being appointed viceroy. In September 1911 he accepted the proconsulship of Egypt, and until August 1914 he ruled that country and the Sudan. Protection of the peasants from seizure of their land for debt and the advancement of the cotton-growing interest were his basic concerns. Tolerating no opposition, he was about to depose the hostile Khedive ʿAbbās II (ʿAbbās Ḥilmī) of Egypt when World War I broke out.

Kitchener, who was on leave in England and had just received an earldom and another viscountcy and barony (June 1914), reluctantly accepted an appointment to the Cabinet as secretary of state for war and was promoted to field marshal. He warned his colleagues, most of whom expected a short war, that the conflict would be decided by the last 1,000,000 men that Great Britain could throw into battle. Quickly enlisting a great number of volunteers, he had them trained as professional soldiers for a succession of entirely new "Kitchener armies." By the end of 1915 he was convinced of the need for military conscription, but he never publicly advocated it, in deference to Prime Minister Herbert H. Asquith's belief that conscription was not yet politically practicable.

In his recruitment of soldiers, planning of strategy, and mobilization of industry, Kitchener was handicapped by British governmental processes and by his own distaste for teamwork and delegation of responsibility. His Cabinet associates, who did not share in the public idolatry of Kitchener, relieved him of responsibility first for industrial mobilization and later for strategy, but he refused to quit the Cabinet. His career was ended suddenly, by drowning, when the cruiser HMS *Hampshire,* bearing him on a mission to Russia, was sunk by a German mine.

A biography, *Kitchener, Portrait of an Imperialist* (1958), was written by Philip Magnus.

kite, any of numerous birds of prey belonging to one of three subfamilies (Milvinae, Elaninae, Perninae) of the family Accipitridae. Typically, a kite is lightly built, with a small



Swallow-tailed kite (*Elanoides forficatus*)
James A. Kern

head, partly bare face, short beak, and long narrow wings and tail. Kites occur worldwide in warm regions. Some kites live on insects; others are primarily scavengers but also take rodents and reptiles; and a few are strictly snaileaters. Kites are buoyant in flight, slowly flapping and gliding with wings angled back. Several species are as graceful as terns.

True kites, Milvinae, have rather narrow beaks, the upper mandible being wavy edged. They are typified by the red kite (*Milvus milvus*)—of Europe, northern Africa, and the Middle East—and the black, or black-eared, kite (*M. migrans*)—found over much of the Old World. Both are large (to about 55 centimetres [22 inches]), reddish birds (the black kite darker), lightly streaked on the head, with long, angled wings and notched tail. The Brahminy kite (*Haliastur indus;* subfamily Milvinae) ranges from India to northeastern Australia. It is red brown except for white foreparts. It eats fish and garbage. The buzzard kite (*Hamirostra melanosternon;* subfamily Milvinae) of Australia is a large black-breasted bird; it lives mainly on rabbits and lizards. It also eats emu eggs, reportedly dropping rocks on them to break the thick shells.

The snail kites, found only in the New World, also belong to the subfamily Milvinae. They have sickle-shaped beaks adapted to feeding on snails, their only food. Best known is the Everglade kite (*Rostrhamus sociabilis*), now rare in Florida and Cuba but occurring in numbers in eastern Mexico, Central America, and most of eastern South America. It is a blackish or slate-coloured bird, about 50 cm (20 in.) long, with red eyes and white tail-base.

The swallow-tailed kite of the New World (*Elanoides forficatus*) is a striking black and white bird of the subfamily Perninae. It is about 60 cm (24 in.) long, including its long forked tail. It is most common in tropical eastern South America but also occurs from Central America to the United States.

The swallow-tailed kite of Africa (*Chelicti-*

nia riocourii) is a small gray and white bird of the subfamily Elaninae. It occurs from Nigeria to Somaliland. The white-tailed kite (*Elanus leucurus;* subfamily Elaninae) occurs from Argentina to California, where it is one of the few North American raptors increasing in number. It is gray with a white tail, head, and underparts and conspicuous black shoulder patches. It eats rodents. Similar kites of the genus *Elanus* occur in tropical Africa, Asia, and Australia. For kites called cuckoo falcons, *see* falcon.

kite, heavier-than-air soaring contrivance, used for sport or recreation, made of a light frame of varying shape covered with paper, plastic, or cloth and attached to a long cord held in the hand or wound on a reel or drum, to be sent up into the air by means of its resistance to the wind. It is named after a graceful member of the hawk family, the kite.

One tradition holds that kites were invented by the 5th-century-BC Greek scientist Archytas of Tarentum, but they have been in use among Asian peoples from time immemorial. The sport has long been a national pastime of the Koreans, Chinese, Japanese, and Malayans. Kites flying at night over a house were believed to keep evil spirits away. A religious significance is still connected to some ceremonial kite flying in Asia.

In his famous experiment of 1752, Benjamin Franklin hung a metal key from a kite line and, by attracting electricity from the air during a storm, demonstrated the electrical nature of lightning. Kites were long used for weather observations; instruments were carried aloft to record otherwise unobtainable data until the advent of balloons and airplanes. Military experiments employing kites for observation were carried out before the start of the 20th century, but most military experiments ended with the advent of the airplane.

Types of kites most commonly used are the three-sticker (hexagonal), the malay (modified diamond), and the box kite. Those with only one flat surface must have tails hanging from the trailing edge to maintain balance. Tails are effective because of resistance to air, not because of weight; therefore, many light crosspieces of material inserted into knots in a line will do well for a tail. The shape can be designed so that the kite will be self-correcting by incorporating a dihedral (two-sided) angle in the surface or by bowing the main cross stick to a depth of 10 percent of its length. If not completely self-correcting, the kite will certainly require less tail for stabilization.

In the three-sticker, all sticks are of the same length, crossed and tied in the middle, spread symmetrically, with string run around the border and the whole covered with light material. This makes a flat surface and requires a tail hung from the centre of a short loop attached to the two trailing points. A bridle is composed of three cords—each of a length equal to half the width of the kite. The cords lead from the centre and the two highest points of the kite to a central knot or ring to which is tied the line to the flier's hand.

The malay, a tailless two-sticker, has its sticks of equal length crossed and tied with the centre of one at a spot one-seventh the distance from the top of the other. The bridle has two legs, one from the top of the diamond and the other from the lowest point, meeting a little below the crossing of the sticks. A string pulled tight across the back of the cross stick will bow the surface, making the kite self-balancing.

The box kite, an invention of the Australian Lawrence Hargrave in the 1890s, is named for its rectangular shape, the frame being twice as long as the width and the ends left uncovered, with one-third of the length covered around each end. The bridle consists of two lines, one to each end. The kite flies on one edge and needs no tail. The shape can be other than square in cross section: it may be oblong and fly on a wide side with a four-leg bridle; or it may be triangular, round (barrel kite), or even five- or six-sided.

Kites are best flown in open spaces where the wind can blow steadily and close to the ground. Best wind velocity is 8 to 20 miles (13 to 32 km) per hour: less wind makes it difficult to lift the kites, and more makes them hard to handle or may even break them. Contact of the hand line with high-tension electric lines or wires must be avoided because of the great danger of electrocution through a damp cord.

Kithairón (Greece): *see* Cithaeron.

kithara, Roman CITHARA, stringed musical instrument, one of the two principal types of ancient Greek lyres. It had a wooden soundboard and a box-shaped body, or resonator, from which extended two hollow arms connected by a crossbar. Three, originally, but later as many as 12 strings ran from the crossbar to the lower end of the instrument, passing over a bridge on the soundboard. The strings were usually played with a plectrum, the left-hand fingers damping unwanted strings and at times apparently stopping the strings or producing harmonics. In solos, the fingers of both hands sometimes plucked the strings. The kithara was held upright or inclined toward the player, its weight often supported by an over-the-shoulder or wrist-to-yoke armband.

In early Greek times the *rhapsōdoi,* or epic singers, accompanied themselves on the kithara, and the *phorminx* of Homer was probably a form of that instrument. Later the kithara was the lyre of the *kitharōdoi,* or professional player-singers. Latinized, it became the principal stringed instrument of the Romans. In Latin writings of early Christian Europe "cithara" often referred to the harp as well as to surviving forms of the lyre. Many instrument names derive from the word kithara—among them guitar, cittern, and zither. *See also* lyre.



Kithara player, drawing from an Attic red-figured amphora; in the Museum of Fine Arts, Boston

By courtesy of the Museum of Fine Arts, Boston, John Michael Rodocanachi Fund

Kíthira (Greece): *see* Cythera.

Kitikmeot, north-central region of the Northwest Territories, Canada. Kitikmeot region, created in 1981 by the territorial government from the northern part of Fort Smith region, was called Central Arctic region until 1982 when it received its present name. Kitikmeot is the traditional Eskimo (Inuit) name for the area. The region encompasses the central Arctic coast, extending inland (south) to Contwoyto Lake and eastward to include Boothia Peninsula. It also comprises the central Arctic islands of Victoria, Stefansson, and King William, as well as the southern parts of Prince of Wales and Somerset islands. Lying almost entirely above the Arctic Circle, the region's landscape is characterized by tundra vegetation. Cambridge Bay on Victoria Island is the regional headquarters. Eskimos form the majority of the population; they are engaged largely in traditional economic activities. Commercial char fishing is also important. Pop. (1986) 3,750.

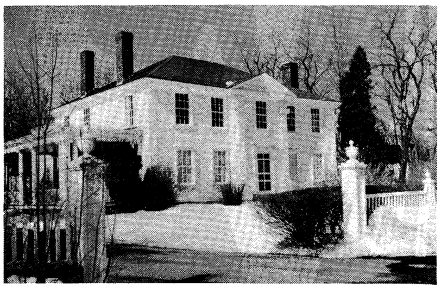
Kitimat, district municipality, on the west coast of British Columbia, Canada, at the head of the Douglas Channel, a deepwater fjord extending inland from Hecate Strait for 80 miles (129 km). Named for a nearby Indian village, Kitimat, with its deepwater anchorage, came to prominence in 1951, when the Aluminum Company of Canada chose it as the site for a huge aluminum smelter, completed in 1954. Hydropower for the electrolytic process is supplied from Kemano, 51 miles (82 km) southwest, via the Nechako River. A modern, planned community sprang up in the wilderness south of Terrace, to which it is linked by rail. While the economy of Kitimat is largely dependent upon aluminum, a forest products complex and commercial fishing are also of significance. Inc. 1953. Pop. (1986) 11,196.

Kition (ancient city, Cyprus): *see* Citium.

Kitt Peak National Observatory (KPNO), astronomical observatory located on the Papago Indian Reservation 50 miles (80 km) southwest of Tucson, Ariz., at an elevation of 6,888 feet (2,100 m). It was established in 1958 by the National Science Foundation (NSF) in response to a long-felt need by astronomers in the eastern half of the United States for access to excellent optical observing facilities in a favourable climate. Operated by the Association of Universities for Research in Astronomy under contract with the NSF, the observatory houses a collection of 11 modern optical telescopes and auxiliary instruments, including a telescope with a 4-metre (157-inch) reflector, one of the largest in the world. In addition, the observatory features the largest telescope ever designed for solar observation and a smaller vacuum tower telescope, which is also used for studying the Sun. KPNO is noted for its research on the solar system, the stars and nebulae of the Milky Way Galaxy, and the external galaxies.

kittel, plural KITTEL, in Judaism, a white robe worn in the synagogue on such major festivals as Rosh Hashana and Yom Kippur. The rabbi wears it, as does the cantor, the blower of the shofar (ritual ram's horn), and male members of Ashkenazi (German-rite) congregations. Before a Seder dinner, the leader of the Passover (Pesaḥ) service dons a *kittel,* and in Orthodox communities the bridegroom wears it at his wedding. Pious Jews use the *kittel* as a burial shroud.

Kittery, town, York county, southwestern Maine, U.S., at the mouth of the Piscataqua River, on the Atlantic coast, opposite Portsmouth, N.H. Settled in 1623, it was incorporated (1647) as Piscataqua Plantation, Maine's first town, and was later renamed for the Champernowne family's estate, Kittery Point, in Devon, Eng. It has been a shipbuilding centre since Revolutionary times, and John Paul Jones's *Ranger,* the first ship to fly the American flag, was launched there in 1777. The Portsmouth Naval Shipyard, which builds and services nuclear submarines, is in Kittery. The treaty of 1905 ending the Russo-Japanese

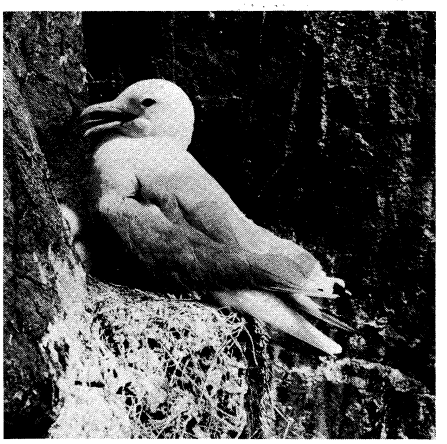


Lady Pepperell House (1760), Kittery, Maine
Gordon A. Reims

War was signed there. The town's Lady Pepperell House (1760) is an elaborate two-story structure of Georgian design. Nearby in South Berwick is the birthplace of novelist Sarah Orne Jewett and Hamilton House (*c.* 1785), the setting for her novel *The Tory Lover.* Pop. (1980) 9,314.

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kittiwake, also called BLACK-LEGGED KITTIWAKE (*Rissa tridactyla*), oceanic gull, a white bird with pearl-gray mantle, black-tipped wings, black feet, and yellow bill. It nests on



Kittiwake (*Rissa tridactyla*)
Andrew M. Anderson—EB Inc.

the North and South Atlantic coasts. Kittiwakes have evolved a number of behavioral and structural modifications for nesting on narrow cliff ledges. A close relative, with red bill and feet, is the red-legged kittiwake (*R. brevirostris*), which inhabits the region of the Bering Sea.

Kittl, Ema (soprano): *see* Destinn, Emmy.

Kittredge, George Lyman (b. Feb. 28, 1860, Boston—d. July 23, 1941, Barnstable, Mass., U.S.), American literary scholar and teacher, one of the foremost authorities of his time on the writings of Shakespeare, Chaucer, and Sir Thomas Malory.

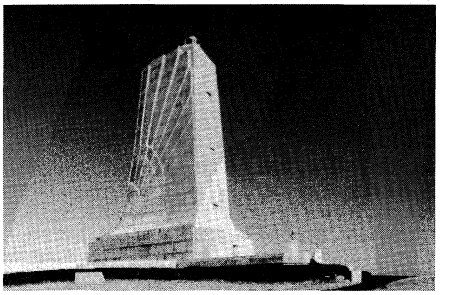
As a teacher, Kittredge was both the terror and delight of undergraduate students, conducting his year-long course in Shakespeare as a painstaking, line-by-line study of six plays. He taught his graduate courses in a less dramatic and more scholarly way. His major writings, along with many journal articles, established him as the then preeminent U.S. scholar of English literature.

After Kittredge received his A.B. degree at Harvard in 1882, he taught Latin at Phillips Exeter Academy (New Hampshire, 1883–88), with a year off for study abroad. He returned to teach at Harvard in 1888 and remained there until his retirement in 1936 (from 1917 as the first Gurney Professor of English). He was a protégé of Francis J. Child, the English and Scottish popular-ballad scholar, whose course in English Kittredge took over after his mentor's death in 1896. Kittredge was known as a teacher for his brilliant, discursive style. He was also noted for his sharp wit and impressive personal manner.

Chaucer and His Poetry (1915) was acclaimed as one of the first works to make clear Chaucer's greatness to modern readers. Other books include *A Study of Gawain and the Green Knight* (1916); *Words and Their Ways in English Speech* (1901), with J.B. Greenough; *Witchcraft in Old and New England* (1929); and a notable edition of *The Complete Works of Shakespeare* (1936).

A biography by Clyde K. Hyder was published in 1962.

Kitty Hawk, town, Dare County, northeastern North Carolina, U.S., on a narrow sand barrier facing the Atlantic Ocean, opposite Albemarle Sound. Immediately south at Kill Devil Hills is the Wright Brothers National



The Wright Brothers National Memorial at Kitty Hawk, N.C.
Milt and Joan Mann from CameraMann

Memorial (1927), commemorating the flight there of Wilbur and Orville Wright on Dec. 17, 1903, the first powered airplane flight in the United States. Kitty Hawk is probably derived from an Indian (Algonkian) name recorded in 1729 as Chickahauk; its meaning is uncertain.

Kitwe, town in Copperbelt Province, Zambia, East Africa. It is the second largest town in Zambia, and the main industrial and commercial centre of the copper belt. Founded in 1936, Kitwe grew with the rapid development of copper mining, though secondary industries have also been established. Planned on Western models, the town receives its power supply from the Kariba Dam. Kitwe is connected by rail, road, and air with major centres of central and southern Africa. Nkana Mine Township was integrated with Kitwe in 1961, and municipal status was reached in 1966. The Zambia Institute of Technology was founded in 1970. The population of Kitwe includes a large number of Europeans. Pop. (1980 prelim.) 314,794.

Kitzbühel, town, *Bundesland* (federal province) Tirol, western Austria, in the Kitzbühel Alps, at the southern foot of the



Liebfrauenkirche (Church of Our Lady), in Kitzbühel, Austria
Warren L. Condit—Shostal/EB Inc.

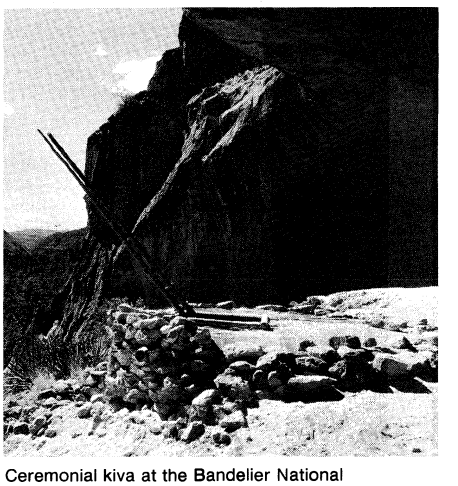
Kitzbüheler Horn (6,548 ft [1,998 m]). First mentioned in 1165 and chartered in 1271, it was held by the bishops of Regensburg and Bamberg under the dukes of Bavaria until it passed to Tirol in 1504. Silver and copper mining brought great prosperity in the 16th and 17th centuries. The town has many old gabled houses, and several of its medieval castles have been converted into hotels. Notable buildings include the parish church of St. Andreas (1435–1506, with a Baroque interior), the 14th-century church of St. Katharina, and the two-story Liebfrauenkirche (Church of Our Lady, with lower [1373] and upper [1490] levels; converted to Baroque style 1738). A world-famous winter-sports centre, Kitzbühel is also a climatic health resort with a busy summer tourist trade. Adjacent is the spa of Schwarzsee (a warm mountain lake). Pop. (1981) 7,872.

Kitzbühel Alps, German KITZBÜHELER ALPEN, range of the Eastern Alps in western Austria extending for 40 mi (65 km) between the Ziller (west) and Saalach (east) rivers. The highest points in the range are the Kreuzjoch (8,392 ft [2,558 m]) in the west and the Gaisstein (7,753 ft) in the east. Overlooking the Pinzgau (valley of the Upper Salzach River) to the south, the mountains are divided into two sections by the Thurn Pass (4,180 ft), which is crossed by a road connecting the towns of Kitzbühel (north) and Mittersill (south). Many summer resorts and winter-sports centres lie in the region.

Kiuchüan (China): *see* Chiu-ch'üan.

kiva, subterranean ceremonial and social chamber found in the Pueblo American Indian villages of the southwestern United States, particularly notable for the colourful mural paintings decorating the walls.

Because the kiva is related to the family origins of the tribe and because two or more



Ceremonial kiva at the Bandelier National Monument, New Mexico
By courtesy of the New Mexico State Tourist Bureau

tribal clans always inhabit a Pueblo community (*see* pueblo), there are always at least two kivas per village.

A small hole in the floor of the kiva (sometimes carved through a plank of wood), called the *sipapu,* served as the symbolic place of origin of the tribe. Although its most important purpose is for ritual ceremonies, for which altars are erected, the kiva is also used for political meetings or casual gatherings of the men of the village. Women are almost always excluded from the kiva.

The traditional round slope of the earliest kiva, in contrast to the rest of Pueblo architecture, which is square or rectangular, recalls the circular pit houses of the prehistoric bas-

ket-weaving culture from which these tribes, primarily Hopi and Zuni, descend (*see* cliff dwellings).

The kiva murals depict sacred figures or scenes from the daily life of the tribe. The style of these paintings tends to be geometric, with an emphasis on straight rather than curved lines and with the entire mural laid out in a linear pattern around the walls. The murals are painted on adobe plaster with warm, colourful pigments made from the rich mineral deposits of the area. Frequently the Indians plastered over an old mural to paint a new one on top; in recent years the several layers of a number of kiva murals have been unpeeled and restored.

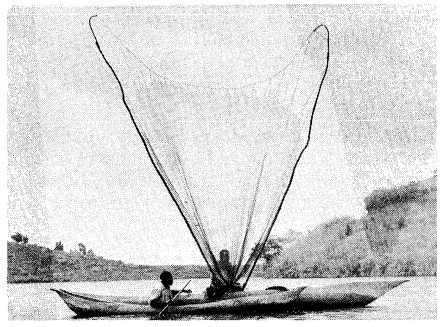
kivela, also spelled KWELA (Zulu: "to climb"), popular urban dance music of South Africa. Coined by Elkin Sithole in the 1940s to refer to choral response in Zulu vocal music, the term kivela had been broadened by the 1950s to refer to the music of street bands playing penny whistles, who also performed at township dances. Subsequently one or two acoustic guitars and a string bass were added. The kivela repertoire came to include North American swing music, standard from the 1950s on. In the 1950s Spokes Mashiyane and Lemmy Special Mabaso were well-known kivela flute and saxophone players, and the style spread to Rhodesia and Nyasaland (now Malawi). During the 1960s the Malawi musicians Donald and Daniel Kachamba became prominent. In Johannesburg, kivela was also known as jive.

Kivi, Aleksis, pseudonym of ALEKSIS STENVALL (b. Oct. 10, 1834, Nurmijärvi, Russian Finland [now in Finland]—d. Dec. 31, 1872, Tuusula), father of the Finnish novel and drama and the creator of Finland's modern literary language.

Though Kivi grew up in rural poverty, he entered the University of Helsinki in 1857. In 1860 he won the Finnish Literary Society's drama competition with his tragedy *Kullervo,* based on a theme taken from the Finnish national epic *Kalevala.* His most famous plays are the rural comedies *Nummisuutarit* (1864; "Shoemakers of the Heath"), the story of the unsuccessful courting of a simple-minded and gullible youth, and *Kihlaus* (1867; "Fugitives"). Kivi's *Seitsemän veljestä* (1870; *Seven Brothers*), the first novel written in Finnish, tells the story of some freedom-loving village youths who take to the woods and live a life of adventure but gradually mature and finally accept the responsibilities of sober citizens in a farming community. It contains elements of realism and Romanticism and a great deal of humour. As Finland's first professional writer, Kivi struggled throughout his life against poverty and hostile criticism. In his last years he was psychotic. Though his works are now regarded as classics, a collection of his poems, *Kanervala* (1866; "Land of the Heathen"), which departed from contemporary poetic conventions, did not begin to be fully appreciated until almost a century after his death.

Kivu, Lake, French LAC KIVU, one of the great lakes of East Africa, situated between Zaire in the west and Rwanda in the east. Lying at 4,790 feet (1,460 m) above sea level, it occupies 1,040 square miles (2,700 square km) and is 55 miles (90 km) long (north–south) and 30 miles wide (east–west). From an average depth of 722 feet (220 m), it plunges to a maximum of 1,558 feet (475 m). Lake Kivu has a rough, jagged coast and contains numerous islands, the largest of which is Idjwi. It was at one time part of a larger body of water that filled a structural trough in the Earth. Volcanic outpourings along its northern shore created a dam that separated Kivu from Lake Edward (Lake Idi Amin Dada), barred Kivu's northern outflow, and reversed its drainage to the south through the Ruzizi (Rusizi) River into Lake Tanganyika.

The Mururu hydroelectric dam was completed at the Ruzizi River's outlet in 1958. Kivu's shores are densely populated, the principal towns being Bukavu and Goma in Zaire and Gisenyi (Kisenyi) in Rwanda. The first



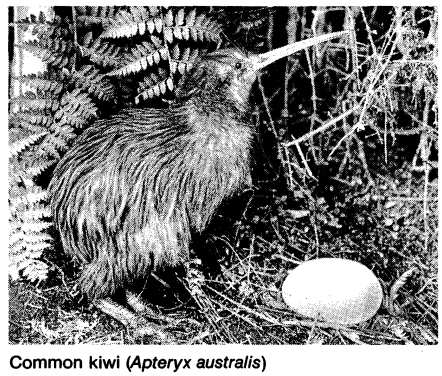
Fishermen casting their net on Lake Kivu, Zaire
Central Press—Pictorial Parade/EB Inc.

European to visit the lake was the German explorer Count Adolf von Götzen in 1894. Although it is supplied with fish, the lake is poor in fauna but rich in volcanic substance. Great volumes of dissolved methane gases that may be developed as energy sources exist in its deep waters.

Kiwanis International, worldwide community-service organization for men and women that was founded in Detroit, Mich., in 1915. In the late 20th century it had more than 300,000 members in about 8,000 clubs and 70 countries. The members of Kiwanis International seek to provide assistance to the young and the elderly, create international understanding and goodwill, help develop community facilities, support agriculture and conservation, and mount programs to safeguard against crime and eliminate alcohol and drug abuse. The name Kiwanis is derived from an American Indian term meaning "we make ourselves known."

A local Kiwanis club may select two members from each business or profession. The organization's coeducational youth affiliates are Key Club International, for high-school students, and Circle K International, for college students. Kiwanis International's headquarters are located in Indianapolis, Ind.

kiwi, any of three species of flightless birds belonging to the genus *Apteryx* and found in New Zealand. The name is a Maori word referring to the shrill call of the male. Kiwis are grayish brown birds the size of a chicken. They are related to the extinct moas. Kiwis are unusual in many respects: the vestigial wings are hidden within the plumage; the nostrils are at the tip (rather than the base) of the long, flexible bill; the feathers, which have



Common kiwi (*Apteryx australis*)
Pictorial Parade—EB Inc.

no aftershafts, are soft and hairlike; the legs are stout and muscular; and each of the four toes has a large claw. The eyes are small and inefficient in full daylight, the ear openings are large and well developed, and very long bristles (perhaps tactile) occur at the base of the bill.

Dwelling in forests, kiwis sleep by day in burrows and forage for food—worms, insects and their larvae, and berries—by night. They can run swiftly when required; when trapped they use their claws in defense.

One or two large white eggs—up to 450 g (1 pound) in weight—are laid in a burrow and are incubated by the male for about 80 days. The egg is, relative to the size of the bird, the largest of any living species. The chick hatches fully feathered and with its eyes open; it does not eat for about a week.

Although no longer abundant, kiwis appear to be in no danger of extinction and may even be gradually adapting to semipastoral land.

The genus *Apteryx* forms the family Apterygidae, order Apterygiformes. Three species of kiwis are recognized: the common kiwi (*A. australis*), on North, South, and Stewart islands; the little spotted kiwi (*A. oweni*), on South Island; and the great spotted kiwi (*A. haasti*), South Island.

kiwi, also called CHINESE GOOSEBERRY, edible fruit of the vine *Actinidia chinensis* (family Actinidiaceae). The plant is native to China and Taiwan and is now grown commercially in New Zealand and California. The egg-shaped kiwi fruit has a furry brownish green skin and firm, translucent green flesh with edible purple-black seeds at the centre. The fruit has a slightly acid taste resembling that of a gooseberry or perhaps a honeydew melon. It can be eaten raw or cooked, and its juice is sometimes used as a meat tenderizer.

Kiyev (Ukrainian S.S.R.): *see* Kiev.

Kizel, city, Perm *oblast* (province), western Russian S.F.S.R. It lies on the western slope of the Ural Mountains, along the Kizel River. Founded in 1788, it developed in the 1890s following the construction of the railway to Perm and became a city in 1926. The present-day city serves as an industrial centre in the Kizel coal basin. Mining equipment is produced, and a mining college is located in the city. Pop. (1970) 46,264.

Kizhi Island, island in Lake Onega, Karelian Autonomous Soviet Socialist Republic, northwestern Russian S.F.S.R. The island, whose name originates from *kizharsuari* ("island of games"), was located on the important 14th-century trade route from the town of Novgorod to the White Sea. The settlement grew around the Spasskiy Church that was founded in the mid-16th century. In the 17th century, the island served as a defense post against Swedish and Polish invasions. During the reign of Catherine II the Great, several major peasant revolts took place in Kizhi between 1769 and 1771.

Today the island is best known for its Museum Site of History and Architecture (opened 1960), where early wooden barns, houses, a windmill, and several churches were collected and restored as part of an open-air museum. The Preobranzhenskaya (Transfiguration) Church (1714), 121 feet (37 m) in height, with its three tiers and 22 cupolas, is often compared to St. Basil's Cathedral in Moscow's Red Square. The Preobranzhenskaya houses a collection of iconostases (each a screen or partition with doors and tiers of icons used to separate the altar from the nave in Eastern churches). The Pokorovskaya (Intercession) Church (1764) has 10 cupolas, and its interior is decorated with icons made locally in the 17th and 18th centuries. St. Lazarus, the oldest church (built 1390) in the Karelian Autonomous S.S.R., was transported to the open-air museum from the Murom Monastery

in the Pudozh region and restored in 1961. Tourism is Kizhi's major industry.

Kızıl Adalar, English PRINCES ISLANDS, historically DEMONESI INSULAE, group of nine islands (*adalar*) in the Sea of Marmara a few miles southeast of Istanbul. They form Adalar *ilçe* (district) of Istanbul *il* (province), Turkey. There are permanent inhabitants on the smallest island, Sedef Adası (ancient Antirobethos), and on the four larger islands, Büyükada (Prinkipo, ancient Pityoussa), Heybeli Ada (Halki, ancient Chalcitis), Burgaz Adası (Antigoni, ancient Panormos), and Kınalı Ada (Proti). Büyükada was Trotsky's home after his exile from the Soviet Union in 1929. Heybeli Ada has a branch of the Turkish naval academy.

In ancient times the islands were known for the copper mines on Chalcitis; the island's name was derived from the Greek word *chalkos* ("copper"). During the Byzantine period numerous convents and monasteries were built; because of their relative isolation and proximity to the capital, they were often used as places of exile for fallen royalty and other notables, who often were blinded before banishment. Byzantine monuments include the chapel of St. John the Baptist on Burgaz Adası, said to have been built by the empress Theodora *c.* 842, and the chapel of the Theotokos on Heybeli Ada, dating from the 14th century. Also on Heybeli Ada is a Greek Orthodox school of theology, rebuilt in 1844.

In summer the islands serve as popular resorts for the Istanbul region, with hotel and other tourist facilities concentrated on the largest island, Büyükada. Motor vehicles are prohibited: horse-drawn carriages are the chief means of transportation. The scarcity of water has hampered the islands' development. Pop. (1980) 18,232.



Horse-drawn carriages on one of the Kızıl Adalar (Princes Islands), Turkey, with the Sea of Marmara and the Asian coast in the background

H. Angelo-Castrillon—Black Star/EB Inc.

Kızıl River, Turkish KIZIL IRMAK, historically HALYS, river, the longest wholly within Turkey. It rises in the Kızıl Dağ (*kızıl,* "red") in north central Anatolia at an altitude of about 6,500 ft (1,980 m). It flows southwest through the *il* (province) of Sivas, past the towns of Zara and Sivas. It then turns northward in a great crescent-shaped bend, where it breaks through the Pontic ranges in Çorum *il,* and flows into the Black Sea between Sinop and Samsun after a total course of about 734 mi (1,182 km). The river bed is shallow, and the volume of water fluctuates greatly with the seasons, with a minimum in summer and a maximum in spring when it is fed by melted snow and rainwater. The variation in its channel and volume makes the river unsuitable for navigation. It is, however, valuable for irrigation and the production of hydroelectricity. Two large hydroelectric schemes are in operation at Hırfanlı and Keşikköprü in Ankara *il.* These, together with the smaller plant at Kırıkkale, provide electricity to the Black Sea, Marmara, and Aegean regions. The large delta formed by the Kızıl River near Bafra on the Black Sea is noted for its tobacco.

Where the same name may denote a person, place, or thing, the articles will be found in that order

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Kizilbash, Turkish KIZILBAŞ (Red Head), any member of the seven Turkmen tribes who wore red caps to signify their support of the founders of the Ṣafavid dynasty (1501–1736) in Iran. The name, first applied by orthodox Turks, was applied later to the followers of a Shīʿī sect in eastern Asia Minor. It also was given in Afghanistan to the Persian-speaking Turkmens, who settled in Kābul and other cities from about 1737 and engaged in government service and trade.

Kizzuwadna, also spelled KIZZUWATNA, Hurrian kingdom of southeastern Anatolia near the Gulf of Iskenderun in present-day Turkey. Kizzuwadna concluded a treaty with the Hittite Kingdom in the late 16th century BC and remained a major independent power until after 1340 BC, when it was reduced to a Hittite vassal state by Suppiluliumas I. In the famous Battle of Kadesh (1299/1291 BC) Kizzuwadna supplied troops to the Hittite king Muwatallis against Ramses II of Egypt. The outcome of this battle enabled the Hittites to solidify their control of Syria.

Although Kizzuwadna had become a satellite state of the Hittite Kingdom, it continued to exert cultural influence. Kizzuwadna was, for example, one of the chief centres of the Hurrian cult of the goddess Hebat, and this cult came to strongly influence the Hittite state religion during the late 13th century BC. Kizzuwadna also played a significant role in the economy of the kingdom as it became a key centre for iron smelting and manufacture.

Kjeldahl method, in analytical chemistry, procedure widely used for estimating the nitrogen content of foodstuffs, fertilizers, and other substances, invented in 1883 by a Danish chemist, Johan G.C.T. Kjeldahl. The method consists essentially of transforming all nitrogen in a weighed sample into ammonium sulfate by digestion with sulfuric acid, alkalizing the solution, and determining the resulting ammonia by distilling it into a measured volume of standard acid, the excess of which is determined by titration.

Kjellén (Johan) Rudolf (b. June 13, 1864, Torsö, Swed.—d. Nov. 14, 1922, Uppsala), Swedish political scientist and politician whose conservative theory of the state was influential beyond the borders of Sweden.

Kjellén was educated at the University of Uppsala, and he taught at Göteborg (1901–16) and Uppsala (from 1916). Kjellén is best known for the systematic works in which he treated modern states as organic systems that flourish and then decay. In *Schweden* (1917) he coined the terms *geopolitik,* the problems and conditions within a state that arise from its geographical features; *oecopolitik,* the economic factors that affect the power of the state; and *demopolitik,* the nation's racial elements and the problems that they create. Late in his life he analyzed the different kinds of national constitutions. Kjellén served several terms as a conservative member of the Swedish parliament. His influence was particularly strong in Germany, where his *Staten som lifsform* (1916; "The State as a Life-Form") was widely read and where *geopolitik* took on an ideological meaning quite different from his social scientific concept.

Kjustendil (Bulgaria): *see* Kyustendil.

Klabund, pseudonym of ALFRED HENSCHKE (b. Nov. 4, 1890, Crossen, Ger.—d. Aug. 14, 1928, Davos, Switz.), Expressionist poet, playwright, and novelist who influenced German literature with his adaptations of Oriental literature. Notable among his free, imaginative renderings of Chinese, Japanese, and Persian literature are *Li-tai-pe* (1916), *Lao-tse* (1921), and *Der Kreidekreis* (1924; *The Circle of Chalk*), a successful drama later adapted by the German playwright Bertolt Brecht in his play *Der kaukasische Kreidekreis* (*The Caucasian Chalk Circle*).

A consumptive who spent many years in sanatoriums, Henschke identified with the eternally seeking wandering poet and called himself Klabund, a name derived from *Klabautermann* ("hobgoblin") and *Vagabund* ("vagabond"). Restlessness and versatility characterize his work. He composed poetry in a variety of forms, and he created a new prose form, the "Expressionist novella." Notable in this genre are his autobiographical "novels of longing," with themes of sickness and love; biographical "novels of passion," with sensual portraits of historical figures (*e.g., Pjotr,* 1923; *Peter the Czar*); and his greatest achievements in prose, two "novels of fulfillment"—*Bracke* (1918; *Brackie, the Fool*) and *Borgia* (1928; *The Incredible Borgias*).

Kladno, mining city, Středočeský *kraj* (Central Bohemia region), Czechoslovakia, northwest of Prague. The two original forest villages of Kladno and Buštěhrad developed after 1842 as the industrial centre of the Kladno hard-coal basin. There are local deposits of iron, but most is imported from the Soviet Union in exchange for manufactured goods. The town has blast furnaces and a rolling mill and is the site of large steelworks. Finished parts for the machine industry, cables, bicycles, and semi-finished products are manufactured. Steel alloys and pig iron are also produced. Pop. (1983 est.) 71,973.

Klafsky, Katharina (b. Sept. 19, 1855, Szent-János, Hung.—d. Sept. 22, 1896, Hamburg), Hungarian dramatic soprano known for her interpretations of Wagnerian roles.

Klafsky was a chorus singer in Vienna in 1874 and later studied with the famous singer and teacher Mathilde Marchesi. She sang the part of Brangäne in the first Leipzig performance of Wagner's *Tristan und Isolde* (1882) and from 1886 to 1895 established herself as one of the greatest singers in Germany. Besides her Wagnerian roles she was known for her performances as Donna Anna (in Mozart's *Don Giovanni*), Leonore (in Beethoven's opera *Fidelio*), and Norma (in Bellini's opera of the same name).

Klagenfurt, city, capital of *Bundesland* Kärnten (federal province of Carinthia), on the Glan River of southern Austria in a basin east of the Wörther See (a mountain lake) and north of the Karawanken Mountains. Founded in the 12th century and chartered in 1279, it passed to the Habsburgs in 1335. As it was largely destroyed in a fire in 1514, most of its notable buildings date from the 16th century and have lines influenced by Italian architects who had been called in to build fortifications. The city has been the capital of Kärnten since 1518 and the seat of the prince-bishops of Gurk since 1787. Notable landmarks are the Dragon Fountain (1590) in the New Square, the 17th-century town hall, the Cathedral (1578–91), the parish church, and the Landhaus (1574–90), where the Diet of Kärnten still sits. The city is the site of the state museum, with

folklore, Alpine, and natural-history annexes; the Diocesan Museum; and a state art gallery. A communications and tourist centre, Klagenfurt has metal, food, and chemical industries and manufactures clothing, shoes, leather goods, tobacco, wood products, and electrical apparatus. The Carinthian Conservatory of Music was founded in 1931. Pop. (1981) 86,303.



City theatre in Klagenfurt, Austria
F. Wolfsberger—ZEFA

Klages, Ludwig (b. Dec. 10, 1872, Hannover, Ger.—d. July 29, 1956, Kilchberg, near Zürich), German psychologist and philosopher, distinguished in the field of characterology.

Educated in chemistry, physics, and philosophy at the University of Munich, where he also taught, he was a leader in the German vitalist movement (1895–1915), which argued that laws of physics and chemistry alone cannot explain life. In 1905 he founded at Monaco the Seminar für Ausdruckskunde, a centre for characterological study, which he moved to Kilchberg, Switz., in 1919.

Klages believed human beings to be distinguishable from other animals by a "spirit" (*Geist*) that controls their thoughts and ultimately creates life stresses through the emergence of an uncontrolled "ego." His research sought to define and structure characteristics evidenced in different egos, as documented in *Prinzipien der Charakterologie* (1910; "Principles of Characterology"), *Geist und Leben* (1935; "Spirit and Life"), and *Die Sprache als Quell der Seelenkunde* (1948; "Language as the Source of Knowledge of the Soul").

Klaipėda, German MEMEL, city and port, Lithuanian Soviet Socialist Republic, on the narrow channel by which the Kurisches Haff (Courland Lagoon) and Neman (German Memel, Lithuanian Nemunas) River connect with the Baltic Sea. Beside a small earlier settlement, the local population constructed a fortress in the early 13th century; in 1252 it was seized and destroyed by the Teutonic Knights, who built a new fortress called Memelburg. The town, later called Memel, and the adjacent territory were settled by Germans and formed part of the province of East Prussia. In 1923 Memel was given to Lithuania and renamed Klaipėda. The ice-free port expanded considerably and handled most of Lithuania's foreign trade. Ceded back to Germany in 1939, it passed to the U.S.S.R. in 1945.

Modern Klaipėda has major shipbuilding and repair yards specializing in trawlers and floating docks. It is the base of a large deep-sea fishing fleet and has a fish cannery. Other industries include cotton textiles, pulp and papermaking, timberworking, and the production of radio and telephone parts and amber jewelry. Pop. (1983 est.) 188,000.

Klaipėda dispute: *see* Memel dispute.

Klaj, Johann (German), Latin JOHANNES CLAJUS (b. 1616, Meissen, Saxony—d. 1656, Kitzingen, near Würzburg, Franconia), German poet who helped make mid-17th-century Nürnberg a centre of German literature.

Klaj studied theology at Wittenberg, and then went to Nürnberg where, with Georg Philipp Harsdörfer, he founded in 1644 the literary society known as the Pegnitz order. He taught at Nürnberg, and in 1650 went as teacher and preacher to Kitzingen. He specialized in pastoral poetry, often distinguished by its ingenious sound effects, and wrote, jointly with Harsdörfer, the *Pegnesisches Schäfergedicht* (1644; *Pegnitz's Idyll*) and the *Fortsetzung der Pegnitzschäferey* (1645; *The Pursuit of Pegnitz's Meadows*). He also specialized in religious oratorios and mystery plays, such as *Die Auferstehung Jesu Christi* (1644; *The Resurrection of Jesus Christ*), *Freudengedicht auf die Geburt Christi* (1645; *Joyful Verses on the Birth of Christ*), *Trauerspiel vom leidenden Christus* (1645; *The Tragedy of the Sorrows of Christ*), and *Herodes* (1645).

Klamath (people): *see* Modoc and Klamath.

Klamath Falls, city, seat (1882) of Klamath County, southern Oregon, U.S., at the southern end of Upper Klamath Lake, in the foothills of the Cascade Range. It is headquarters of the Winema National Forest and site of the Oregon Institute of Technology (1947). Settled in 1867 at the falls of Link River by George Nurse and called Linkville, it was laid out (1878) and was renamed (1893) for the Klamath Indians. Completion (1906) of the Klamath Irrigation Project and the arrival of the railroad (1909) stimulated its growth as a lumbering centre and shipping and processing point for livestock, potatoes, and grain. The 1¼-mi (2-km) Link River (entirely within the city) connects Lake Ewauna with Upper Klamath Lake (a pelican sanctuary). Crater Lake National Park is 50 mi (80 km) north of the city. Inc. town, 1889; city, 1906. Pop. (1980) 16,661.

Klamath Mountains, segment of the Pacific Coast Ranges, extending southward for about 250 mi (400 km) from the foothills south of the Willamette Valley in southwestern Oregon, U.S., to the northwest side of the Central Valley of California. The mountains rise to Mt. Eddy (9,038 ft [2,755 m]) and include numerous subranges. They are deeply dissected by many rivers (especially the Rogue and Klamath), and they contain a headstream of the Sacramento River. Largely within conservation areas, the range, named for the Klamath Indians, embraces parts of the Klamath and five other national forests and includes the Oregon Caves National Monument. Lumbering, dairying, fruit growing, hunting, fishing, and tourism are the main regional economic activities.

Klamath River, river rising in Upper Klamath Lake just above Klamath Falls, Ore., U.S. It flows south for 1¼ mi (2 km) as the Link River to Lake Ewauna, where it emerges as the Klamath River, and continues generally southwesterly 250 mi through the Klamath Mountains in California to the Pacific Ocean near Requa, Calif. The upstream basin section has extensive irrigation developments. Copco No. 1 Dam (1922) in northern California is used for power. Lower Klamath Lake, dried up when its Klamath River connection was closed in 1917, has been developed as a wildlife refuge and for agricultural use. Chief tributaries of the Klamath are the Shasta, which joins it near Yreka, and the Trinity, joining it near Weitchpec.

Klang (Malaysia): *see* Kelang.

Klapka, György (b. April 7, 1820, Temesvár, Hung., Austrian Empire—d. May 17, 1892, Budapest), soldier and Hungarian nationalist, one of the leaders in the revolutionary war of 1848–49.

Klapka entered the Austrian army in 1838, but on the formation of a Hungarian national force in the spring of 1848 he at once joined it. His energy and ability won him rapid promotion, to commander of a corps on Jan. 12, 1849, and to full general on April 6. In the spring offensive of 1849 he commanded a force of 20,000 men, based on the fortress of Komárom (Komarno), that harried the Austrian armies. He held Komárom until Sept. 27, 1849, when he surrendered on honourable terms.



Klapka, portrait on a coin; in the Hungarian National Museum, Budapest
By courtesy of the Hungarian National Museum, Budapest

Thereafter Klapka lived in exile for many years, at first in England and then in Switzerland, working for Hungarian independence from the Habsburg Empire. He was especially active when Austria was involved in crises or wars, as in 1854, 1859, and 1866. During the war between Austria and Sardinia (1859), he helped organize a Hungarian legion in Italy; and in the Austro-Prussian War (1866), as a Prussian major general, he organized a Hungarian corps in Silesia.

An amnesty in 1867 allowed Klapka to return to Hungary, where he entered Parliament as a supporter of the Austro-Hungarian Compromise, which established the Dual Monarchy of the two nations. In 1877, when war between the Ottoman Empire and Russia seemed imminent, he was engaged to reorganize the Turkish army.

Klapka wrote *Memoiren* (1850); *Der Nationalkrieg in Ungarn,* 2 vol. (1851; "The National War in Hungary"); *Der Krieg im Orient* (1855; "The War in the East"), a history of the Crimean War; and further memoirs, *Aus meinen Erinnerungen* (1887; "My Recollections"), recollections, however, that are not always consistent.

Klaproth, Heinrich Julius (b. Oct. 11, 1783, Berlin—d. Aug. 28, 1835, Paris), German Orientalist and explorer whose major work, *Asia polyglotta nebst Sprachatlas* (1823; "Asia Polyglotta with Language Atlas"), is one of the important early surveys of Oriental languages, notably the Caucasian languages, and is the only source of information on several extinct Caucasian languages.

Son of the chemist Martin Heinrich Klaproth, Heinrich won notice for accomplishments in language studies that brought him a teaching appointment at the St. Petersburg (now Leningrad) Academy. In 1805 he accompanied a Russian diplomatic mission to China and, following his return to St. Petersburg, made an extensive ethnographic and linguistic exploration of the Caucasus (1807–08), publishing *Reise in den Kaukasus,* 2 vol. (1814; "Travels in the Caucasus"). From 1815 he lived in Paris, becoming professor of Asiatic languages and literature in the pay of the king of Prussia in 1816. Much of what is known of the Indo-Iranian Ossetic language comes from Klaproth; his *Asia polyglotta,* though later superseded in certain respects, in its time formed a new departure for the classification of Eastern languages.

Klaproth, Martin Heinrich (b. Dec. 1, 1743, Wernigerode, Brandenburg—d. Jan. 1,

1817, Berlin), German chemist who discovered uranium (1789), zirconium (1789), and cerium (1803). He described them as distinct elements, though he did not obtain them in the pure metallic state.

An apothecary for many years, and then a military instructor in chemistry, he taught chemistry from 1792 and was chosen to be professor of chemistry at the University of Berlin at its founding (1810).

The leading chemist of his time in Germany, Klaproth was an exact and conscientious worker who helped to improve and systematize analytical chemistry and mineralogy. He was one of the earliest non-French



Martin Heinrich Klaproth, engraving
Bavaria-Verlag

adherents of Antoine Lavoisier's antiphlogistic doctrines. He rediscovered titanium (1795) about four years after its initial discovery and named it. He elucidated the composition of many substances, including compounds of tellurium, strontium, beryllium, and chromium. In addition to more than 200 papers, he published a five-volume chemical dictionary with F.B. Wolff (1807–10) and a four-volume supplement (1815–19).

Klarsfeld, Beate and Serge, Beate Klarsfeld *née* KUNZEL (respectively b. Feb. 13, 1939, Berlin; b. Sept. 17, 1935, Bucharest), wife-and-husband team resident in Paris, internationally noted for their anti-Nazi and pro-Israel activities.

Beate Kunzel, born a German Protestant, quit her secretarial job in Berlin at age 21, moved to Paris to study French, and met Serge Klarsfeld, whom she married in 1963. Serge, a French Jew, had suffered under the Nazis—he, his mother, and his sister having hidden from the Gestapo in Nice in 1943 as his father was arrested, eventually to disappear in the death camp of Auschwitz. Serge in the 1950s studied history at the Sorbonne, received a *licence* in law from the University of Paris, and was studying at the Institute of Political Studies of Paris when he met Beate.

Serge had worked in an Israeli kibbutz in 1953 and had written a thesis on the "Cooperative Economy in Israel" (1959). In 1966 he visited Auschwitz and in 1967 served as a volunteer in the Six-Day War in Israel.

Beate Klarsfeld in 1967 wrote a series of articles in the leftist newspaper *Combat* attacking German Chancellor Kurt Kiesinger for his role as a Nazi propagandist during World War II. In 1968 she attended a rally at which he was speaking, charged to the podium, and slapped Kiesinger on the face. She was arrested, tried, and sentenced but was released on probation. In the years to come she and her husband publicized the pasts of other Nazis and wartime collaborators, forcing some resignations from high posts. They also began pressing for prosecution of former Nazi criminals—among whose ranks they included Kurt Lischka, Herbert Hagen, Ernst Heinrichsohn, Jean Leguay, Werner Best, Gustav Richter, Theodor Ganzemüller, Alois Brunner, and, most notably, Klaus Barbie. In the course of their campaigns and demonstrations, Beate was arrested repeatedly and briefly jailed. They also received a number of death threats, and their car was blown up.

Concurrently, Beate Klarsfeld tried to campaign in such Arab capitals as Rabat, Damascus, and Beirut, as well as elsewhere, accusing Arabs of "barbarities" and urging them to let Israel "live in peace." Almost every summer the Klarsfelds spent a month at various kibbutzim in Israel.

The Klarsfelds' work was funded by the nonprofit Beate Klarsfeld Foundation.

Klaus, Brother, German BRUDER KLAUS: *see* Nicholas of Flüe, Saint.

Klaus, Karl Karlovich, also called CARL ERNST CLAUS (b. Jan. 23, 1796, Dorpat, Russia [now Tarta, Estonian S.S.R.]—d. March 24, 1864, Dorpat), Russian chemist (of German origin) credited with the discovery of ruthenium in 1844.

Klaus was educated at Dorpat, where he became a pharmacist; later he taught chemistry and pharmacy at the universities of Dorpat and Kazan. Klaus was noted for his researches on the platinum metals osmium, palladium, iridium, and rhodium, and it was in the course of investigating the waste residues of the platinum refinery in St. Petersburg (Leningrad) that he discovered ruthenium.

klavier (musical instrument): *see* clavier.

Kle, also spelled KLAY, or CLAY, town, western Liberia, western Africa. It is a traditional trading centre among the Gola. The B.F. Goodrich Company, Liberia, Inc., established a plantation, hospital, power plant, housing, schools, and roads to the west of the town, which began producing rubber in 1963. Pop. (latest census) 2,163.

Kléber, Jean-Baptiste (b. March 9, 1753, Strasbourg, Fr.—d. June 14, 1800, Cairo), French general of the Revolutionary wars who suppressed the counterrevolutionary uprising in the Vendée area of western France in 1793; later he had a prominent role in Napoleon Bonaparte's Egyptian campaign (1798–1800).

The son of a mason, Kléber was an officer in the Austrian Army from 1776 to 1782. He was an architect for a time in Paris, and, in July 1789, shortly after the outbreak of the Revolution, he joined the national guard. France went to war with Austria and Prussia in 1792, and from April to July 1793 Lieutenant Colonel Kléber ably defended Mainz from Austrian besiegers. As a result, he was made a general in August 1793 and assigned to crush the royalist-led Roman Catholic in-



Kléber, engraving by G. Fiesinger after a drawing by J. Guérin
By courtesy of the Bibliotheque Nationale, Paris

surgents of the Vendée. On October 17, he severely defeated the Vendéans at Cholet. He later destroyed the rebel army in two battles—at Le Mans on December 13 and at Savenay 10 days later.

Sent north to join Jean-Baptiste Jourdan's Army of the Moselle in April 1794, Kléber distinguished himself in the Battle of Fleurus (June 26), a key victory in the French conquest of Belgium.

In April 1798 Kléber was made commander of a division in the forces assembled by Napoleon Bonaparte for the invasion of Egypt. After the French landed at Alexandria on July 1–2, Kléber was wounded in the ensuing battle. He remained in Alexandria as governor for several months, but on April 16, 1799, he defeated the Turks at Mount Tabor. On Napoleon's departure for France in August 1799, Kléber was left in command of the expeditionary forces. In January 1800 he signed a convention with a British admiral by which the French were to evacuate their troops from Egypt. When the British government refused to recognize the agreement, Kléber reopened hostilities, defeating a Turkish army at Heliopolis (near Cairo) on March 20 and recapturing Cairo on April 21. He had begun to govern Egypt when he was assassinated by a fanatic in June.

Consult the INDEX *first*

Klebs, Edwin (b. Feb. 6, 1834, Königsberg, Prussia [now Kaliningrad, Russian S.F.S.R.]—d. Oct. 23, 1913, Bern), German physician and bacteriologist noted for his work on the bacterial theory of infection. With Friedrich August Johannes Löffler in 1884 he discovered the diphtheria bacillus, known as the Klebs–Löffler bacillus.

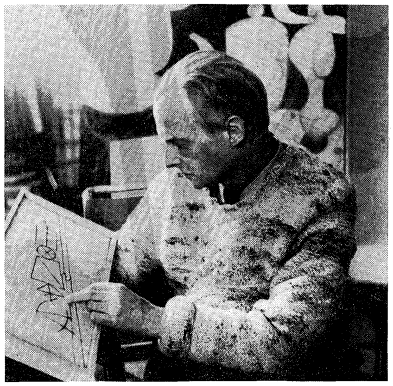
Klebs was assistant to Rudolf Virchow at the Pathological Institute, Berlin (1861–66). He held several professorships in European universities and in Chicago at the Rush Medical College (1896). He preceded Robert Koch in studying the bacteriology of traumatic infections, and in 1876 he succeeded in producing endocarditis by mechanical means combined with general infection. From researches on tuberculosis he was able to produce bovine infection by means of milk. In 1878 he successfully transmitted syphilis to monkeys, antedating the experiments of Élie Metchnikoff and Émile Roux by 25 years. He also studied malaria, hemorrhagic pancreatitis, and gigantism. Apart from monographs and articles, he produced a handbook of pathological anatomy (1869–76) and a treatise on general pathology (1887–89).

Klebsiella pneumoniae, or FRIEDLÄNDER'S BACILLUS, a species of rod-shaped bacteria of the family Enterobacteriaceae found in the respiratory and intestinal and urogenital tracts of man and other animals. Its most frequent manifestation is a fatal type of pneumonia in alcoholics and persons with debilitating illnesses. It is also found in persons suffering from sinusitis, pharyngitis, liver abscesses, peritonitis, endocarditis, and other diseases. *K. pneumoniae* is resistant to antibiotic therapy.

Klee, Paul (b. Dec. 18, 1879, Münchenbuchsee, near Bern—d. June 29, 1940, Muralto-Locarno, Switz.), artistically isolated yet influential Swiss genius of abstract painting who attempted through his own highly inventive pictorial language to convey the essential, spiritual significance of things. In their fanciful pictography and linear freedom, his works sometimes suggest the art of children.

Early life and education. Klee's mother, *née* Ida Maria Frick, was Swiss, and she had studied music at the Stuttgart conservatory. His father, Hans Klee, was a German music teacher who had abandoned his singing career.

Klee's involvement with the musical and visual arts began early in his life. At the age of four, he sought refuge near his mother when the devils he was scrawling on scraps of paper seemed to him to come to life. In his Uncle Ernst's cafe he would daydream over the sinuous patterns in the marble tabletops, which suggested to him fantastic designs. The



Klee, 1939
Aufnahme Fotopress

boy's imagination was also stimulated by the stories he heard from his grandmother Frick. At seven, he began to play the violin.

As a student, Klee was considered attentive, but he early displayed an original turn of mind opposed to the established order. He described his boyhood education as "mountains immeasurably high but with no foot." As a youth he was particularly fond of Greek and drawing (12 notebooks filled with drawings are preserved in the Klee-Stiftung in Bern), but most of all he liked to play the violin. His musical talents were so developed that he was used as a substitute by the Bern symphony orchestra. The teenage Klee also wrote precociously sophisticated poetry and short stories.

Upon graduating from secondary school in 1898, Klee decided to devote himself exclusively to painting. Choosing Munich over Paris as a place to study art, he attended an art preparatory school in the Bavarian capital until he entered the Munich Academy in 1900 and studied under Franz von Stuck, an academic painter known for his allegorical pictures. Stuck demanded of his pupils a strict knowledge of anatomy and preferred to make them concentrate most of their time on drawing rather than on painting. Repelled by his teacher's conformity, Klee left the academy in 1901. His enthusiasm for avant-garde German publications, such as the magazine *Jugend* and the satirical newspaper *Simplicissimus,* further influenced his departure from artistic and intellectual conventionalism.

During his art-student years he assiduously attended concerts, being especially attracted to the music of the German Romantic composer Richard Wagner and the works of the Austrian composers Richard Strauss and Mozart. It was at a musical evening in the winter of 1899–1900 that he first met Lily Stumpf, the daughter of a prominent Munich doctor; he married her in 1906.

In June of 1901 Klee left Munich, briefly returned to Bern, and then set out for Italy with his friend Hermann Haller, a painter who later became one of Switzerland's leading sculptors of the early 20th century. Visiting Milan, Genoa, Rome, Naples, and Pompeii, Klee was particularly drawn to the works of such great masters of the Italian Renaissance as Michelangelo, Botticelli, Tintoretto, and Pinturicchio.

Artistic development. He returned to Bern in May of 1902 and lived in the Münchenbuchsee house of his childhood until his marriage. Artistically and intellectually, this was an important period in Klee's life. In art he decided he would like to begin everything again by himself, without taking account of the accomplishments of the past, although this attitude did not prevent him from studying anatomy and the handling of the mediums of the visual arts. He also continued to read voraciously.

In 1905, from May 31 to June 13, Klee visited Paris, where he saw an important retrospective exhibition of the works of the U.S. artist James McNeill Whistler (1834–1903) and was overwhelmed by the art of the French Impressionist Pierre-Auguste Renoir (1841–1919). Returning to Bern, he collected into a portfolio 15 etchings he had executed and submitted them to the jury of the Neuen Münchner Sezession exhibition. Ten of these were selected for the show, including "Jungfrau im Baum" ("Virgin in a Tree") and "Der Held mit dem Flügel" ("Hero with the Wing"). In these etchings, with their aggressive, fantastic figures, Klee reveals an almost menacing humour. He escaped the dullness and stifling atmosphere of Bern by this black humour and through his precisely detailed, grotesque imagery, exemplified in the etching "Zwei Männer, einander in höherer Stellung vermutend, begegnen sich" ("Two Men Meet, Each Believing the Other to Be of a Higher Rank"). Working from nature as well as his imagination, Klee also executed drawings, watercolours, and paintings on glass. After having modelled some statuettes in Plasticine, Klee went to live in Munich in 1906.

After marrying, the Klees lived in Schwabing, the artists' section of Munich. They resided there until Klee was called to teach at the Bauhaus in the autumn of 1920. And it was in Schwabing that his son Felix was born on Nov. 30, 1907. Lily, a pianist, largely supported the family by teaching music; Klee did not begin to sell his paintings until 1914. Although the Klees lived in relative poverty, Paul felt freer and more at home than in Bern, for he was able to choose between a wider variety of exhibitions and concerts, as well as to encounter more stimulating contemporaries in the arts.

In 1911–12 Klee did the filiform pen-and-ink illustrations for an edition (1920) of *Candide,* a satirical work by the 18th-century French writer Voltaire. He also had his first one-man shows that year. They were held in Switzerland at the museums of Zürich, Bern, Basel, and Winterthur. Having made the acquaintance of the German Expressionist painters Wassily Kandinsky and Franz Marc in 1912, Klee participated in the second Munich exhibition of the avant-garde *Blaue Reiter* (Blue Rider) group. He began to receive many invitations to exhibit his works from important private galleries such as the Sonderbund Gallery in Cologne and Galerie "Der Sturm" in Berlin.

During a 16-day stay in Paris in April 1912, the influential German collector Wilhelm Uhde introduced Klee to the leading Cubist painters working in France. Klee was especially taken with the colouristic works of Robert Delaunay, the originator of Orphic Cubism. He was also moved by the works of Vincent van Gogh. The proto-Expressionist works of this Dutch painter disturbed Klee deeply, for he saw behind their intensity "a brain that suffers from the combustion of a star." The engravings of another late 19th-century proto-Expressionist, the Belgian artist James Ensor, also interested him at this time. Although showing a definite preference for the expressionism of northern European art, Klee placed Paul Cézanne above all recent painters and began to be impressed by his contemporary, the great French master of 20th-century painting Henri Matisse.

In April 1914 Klee undertook a trip to Tunis in the company of two other painters, Louis Moilliet and August Macke. The "three wise men of the West," as someone called them, were each profoundly influenced by this North African experience. While painting watercolours at Qayrawān (Tunisia), Klee experienced a revelation of the nature of colour. "Colour possesses me . . ." he wrote in his diary. "It will possess me always. . . . That is the meaning of this happy hour: colour and I are one." Although his Tunisian trip lasted only 12 days, it changed the course of his art from a descriptive image of natural reality to a less figurative art and to being, as Klee wrote, "abstract, with memories."

On Aug. 1, 1914, World War I broke out. Klee's friend August Macke was killed September 26 on the Champagne front in France. Another of his friends, Franz Marc, one of the pioneers of German Expressionism, fell at Verdun on March 4, 1916. Called up for duty a few days after Marc's death, Klee served in the German army and was stationed at several locations, including the aviation depot at Schleissheim near Munich, where he painted and polished airplanes. It cannot be said that military life frightened or disturbed him greatly; he found it endurable, and its overall effect on him was that of a "fantastic dream." His superiors respected his reputation and permitted him to live in town and visit his family. He also obtained permission to write the preface to the catalog for an exposition of Franz Marc's paintings. In moments of leisure he painted in watercolours, sketched, and read. Demobilized after the defeat, he rented a studio in the Schlösschen Suresnes in Munich. The wealthy Bern collector Hermann Rupf requested some of his watercolours, for himself and for Kahnweiler, the Paris dealer and champion of the Cubists.

In 1919 he began to paint primarily in oil. His paint became increasingly thicker. Far from being a transcription of the tonalities of the external world, Klee's colour was invented, corresponding to the inner leaps of his spirit. In November 1920 the Bauhaus, a school of design founded by the German architect Walter Gropius on the principle that "to build is a biological and not an aesthetic phenomenon," invited Klee to join the staff as an instructor of painting. Klee accepted and left Munich for Weimar in January of the following year. At the Bauhaus, the general educational method was to emphasize the technical aspect of art. The ideal was not "art for art's sake" but a utilitarian art, an inspired craftsmanship, that would be applicable to decorative or monumental projects. Through the Bauhaus would be created "the new edifice . . . born of innumerable hands." One wonders how Klee, such an internal and poetic individual, was able to venture into this communal atmosphere. But he possessed a thorough knowledge of pictorial optics and a unique pedagogical gift. Klee taught in accordance with a method that he himself discovered and expounded in the *Pädagogisches Skizzenbuch* (1925; *Pedagogical Sketchbook*).

In the summer of 1924 Klee spent six weeks in Sicily—at Taormina, where he painted watercolours, and at Syracuse, which seemed to him an "abstract landscape." After continual attack by the press and public of Weimar, the Bauhaus was forced to close its doors in 1925. Encouraged by the German dramatist Gerhart Hauptmann, however, the Bauhaus moved its activities to Dessau, where, in 1926, it reopened in a building constructed by Gropius. In July the Klees moved to Dessau, where their neighbour was Kandinsky. Work in Klee's studio alternated with classes, music, lectures, and collaboration on the magazine *Bauhaus.*

On Dec. 20, 1928, Klee embarked at Genoa for Egypt. Visiting Cairo, Luxor, and Aswan in a few days, this trip, like his earlier Tunisian journey, exerted a profound effect on him. Klee resigned his Bauhaus post in 1931 and accepted a position at the Düsseldorf Academy.

He no longer had to teach, being able to support himself by the sale of his work, but he needed to satisfy his pedagogic nature.

Last years. Klee's existence in Germany was doomed when Adolf Hitler was appointed chancellor in January 1933. Attacked by the Nazis, Klee was treated as a barbarian and a corrupted foreigner. He left Germany, traveling to Italy, Switzerland, and France. Profoundly disgusted by the Hitler regime, Klee again took up residence in politically neutral Switzerland, settling in Bern in 1933. In 1934 Klee had his first London exhibition; while in Bern and Basel, an important retrospective of his work was held in 1935. During the summer an attack of bronchitis followed by measles brought about pulmonary and cardiac complications. Ultimately, Klee's condition was diagnosed as scleroderma, a rare disease that results in a drying up of the mucous membranes and ends by striking the heart. Klee was initially unconcerned. He continued his work, took cures at Tarasp, and went to recuperate at Montana-sur-Sierre in the Swiss canton of Valais. Gradually, however, his hope of recovering diminished. In 1937 he became feverishly active and did not interrupt his work except for short walks. His palette took on brilliant strength, as seen in the pastel "Figur im Garten" ("Figure in the Garden"). In the same year, an exhibition of confiscated art, called Degenerate Art, opened in Munich. It included, among the many masterpieces of modern art condemned by the Nazis, 17 works by Paul Klee. On the occasion of Klee's 60th birthday, in 1939, he received telegrams and presents from everywhere, except official Germany.

In early 1940 Klee wrote, "It is no accident that I have entered on the tragic path. Plenty of sheets of drawings have pointed the way and said: the time has come." Klee executed that same year a series of angels, which are closer to those of Islām than to the angels of Christianity. He also painted "Tod und Feuer" ("Death and Fire"), his *Dies Irae,* which seems to foreshadow his approaching death. Klee began his final illness at the sanitarium of Orselina-Locarno on May 10. He was taken to the Saint Agnes clinic at Muralto-Locarno, where he died of a heart attack a few weeks later. On July 1 he was cremated at Lugano, and the urn was finally buried in September 1942 in the Schosshalden cemetery at Bern. The tombstone is inscribed with a passage from his diary: "I cannot be grasped in this world. For I am as much at home with the dead as with those beings who are not yet born."

Assessment. Paul Klee is generally acclaimed one of the greatest visionaries of all time, an artist to whom the universe opened the secret of its metamorphosis. His work reveals a prodigious knowledge of pictorial illusion. Imbued with autohypnosis, Klee's art communicates a poetic spell created by a seemingly magical transfiguration of the real. If Expressionism can be considered as the "direct visualization of individual emotion," Klee perhaps can be said to belong to this movement. He was able to create a new language of colour, form, and space and to develop a private symbolism that communicates deeply. Klee was also an accomplished musician, and much of his system of visual form is built up like musical form. To Klee, "art was a symbol of creation, an example much as the earth exemplifies the cosmos." He proceeded to create his own reality, which does not represent the familiar reality but penetrates to a reality that is not known until one sees his paintings. The present state of things, he felt, is only a momentary and accidental arrangement, and he attempted to communicate a world as it might once have been or is in the process of becoming. If a work of art is able to be more than a pleasing decoration, if it is able to give insight and perhaps change lives, then it may be understood why Klee is one of the most admired artists of one of the most creative periods in the history of art. (P.Co.)

MAJOR WORKS. *Paintings.* "Zoological Garden" (1918; Klee Foundation, Bern); "Villa R" (1919; Kunstmuseum, Basel, Switz.); "Graduated Shades of Red-Green" (1921; Yale University Art Gallery); "A Young Lady's Adventure" (1922; Tate Gallery, London); "Dance, Monster, to My Soft Song!" (1922; Solomon R. Guggenheim Museum, New York City); "Magic Theatre" (1923; Klee Foundation); "Around the Fish" (1926; Museum of Modern Art, New York City); "Pastorale" (1927; Museum of Modern Art, New York City); "Monument at the Edge of an Orchard" (1929; Klee Foundation); "The Mocker Mocked" (1930; Museum of Modern Art, New York City); "Arab Song" (1932; Phillips Collection, Washington, D.C.); "Child Consecrated to Suffering" (1935; Albright-Knox Art Gallery, Buffalo); "Rich Harbour" (1938; Kunstmuseum); "Demonry" (1939; Klee Foundation); "Death and Fire" (1940; Klee Foundation).

Writings. Pädagogisches Skizzenbuch (1925; *Pedagogical Sketchbook,* 1953); *Paul Klee: His Life and Work in Documents,* selected from posthumous writings and unpublished letters by Felix Klee; *Tagebücher von Paul Klee, 1898–1918,* ed. by Felix Klee (1957; *The Diaries of Paul Klee, 1898–1918,* 1964, reprinted 1968).

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Kleef (Germany): *see* Kleve.

Kleiber, Erich (b. Aug. 5, 1890, Vienna—d. Jan. 27, 1956, Zürich), Austrian conductor who performed many 20th-century works but was especially known for his performances of works by Mozart, Beethoven, Richard Wagner, and Richard Strauss and for his fidelity to composers' intentions.

Kleiber studied in Prague and between 1912 and 1922 conducted at several German opera houses. In 1923 he became general music director of the Berlin state opera, where he gave the first performance of Alban Berg's *Wozzeck* in 1925. In 1935 he left Germany. He conducted German opera at Buenos Aires (1936–49) and became an Argentine citizen. In 1954 he became chief conductor of the Berlin opera but resigned in 1955 after difficulties with the German Democratic Republic. He composed concerti for piano and for violin, orchestral and chamber works, and songs.

Klein, A(braham) M(oses) (b. 1909, Ratno, Volhynia, Russian Empire [now in Ukrainian S.S.R.]—d. Aug. 21, 1972, Montreal), Canadian poet whose verse reflects his strong involvement with Jewish culture and history. He was a member of the Montreal group.

Though raised in an Orthodox environment and encouraged to enter the rabbinate, Klein attended McGill University (1926–30) and then studied law at the University of Montreal (1930–33). In the ensuing years he practiced law in Montreal and at various times edited the *Canadian Jewish Chronical,* was a lecturer at McGill, and was active in the Co-operative Commonwealth Federation (now the New Democratic Party). Following a nervous breakdown in the mid-1950s he retired from legal practice, ceased editing and writing, and lived in seclusion with his family until his death.

An ardent supporter of Zionism, Klein made the Jewish experience a vehicle for his artistic expressions. *Hath Not a Jew . . .* (1940), *Poems* (1944), and *The Hitleriad* (1944) are volumes that deal with Jewish persecution by the Russians and Nazis. After a visit to Israel he wrote about its creation in *The Second Scroll* (1951), a symbolic novel that carries overtones of the techniques of James Joyce, on whom Klein was an authority. *The Rocking Chair and Other Poems* (1948) departs from the Jewish frame of reference in describing the change wrought by industrialization on Quebec.

Klein, Calvin (Richard) (b. Nov. 19, 1942, Bronx, New York City), American fashion designer noted for his womenswear, menswear, cosmetics, bed and bath linens, and other designer collections.

Klein studied at the Fashion Institute of Technology in New York City and, after graduating in 1962, went to work as an apprentice designer for a coat-and-suit manufacturer in the New York garment district. In 1968, when he opened his own company, the fashion industry was in a depressed period, with casual hippie-style clothing and the microminiskirt defining the range of fashions. The direction Klein took was to provide simple, understated clothing. Though noted at first for suits and coats, he gradually placed more emphasis on sportswear, particularly interchangeable separates.

He was the first designer to win three consecutive Coty Awards for womenswear (1973–75) and was the youngest designer of ready-to-wear clothes ever elected to the Coty Hall of Fame (1975). Klein described his design philosophy as the making of "simple, comfortable but stylish clothes—but with nothing overscale or extreme." His clothes were relatively expensive, classic, elegant, and easy to wear, and they obviously struck a responsive chord among buyers. Moreover, his achievements were said to represent not only the triumph of his particular brand of classical styling but also the maturation of the American fashion industry.

Klein, (Christian) Felix (b. Nov. 25, 1849, Düsseldorf, Rhine Province—d. June 22, 1925, Göttingen, Ger.), German mathematician whose synthesis of geometry as the study of the properties of a space that are invariant under a given group of transformations, known as the *Erlanger Programm,* profoundly



Felix Klein

By courtesy of the University Library, Gottingen, Ger.

influenced mathematical development. He became professor of mathematics at the University of Erlangen (1872–75), where his inaugural lecture set forth the views contained in the *Erlanger Programm,* derived from his admiration for the unifying possibilities of group theory. He collaborated with Sophus Lie of Norway and was first to systematize Lie's contact transformations. Shortly before 1916, new geometries were discovered that do not fit Klein's *Programm,* but his synthesis is still important and useful for those geometries that do conform.

Klein was professor at the universities of Leipzig (1880–86) and Göttingen (1886–1913). He was editor of the *Mathematische Annalen* of Göttingen from 1872 and in 1895 founded the great mathematical *Encyklopädie,* which he continued to supervise until his death. His works on elementary mathematics, including *Elementar mathematik von höheren standpunkte aus* (1908; *Elementary Mathematics from an Advanced Standpoint*), reached a wide public. Of his more technical writings, *Vorlesungen über das Ikosaeder* (1884; "Lectures on the Icosahedron") and *Vorlesungen über die Theorie der automorphen Functionen,* 2 vol. (1897, 1902; "Lectures on the Theory of Automorphous Functions") are considered outstanding.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Klein, Lawrence Robert (b. Sept. 14, 1920, Omaha, Neb., U.S.), U.S. economist whose work in developing macro-econometric models for national, regional, and world economies won him the 1980 Nobel Prize for Economics.

After graduating from the University of California, Berkeley, in 1942, Klein studied under Paul Samuelson at the Massachusetts Institute of Technology, taking his Ph.D. in 1944. From 1944 to 1947 he was involved in econometric research at the University of Chicago, and from 1948 to 1950 he was on the staff of the National Bureau of Economic Research. Subsequently he was associated with the Survey Research Center of the University of Michigan in 1949–54, the Institute of Statistics of Oxford University in 1954–58, and the Wharton School of the University of Pennsylvania from 1958; in 1968 he became Benjamin Franklin professor of economics and finance.

Klein's researches produced a series of increasingly detailed and sophisticated models of economic activity. The Wharton Models found wide use in forecasting gross national product, exports, investment, and consumption. A more ambitious effort, the LINK project, incorporated data gathered from a large number of industrialized, centrally planned, and developing countries to forecast trade and capital movements and to test the effects of proposed changes in political and economic policies.

Klein, Melanie, *née* REIZES (b. March 30, 1882, Vienna—d. Sept. 22, 1960, London), Austrian-born British psychoanalyst known for her work with young children, in which observations of free play provided insights into the child's unconscious fantasy life, enabling her to psychoanalyze children as young as two or three years of age.

The youngest child of a Viennese dental surgeon, Klein expressed an early interest in medicine but abandoned her plans when she married at 21. The marriage, though unhappy, produced three children. She became interested in psychoanalysis in Budapest a few years before World War I, undergoing psychoanalysis with Sándor Ferenczi, himself a close associate of Freud. Ferenczi urged her to study the psychoanalysis of young children, and in 1919 she produced her first paper in the field. Two years later she was invited by Karl Abraham to join the Berlin Psychoanalytic Institute, remaining there until 1926, when she moved to London.

In *The Psychoanalysis of Children* (1932), she presented her observations and theory of child analysis. Believing children's play to be a symbolic way of controlling anxiety, she observed free play with toys as a means of determining the psychological impulses and ideas associated with the early years of life. Her object-relations theory related ego development during this period to the experience of various drive objects, physical objects that were associated with psychic drives. In early development, she found, a child relates to parts rather than to complete objects—for example, to the breast rather than to the mother. This unstable and primitive mode of identification was termed by Klein the paranoid-schizoid position. The next development phase is the depressive position, in which the infant comes to relate to whole objects, such as the mother or father. This phase is marked by the infant's recognition of the ambivalence of his feelings toward objects, and thus the moderation of his internal conflicts about them.

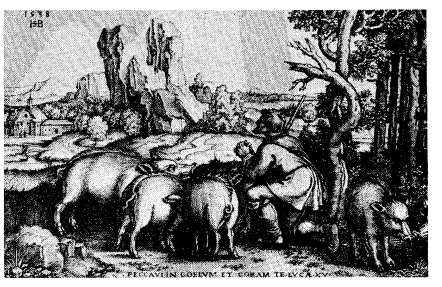
Klein believed that the anxiety in the paranoid-schizoid position was persecutory, threatening the annihilation of the self, and the anxiety of the second, later position was depressive, being related to fear of the harm done to loved objects by the infant's own destructive impulses.

Beginning in 1934 Klein used her work with adult patients to clarify and extend her ideas on infant and childhood anxiety, presenting her views in a number of papers and a book, *Envy and Gratitude* (1957). Her final work, published posthumously in 1961, *Narrative of a Child Analysis,* was based on detailed notes taken during 1941.

Klein bottle, topological space, named for the German mathematician Felix Klein, obtained by identifying two ends of a cylindrical surface in the direction opposite that is necessary to obtain a torus. The surface is not constructible in three-dimensional Euclidean space but has interesting properties, such as being one-sided, like the Möbius strip (*q.v.*); being closed, yet having no "inside" like a torus or a sphere; and resulting in two Möbius strips if properly cut in two.

Klein Karroo (South Africa): *see* Little Karroo.

Kleinmeister, also called NÜRNBERG KLEINMEISTER, group of engravers, working mostly in Nürnberg in the second quarter of the 16th century, whose forms and subjects were influenced by the works of Albrecht Dürer.



"The Prodigal Son," engraving by the Kleinmeister Hans Sebald Beham, 1538

By courtesy of the trustees of the British Museum; photograph, John Freeman

Their engravings were small and thus easily portable. Usually flawless in technique, they stressed topical, didactic, intimate, and often familiar and popular subjects meant for mass appeal.

The artists used classical forms derived from Dürer and from the works of contemporary Italian artists, which gradually introduced the influence of Italian Mannerist forms. The most important member of the group was Hans Sebald Beham; others were his brother Barthel, Georg Pencz, Hendrich Aldegrever, and Jakob Binck.

Kleist, E(wald) Georg von (b. *c.* 1700, Prussian Pomerania?—d. Dec. 11, 1748, Köslin, Pomerania?), German administrator and cleric who discovered (1745) the Leyden jar, a fundamental electric circuit element for storing electricity, now usually referred to as a capacitor. The device was independently discovered at about the same time by Pieter van Musschenbroek, who investigated it more thoroughly than Kleist.

Kleist, Ewald Christian von (b. March 7, 1715, Zeblin, Pomerania—d. Aug. 24, 1759, Frankfurt an der Oder, Brandenburg), German lyric poet best known for his long poem *Der Frühling,* which, with its realistically observed details of nature, contributed to the development of a new poetic style.



Ewald Kleist, detail of a contemporary engraving

Historia-Photo

Brought up by Jesuits, he studied law and mathematics and then became an army officer, first in Denmark and then in 1740 in Prussia. In Potsdam, while in service, he met Johann Wilhelm Ludwig Gleim, through whose influence and friendship he first became a poet. The happiest years of his life were 1757 and 1758, when he became close friends with the writer Gotthold Ephraim Lessing and came in contact with the literary circle in Leipzig. From this period come his patriotic and heroic poems, inspired by his experience in the Seven Years' War, *Ode an die Preussische Armee* (1757) and the short epic *Cessides und Paches* (1759), considered to be the most polished of all his poems. *Der Frühling* (1749), influenced by the Scottish poet James Thomson's *Seasons,* is typical of his heartfelt nature poetry in which passionate love for nature is expressed in vivid imagery. Wounded in the battle of Kunersdorf, he died the "death for the fatherland" of which he had written in his poetry.

Kleist, (Bernd) Heinrich (Wilhelm) von (b. Oct. 18, 1777, Frankfurt an der Oder, Brandenburg—d. Nov. 21, 1811, Wannsee, near Berlin), the first of the great German dramatists of the 19th century. Poets of the Realist, Expressionist, Nationalist, and Existentialist movements in France and Germany all saw their prototype in Kleist, a poet whose demonic genius had foreseen modern problems of life and literature.

Having grown up in military surroundings that were distasteful to him, Kleist was dissatisfied with the career of an army officer, which had been chosen for him, and resigned his commission after "the loss of seven valuable years." For a time he studied law and mathematics, but his reading of the philosophy of Immanuel Kant destroyed his faith in the value of knowledge. Despairing of reason,



Heinrich Kleist, drawing by Wilhelmina von Zenge, 1801; in the Staatsbibliothek Preussischer Kulturbesitz, Berlin

By courtesy of the Staatsbibliothek, Berlin

he decided to place his trust in emotion. The conflict between them remained unresolved, however, and lies at the heart of his work.

Kleist abandoned his studies and went first to Paris and then to Switzerland. There he wrote his first work, the tragedy *Die Familie Schroffenstein* (1803; "The Schroffenstein Family"), which depicts pathological states with ruthless clarity. Underlying this drama of error is Kleist's recurring theme, the fallibility of human perception and the inability of the human intellect by itself to apprehend truth. At this time he was also working on the unfinished play *Robert Guiskard,* an extremely ambitious work in which he attempted to unite ancient Sophoclean tragedy and the Shakespearean drama of character. He set out on a new journey and in Paris, overcome by despair, burned his manuscript of *Guiskard* (though he partially rewrote it later) and tried to volunteer for the French army. Expelled from France, he traveled to East Prussia and applied for a civil-service post in Königsberg. He resigned during training, however, and left for Dresden, where he hoped to continue writing, but was arrested by the French and imprisoned for six months as a spy.

In Dresden (1807–1809) he became a member of a large circle of writers, painters, and patrons and, with the political philosopher Adam Müller, published the periodical *Phöbus,* which lasted only a few months. While he was in prison his adaptation of Molière's *Amphitryon* (published 1807) attracted some attention, and in 1808 he published *Penthesilia,* a tragic drama about the passionate love of the queen of the Amazons for Achilles. Although this play received little acclaim, it is now thought to contain some of Kleist's most powerful poetry, with the grimness of plot and intensity of feeling that have made his place unique among German poets. In March 1808 Kleist's one-act comedy in verse, *Der zerbrochene Krug* (*The Broken Pitcher*), was unsuccessfully produced by Goethe in Weimar. The play employs vividly portrayed rustic characters, skillful dialogue, earthy humour, and subtle realism in its depiction of the fallibility of human feeling and the flaws inherent in human justice. It ranks among the masterpieces of German dramatic comedy. Toward the end of 1808, inspired by a threatened rising against Napoleon, Kleist wrote some savage war poems and a political and patriotic tragedy, *Die Hermannsschlacht* (1821; "The Warrior's Battle"), and in 1809 attempted to found a political periodical that would call all Germany to arms. Between 1810 and 1811 his *Das Käthchen von Heilbronn* (1810; *Katherine of Heilbronn*), a drama set in Swabia during the Middle Ages, was performed in Vienna, Graz, and Bamberg. But the Berlin stage remained closed to him.

Kleist also wrote eight masterly novellas, collected in *Erzählungen* (1810–11), of which *Michael Kohlhaas, Das Erdbeben in Chili* (*The Earthquake in Chili*), and *Die Marquise von O...* have become well-known as tales of violence and mystery. They are all characterized by an extraordinary economy, power, and vividness and by a tragic subject matter in which men are driven to the limits of their endurance by the violence of other men or of nature. Kleist's last drama, *Prinz Friedrich von Homburg* (published posthumously in 1821 by Ludwig Tieck), is a brilliant psychological drama. The play's problematical hero is Kleist's finest figure, reflecting Kleist's own conflicts between heroism and cowardice, dreaming and action.

For six months Kleist had edited the daily newspaper *Berliner Abendblätter,* and, when it ceased publication, he lost his means of livelihood. Disappointed in life and embittered by the lack of recognition accorded him by his contemporaries, particularly Goethe, he came to know an incurably sick woman, Henriette Vogel, who begged him to kill her. This gave Kleist the final incentive to end his tragic life, and on Nov. 21, 1811, he shot Henriette and himself on the shore of the Wannsee.

Kleist, Paul Ludwig (Ewald) von (b. Aug. 8, 1881, Braunfels an der Lahn, Ger.—d. October? 1954, Vladimirovka Camp, Russian S.F.S.R.), German general during World War II.

Educated in a German military school, he served as a lieutenant of hussars and a regimental commander in World War I. After the Armistice, he served in various high staff appointments before being retired in 1939. He was recalled to service upon the outbreak of World War II and was put in command of an army corps.

A master of the blitzkrieg form of warfare, Kleist participated in the German invasion of Poland (1939) and commanded the tank corps that broke through the Ardennes Forest and thus began the rout of the French army in June 1940. He led the mechanized column that took Belgrade in the Yugoslavian campaign (1941). Early in the invasion of the Soviet Union, his tank army led the German attack on Kiev and the advance through the Ukraine. In November 1941 Kleist's armies captured Rostov, only to lose it a week later when the Soviet general S.K. Timoshenko launched a counteroffensive. When the Germans renewed their offensive in the summer of 1942, Kleist's 1st German tank army drove through to the foothills of the Caucasus but then had to retreat, narrowly escaping encirclement. Kleist was promoted to the rank of field marshal in 1943 but was dismissed from his command by Hitler in 1944. In 1945 he was captured by U.S. troops. In 1948 he was sentenced to 15 years' imprisonment by a Yugoslavian court and was turned over to authorities in the Soviet Union, where he died in prison.

Klem, Bill, byname of WILLIAM JOSEPH KLEM, original surname KLIMM, also called THE OLD ARBITRATOR (b. Feb. 22, 1874, Rochester, N.Y., U.S.—d. Sept. 16, 1951, Coral Gables, Fla.), American professional National League baseball umpire who is considered by many the greatest umpire of all time. Klem is credited with introducing hand and arm signals to indicate calls of pitched balls and strikes and foul and fair batted balls. He was also famous for his practice of drawing a line in the dirt with his shoe and ejecting any player or manager who crossed it while protesting a call. He was one of the first umpires to leave his position behind home plate (in the days of only two umpires) to race to third base, make a call there, and run back to home plate for another call if necessary.

Klem was a catcher for Hamilton (Ont.) in the Canadian League in 1896. After his arm went bad he turned to umpiring, in the Connecticut State League (1902), the New York State League (1903), and the American Association (1904). He changed his name to Klem and worked in the National League postseason in 1905 and thereafter until his retirement. He worked behind the plate exclusively for 16 years because his judgment was considered so good in calling balls and strikes. He umpired 18 World Series, a record. He retired from game duty in 1941 but was chief of the league's umpire staff until his death. He was elected to the Baseball Hall of Fame in 1953.

Klemm, Gustav Friedrich (b. Nov. 12, 1802, Chemnitz, Saxony [Germany]—d. Aug. 25/26, 1867, Dresden, Saxony), German anthropologist who developed the concept of culture and is thought to have influenced the prominent English anthropologist Sir Edward Burnett Tylor. Klemm spent most of his life as director of the royal library at Dresden.

Distinguishing three stages of cultural evolution (which he identified as those of savagery, domestication, and freedom), Klemm divided mankind into active and inactive races and believed that peoples differed in mentality and temperament. *Allgemeine Kulturgeschichte der Menschheit,* 10 vol. (1843–52; "General Cultural History of Mankind"), includes a history of mankind in terms of social organization, technology, and beliefs. He described the material foundations of culture in *Allgemeine Kulturwissenschaft,* 2 vol. (1854–55; "General Science of Culture").

Klemperer, Otto (b. May 14, 1885, Breslau, Ger.—d. July 6, 1973, Zürich), one of the outstanding German conductors of his time.

Klemperer studied in Frankfurt and Berlin and on the recommendation of Gustav Mahler was made conductor of the German National Theatre at Prague in 1907. Between 1910 and 1927 he conducted opera at Hamburg, Barmen, Strassburg, Cologne, and Wiesbaden. In 1927 he became director of the Kroll Opera in Berlin, where he expanded the repertory to include works by Paul Hindemith, Ernst Krenek, and Igor Stravinsky. He was conductor of the Los Angeles Philharmonic Orchestra (1933–39) and of the Budapest Opera (1947–50). In his later years he was especially known for his interpretations of the symphonies of Beethoven and Mahler. His compositions include choral works and songs.

Klenze, Leo von (b. Feb. 24, 1784, Bockenem, Hanover [Germany]—d. Jan. 27, 1864, Munich), German architect who was one of the most important figures associated with Neoclassicism in Germany.

Trained in Berlin by Friedrich Gilly, Klenze's career after 1816 was centred in Munich, where he was the court architect to Maximilian I and Ludwig I, kings of Bavaria. He was especially enamoured of ancient Greek and Hellenistic architecture, and many of his buildings are masterpieces of the Greek Revival style—*e.g.,* the Glyptothek (1816–30, Munich), the Propylaeon (1846–63, Munich), the Walhalla temple (1831–42, near Regensberg, Ger.), and the new Hermitage Museum (1839–49, St. Petersburg, now Leningrad). Stylistically eclectic like many 19th-century architects, he also worked in the Renaissance style—*e.g.,* the Königsbau (1826–35) and Festaalbau (1833) of the royal palace in Munich—and designed the Neo-Byzantine Allerheiligen or Hofkirche (1827) in Munich.

Klephtic ballad, any of the songs and poems extolling the adventures of the Klephts, Greek nationalists living as outlaws in the mountains during the period of Turkish domination over Greece (1453–1828). Containing some of the most beautiful and vivid verse in Modern Greek, the songs, mainly from the 18th century, are an entirely spontaneous poetry, composed in popular language and in 15-syllable verse, rhymed and unrhymed. They are pervaded with the spirit of the forests and the

mountains and, like so much of Greek popular poetry, personify trees, rocks, and rivers. Even the mountains praise the prowess of the Klephts, bewail their deaths, and comfort the disconsolate wives and mothers. Klephtic ballads have been a constant source of inspiration and rejuvenation to Modern Greek poetry and to Greek nationalism.

kleptomania, recurrent compulsion to steal without regard to the value or use of the objects stolen. Although widely known and sometimes used as an attempted legal defense by arrested thieves, genuine kleptomania is a fairly rare mental disorder. A kleptomaniac may hide, give away, or secretly return the stolen items, but he or she seldom uses them or attempts to profit by their resale. The kleptomaniac usually has the economic means to purchase what he steals and obtains gratification from the theft itself rather than from its object.

Kleptomania is classified as a disorder of impulse control, meaning that the victim is unable to overcome the urge to steal and feels an increasing tension with attempts to resist, until yielding to the impulse gives release. In some cases, the stolen objects may have a symbolic sexual or other significance for the kleptomaniac, but the sexual aspects of the disorder are not always evident.

Psychotherapy can be effective in alleviating the disorder, but few kleptomaniacs seek help unless they are caught in a theft or are referred to a psychiatrist for treatment of depression or anxiety related to their fears of being apprehended.

Klerksdorp, town and principal centre of the Klerksdorp-area goldfields, southwestern Transvaal, South Africa. It lies approximately 80 miles (130 km) southwest of Johannesburg. The "old town," which was founded in 1837 on the Schoonspruit River near its confluence with the Vaal, was the first Boer settlement in the Transvaal. Opposite, on the eastern bank, lies the "new town," dating from 1888. An important grain-producing, mining (after 1932; gold and uranium), and industrial centre, Klerksdorp expanded greatly in the second half of the 20th century, with new industrial development and residential suburbs. Pop. (1985) 48,947.

kleśa (in Buddhism): *see* āsrāva.

Klesl, Melchior, Klesl also spelled KHLESL (b. Feb. 19, 1552, Vienna—d. Sept. 18, 1630, Vienna), Austrian statesman, bishop of Vienna and later a cardinal, who tried to promote religious toleration during the Counter-Reformation in Austria. Converted from Protestantism by the Jesuits, he became an outstanding preacher and served as bishop of Vienna from the 1590s.



Klesl, detail from an engraving by Johann Friedrich Rosbach

By courtesy of the Bild-Archiv, Osterreichische Nationalbibliothek, Vienna

Becoming the most trusted adviser of the Habsburg archduke Matthias, king of Hungary and of Bohemia, he helped to procure his patron's election as Holy Roman emperor (June 13, 1612), was appointed director of the privy council, and was allowed by Matthias to conduct most of the secular political affairs of the empire. Klesl was made a cardinal secretly in 1615 and publicly the next year. He hoped to reconcile the religious factions within the empire by means of reciprocal concessions. His conciliatory attitude was resented by the German Catholic princes and by the archdukes Maximilian and Ferdinand (afterward emperor as Ferdinand II). When Klesl recommended concessions to the Bohemian Protestants, he was seized by the archdukes in 1618 and imprisoned. In 1627 Ferdinand II allowed Klesl to return as bishop to Vienna and restored most of his fortune.

Kleve, also spelled CLEVE, English CLEVES, Dutch KLEEF, city, North Rhine-Westphalia *Land* (state), western Germany. It lies less than 5 miles (8 km) south of the Dutch border and is connected with the Rhine River by a canal. The seat of the counts of Cleves from the 11th century, it was chartered in 1242. The county passed to the counts of La Marck in 1368; it was made a duchy in 1417 and acquired the duchies of Jülich and Berg in 1521. Anne of Cleves (d. 1557), daughter of Duke John, was the fourth wife of Henry VIII of England. The town passed to the electors of Brandenburg by the Treaty of Xanten in 1614. Held by the French during the Revolution and the Napoleonic Wars, it passed to Prussia in 1815. The town was severely damaged in World War II. The former ducal castle, Schwanenburg (Swans' Castle), associated with the legend of Lohengrin (the Knight of the Swan), is now a law court; its two towers date from 1429 and 1440. Also notable are the Collegiate Church (1341–1426) and the Minorite Church (1427). Tourism is important in the city, and food processing, clothing manufacture, and chemicals are important industries. Pop. (1989 est.) 44,416.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Klimt, Gustav (b. July 14, 1862, Vienna—d. Feb. 6, 1918, Vienna), Austrian painter and founder of the school of painting known as the Vienna Sezession.

After studying at the Vienna School of Decorative Arts, Klimt in 1883 opened an independent studio specializing in the execution of mural paintings. His early work was typical of late 19th-century academic painting, as can be seen in his murals for the Vienna Burgtheater (1888) and on the staircase of the Kunsthistorisches Museum.

In 1897 Klimt's mature style emerged, and he founded the Vienna Sezession, a group of painters who revolted against academic art in favour of a highly decorative style similar to Art Nouveau (*q.v.*). Soon thereafter he painted three allegorical murals for the ceiling of the University of Vienna auditorium that were violently criticized; the erotic symbolism and pessimism of these works created such a scandal that the murals were rejected. His later murals, the "Beethoven Frieze" (1902; Österreichische Galerie, Vienna) and the murals (1909–11) in the dining room of the Stoclet House, Brussels, are characterized by precisely linear drawing and the bold and arbitrary use of flat, decorative patterns of colour and gold leaf. Klimt's most successful works include "The Kiss" (1908; Österreichische Galerie, Vienna) and a series of portraits he did of fashionable Viennese matrons, such as "Frau Fritza Riedler" (1906; Österreichische Galerie)



"Frau Fritza Riedler," oil on canvas by Gustav Klimt, 1906; in the Österreichische Galerie, Vienna

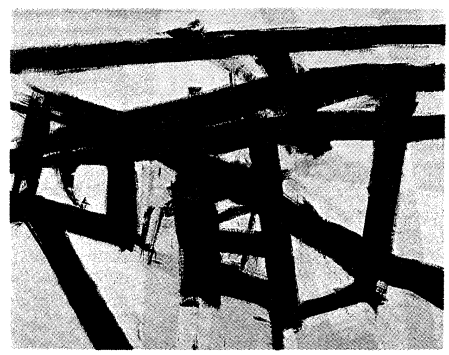
By courtesy of the Osterreichische Galerie, Vienna

and "Frau Adele Bloch-Bauer" (1907; Österreichische Galerie). In these works he treats the human figure without shadow and heightens the lush sensuality of skin by surrounding it with areas of flat, highly ornamental, and brilliantly composed areas of decoration.

Klin, city, Moscow *oblast* (administrative region), western Russian Soviet Federated Socialist Republic. First documented in 1234, it was for long a fort between the principalities of Moscow and Tver. In the 18th century, after a period of unimportance, Klin became a transport centre on the Moscow–St. Petersburg road. In Soviet times the city became one of the first centres of the chemical industry, producing synthetic fibre, glass, and laboratory instruments. A museum devoted to the Russian composer Peter Ilich Tchaikovsky is located within the city. Pop. (1986 est.) 95,000.

Kline, Franz (b. 1910, Wilkes-Barre, Pa., U.S.—d. May 13, 1962, New York City), American artist who was one of the leading painters of the post-World War II Abstract Expressionist movement.

Kline studied at Boston University (1931–35) and at the Heatherley School of Art, London (1937–38), settling in New York City in the latter year. He was originally a representational painter, working in a style that merged Cubism and social realism. But in 1949, after viewing some of his black-and-white sketches enlarged by a projector, he realized their potential impact as large, abstract compositions.



"Mahoning," oil on canvas by Franz Kline, 1956; in the Whitney Museum of American Art, New York City

By courtesy of the Whitney Museum of American Art, New York City

He began immediately to develop a highly personal form of Abstract Expressionism, a style of art based on the more or less spontaneous expression in abstract design of the artist's psychic states. Within a phenomenally

short period of time, he mastered the new style, producing such masterpieces as "Nijinsky (Petrushka)" (*c.* 1950; Mr. and Mrs. David Orr Collection, New York City) almost immediately. Using inexpensive commercial paints and large house painter's brushes, he built graphic networks of rough but controlled bars of black paint on white backgrounds, creating positive shapes with the white areas as well as with the black strokes. Paintings such as "Mahoning" (1956; Whitney Museum of American Art, New York City) are characteristically of such large dimensions that the total effect is one of majesty and power. In the late 1950s Kline introduced colour into his paintings. Before his death, his work assumed a new direction in the extreme simplicity and elegance of huge, carefully balanced masses.

Klinefelter's syndrome, relatively common (one per 500 live male births) human sex-chromosome disorder. It is characterized by the following: small testes, lack of sperm formation, late puberty with reduced secondary sexual characteristics (but with normal-sized penis), usually a delicate and long-limbed physique, occasionally breast enlargement (gynecomastia), and about a 25 percent frequency of mental retardation but a much higher frequency of behavioral difficulties.

Treatment with male hormone will normalize male appearance and produce a natural sex drive, but the patient will remain sterile.

The majority of Klinefelter individuals have one extra female sex chromosome, resulting in an XXY pattern and a total of 47 chromosomes instead of 46. Other, less frequent, chromosomal patterns include XXXY, XXXXY, XXYY, XXXYY, mixtures (mosaics), and partial losses or deletions. About 40 percent of the diagnosed examples of Klinefelter's syndrome have a normal XY pattern. One variant of Klinefelter's syndrome, the XXXXY type, is characterized by fusion of the forearm bones and other skeletal anomalies, underdevelopment of the penis and scrotum, incomplete descent of the testes, and marked mental retardation.

Diabetes mellitus and goitre incidence are more common, and various cancers may be more prevalent among Klinefelter's syndrome patients. Thyroidal trapping of radioactive iodine and the responses of the thyroid to injections of thyrotropin (TSH; thyroid-stimulating hormone) may be low. Testosterone production tends to be below normal, with urinary 17-ketosteroids in the normal or low-normal range. The serum and urinary gonadotropins follicle-stimulating hormone (FSH) and luteinizing hormone (LH) are usually, but not necessarily, increased.

Klinger, Friedrich Maximilian von (b. Feb. 17, 1752, Frankfurt am Main—d. March 9, 1831, Dorpat, Estonia), dramatist and novelist, a representative of the German literary revolt against rationalism in favour of emotionalism known as the Sturm und Drang (*q.v.*) movement. Indeed, it took its name from his play *Der Wirrwarr, oder Sturm und Drang* (1776; "Confusion, or Storm and Stress").

The reckless, rebellious style of Klinger's early life seems the very embodiment of Sturm und Drang in its simpler interpretation. His numerous plays, written at top speed and in the fury of inspiration, are usually built around a Promethean hero, but they lack probability, psychological depth, and dramatic form. Many of their scenes and incidents are borrowed from Shakespeare. The best of these works, *Die Zwillinge* (1776; "The Twins"), like Schiller's *Die Räuber* ("The Robbers"), deals with a favourite theme of the period, the enmity of brothers.

After touring for a few years as theatre poet with a troupe of actors, Klinger in 1780 entered the Russian army and rose eventually to the rank of general. He married a natural daughter of the empress Catherine, filled several important posts, and was curator of the University of Dorpat (1803–17). In his later years, having outgrown the angry resentment of his early period, he wrote two tragedies on the Medea theme and a cycle of nine romances that express a Rousseauan longing for simplicity and idyllic nature.



Friedrich von Klinger, drawing by Goethe; in the Freies Deutsches Hochstift, Frankfurter Goethe-Museum, Ger.

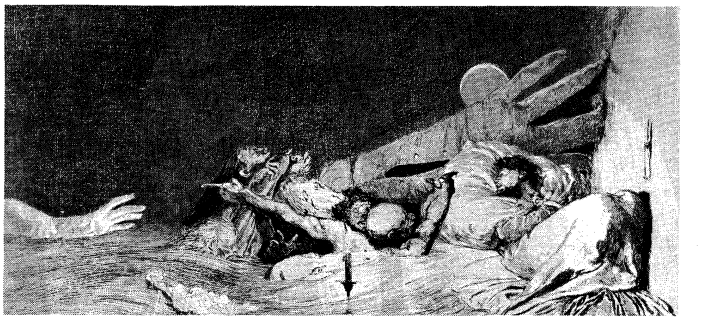
By courtesy of the Freies Deutsches Hochstift, Frankfurter Goethe-Museum, Ger.

Klinger, Max (b. Feb. 18, 1857, Leipzig—d. July 5, 1920, near Naumburg, Ger.), German painter, sculptor, and engraver, whose art of symbol, fantasy, and dreamlike situations belonged to the growing late-19th-century awareness of the subtleties of the mind. Klinger's visionary art has been linked with that of Arnold Böcklin; the expression of his vivid, frequently morbid imaginings, however, was not noted for technical excellence. He was one of the artists to have a deep influence on De Chirico.

Klinger, who had received some training at the Karlsruhe art school, created a sensation at the Berlin academy exhibition in 1878 with two series of pen-and-ink drawings—*Series Upon the Theme of Christ* and *Fantasies Upon the Finding of a Glove.* Their daring originality caused an outburst of indignation; nonetheless, the *Glove* series, on which Klinger's contemporary reputation is based, was bought by the Berlin National Gallery. These ten drawings (engraved in three editions from 1881) tell a strange parable of a hapless young man and his obsessive involvement with an elusive, humanoid, lost glove.

In 1887 "The Judgment of Paris" caused another storm of protest because of its rejection of all conventional attributes and its naively direct conception. In his painting Klinger aimed at neither classic beauty nor modern truth but at an impressive grimness with overtones of mysticism. His "Pietà" and "Christ in Olympus" are characteristic examples.

Klinger's leanings toward the gruesome and grotesque found further expression in his Goyaesque "cycles" of etchings: "Deliverances of Sacrificial Victims Told in Ovid," "Fantasy on Brahms," "Eve and the Future," "A Life," and "Of Death." In his use of the etching needle he did not pursue technical excellence, but rather expressiveness.



"Anguish," etching by Max Klinger, Plate VII from the series *Fantasies Upon the Finding of a Glove*, 1878–80; in the Museum of Modern Art, New York

By courtesy of the Museum of Modern Art, New York, Purchase Fund

His late work was primarily sculpture. Interested in materials and colour, he executed polychromed nudes possessing a distinctly eerie quality, as well as statues made of varicoloured materials in the manner of Greek chryselephantine sculpture (*e.g.*, "Beethoven" (1902), "Salome," and "Cassandra"). His last project, a colossal monument to Richard Wagner, remained unfinished at his death.

Klint, Kaare (b. Dec. 15, 1888, Copenhagen—d. March 28, 1954), Danish architect and celebrated furniture designer who originated the highly influential modern Scandinavian style, which notably enlarged the vocabulary of progressive design. He was also a leading exponent of ergonomics, an aspect of technology that applies biological and engineering data to problems related to the mutual adjustment of man and machine, seeking to ensure that the tools and machines man uses and the work he performs are in accordance with his physical characteristics.



Collapsible teak deck chair with wicker seat by Klint, 1933

By courtesy of the Victoria and Albert Museum, London, Crown copyright

The son of P.V. Jensen Klint, considered Denmark's leading early 20th-century architect, Kaare worked first as an architect but later as a furniture designer. He founded (1924) the Danish Academy of Art, in which he became the first professor of the furniture department. Unlike his French and German contemporaries, his designs, indebted to the simplest Chippendale, Biedermeier, and Far Eastern styles and, particularly, to the furniture of the American Shakers, had an honest, sophis-

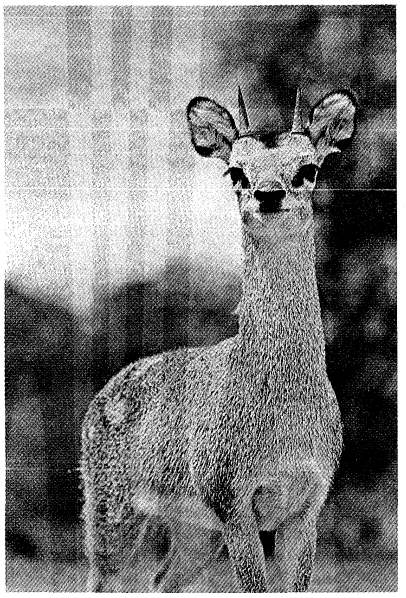
ticated charm and warmth achieved through craftsmanship (a stark contrast to strictly machine-made products) without drawing attention to an obvious handmade look.

Like his father, Klint encouraged the study of past styles, not to copy them but to learn from them the functionality of form and construction. But, unlike his father, he did not advocate modernity for its own sake. He made painstaking studies in drawing of human requirements and functions, balancing a beautiful appearance with a fulfillment of purpose. His teak deck chair of 1933, for example, is unquestionably functional and is designed to provide the maximum amount of comfort, yet in itself a clean and beautiful piece.

Many of Klint's designs depend for their aesthetic effect on wood finishes, almost to the point of preciosity. Every piece ultimately serves its function, such as a sideboard proportioned to store standard tablewares. His style from the 1920s and 1930s had vast influence on Western designers, notably Hans Wegner and Finn Juhl, and reached a height of popularity after 1945 throughout Europe and the United States.

To make the best use of the Britannica, consult the INDEX *first*

klipspringer (*Oreotragus oreotragus*), sure-footed African antelope, family Bovidae (order Artiodactyla), inhabiting rocky heights north to Ethiopia and Nigeria. The klipspringer stands about 55 centimetres (22 inches) at



Klipspringer (*Oreotragus oreotragus*)
John Blower—The National Audubon Society Collection/Photo Researchers

the shoulder. It has a thick, coarse, grizzled coat of yellow and gray, and almost no tail. The male (sometimes the female also) carries straight, spikelike horns. The klipspringer stands on the tips of its blunt, rounded hooves and runs in a stilted, bouncing manner. An agile jumper, it is chamois-like in its ability to move quickly among precarious rocks.

klismos, light, elegant chair developed by the ancient Greeks. Perfected by the 5th century BC and popular throughout the 4th century BC, the klismos had four curving, splayed legs and curved back rails with a narrow concave backrest between them. Often illustrated on Greek pottery, the design was resurrected in the French Directoire and English Regency styles and in the American Empire style. The uprights of the open chair back and the rear legs were often carved from single pieces of wood, forming graceful curves. The seat rail was generally lower than the tops of the legs, and a piece of fabric or animal skin was frequently placed on the seat.

Klitzing, Klaus von (b. June 28, 1943, Schroda [Sroda], German-occupied Poland), German physicist who was awarded the Nobel Prize for Physics in 1985 for his discovery that under appropriate conditions the resistance offered by an electrical conductor is quantized; that is, it varies by discrete steps rather than smoothly and continuously.

At the end of World War II, Klitzing was taken by his parents to live in West Germany. He attended the Technical University of Brunswick, graduating in 1969, and then earned a doctorate in physics at the University of Würzburg in 1972. In 1980 he became a professor at the Technical University of Munich, and in 1985 he became director of the Max Planck Institute for Solid State Physics in Stuttgart, Ger.

Klitzing demonstrated that electrical resistance occurs in very precise units by using the Hall effect. The Hall effect denotes the voltage that develops between the edges of a thin current-carrying ribbon placed between the poles of a strong magnet. The ratio of this voltage to the current is called the Hall resistance. When the magnetic field is very strong and the temperature very low, the Hall resistance varies only in the discrete jumps first observed by Klitzing. The size of those jumps is directly related to the so-called fine structure constant, which defines the mathematical ratio between the motion of an electron in the innermost orbit around an atomic nucleus to the speed of light.

The significance of Klitzing's discovery, made in 1980, was immediately recognized. His experiments enabled other scientists to study the conducting properties of electronic components with extraordinary precision. His work also aided in determining the precise value of the fine structure constant and in establishing convenient standards for the measurement of electrical resistance.

Kliuchevskaya Sopka (Russian S.F.S.R.): *see* Klyuchevskaya Sopka.

Kliuchevsky, Vasily Osipovich: *see* Klyuchevsky, Vasily Osipovich.

KLM, abbreviation of KONINKLIJKE LUCHTVAARTMAATSCHAPPIJ NV (Dutch: Royal Air Transportation Company), English ROYAL DUTCH AIRLINES, Dutch airline founded on Oct. 7, 1919, and flying its first scheduled service, between Amsterdam and London, on May 17, 1920. It is the world's oldest continuously operating airline. Headquarters are at Amstelveen, Neth.

KLM was founded by a group of banking and business interests led by a former Dutch pilot, Albert Plesman (1889–1953), who headed the company until his death. KLM's first route, between Amsterdam and London, was followed the same year by a route to Copenhagen, via Hamburg, and in 1923 by a route to Brussels. As early as 1921 KLM had opened the world's first airline reservations and ticket office, in Amsterdam.

In 1928 Plesman also founded Koninklijke Nederlandsch-Indische Luchtvaart Maatschappij (KNILM), the Royal Netherlands-East Indies Airlines, which in 1930 inaugurated regular flights from The Netherlands to Batavia (now Jakarta) in the Dutch East Indies, a trip of 8,700 miles, until 1940 the world's longest scheduled air route. KNILM merged with KLM in 1945.

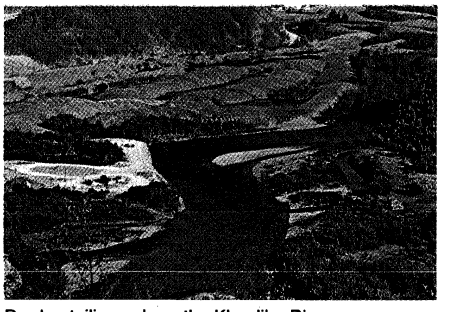
In the 1920s and '30s KLM's routes spread throughout The Netherlands and Europe. During World War II, however, KLM lay largely dormant except in the West Indies, where its service, begun in 1941, grew rapidly, expanding to nine Caribbean and Latin American countries by 1945.

In 1945 KLM resumed its European service. On May 21, 1946, it became the first European airline to introduce scheduled service across the North Atlantic, to New York. The same year it established trunk lines across the South Atlantic, to Curaçao and South America. By the late 20th century KLM was flying worldwide to more than 100 cities in more than 70 countries.

Kłodzko, German GLATZ, city, Wałbrzych *województwo* (province), southwestern Poland, in the Sudety (Sudeten) mountains on both sides of the Nysa Kłodzka River. A Polish frontier settlement existed there from the 6th to the 10th century; a fortress was then built to protect the town from Bohemian forces. The town passed to Bohemia in 1327, then to Austria and Prussia, successively; it returned to Poland in 1945. The oldest relic of Polish literature, the famous 15th-century *Florian Psalter,* was written in Kłodzko.

The modern city is a communications hub for the surrounding area and a well-known tourist centre containing a stone bridge (1390) and several historic buildings. The main industries are lumber milling, metallurgical working, textile weaving, and food processing. Pop. (1984 est.) 29,300.

Klondike River, tributary of the Yukon River, in western Yukon Territory, Canada. With its major tributary, the North Klondike, it rises in the Ogilvie Mountains and flows



Dredge tailings along the Klondike River near Bonanza Creek, Yukon Territory
John de Visser

westward for 100 mi (160 km) to join the Yukon at Dawson, the river's historic settlement. The Klondike became famous in 1896 with the discovery of gold in Bonanza Creek and other small tributaries. As a result thousands of prospectors swarmed into the valley. Several years later, with the exhaustion of the most readily accessible placer deposits, the population decreased drastically. Limited mining by hydraulic and dredging methods continued along other tributaries of the Klondike River until 1966, when all operations ceased. The surrounding territory bears the river's name, which is of uncertain origin.

Klonowic, Sebastian (Fabian), pseudonym ACERNUS (b. *c.* 1545, Sulmierzyce, Pol.—d. Aug. 29, 1602, Lublin), Polish poet whose work in Latin and Polish is valuable chiefly as cultural history.

A burgher, he settled first in Lwów and later in Lublin, where he became mayor and a municipal juror. In the Latin poem "Roxolania" (written 1584) he gave the first complete account of the geography, landscape, and people of Ruthenia. In the Polish poem *Flis* (1595; "The Boatmen") he vividly described the valley of the Vistula River and the life and customs of its raftsmen. *Worek Judaszów* (1600; "Judas' Sack"), also in Polish, is a satirical and didactic work on the low life of Lublin. In the satirical and didactic Latin poem *Victoria deorum* (1587; "The Victory of the Gods") he contended that true nobility depends not upon birth but upon character.

Kloos, Willem (Johan Theodoor) (b. May 6, 1859, Amsterdam, Neth.—d. March 31, 1938, The Hague), Dutch poet and critic who was the driving intellectual force of the 1880 Dutch literary revival and the cofounder and mainstay of its periodical, *De nieuwe gids* ("The New Guide"). A ruthless critic of the rhetorical, passionless nature of traditional Dutch writing, Kloos continually championed the idea of beauty as the highest value in art and life.

In 1882 he published the poetry of his friend Jacques Perk, who had died prematurely. Kloos's inspired introduction, containing the maxim "poetry alone makes life worth living," is regarded as the manifesto of the 1880 movement.

An admirer of the English Romantic poets John Keats and Percy Bysshe Shelley, Kloos determined to reestablish the sonnet as a valid art form with a new rhythmic freedom. His own early sonnets, collected in *Verzen* (1894), show his mastery of the form. Inspired by Herman Gorter's poem "Mei" (1889), the masterpiece of the movement, Kloos evolved the dictum that poetry should be "the most individual expression of the most individual emotion." This aspect of the 1880 movement eventually proved the spiritual downfall of Kloos, for, unlike his fellow poets Gorter and Albert Verwey, he did not develop beyond this stage. His later poetic and critical works reflect the unbalanced, self-pitying, and self-adulatory condition into which he lapsed.

Klopstock, Friedrich Gottlieb (b. July 2, 1724, Quedlinburg, Saxony [Germany]—d. March 14, 1803, Hamburg), German epic and lyric poet whose subjective vision marked a break with the rationalism that had dominated German literature in the early 18th century.

After reading John Milton's *Paradise Lost* in the translation by the influential Swiss critic J.J. Bodmer, Klopstock chose a religious theme for the epic poem he had planned to write while still a student. In 1749 the first three cantos of his epic poem *Der Messias* (*The Messiah*), written in unrhymed hexameters, appeared. The emotional handling of the theme created a sensation.

Better to fulfill his poetic mission, Klopstock left his studies at the University of Leipzig and became a private tutor at Langensalza, Thuringia. There he fell in love with a cousin, the "Fanny" of his odes. Disappointed in romance, he went to Zürich (1750), staying for six months with Bodmer.

An invitation and an annuity from Frederick V of Denmark took him to Copenhagen, where he remained for 20 years. In 1754 he married Margarethe (Meta) Moller of Hamburg, who was the "Cidli" of his odes. Grief over her early death affected his creativity. A collection of his *Oden* ("Odes") was published in 1771. In 1770 he retired to Hamburg, where the last five cantos of *Der Messias* were produced with waning inspiration three years later. In 1791 he married Johanna Elisabeth von Winthem, his first wife's niece and a close friend for many years.

Despite the success of *Der Messias*—the work was translated into 17 languages—it is chiefly as a lyric poet that Klopstock established his reputation. The free verse forms he used in his hymnlike odes permitted a more natural and expressive use of language. He anticipated the Romantics in this, as well as in choosing patriotic themes for his odes and in his search for themes deriving from Teutonic mythology. Three of his six plays deal with the ancient Germanic hero Arminius.

Klosterneuburg, town, *Bundesland* Niederösterreich (federal state of Lower Austria), northeastern Austria. It lies on the west bank of the Danube River at the foot of the Leopoldsberg (1,394 feet [425 m]) and at the north edge of the Vienna Woods (Wienerwald), just northwest of Vienna. It was originally the site of a Roman fortress (Asturis). Later, a settlement called Neuburg developed around a castle on the Leopoldsberg and an Augustinian abbey, both of which were founded in about 1100 by the Babenberg margrave Leopold III of Austria. The abbey section was designated Klosterneuburg after 1218, when it was separated from the market district (Korneuburg) by flooding. It was chartered in 1298. The town was part of Vienna from 1938 until it was returned to Niederösterreich in 1954. The abbey (Chorherrenstift), one of the oldest and richest in Austria, has an important museum and a valuable library. The abbey church (1114–36) contains a famous wrought-gold and enamel altar (1181) by Nikolaus von Verdun. The town is the site of one of the few academic institutions in the world specializing in wine making, the Federal College of Viticulture and Pomology (1860). A popular river resort, Klosterneuburg also produces various manufactures, especially wood products and chemicals. Pop. (1981) 22,975.

Kluck, (Heinrich Rudolph) Alexander von (b. May 20, 1846, Münster, Prussian Westphalia [Germany]—d. Oct. 19, 1934, Berlin), German general who, in World War I, commanded the 1st Army in the German offensive against Paris at the beginning of the war.



Kluck, 1914

By courtesy of the Staatsbibliothek Preussischer Kulturbesitz Bildarchiv, Berlin

Kluck saw service in the Seven Weeks' War (1866) and in the Franco-German War (1870–71). In 1906 he became a general of infantry and in 1913 an inspector general. On the outbreak of war in 1914 he assumed his war appointment as commander of the 1st Army on the extreme right flank of the German force that would penetrate into northern France. His task was to roll up the left flank of the French armies, encircle Paris, and thus bring the war in the West to a rapid conclusion. These plans miscarried, mainly because of lack of control by supreme headquarters and a counteroffensive by French and British forces. He almost succeeded in reaching Paris but was defeated only 13 miles from the city by Anglo-French forces in the First Battle of the Marne, Sept. 6–9, 1914. By October 1914 the German advance had been halted and trench warfare had begun.

Kluck was wounded in March 1915 and retired the next year. His version of the battle, which lost him his command, can be found in his book *Der Marsch auf Paris und die Marneschlacht* ("The March on Paris and the Battle of the Marne"; 1920; 2nd ed., 1926).

Kluckhohn, Clyde K(ay) M(aben) (b. Jan. 11, 1905, Le Mars, Iowa, U.S.—d. July 29, 1960, Santa Fe, N.M.), American professor of anthropology at Harvard University, who contributed to anthropology in a number of ways: by his ethnographic studies of the Navajo; by his theories of culture, partial-value systems, and cultural patterns; by his intellectual leadership and stimulation of a large number of students; and by his representation of anthropology in government circles.

He attended several universities: he received his B.A. from the University of Wisconsin (1928) and then studied at the University of Vienna (1931–32) and at the University of Oxford as a Rhodes Scholar (1932). He took his Ph.D. at Harvard (1936), where he taught for the rest of his career.

Kluckhohn's lifelong interest in the Navajo Indians began in 1922, when, for health reasons, he was sent to live on a ranch near Ramah, N.M. There, Kluckhohn introduced himself to the nearby Navajo and mastered their language and learned their customs.

Among Kluckhohn's numerous studies of the Navajo are *Navaho Classification of Their Song Ceremonials* (1938) and *Introduction to Navaho Chant Practice* (1940, both written with Leland C. Wyman), and *Navaho Witchcraft* (1944), which is considered his finest work.

Kluckhohn's basic ideas about culture are contained in *Mirror for Man,* which won the McGraw-Hill prize for the best popular work in science in 1949. He averred that, despite wide differences in customs, there are apparently fundamental human values common to the diverse cultures of the world.

Klug, Aaron (b. Aug. 11, 1926, Lithuania), British chemist who was awarded the 1982 Nobel Prize for Chemistry for his investigations of the three-dimensional structure of viruses and other particles that are combinations of nucleic acids and proteins. Klug's discoveries in biology were made in conjunction with his own development of the techniques of crystallographic electron microscopy, whereby series of electron micrographs, taken from different angles, can be combined to produce three-dimensional images of particles. His method has been widely used to study proteins and viruses.

Klug was taken by his parents from Lithuania to South Africa when he was three years old. He entered the University of the Witwatersrand at Johannesburg intending to study medicine, but he graduated with a science degree. He then began a doctoral program in crystallography at the University of Cape Town but left with a master's degree upon receiving a fellowship at Trinity College, Cambridge, where he completed his doctorate in 1953. He then accepted a research fellowship at Birkbeck College of the University of London, undertaking the study of the structure of tobacco mosaic virus and other viruses. In 1958 Klug became director of the Virus Structure Research Group at Birkbeck. In 1962 (at the invitation of Francis Crick, who shared a Nobel Prize that year) Klug returned to Cambridge as a staff member of the Medical Research Council; in 1978 he was named joint head of its division of structural studies. He was knighted in 1988.

Kluge, (Hans) Günther von (b. Oct. 30, 1882, Posen, Prussia [now Poznań, Pol.]—d. Aug. 18, 1944, near Metz, Fr.), German field marshal who was one of Adolf Hitler's ablest commanders on the Eastern Front during World War II. Later he played a vacillating role in the conspiracy of 1944 against the Führer.

Of an old aristocratic family, Kluge served in World War I and remained in the army. During World War II he successfully led an army in the Polish, French, and early Russian campaigns. As commander of the army group, centre, in the Soviet Union from December 1941 until he was wounded in October 1943, he was largely successful in containing the massive Soviet offensives against his forces. After the Allied landings in France in June 1944, Hitler, on July 3, replaced Field Marshal Gerd von Rundstedt, the German commander in chief, west, with Kluge, who was unable to stop the Anglo-American advance.

A member of the old officer corps antipathetic to Hitler, the Field Marshal had established contacts with the conspirators against the Führer but had no knowledge of the assas-



Kluge
Suddeutscher Verlag, Munich

sination attempt of July 20, 1944. His name appeared in several incriminating papers, however, and Hitler, suspecting him of complicity, refused to send him reinforcements and dismissed him on August 17. Despondent over his military failure and anticipating arrest, Kluge committed suicide the next day.

Klüver, Heinrich (b. May 25, 1897, Holstein, Ger.—d. Feb. 8, 1979, Oak Lawn, Ill., U.S.), German-born U.S. experimental psychologist and neurologist who made many contributions to the understanding of the relationships between the brain and behaviour. His investigations ranged from photographic visual memory in children (1926) and hallucinations induced by mescaline (1928) to comparative studies of neural mechanisms involved in perception.

A professor at the University of Chicago (1933–63), Klüver wrote *Behavior Mechanisms in Monkeys* (1933), a work that had far-reaching influence on behavioral and neurological research. The Klüver–Bucy syndrome refers to the behavioral and physiological effects following the removal of the temporal lobes (comprising most of the lower cerebrum) from monkey brains.

In later years Klüver turned to neurochemistry, particularly to the study of free porphyrins found in the brain. His work on the staining of nervous tissue was widely used by other investigators. He also wrote *Mescal and Mechanisms of Hallucinations* (1966).

klystron, thermionic electron tube making use of the controlled speed of a stream of electrons. The electrons are originally accelerated to high velocity by a potential of several hundred volts and enter a narrow gap that forms part of a cavity resonator system, where they are acted upon by a radio frequency field, causing a bunching-up effect. Amplitude modulation of the electrons in their bunched-up state induces a strong signal as the stream passes through the gap of a second resonator. Klystrons are used in ultra high-frequency circuits, where they can produce oscillations up to 400,000 megahertz (400,000 megacycles per second), in the short microwave range.

Klyuchevskaya Sopka, also spelled KL'UČEVSKAJA, OR KLIUCHEVSKAYA, SOPKA, English KLYUCHEVSK VOLCANO, active volcano of the Kamchatka Peninsula, far eastern Russian Soviet Federated Socialist Republic, one of the highest active volcanoes in the world, rising to a height of 15,584 ft (4,750 m), the highest point on the peninsula. The volcano consists of a truncated cone with a central crater, with some 70 lateral craters and cones on the lower slopes. The volcano, which has erupted more than 50 times since 1700, is characterized by smoke continuously billowing above its summit. The Kamchatka Volcanological Station, established in 1935, is located at its base.

Klyuchevsky, Vasily Osipovich, Klyuchevsky also spelled KLIUCHEVSKY (b. Jan. 28 [Jan. 16, old style], 1841, Voznesenskoye, Penza province, Russia—d. May 25 [May 12, O.S.], 1911, Moscow), Russian historian whose sociological approach to the study of Russia's past and lively writing and lecturing style made him one of the foremost scholars of his time.

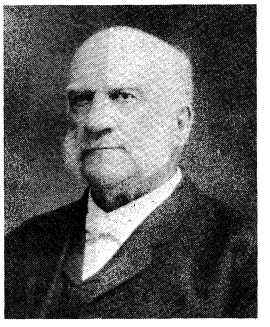
The son of a poor village priest, Klyuchevsky attended a seminary school before transferring to the University of Moscow (1861), where he studied history and philology. Combining his insights into rural life, his familiarity with Old Church Slavonic and ancient Russian source materials, and his university studies, Klyuchevsky wrote a series of theses, including his doctoral dissertation on the boyar duma (council of the upper nobility) of Muscovite Russia, that won him immediate professional recognition. Klyuchevsky received appointments at the Alexandrian Military School, the University for Women at Moscow, and the Moscow Theological Academy, and in 1879 he became professor of history at the University of Moscow.

Toward the end of his career Klyuchevsky succumbed to the pressure of his students (many of whom had derived political implications from his lessons and had become leading figures in the liberal Constitutional Democratic Party, or Kadets) and published four volumes of his collected lectures (1904–10). The final volume of *Kurs russkoy istorii* (*A History of Russia,* 5 vol., 1911–31) was completed by one of his students and published in 1921.

KMT (Chinese political party): *see* Nationalist Party.

Knaben Wunderhorn, Des, English THE BOY'S MAGIC HORN (1805–08), anthology of German folk songs, subtitled *Alte deutsche Lieder* ("Old German Songs"), that established its editors, the poet Clemens Brentano and the antiquarian Achim von Arnim (*qq.v.*), as leaders of the Romantic movement by reviving enthusiasm for the *Volkslied* ("folk song," or "peasant song") tradition in German lyric poetry. Reputedly genuine folk songs dating from the Middle Ages, many of the poems were, in fact, either anonymously composed by such 17th-century poets as Simon Dach and Hans Jacob Grimmelshausen or rewritten by Brentano and Arnim to improve what Arnim called "authentically historical discords." Attacked by philologists for historical inaccuracies but praised by Goethe, to whom it was dedicated, *Des Knaben Wunderhorn* preserves many of the melodic, spontaneous phrases and metres of old German folk songs.

Knapp, Seaman Asahel (b. Dec. 16, 1833, Schroon Lake, N.Y., U.S.—d. April 1, 1911, Washington, D.C.), U.S. agriculturist who originated the farm demonstration method in which an expert demonstrates, farm by farm, new agricultural discoveries and technologies.



Knapp, 1906
By courtesy of Iowa State University, Ames

Knapp was graduated (1856) from Union College, Schenectady, N.Y., and taught school for several years. In 1866 he moved to Iowa, where he was by turns a farmer, livestock breeder, banker, professor (from 1879) and president (1884–86) of Iowa State Agricultural College and Farm (now Iowa State University of Science and Technology) at Ames. In 1882 he helped draft a bill that was a precursor of the Hatch Act of 1887, which provided for the dissemination of practical and scientific agricultural information and allocated money to each state to establish agricultural experimental stations.

In 1886 Knapp moved to Louisiana, where he guided the establishment of rice as a staple crop. During the boll weevil invasion of Texas (1904), Knapp, as a representative of the U.S. Department of Agriculture (USDA), supervised a demonstration that proved the effectiveness of good farming techniques in weevil control. Thus he originated the program of the Farmers Cooperative Demonstration Work of the USDA, in which representatives of the department, usually known as county agents, worked with farmers to familiarize them with the findings of agricultural scientists. The system he formulated eventually included home demonstration agents to help farm women and 4-H clubs for the benefit of farm boys and girls. Joseph Cannon Bailey's biography of Knapp was published in 1945.

Knappertsbusch, Hans (b. March 12, 1888, Elberfeld, Ger.—d. Oct. 25, 1965, Munich), German orchestral and opera director best remembered for his interpretation of the music of Richard Wagner and Richard Strauss.

As a youth, Knappertsbusch was discouraged from studying music and was nudged by his parents in the direction of philosophy, in which he matriculated at the University of Bonn. However, he also pursued his interest in music and in 1908 began studying at the Cologne Conservatory under Fritz Steinbach and Otto Lohse. As a young man he was able to spend several summers as an assistant to Hans Richter at Bayreuth. After five years as director of the opera company in Elberfeld (1913–18) he moved on to Leipzig and Dessau and in 1922 was appointed to succeed Bruno Walter as director of the Bayerische Staatsoper in Munich. Rebuked by the Nazis for presenting a foreign opera in 1934, he was effectively ousted two years later when he refused to join the Nazi Party and his life contract was cancelled on Hitler's orders. He went to Vienna, where he became director of the Vienna Philharmonic and the Vienna Opera, but *Anschluss* by the Germans in 1938 made his tenure difficult there.

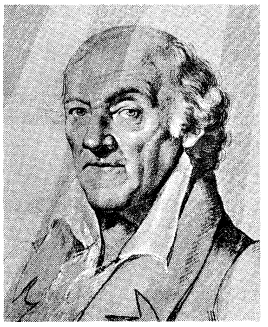
He returned to Munich and the Staatsoper after World War II. Ironically, he was briefly blacklisted by the U.S. military government on grounds that he had contributed to the German war effort, but he was able to demonstrate his antipathy for the Nazis and was cleared. He often conducted at the Bayreuth festivals, and many critics believe that his finest performance was the *Parsifal* that he conducted at Munich and again at Bayreuth in 1951. He made a number of recordings.

Knaresborough, parish (town), Harrogate district, county of North Yorkshire, England, on the left bank of the River Nidd where the river has cut a deep gorge in limestone. Knaresborough Castle, founded in 1070, was destroyed in 1646 during the English Civil War. The 12th- and 13th-century hermit St. Robert lived in a nearby cave (now a Roman Catholic shrine), and in it Eugene Aram, a celebrated 18th-century murderer, buried his victim. Mother Shipton, the famous seeress, was born (*c.* 1488) in another cave. The town's main manufactures include clothing, furniture, and linen. Tourism has become increasingly important. Pop. (1981 prelim.) 13,375.

Knave of Diamonds (group of Russian artists): *see* Jack of Diamonds.

Knebel, Karl Ludwig von (b. Nov. 30, 1744, Castle Wallerstein, near Nordlingen, Franconia [Germany]—d. Feb. 23, 1834, Jena, Saxony [Germany]), German poet who was a close friend of J.W. von Goethe and was one of the most talented of the Weimar circle of Neoclassicists.

After serving in the Prussian army, Knebel became tutor to Prince Konstantine of Saxe-Weimar-Eisenach. While traveling with the prince and his older brother, the duke Karl August, Knebel brought about the introduction of Goethe to the duke, who gave Goethe several official positions. Knebel's work on Pindar and his translations of the poetry of Propertius and Lucretius inspired Goethe to study them. Knebel also took part in the first performance of Goethe's *Iphigenie auf Tauris* at the duke's private theatre. The author



Knebel, drawing by Johann Schmeller, 1824

Archiv fur Kunst und Geschichte, Berlin

of graceful sonnets, Knebel collected his poetry in *Sammlung Kleiner Gedichte* (published anonymously in 1815; "Collection of Short Poems") and in *Distichen* (1827; "Couplets").

knee, hinge joint that is formed by the meeting of the thigh bone (femur) and the larger bone (tibia) of the lower leg. The knee is the largest joint in the body and has to sustain the greatest stresses, since it supports the entire weight of the body above it. Consequently, the rounded ends, or condyles, of the femur and tibia that meet at the knee are massive. The rounded ends of the tibia move forward and backward on the corresponding ends of the femur; the kneecap, or patella, rests upon the ends of the femur and serves to prevent the tibia from moving too far forward when the leg is bent. The articulating (meeting) surfaces of the femur and tibia condyles are very smooth and are separated by a slight gap. The femur and the tibia are held together at the joint by a complex system of ligaments that run from the condyles of one bone to the condyles of the other. The two bones' possible contact with each other is cushioned by a synovial membrane and by layers of cartilage on the surface of each condyle. The entire knee joint, including the kneecap, is enveloped in a capsular apparatus that is large enough to allow for the movement of the tibia and also allows the kneecap to swing up and down freely on the front surface of the femur.

The quadriceps muscle of the thigh causes knee extension (straightening of the leg), while a number of other upper leg muscles cause the complementary motion, flexion, or bending, of the leg. Some rotation of the lower leg is also possible when the knee is bent, but the tightening of strong lateral ligaments at the joint prevents rotation when the leg is straight. Although well-adapted for the downward transmission of the body's weight, the structure of the knee itself offers little resistance to the lateral displacement of the femur and tibia condyles during motion, so the knee's stability depends on the strength of the surrounding ligaments and muscles. Most common knee injuries, including bone dislocations and torn cartilage, reflect the susceptibility of the knee joint to the lateral displacement of its bones.

knee-jerk reflex, also called PATELLAR REFLEX, sudden kicking movement of the lower leg in response to a sharp tap on the patellar tendon, which lies just below the kneecap. One of the several positions that a subject may take for the test is to sit with knees bent and with one leg crossed over the other so that the upper foot hangs clear of the floor. The sharp tap on the tendon slightly stretches the quadriceps, the complex of muscles at the front of the upper leg. In reaction these muscles contract, and the contraction tends to straighten the leg in a kicking motion. Exaggeration or absence of the reaction suggests that there may be damage to the central nervous system. The knee jerk can also be helpful in recognizing thyroid disease.

Kneller, Sir Godfrey, BARONET, original name GOTTFRIED KNILLER (b. Aug. 8, 1646/49, Lübeck [Germany]—d. Oct. 19, 1723, London), painter who became the leading portraitist in England during the late 17th and early 18th centuries.



William Russell, 5th earl and 1st duke of Bedford, oil painting by Sir Godfrey Kneller, 1692; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

He studied in Amsterdam under Ferdinand Bol, one of Rembrandt's pupils, before going to Italy in 1672. His "Elijah" (Tate Gallery, London) of that year gives evidence of a style close to Bol's. In Italy he began to paint portraits and modified his style. Arriving in England in 1674 or 1675, he soon established himself as a portrait painter, especially after he painted Charles II, and he succeeded the leading portraitist of the Restoration period, Sir Peter Lely, as principal painter to the king. Kneller was knighted in 1691 and made a baronet in 1715. (Though married, he died without legitimate issue, and the baronetcy became extinct upon his death.)

Kneller's style was broad and facile, but his characterizations could be penetrating. Among his best works are 42 portraits of members of the famous literary association called the Kit-Cat Club, which are now in the National Portrait Gallery, London. These were painted between about 1700 and about 1720 and are of a size (36 x 28 inches) that allows a half-length portrait showing one or both hands; "kitcat size" is now a generic term. He also executed a portrait series entitled the "Hampton Court Beauties" and did portraits of British admirals (National Maritime Museum, Greenwich). Studio assistants painted the draperies and other subsidiary elements in many of Kneller's portraits. Before Kneller, foreign-born artists dominated English painting; after him, native English painters came to the fore and remained there.

Kneset ha-Gedola, also spelled KENESET HA-GEDOLAH (Hebrew: "Great Assembly," or "Great Synagogue"), also called ANSHE KNESET HA-GEDOLA ("Men of the Great Assembly"), assembly of Jewish religious leaders who, after returning (539 BC) to their homeland from the Babylonian Exile, initiated a new era in the history of Judaism.

The assembly dates from the Persian period, of which very little factual history is known. In fact, scholars argue about whether the reference to an assembly in the Book of Nehemiah (8–10) refers to a legend, an existing group, or a model for a future group.

The reference "Ezra and his companions" seems to place Ezra as a leader of the Great Synagogue at the end of the 4th century BC. Another reference, to Simeon the Just as one of "the remnants" of the assembly, is thought to be identified with Simeon II (219–199 BC).

The assembly may have been a tribunal to pass judgments, but contemporary scholarship suggests that the assembly was chiefly or solely a legislative and administrative council, probably a loosely formed representative body meeting for major enactments. It is thought that much of the Jewish liturgy, at least the benedictions of the Kiddush and Havdala, assumed their current form under the assembly.

The members of the Great Assembly are also said to have classified Jewish oral law into three fields of study: Midrash, Halakha, and Haggada. They established the festival of Purim. All the work attributed to the Great Assembly suggests a group of supreme religious authorities, meeting over a long period of time. The title Anshe Kneset ha-Gedola, "Men of the Great Assembly," reflects the idea that the leaders themselves, and not the assembly as an institution, were honoured. There was probably no fixed membership or fixed number of members.

There is some evidence that the assembly also served as a centre of research and learning, with both adults and children as students.

The modern Israeli parliament, the Knesset, takes its title from the Great Assembly of old.

Knesset (Hebrew: "Assembly"), unicameral parliament of Israel and supreme authority of that state. The first Knesset opened in Jerusalem on Feb. 16, 1949, and on the same day elected Chaim Weizmann (1874–1952) the first president of Israel. Many of its procedural rules (takkanoth) are similar to those of the British House of Commons. Israel did not adopt a formal, written constitution, but it later enacted basic laws on the Knesset (1958); on Israeli lands (1960); on the president (1964), who is elected by the Knesset for a five-year term and is eligible for reelection only once; and on government (1968).

The 120-member Knesset is elected every four years under a system that provides for proportional representation for even quite small political parties. Voters (age 18 or older) choose among national lists of candidates (21 or older) offered by political parties and groups. (The whole nation is a single constituency; there are no districts.) If a party's list, for example, receives 5 percent of the vote, the first six persons (5 percent of 120) on that list become members of the Knesset. The parties determine the order of names on their lists. Since it is difficult for a single party to win a majority of the seats, government by coalition is common in Israel.

The prime minister-elect names the Cabinet, the main policy-making body. Its existence is subject to a vote of confidence in the Knesset. Cabinet members are normally members of the Knesset, though nonmembers may be

named. Bills approved as law are published in *Reshumot* ("Official Gazette," 1948–).

Kniaźnin, Franciszek Dionizy (b. Oct. 4, 1750, Vitebsk, Kingdom of Poland [now in Belorussian S.S.R.]—d. Aug. 25, 1807, Końskowola, near Puławy, West Galicia, Empire of Austria [now in Poland]), Polish poet, playwright, and translator.

Kniaźnin produced lyric poetry, odes, love poems, fables, plays, and verses of a religious or patriotic nature. From 1783 he resided at the Puławy palace as a court poet of the princely Czartoryski family. There he wrote his best-known poem, *Hejnał na dzień 3 maja* (1791; "Bugle Call to the Third of May"), and *Na rewolucję 1794 roku* ("For the 1794 [Kościuszko] Revolution"). After witnessing the results of the partition of Poland—especially the destruction of Puławy palace by Russian troops—he lost his mind and died insane.

Knickerbocker school, group of writers active in and around New York City during the first half of the 19th century. Taking its name from Washington Irving's *Knickerbocker's History of New York* (1809), the group, whose affiliation was more a regional than an aesthetic matter, sought to promote a genuinely American national culture and establish New York City as its literary centre. The most important members of the group were Irving, his friend the novelist J.K. Paulding, James Fenimore Cooper, and William Cullen Bryant. Other writers associated with the group were the Abolitionist and woman-suffrage crusader Lydia M. Child, editor and politician G.C. Verplanck, Clement Moore, scholar and author of "'Twas the Night Before Christmas" (1823), and the poet and travel writer Bayard Taylor. *The Knickerbocker Magazine* (1833–65), a literary monthly edited by Lewis G. and Willis G. Clark, though not an official organ of the group, published members' work.

knife, tool or implement for cutting. Knives form the largest class of cutting implements known collectively as cutlery (*q.v.*).

knife case, leather or wooden container for cutlery, placed in pairs on a sideboard or buffet in the dining room. They first appeared in the 17th century and were originally covered with leather and elaborate gilt. Typically, the knife case was a box with a serpentine front and sloping lid, the interior fitted with compartments for the knives. In the 18th century knife cases were also made in the shape of urns and were veneered in wood (first walnut and later mahogany) and sometimes had silver mountings. They also had come to be used as containers for all kinds of cutlery.

By the end of the 18th century, when they were being made in mahogany, with fine ivory inlays and other forms of marquetry, their production had become highly specialized, and sometimes they were incorporated into the main structure of a sideboard. In the 20th century it became fashionable to convert the serpentine-front type of knife cases into stationery cabinets.



Knife case with silver mounts, New York *c.* 1700; in the Metropolitan Museum of Art, New York City

By courtesy of the Metropolitan Museum of Art, New York City, Morris K. Jesup Fund, 1954

knifefish, any of certain New World fishes of the suborder Gymnotoidei, order Cypriniformes. Knifefishes comprise, at most, about 50 species of Central and South American fishes found in quiet lakes and lagoons. They are placed in three families: Gymnotidae (often called gymnotid "eels"); Apteronotidae; and Rhamphichthyidae. Some authorities, however, group all, together with the related electric eel (*q.v.*), in a single family, Gymnotidae, while others recognize more than three families.

Knifefishes are elongated, sideways-flattened, and blade-shaped. They swim by rippling movements of a long anal fin that extends almost the entire length of the underside. They can swim both forward and backward and can also produce low-voltage electrical discharges which they use in locating nearby objects. These fishes are hardy, nocturnal, and either carnivorous or herbivorous. Maximum length is about 90 cm (3 feet). Smaller species, such as the yellow-striped, 30-centimetre *Gymnotus carapo,* are sometimes kept in home aquariums.

The name knifefish is also sometimes given to African and Asian fishes of the family Notopteridae (*see* notopterid).

Knigge, Adolf Franz Friedrich, Freiherr von (baron of) (b. Oct. 16, 1752, Bredenbeck, Hanover [Germany]—d. May 6, 1796, Bremen), German writer, best-known for his work *Über den Umgang mit Menschen* (1788; "On Social Intercourse with People"), a practical guide to happiness and success, written in a pleasant and easy style.

Belonging to a bankrupt family of the landed aristocracy, Knigge studied law and held several minor official positions. As did many writers of his time, he took the didactic and sentimental English novel for his model. *Die Reise nach Braunschweig* (1792; "The Journey to Brunswick"), considered the best of his novels, is a romance critically portraying contemporary middle-class life.

knight, French CHEVALIER, German RITTER, now a title of honour bestowed for a variety of services, but originally in the Middle Ages a formally professed cavalryman.

The first medieval knights were professional cavalry warriors, some of whom were vassals holding lands as fiefs from the lords in whose armies they served, while others were not enfeoffed with land. And though all knights were free men, it was not invariably from the ranks of men born free that knights were recruited. The matter of enfeoffment is not essential to the phenomenon of knighthood as a social factor in the period of its apogee, namely in the 10th–12th century. (*See also* knight service.)

The process of entering knighthood, however, often became formalized. A youth destined for the profession of arms might from the age of 7 or so serve his father as a page before joining the household of his father's suzerain, perhaps at the age of 12, for more advanced instruction not only in military subjects but also in the ways of the world. During this period of his apprenticeship he would be known as a damoiseau (literally "lordling"), or *valet* (German: *Knappe*), until he followed his patron on a campaign as his shieldbearer, *écuyer,* or esquire, or as the bearer of his weapons (armiger). When he was adjudged proficient and the money was forthcoming for the purchase of his knightly equipment, he would be dubbed knight. The ceremonial of dubbing varied considerably: it might be highly elaborate on great feast days or on royal occasions; or it could be simply performed on the battlefield; and the dubbing knight might use any appropriate formula that he liked. A common element, however, was the use of the flat of a swordblade for a touch on the shoulder—*i.e.,* the accolade of knighthood as it survives in modern times.

As knighthood evolved, a Christian ideal of knightly behaviour came to be accepted, involving respect for the church, loyalty to one's feudal or military superiors, and preservation of personal honour. The nearest that the ideal ever came to realization, however, was in the Crusades, which, from the end of the 11th century, brought the knights of Christian Europe together in a common enterprise under the auspices of the church. Knights dubbed at Christ's tomb were known as knights of the Holy Sepulchre. During the Crusades the first orders of knights came into being: the Order of the Hospital of St. John of Jerusalem (Hospitalers), the Order of the Temple of Solomon (Templars), and, rather later, the Order of St. Lazarus, which had a special duty of protecting leper hospitals. These were truly international and of an expressly religious nature both in their purpose and in their form, with celibacy for their members and a hierarchical structure (grand master; "pillars" of lands, or provincial masters; grand priors; commanders; knights) resembling that of the church itself. But it was not long before their religious aim gave place to political activity as the orders grew in numbers and in wealth.

At the same time, crusading orders with a rather more national bias came into being. In Spain, for the struggle against the Muslims there or for the protection of pilgrims, the Orders of Calatrava and of Alcántara and Santiago (St. James) were founded in Castile between 1156 and 1171; Portugal had the Order of Avís, founded about the same time; but Aragon's Order of Montesa (1317) and Portugal's Order of Christ were not founded until after the dissolution of the Templars. For the great order of the German knights, *see* Teutonic Order. These "national" crusading orders followed a course of worldly aggrandizement like that of the international orders; but the crusades in Europe that they undertook, no less than the international enterprises in Palestine, would long attract individual knights from abroad or from outside their ranks.

Between the end of the 11th century and the middle of the 13th, a change took place in the relationship of knighthood to feudalism. The feudal host, whose knights were enfeoffed landholders obliged to give 40 days' service per year normally, had been adequate for defense and for service within a kingdom; but it was scarcely appropriate for the now more frequent long-distance expeditions of the time, whether crusades or sustained invasions such as those launched in the Anglo-French wars. The result was twofold: on the one hand, the kings often resorted to distraint of knighthood, that is, to compelling holders of land above a certain value to come and be dubbed knights; on the other hand, the armies came to be composed more and more largely of mercenary soldiers, with the knights, who had once formed the main body of the combatants, reduced to a minority—as it were to a class of officers.

The gradual demise of the Crusades, the disastrous defeats of knightly armies by foot soldiers and bowmen, the development of artillery, the steady erosion of feudalism by the royal power in favour of centralized monarchy—all these factors spelled the disintegration of traditional knighthood in the 14th and 15th centuries. Knighthood lost its martial purpose and, by the 16th century, had been reduced to an honorific status that sovereigns could bestow as they pleased. It became a fashion of modish elegance for the sophisticated nobles of a prince's entourage.

A great number of secular knightly orders were established from the late Middle Ages onward: for example (to name but a few), The Order of the Garter, The Order of the Golden Fleece, The Order of St. Michael, The Most Ancient Order of the Thistle, and The Most Honourable Order of the Bath. These honours were reserved for persons of the highest distinction in the nobility or in government service or, more generally, for persons distinguished in various professions and arts. In the United Kingdom, knighthood is today the only title still conferred by a ceremony in which sovereign and subject both take part personally. In its modern form the subject kneels and the sovereign touches him or her with a drawn sword (usually a sword of state) first on the right shoulder, then on the left. The male knight uses the prefix Sir before his personal name; the female knight the prefix Dame.

See also Bath, The Most Honourable Order of the; British Empire, The Most Excellent Order of the; Chrysanthemum, Order of the; Companions of Honour, Order of the; Garter, The Most Noble Order of the; Golden Fleece, Order of the; Hospitallers; Legion of Honour; Merit, Order of; Paulownia Sun, Order of the; Pour Le Mérite; Rising Sun, Order of the; Royal Victorian Order; St. Michael and St. George, The Most Distinguished Order of; Templars; Thistle, The Most Ancient and Most Noble Order of the.

Knight, Frank Hyneman (b. Nov. 7, 1885, White Oak Township, McLean County, Ill., U.S.—d. April 15, 1972, Chicago), U.S. economist who is considered the founder of the "Chicago school" of economics.

Knight was educated at the University of Tennessee and at Cornell University, where he obtained his Ph.D. in 1916. He then taught at the University of Iowa (1919–27) and at the University of Chicago (1927–52), becoming emeritus in 1952. Among the many students he influenced was the noted economist Milton Friedman.

His book *Risk, Uncertainty and Profit*, published in 1921, is one of his most important contributions to economics. In it he distinguishes between insurable and noninsurable risks. According to Knight, profit, earned by the entrepreneur who makes decisions in an uncertain environment, is the reward for bearing uninsurable risk. Knight also produced a monograph, *Economic Organisation*, which became a classic exposition of microeconomic theory. Its lucidity in perceiving logical distinctions may have been due to Knight's early training as a philosopher, a training which made him skeptical of much economic theory.

Knight was also an important critic of the Austrian school of economics and its theory of capital. He wrote extensively on liberal forms of social organization, criticizing attempts at social engineering.

Knight, Gowin (baptized Sept. 10, 1713, Corringham, Lincolnshire, Eng.—d. June 8, 1772, London), English scientist and inventor whose work in the field of magnetization led to significant improvements in the magnetic compass.

In 1744 he exhibited powerful bar magnets before the Royal Society of London, proving that he had discovered a greatly improved method of magnetizing. Knight then turned his attention to the compasses used by mariners. He found the needles to be crudely magnetized and inaccurate and suggested the now common rhomboidal shape and an improved suspension. After experimentation by the Royal Navy, his new compass became standard and remained so for almost a century.

Knight, John S(hively) (b. Oct. 26, 1894, Bluefield, W.Va., U.S.—d. June 16, 1981, Akron, Ohio), widely respected U.S. journalist and publisher who developed the Knight Newspapers, one of the major newspaper chains in the United States.

Knight's father moved to Akron to become advertising manager of the *Akron Beacon Journal*, a daily newspaper he came to control some 15 years later. Knight junior worked at the paper in summers as a child. He was educated in Akron and at a private school in Maryland. His college education at Cornell University was interrupted by World War I. After front-line army service in France, he was reluctant to enter journalism, but in 1920 he acceded to his father's wish and started as a sports reporter for the *Beacon Journal*, adopting a pseudonym because he was embarrassed at the poor quality of his work. In time he improved it beyond question; even as an eminent publisher later in life the quality of his occasional reporting was admired. Knight became the managing editor of the paper in 1925. When his father died in 1933 Knight took over as publisher and built on his father's foundation. He became a prize-winning editorial writer and an acquisitive publisher. Among the papers he bought were the *Miami Herald* (1937), the *Detroit Free Press* (1940), the *Chicago Daily News* (1944), and the *Charlotte* (N.C.) *Observer* (1954). Knight sold the *Daily News* to Marshall Field in 1959, but even so Knight Newspapers had a combined circulation of more than 1,000,000 in 1960. Many of the Knight papers were frequent winners of awards for excellence. The Ridder newspaper chain and Knight Newspapers merged in 1974 to form the Knight-Ridder Newspapers group.

To make the best use of the Britannica, consult the INDEX *first*

Knight, Sarah Kemble, byname MADAME KNIGHT (b. April 19, 1666, Boston—d. Sept. 25, 1727, New London, Conn.), U.S. teacher and businesswoman whose vivid and often humorous diary of her unchaperoned journey on horseback from Boston to New York in 1704 is considered one of the most authentic chronicles of 18th-century colonial life in America. Active in business and legal affairs after her husband's and father's deaths, she also conducted a school. In 1825 *The Journal of Mme Knight* was published posthumously; several subsequent revised editions appeared, and in 1935 a facsimile of the handwritten diary was published.

Knight, Thomas Andrew (b. Aug. 12, 1759, Ludlow, Herefordshire, Eng.—d. May 11, 1838, London), British horticulturalist and botanist whose experiments on the adaptive responses of plants and the changes in direction of stem and root growth were the basis of later work on geotropisms.

After graduating from Oxford, Knight applied scientific principles and techniques to practical horticultural problems. He became a correspondent with Sir Joseph Banks of the Royal Society. Knight's scientific work was originally published in the Royal Society's *Philosophical Transactions* (1795–1814); a volume of collected papers appeared in 1841.

Knight performed experiments on the ascent and descent of sap in plants. His experiments with ringing (girdling) disproved Stephen Hales's theory that bark is formed from alburnum (xylem). He also showed that sap in the outer bark differs from the nutrient-rich sap of the alburnum. In 1806 Knight's famous letter to Banks described his experiments with germinating seeds which used centrifugal force to show the effects of gravity on the growth of plants. Knight unsuccessfully used mechanical physical properties to explain the seeds' adaptive responses.

knight bachelor, most ancient, albeit lowest ranking, form of English knighthood, with its origin dating back to the reign of King Henry III. At one time a knight bachelor was a rank that existed on continental Europe as well, but now it survives only in Britain, where the title is still conferred. Historically, the knight bachelor, who was not a member of any order of chivalry, was either a poor vassal who could not afford to fight under his own banner or a knight too young for the responsibility and dignity of the rank of knight banneret. If his services and landed possessions entitled him to promotion, the knight bachelor could apply formally to the commander in the field for the title of banneret.

James I of Great Britain created a registry in the 17th century for knights bachelors, which eventually lapsed. The Imperial Society of Knights Bachelor, founded in 1908, has since attempted to obtain a uniform registration of every knight created. In 1926 a badge design for knight bachelor depicting a sheathed sword between two spurs was approved and adopted. *See also* banneret.

Knight Hospitaller: *see* Hospitaller.

knight service, in the European feudal system, military duties performed in return for tenures of land. The military service might be required for wars or expeditions or merely for riding and escorting services or guarding the castle. To obtain such service, a lord could either enfeoff (grant a fief to) one man for direct and personal service or enfeoff someone who would bring with him other knights. The number of knights supplied usually bore some relation to the size of the fief.

Originally services and equipment were supplied at the vassal's expense. The normal period of service was 40 days a year. In England knight service was held due to the king only. In France, however, the barons as well could claim such service and thus were able to achieve great personal power.

As time went on variations developed. From the mid-12th century fewer knights were being summoned, but they often were serving for longer than 40 days; sometimes service due was rendered in scutage, a tax paid in lieu of service. By 1300 the decline in the importance of cavalry, the increasing use of mercenaries, and the resistance of tenants had combined to reduce substantially the number of knights summoned from any fief.

Knight Templar: *see* Templar.

Knighton, Henry (d. *c.* 1396), English chronicler and an Austin (Augustinian) canon at the Abbey of St. Mary of the Meadows in Leicester. He is important for his vivid picture of the religious reformer John Wycliffe and the rise of the Lollards, and for his favourable account of the generally unpopular John of Gaunt, duke of Lancaster.

Knighton's work is partly a history (*i.e.*, retrospective) and partly a chronicle of contemporary events. The historical portion is composed of two distinct sections: one, covering the period 1066–1337, is a compilation, with occasional emendations, of earlier works, mainly the *Polychronicon* of Ranulf Higden (died 1364); the other, from 1337, is Knighton's own work. His death prevented him from finishing the history, which ends abruptly with events of 1366. The chronicle of the years 1377–95, long regarded as a continuation of Knighton's history by another Leicester canon, was in fact Knighton's original contribution. It was first printed in 1652.

Knights of Columbus, international fraternal benefit society of Roman Catholic men, founded by the Rev. Michael J. McGivney and chartered by the state of Connecticut in the United States in 1882. Besides supplying a wide range of insurance benefits and the op-

portunity for social intercourse, the organization has been active in religious, educational, war relief, and social welfare programs. Since 1948 the Knights has sponsored a Catholic advertising program to explain Catholic beliefs and to promote interfaith understanding. Headquarters of the supreme council is in New Haven, Conn., U.S.

Knights of Labor, first important national labour organization (founded in 1869) in the United States. Named the Noble Order of the Knights of Labor by its first leader, Uriah S. Stephens (*q.v.*), it was originally a secret organization in order to protect its members from employers' reprisals and to give the organization emotional appeal. The platform was based on a belief in the unity of interest of all producing groups (shopkeepers and farmers, as well as labourers) and proposed a system of workers' cooperatives to replace capitalism. After the election of Terence V. Powderly as Grand Master Workman of the national organization in 1879, the group abandoned its secrecy and mystical trappings and struck the word noble from its title. Because Powderly was unwilling to initiate strikes or use other forms of economic pressure to gain the union's objectives, effective control of the organization shifted to regional leaders. As the United States emerged from the depression of the 1870s, the membership of the Knights increased rapidly, reaching a peak of 700,000 in 1886. Their influence declined sharply after that year, in which occurred 1,600 strikes, frequently violent, and the Haymarket Riot in Chicago. The resultant anti-union feeling and the dissatisfaction of many members with the diversity of the group led to its swift decline and the establishment of the American Federation of Labor in December 1886.

Knights of Malta (crusader order): *see* Hospitaler.

Knights of Saint Eulalia (Christian order): *see* Mercedarian.

Knights of Saint John of Jerusalem (crusader order): *see* Hospitaler.

Knights of the Sword (Livonian order): *see* Brothers of the Sword, Order of the.

Knights Templar: *see* Templar.

Kniller, Gottfried: *see* Kneller, Sir Godfrey, Baronet.

Knipper-Chekhova, Olga (Leonardovna), née KNIPPER (b. 1869, Glazov, Russia—d. March 22, 1959, Moscow), world-renowned Russian actress and the wife of playwright Anton Chekhov.

Knipper was rejected by the drama school of the Maly Theatre in Moscow but was noticed by V.I. Nemirovich-Danchenko and asked to join the acting school of the Moscow Philharmonic Society, which he headed. When Nemirovich-Danchenko and Konstantin Stanislavsky formed the Moscow Art Theatre, Knipper was among the original 39 members of the group; she made her debut as Irina in Aleksey Tolstoy's *Tsar Fyodor Ioannovich,* the theatre's first production (1898), and her career paralleled the growth of that organization. Knipper played Arkadina in the Moscow Art Theatre production of Chekhov's *The Seagull* (1898) that made the playwright, the play, and the theatre famous. She appeared in all the original Moscow Art Theatre stagings of Chekhov's plays and was especially successful as Masha in *The Three Sisters* (1901) and Madame Ranevskaya in *The Cherry Orchard* (1904), a role she played again when the theatre celebrated the 300th performance of the play in 1943.

The professional association of Knipper and Chekhov blossomed into love, and they were married in 1901; although Chekhov died in 1904, their attachment was memorialized when Constance Garnett published an English translation of their love letters (1926). Knipper was with the Moscow Art Theatre on their tour throughout Europe in 1919–22 and performed with them in the United States in 1923–24. Her career with the Moscow Art Theatre included successful portrayals in the plays of Molière, Ivan Turgenev, and Maksim Gorky, as well as an appearance as Gertrude in Gordon Craig's production of *Hamlet* (1912). The latter role led to a lifelong friendship and correspondence with Craig. Knipper, a People's Artist of the Soviet Union, was awarded a Stalin Prize in 1943.

knitting, production of fabric by employing a continuous yarn or set of yarns to form a series of interlocking loops. Knit fabrics can generally be stretched to a greater degree than woven types. The two basic types of knits are the weft, or filling knits—including plain, rib, purl, pattern, and double knits—and the warp knits—including tricot, raschel, and milanese. In knitting, a wale is a column of loops running lengthwise, corresponding to the warp of woven fabric; a course is a crosswise row of loops, corresponding to the filling.

Most filling knits can be made by hand or machine, although commercial fabrics are generally machine-made. Basic stitches are the knit stitch, a loop passed through the front of the preceding loop, and the purl stitch, drawn through the back. Some filling knits are fragile because of the dependency of each loop in a vertical row on the stitch next to it. Runs can occur when one loop breaks, releasing other loops in the same row. Filling knits have the greatest amount of stretch in the crosswise direction. The plain knits, also called flat knits, have a flat surface, with short, horizontal loops visible on the back. When produced by hand knitting, this structure is called stockinette. Pile-surfaced fabrics produced by variations of the plain knit include velour and fake furs. Rib knits have pronounced lengthwise ribs formed by wales alternating on both sides of the fabric. These knits are fairly heavy, have good elasticity, and are more durable than the plain knits. Purl knits have horizontal ridges running crosswise on both the face and the back of the fabric, making them reversible. Pattern knits, such as those of fisherman knit sweaters, are produced by varying the manner in which the knit and purl stitches are used. Because the knit stitch tends to advance and the purl stitch to recede, a variety of patterns can be made by adding, dropping, alternating, or crossing stitches. Double knits are heavy and firm and rarely run. They are produced only by machine, with a variation of the rib stitch, the interlock stitch, employing two yarns and two sets of needles, with loops drawn through from both directions.

Warp knits, also produced only by machine, are usually run-resistant and are closer, flatter, and less elastic than filling knits. They are made on a chain loom, with each warp controlled by a separate needle. The loops interlock along the length of the fabric. Tricot is characterized by fine, vertical wales on the surface and crosswise ribs on the back. It has good draping qualities and is frequently used for lingerie and as backing for laminated fabric. Raschel knits have a lacelike, open construction, with a heavy, textured yarn held in place by a much finer yarn. Raschels can be made in a variety of types, ranging from fragile to coarse, and usually have limited stretch. Milanese is made with two sets of warp, one moving downward to the left and the other downward to the right, with the diagonal crossing of the yarns producing a diamond effect on the back, and a fine rib showing on the surface.

Knit fabrics are produced in both flat and tubular form. Filling knits are most often tubular; warp knits are usually flat. Flat filling knits can be shaped by a process called fashioning, in which stitches are added to some rows to increase width, and two or more stitches are knitted as one to decrease width. Circular (tubular) knits are shaped by tightening or stretching stitches.

Knivsflåfoss (Norway): *see* Syv Systre.

knocking, in an internal-combustion engine, sharp sounds caused by detonation of part of the compressed air–fuel mixture in the cylinder. In a properly functioning engine, the charge burns with the flame front progressing smoothly from the point of ignition across the combustion chamber. However, at high compression ratios, depending on the composition of the fuel and the amounts of antiknock agents such as tetraethyl lead present, some of the charge may suddenly ignite ahead of the flame front and burn in an uncontrolled manner, producing intense high-frequency pressure waves. These pressure waves force parts of the engine to vibrate, which produces an audible knock.

Knocking can cause overheating of the spark-plug points, which leads to preignition of the charge and rough, inefficient operation. Severe knocking over a period of time can cause engine damage.

Knolles, Richard (b. *c.* 1550, probably Cold Ashby, Northamptonshire, Eng.—d. July 1610, Sandwich, Kent), English historian who is known chiefly for a study of the Turks.

After graduation from Oxford University in 1564 or 1565, Knolles received an M.A. there in 1570 and continued in residence as a fellow in 1571. Shortly thereafter he became master of the secondary school at Sandwich, where he apparently remained until his death.

His *Generall Historie of the Turkes, from the first beginning of that Nation* appeared in 1603 after 12 years of labour. One of the earliest discussions in English of Turkey and the Muslims, the work became popular and appeared in numerous editions throughout the 17th century. Knolles's prose was admired by Samuel Johnson and Lord Byron, and his book was used as the basis of a play by Nicholas Rowe in 1701–02.

Knopf, Alfred A. (b. Sept. 12, 1892, New York City—d. Aug. 11, 1984, Purchase, N.Y., U.S.), American publisher, the founder and longtime chairman of the prestigious publishing house of Alfred A. Knopf, Inc.

Knopf graduated from Columbia University, N.Y., in 1912, and after working for a short time at the publishing house of Doubleday, Page, & Company, he started his own firm in 1915. Knopf's appreciation of contemporary literature and his broad range of literary contacts in the United States and abroad helped to make his publishing house a success, and he became known for the high literary quality of the cosmopolitan works he published. He was able to attract many important writers through his personal attention to their publishing needs and through his commitment to high standards of craftmanship in the production of their books. By the time of Knopf's death in 1984 the authors published by the Knopf house had garnered a total of 16 Nobel and 27 Pulitzer prizes. Knopf maintained strict control over the editorial content and commercial promotion of the books and paid special attention to the attractiveness of their design and typography. He also served as publisher from 1924 to 1934 of the *American Mercury,* an influential periodical founded by him, H.L. Mencken, and George Jean Nathan in 1924.

In 1966 the Knopf concern became a subsidiary of Random House, Inc. (which was itself owned by Radio Corp. of America), and in 1980 Random House was acquired by S.I. Newhouse and Sons. Knopf became chairman emeritus of his firm in 1972.

knorpelwerk (decorative arts): *see* auricular style.

Knorr, Ludwig (b. Dec. 2, 1859, Munich—d. June 5, 1921, Jena, Ger.), German chemist who discovered antipyrine.

Knorr was educated at Munich, Heidelberg, Erlangen, and Würzburg. He became instructor of chemistry at the University of Erlangen in 1885 and was a teacher at Würzburg and titular professor at the University of Jena.

Knorr is noted for his research in organic chemistry that led to his discovery in 1883 of antipyrine, the first of a series of pyrazolone derivatives that found wide use as antipyretics and analgesics. By 1884 he had isolated and synthesized quinoline and pyrazole. He also investigated keto and enol tautomers and morphine alkaloids.

Knossos, also spelled CNOSSUS, city in ancient Crete, capital of the legendary king Minos, and the principal centre of the Minoan, the earliest of the Aegean civilizations (*see* Minoan civilization). The site of Knossos stands on a knoll between the confluence of two streams and is located about 5 miles (8 km) inland from Crete's northern coast. Excavations were begun at Knossos under Sir Arthur Evans in 1900 and revealed a palace and surrounding buildings that were the centre of a sophisticated Bronze Age culture which dominated the Aegean between *c.* 1600 and *c.* 1400 BC.

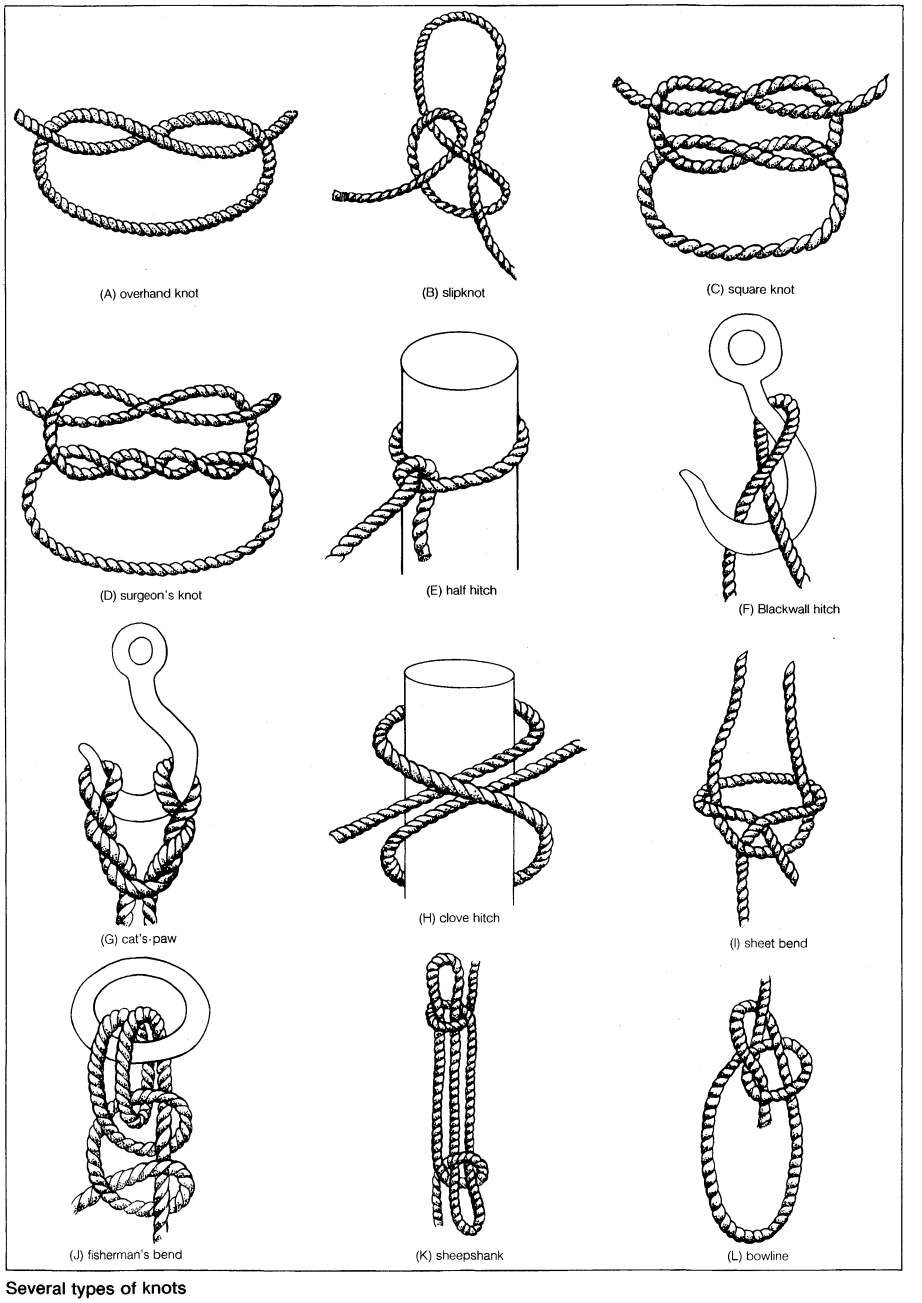
The first human inhabitants of Knossos probably came there from Anatolia in the 7th millennium BC and established an agricultural society based on wheat and livestock raising. At the beginning of the Early Minoan period (3000–2000 BC) they began using bronze and making glazed pottery, engraved seals, and gold jewelry. A hieroglyphic script was invented, and trade with the Egyptians was undertaken. The first palace at Knossos was built at the beginning of the Middle Minoan period (2000–1580 BC). It consisted of isolated structures built around a rectangular court. Knossos produced fine polychrome pottery on a black glazed ground during this period. About 1720 BC a destructive earthquake leveled most of Knossos. The palace was rebuilt, this time with extensive colonnades and flights of stairs connecting the different buildings on the hilly site. The remains of this palace occupy the excavated site in the present day. The administrative and ceremonial quarters of the palace were on the west side of the central court, and the throne room in this area still contains the gypsum chair in which sat the kings of Knossos. This area of the palace also had long narrow basement rooms that served as storage magazines for wheat, oil, and treasure. Workshops were located on the northeast side of the central court, while residences were situated in the southeastern section. An elaborate system of drains, conduits, and pipes provided water and sanitation for the palace, and the whole urban complex was connected to other Cretan towns and ports by paved roads. The art of Minoan fresco painting reached its zenith at this time, with scenes of dancing, sports, and dolphins done in a naturalistic style. The Minoans also replaced their hieroglyphic script with a linear script known as Linear A.

About 1580 BC Minoan culture and influence began to be extended to mainland Greece, where it was further developed and emerged as the culture known as Mycenaean. The Mycenaeans, in turn, achieved control over Knossos sometime in the 15th century BC; the Linear A script was replaced by another script, Linear B, which is identical to that used at Mycenae and which is the prototype of Greek. Detailed administrative records in Linear B found at Knossos indicate that at this time the city's Mycenaean rulers controlled much of central and western Crete.

Some time after *c.* 1400 BC, what Evans called the "Last Palace" of Knossos was destroyed by a fire of uncertain origin, and fires destroyed many other Cretan settlements at this time. Knossos was reduced henceforth to the status of a mere town, and the political focus of the Aegean world shifted to Mycenae on the Greek mainland. Knossos continued to be inhabited through the subsequent centuries, though on a much-reduced scale.

knot, in cording, the interlacement of parts of one or more ropes, cords, or other pliable materials, commonly used to bind objects together. Knots have existed from the time mankind first used vines and cordlike fibres to bind stone heads to wood in primitive axes. Knots were also used in the making of nets and traps, but knot making only became truly sophisticated when it began to be used in the ropes, or rigging, that controlled the sails of early sailing vessels. Knot making thus became the province of sailors, who historically showed great skill and ingenuity in devising various kinds of knots for different purposes. With the coming of steam-powered engines to propel ships, the use of sails, rigging, and knots was much reduced, a trend that has continued even on modern sailboats because of the use of special cleats, winches, and other alternative devices to control the rigging. Knots are still widely used in daily life, though, and are depended on by campers and hikers, mountaineers, fishermen, and weavers, among others.

The principal requirements of a good knot are that it not slip when made and that it be tied and untied without difficulty. There are many different ways of fastening together one rope or cord to another or of attaching a rope to a spar, ring, or other object. In the narrow sense of the term, a knot is a knob made on a rope by turning the rope in on itself through a loop, as in an overhand knot. A hitch is used to attach a rope to some other object such as a spar, while a bend is used to fasten one rope to another rope. The governing principle of all knots, hitches, and bends is that the strain which pulls against them draws their constituent parts more tightly together, and the resulting friction allows the knot to "hold." The "standing part" of a rope refers to that part which leads from the knot being tied toward the load. Some of the more important knots are described below.



Several types of knots

The overhand knot (knot A in the Figure) is the simplest type of knot and is used to make a knob in a rope, string, or cord. It is used for tying packages, to keep rope ends from fraying, and as a first step in making more complex knots such as the surgeon's knot and the square knot. An overhand knot is made by crossing the rope end around the standing part to form a loop, bringing the rope's end through the loop, and pulling the rope taut. A slipknot (B) results when, in tying an overhand knot, a loop instead of the rope's end is slipped through the first loop. Such a knot is easily slipped loose by pulling on its free end. Shoelaces are usually tied with a double slipknot. A square knot (C) is composed of two overhand knots turned in opposite ways. It flattens when pulled tight, making it useful in first aid and for tying packages. A surgeon's knot (D) is an elaborated form of the square knot; it is composed of two overhand knots turned in opposite ways but with an additional twist taken after the first overhand is tied. This allows the parts of the rope to be held in place by friction until the second overhand is tied. The knot derived its name from its surgical use in tying a ligature around a cut artery.

A half hitch (E) is the simplest form of hitch and is actually a variant of the overhand knot. It is made by passing the end of a rope around its standing part and through the loop thus formed. Two half hitches, formed by making a second half hitch around the rope's standing part, are often used to secure the end of a rope to itself after it has been wrapped around a ring, piling, or other mooring. The timber hitch, in which the rope is turned back on itself at least three times, is a rapidly tied variation that is used by loggers on tree trunks. A Blackwall hitch (F) is used to fasten a rope to a hook. It is made by doubling a rope near its end to form a loop and putting the shank of the hook through the loop so that the loop may be jammed between the rope's standing part and the hook. A more versatile knot used to attach a rope to a hook is the cat's-paw (G). It is made by twisting two parts of a rope in opposite directions, forming two side-by-side eyes through which the base of the hook is passed so that a sling hangs from the hook. The knot thus formed can be used to lift loads at any desired angle by varying its position in relation to the sling. The clove hitch (H), also called a builder's knot or a ratline hitch, is made by passing the rope's end around an object and then crossing it over the rope's standing part to form a loop, then passing the end around the object again to form a second loop, through which the end is passed. This knot is used to temporarily fasten a rope to a spar, mast, tree trunk, and so on. The knot can be detached simply by lifting it off the object. The clove hitch rarely slips, but it can work loose with continuous tugging.

The sheet bend (I), or weaver's knot, is widely used by sailors for uniting two ropes of different sizes. The end of one rope is passed through a loop of the other, is passed around the loop, and under its own standing part. An ordinary fishnet is a series of sheet bends. The fisherman's, or anchor, bend (J) is an especially strong and simple knot that will not jam or slip under strain and can be untied easily. The knot is used to attach a rope to a ring, hook, anchor, or other object. It is made by taking two rounds of the rope around a solid object, then passing the end under both turns to form a pair of half hitches. When not under strain, however, the fisherman's bend may slip loose if the free end is not secured.

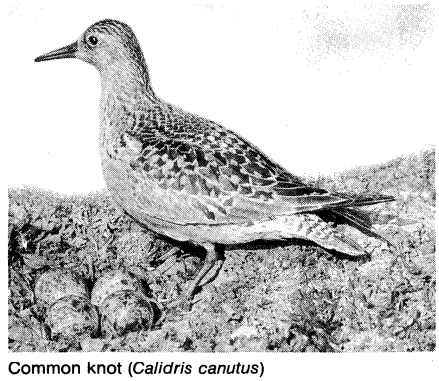
The sheepshank (K) is a simple knot that is useful for temporarily shortening a rope. It is made by making a double loop in the rope and tying a half hitch at each end. It can be used to strengthen a rope at its weak point by placing the weak part in the middle between the two loops. The sheepshank will hold only while there is a strain on the knot to keep the half hitches taut. It can be secured, however, either by slipping an object through each end of the loop or by an overhand knot tied over each loop.

The bowline (L) forms a loop that cannot slip. It is a very common and useful knot that is used for mooring boats and hoisting or hauling objects. It is made by laying the rope's end over its standing part to form a loop over the end, then taking the end around behind the standing part and through the loop. A variant, the running bowline, is used to make a lasso, and another variant, the bowline on a bight, can be comfortably used as a sling to raise or lower a person seated in the loop.

A splice (*q.v.*) is made by untwisting the constituent strands of two rope ends and weaving them together. Seizing (*q.v.*) involves the fastening together of two ropes by means of another rope.

knot, in navigation, measure of speed at sea, equal to one nautical mile (6,080 feet in the British admiralty mile; 1,852 metres, or 6,076.115 feet, in the international mile) per hour. This is approximately 1.15 statute miles per hour. Thus, a ship moving at 20 knots is traveling as fast as a land vehicle at about 23 miles (37 km) per hour. The term knot probably results from its former use as a length measure on ships' log lines, which were used to measure the speed of a ship through the water (*see* log). Such a line was marked off at intervals by knots tied in the rope. Each interval, or knot, was about 47 feet (14.3 metres) long. When the log was tossed overboard, it remained more or less stationary while its attached log line trailed out from the vessel as the latter moved forward. After 28 seconds had elapsed, the number of knots that had passed overboard was counted. The number of knots that ran out in 28 seconds was roughly the speed of the ship in nautical miles per hour.

knot, in zoology, genus of large, plump sandpipers of the subfamily Calidritinae, family Scolopacidae. The common knot (*Calidris canutus*), about 25 cm (10 inches) long including the bill, has a reddish breast in breeding plumage (hence another name, robin sandpiper); in winter it is plain gray. It breeds on dry, stony tundra throughout the Arctic and migrates great distances along the coasts of all continents; some winter as far south as Australia and New Zealand. Highly sociable, knots stand almost body-to-body on the shore, moving like a carpet of birds as they feed. The great, or Asiatic, knot (*C. tenuirostris*) is a rare species breeding in Siberia.



Common knot (*Calidris canutus*)

D. Muir from The National Audubon Society Collection/Photo Researchers—EB Inc.

Know-Nothing Party, also called AMERICAN PARTY, U.S. political party that flourished in the 1850s. The Know-Nothing Party was an outgrowth of the strong anti-immigrant and especially anti-Catholic sentiment that started to manifest itself during the 1840s. A rising tide of immigrants, primarily Germans in the Midwest and Irish in the East, seemed to pose a threat to the economic and political security of native-born Protestant Americans. In 1849 the secret Order of the Star-Spangled Banner formed in New York City, and soon after lodges formed in nearly every other major American city.

Members, when asked about their nativist organizations, were supposed to reply that they knew nothing, hence the name. As its membership and importance grew in the 1850s, the group slowly shed its clandestine character and took the official name American Party. As a national political entity, it called for restrictions on immigration, the exclusion of the foreign-born from voting or holding public office in the United States, and for a 21-year residency requirement for citizenship.

By 1852 the Know-Nothing Party was achieving phenomenal growth. It did very well that year in state and local elections, and with passage of the Kansas–Nebraska Act in 1854 it won additional adherents from the ranks of conservatives who could support neither the proslavery Democrats nor antislavery Republicans. When Congress assembled on Dec. 3, 1855, 43 representatives were avowed members of the Know-Nothing Party.

That, however, was the peak of Know-Nothing power. At the American Party Convention in Philadelphia the following year, the party split along sectional lines over the proslavery platform pushed through by Southern delegates. Party presidential candidate Millard Fillmore carried just one state (Maryland) in the 1856 election, and congressional strength dropped to 12 representatives.

Caught in the sectional strife that was disrupting all national institutions, the American Party fell apart after 1856. Antislavery Know-Nothings joined the Republican Party, while Southern members flocked behind the proslavery banner still held aloft by the Democratic Party. By 1859 the American Party's strength was largely confined to the border states. In 1860 remnants of the Know-Nothings joined old-line Whigs in establishing the Constitutional Union Party and nominated John Bell of Tennessee for president. Bell finished fourth in popular votes in the four-man contest of that year.

Two other groups that took the name American Party appeared in the 1870s and 1880s. One of these, organized in California in 1886, proposed a briefly popular platform calling mainly for the exclusion of Chinese and other Orientals from industrial employment.

Knowlton, Charles (b. May 10, 1800, Templeton, Mass., U.S.—d. Feb. 20, 1850, Winchendon), American physician whose popular treatise on birth control, the object of celebrated court actions in the United States and England, initiated the widespread use of contraceptives.

A graduate (M.D., 1824) of Dartmouth College, Hanover, N.H., Knowlton published anonymously a book advising couples of birth-control methods, *The Fruits of Philosophy: or The Private Companion of Young Married People* (1832), the first work of its kind in the United States. A second edition, bearing the author's name, appeared in 1833.

Although the treatise presented a temperate discussion of the medical, social, and economic aspects of birth control, it violated current conventions of taste. Prosecuted in the United States, Knowlton was fined in Taunton, Mass. (1832), and imprisoned for three months in Cambridge the same year. A second prosecution at Greenfield, Mass., resulted in his acquittal. *The Fruits of Philosophy* became the object of a famous test case in England, *The Queen* v. *Charles Bradlaugh and Annie Besant,* which was eventually (1877) decided

in favour of the defendants. After this trial, sales of the book rose from fewer than 1,000 a year to more than 250,000 a year.

Knowsley, district (borough), metropolitan county of Merseyside, England, lying to the east of Liverpool. Knowsley takes its name from the parish of Knowsley, the seat of the earls of Derby and home of the Stanley family since the 14th century. The district has an area of 38 square miles (97 square km).

Apart from Prescot, which was an important watchmaking centre in the 18th century, most industrial development in Knowsley has taken place during the 20th century. Huyton grew rapidly between 1930 and 1950 to house some of Liverpool's overspill population. Kirby developed after 1952 when Liverpool began to build a new town around an industrial estate. Other overspill housing development has taken place at Knowsley and Halewood. Halewood was also chosen in 1960 for the site of a new automobile plant, one of the world's largest self-contained industrial complexes. Other major industry in the borough includes the manufacture of electrical cables at Prescot and a range of engineering, food, and light industries. Part of Knowsley estate is now a wild animal safari park. Pop. (1985 est.) 166,300.

Knox, Fort, major U.S. military reservation (110,000 acres [44,510 hectares]) in Hardin County, northern Kentucky, U.S. It lies 30 miles (48 km) southwest of Louisville. Established in 1918 as Camp Knox (named for Major General Henry Knox, first U.S. secretary of war), it became a permanent military post in 1932. For maximum security the U.S. Bullion Depository, a solid square bomb-proof structure with mechanical protective devices, was built there in 1936 to hold the bulk of the nation's gold. During World War II, the gold vault was used as a repository for the original copy of the U.S. Constitution and Declaration of Independence, the Magna Carta, and the original draft of Lincoln's Gettysburg Address. Since 1940 Fort Knox has been the U.S. Army Armor Headquarters with various training schools. Its Patton Museum of Cavalry and Armor displays American Civil War and captured enemy weapons. Pop. (1980) 31,095.

Knox, Henry (b. July 25, 1750, Boston—d. Oct. 25, 1806, Thomaston, Maine, U.S.), American general in the War of Independence (1775–83) and first secretary of war under the U.S. Constitution.

During the winter of 1775–76, Knox, a colonel in charge of artillery in the Continental Army, was sent by General George Washington to Fort Ticonderoga, in New York, to bring back captured British artillery there. In a remarkable feat, Knox brought back artillery totaling 120,000 pounds, using oxen, horses, and men to transport the guns over snow and ice 300 miles (480 km) to Boston. The weapons were used to drive the British from that besieged city and formed the basis for the U.S. Revolutionary artillery.



Henry Knox, detail of a portrait by Gilbert Stuart; on deposit at the Museum of Fine Arts, Boston

By courtesy of the City of Boston; on deposit at the Museum of Fine Arts, Boston

In the Philadelphia campaign (1778), Knox, then a brigadier general, distinguished himself in commanding the artillery at Monmouth, N.J. (June), and later at the decisive Battle of Yorktown (1781). He was made a major general and at the end of the war succeeded Washington as commander of the army (December 1783). Knox resigned his command early in 1784 and moved to Boston. He became secretary of war (1785) in the government under the Articles of Confederation and was carried over into President Washington's first Cabinet (1789). He retired to a large estate at Thomaston, Maine, in 1795. A biography is North Callahan's *Henry Knox, General Washington's General* (1958).

Knox, John (b. *c.* 1514, near Haddington, Lothian, Scot.—d. Nov. 24, 1572, Edinburgh), foremost leader of the Scottish Reformation, who set the austere moral tone of the Church of Scotland and shaped the democratic form of government it adopted. He was influenced by George Wishart, who was burned for heresy in 1546, and the following year Knox became the spokesman for the Reformation in Scotland.



Knox, engraving from *Icones*, by T. Beza, 1580

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

After a period of intermittent imprisonment and exile in England and on the Continent, in 1559 he returned to Scotland, where he supervised the preparation of the constitution and liturgy of the Reformed Church. His most important literary work was his *History of the Reformation in Scotland.*

Early life. Almost nothing is known of Knox's life before 1540, the accounts given by his earlier biographers being mostly fanciful. Of his parentage it is known only that his mother's name was Sinclair (Knox used the name John Sinclair as an incognito in times of danger); that his father's name was William; and that he and both Knox's grandfathers had fought, and two of them had died—perhaps at the Battle of Flodden against Henry VIII's troops. The family may have been farmers.

It is supposed that Knox trained for the priesthood under the scholar John Major, most probably at the University of St. Andrews. Knox did not take a master's degree, however, but he ended his training with a mind imbued with that delight in abstract thought and dialectical disputation which, even in that age, was recognized throughout Europe as typical of Scottish scholarship. He was in priest's orders by 1540 and was in 1543 known to be also practicing as an apostolic notary in the Haddington area, which would seem to indicate that he was in good standing with the ecclesiastical authorities.

Two years later, however, Knox was in more equivocal company as tutor to the sons of two gentlemen of East Lothian who were deeply involved in the intrigues of political Protestantism. Under their protection, George Wishart, a Scottish Reformation leader who was to become an early martyr for the cause, began a preaching tour in the Lothians in December 1545. Knox was much in his company; and his complete conversion to the Reformed faith dates from his contact with Wishart, whose memory he cherished ever afterward. Wishart was burned for heresy in March 1546 by Cardinal David Beaton, archbishop of St. Andrews, who, rather than the weak governor, was the real ruler of Scotland. Wishart's execution began a chain of events that profoundly altered Knox's life. Three months later, Beaton was murdered by Protestant conspirators who fortified themselves in St. Andrews castle.

Meantime, Knox, accompanied by his pupils, was moving from place to place to escape persecution and arrest. His desire was to go to Germany to study there at the Protestant seats of learning; but his employers sent word to him to take their sons to St. Andrews and continue their education under the protection of the castle. Thus, in April 1547, less than a year after the cardinal's murder and against his own desire, Knox arrived with his pupils in St. Andrews—still an unknown man. The three months he spent there transformed him, against his own predisposition, into the acknowledged spokesman and protagonist of the Reformation movement in Scotland. The Protestants in the castle had become involved in controversy with the university; several of them, becoming aware that a man of uncommon gifts had joined them, pressed upon Knox's conscience the duty of taking up "the public office and charge of preaching." Knox's inclination was for the quiet of the study and the schoolroom, not for the responsibilities and perils of the life of a preacher of a proscribed and persecuted faith. He resisted the call with tears, and only after great hesitation was he persuaded to preach in the town of St. Andrews a sermon that convinced friend and foe alike that the great spokesman of Scottish Protestantism had been found. This was the turning point of Knox's life; from this time forward he regarded himself as called to preaching by God, and he was the more certain of the divine origin and compulsion of the call in that it ran counter to every inclination of his own.

At the end of June 1547, French assistance reached the governor of Scotland. The garrison of St. Andrews castle, bombarded from without and assailed by plague within, capitulated on terms that were not kept; Knox and others were carried off to slavery in the French galleys. English intervention secured his release 19 months later, though with permanently broken health.

In England the Protestant government of Edward VI was endeavouring to hurry clergy and people into the Reformation faster, if anything, than most of them were willing to go. For this program preachers and propagandists were urgently required; and since a return to a Scotland under Roman Catholic rule was impossible for Knox at this time, the English government promptly made him one of a select corps of licensed preachers and sent him north to propagate the Reformation in the turbulent garrison town of Berwick-upon-Tweed. He brought order to the town and established a congregation on Puritan lines, and there he met Marjorie Bowes, who was to become his wife. Early in 1551 he was given a new assignment in Newcastle and a little later was appointed to be one of the six royal chaplains whose duties included periodic res-

idence at, and preaching before, the court as well as itinerant evangelism in areas where the regular clergy were lacking in Protestant zeal. He later refused to accept the bishopric of Rochester and the vicarage of Allhallows, London, but continued, under the patronage of the government, to exercise an itinerant ministry mainly, but not exclusively, in Buckinghamshire, Kent, and London.

In three respects Knox left his mark on the Church of England: he took part in the shaping of its articles; he secured the insertion into *The Book of Common Prayer* of the so-called black rubric, which denies the corporal presence of Christ in the consecrated bread and wine used in Holy Communion and explains that kneeling at communion implies no adoration of the elements; and he was one of the chief foster fathers of English Puritanism, a reform movement started within the state church with a view to the more rigorous application of Reformation principles in doctrine and worship.

Escape to the Continent. On the accession of Mary Tudor, a Roman Catholic, to the throne in 1553, Knox was one of the last of the Protestant leaders to flee the country. He escaped to the Continent disturbed by the realization that the fate of "true religion" in England had turned on the religious opinions of one woman. He could see no security for the Reformation anywhere if the personal whim of a sovereign was permitted to settle the religion of a nation. Might it not be legitimate for Protestant subjects, in such circumstances, to resist—if necessary by force—the subversion of their religion by a Roman Catholic ruler? Knox formulated his fateful conclusion, later to be applied in Scotland, that God-fearing magistrates and nobility have both the right and the duty to resist, if necessary by force, a ruler who threatens the safety of true religion. Also in 1554 Knox published his *Faithful Admonition* to the Protestants who remained in England. Its extremism and intemperate language served to increase the sufferings of those to whom it was addressed; and, coming as it did from one who was in comparative safety, it alienated many in England from him.

In the same year, on the insistence of John Calvin, Knox became minister of a congregation of English refugees, mainly Puritan, in Frankfurt am Main; but he remained there for only a few months. He then became minister of the growing congregation of English exiles in Geneva, a pastorate that lasted until his final return to Scotland in 1559, but was interrupted at the outset by a visit (1555–56) to Berwick and a nine-month sojourn in Scotland, in the course of which he married Marjorie Bowes. She died, having borne him two sons, in 1560.

In Edinburgh Knox was astounded by the progress made by the Reformed cause and by the eager reception given to him by all classes in the community. To the nobility, in visits to their country houses, he propounded his doctrine of "justifiable resistance" to Roman Catholic rulers who attacked the faith of Protestant subjects and urged them to withdraw from all the rites and ceremonies of the Roman Church and to band themselves together for the defense of Protestantism in case that should prove necessary. A peremptory summons from his congregation called him back to Geneva; but he left to the faithful in Scotland an important *Letter of Wholesome Counsel* (1556) enjoining not only private family worship but also weekly meetings of believers for corporate Bible study and discussion. From these weekly meetings, Reformed congregations grew apace, and from the leaders of these congregations came the elders of the Reformed Church.

Geneva was to Knox a beloved city, where he spent the happiest years of his life, highly esteemed, in peace, and among kindred souls. From this period (1556–58) dates his elaborate and rather tedious treatise on *Predestination* as well as his *first blast of the trumpet against the monstruous regiment* [rule] *of women,* in which he states with uncurbed vehemence the common belief of his day that the exercise of authority by women is contrary to both natural law and revealed religion. The pamphlet was aimed at the three women who were holding the reins of government in England, France, and Scotland and were oppressing Protestantism; but, unfortunately for Knox, publication coincided with the accession in England of the Protestant Elizabeth I, who indignantly and permanently debarred the rash author from her realm.

Recall to Scotland. In Scotland matters reached a crisis in the spring of 1559. Two years earlier the Protestant lords had signed a "band," or covenant, on Knox's advice, pledging themselves to foster and defend "The Congregation of the Lord" and its ministers (hence their name "Lords of the Congregation"). The queen regent, the French-born Mary of Guise, had deemed it politic to make concessions to them. But when hostilities between Spain and France ended early in 1559, opening the possibility of stronger French intervention in Scotland, the Queen Regent felt that the time had come to call a final halt to the expansion of Protestantism. To this end she summoned the Protestant preachers, as ringleaders of the growing Protestant insubordination, to appear before her on May 10, at Stirling. The Protestants replied by recalling Knox from Geneva, and the Protestant lords, lairds, and commoners mustered at Dundee. On May 4 Knox joined them and they advanced to Perth, where, after a vehement sermon by Knox, the friaries were sacked.

By the end of June, Edinburgh was temporarily in Protestant hands and Knox was preaching in St. Giles'; but the triumph was illusory and Knox knew it. The voluntary army of Protestants could not keep the field for more than a few weeks; the mercenary army of the Queen Regent could keep the field indefinitely and strike a crushing blow as Protestant strength declined. At this juncture Henry II of France died and power fell into the hands of the Guises, the brothers of the Queen Regent and uncles of the young queen of France—Mary, queen of Scots and consort of Francis II, the new king of France. Strong French intervention in Scotland was now assured in furtherance of the Guise plan to displace Queen Elizabeth of England and to unite France, Scotland, and England under Francis II, of France, and Mary. Thus a political issue of critical international importance cut athwart the religious issue in Scotland. A French victory in Scotland would place Elizabeth and England in peril. It therefore behooved England to make common cause with the Scottish Protestants. Knox lost no opportunity of driving this fact home to Elizabeth. The autumn and winter of 1559 saw the Scottish Protestants in desperate plight. Only Knox's superhuman exertions and indomitable spirit kept the cause in being. In the blackest hour Knox put fresh heart into the despairing Protestant leaders and staved off defeat at the hands of the government's French mercenaries. On Knox's resolution alone in these months hung the fate not only of Scottish Protestantism but of Elizabeth's England as well.

In the spring of 1560, Elizabeth at last consented to English action. In April, 10,000 English troops joined the Scottish Protestants, the Queen Regent died in Edinburgh castle, and the disheartened French gave up. By treaty, French and English troops were then withdrawn, leaving the victorious Scottish Protestants to set their own house in order. Queen Mary was a Roman Catholic and an absentee in France, and all her sympathies were with the defeated side. The Scottish Parliament had never exercised much power, but now, meeting in August without royal authority, it proceeded to grapple with the religious issue. The Scots Confession (hurriedly prepared by Knox and three others) was adopted and papal jurisdiction was abolished.

Shaping the Reformed Church. Knox, aided by a committee of distinguished churchmen, laid before the Scottish Parliament the *First Book of Discipline* containing proposals for the constitution and finance of the Reformed Church. Worship was to be regulated by the *Book of Common Order* (also called Knox's Liturgy), according to which congregations were to be governed by elders elected annually by the people and the elders were to aid the minister to maintain firm moral discipline among the people. Ministers were to be elected by the people but to be appointed only after rigorous examination of life and doctrine by their ministerial brethren. The ablest ministers were to be appointed superintendents of areas roughly corresponding to the old dioceses; they were to supervise the ministers and congregations in the area and were to be assisted by provincial synods of ministers and elders. In the high place given to the laity, Knox's system contains the most essential element of later Presbyterianism.

The *Book of Discipline* proceeds to outline a most elaborate educational scheme and plans for a much-needed scheme of systematic aid of the poor. Finally it urges that the endowments of the old church should be made available for the financing of these admittedly costly schemes of the new church. But the proposals thus outlined foundered on the rock of finance. The endowments of the old church were plunder in a poor land for the nobility, who had scant sympathy with Knox's "devout imaginings." Parliament shelved the financial problem by the temporary expedient of granting to the remaining Roman Catholic clergy the life-rent of their benefices, provided they contributed to the maintenance of the Reformed Church out of their revenues. Knox was deeply embittered by the enforced abandonment of his schemes for education and poor relief and by the scant provision for the Reformed Church.

Mary arrived in Scotland in 1561 already persuaded that Knox was to be her archenemy and that the country could not hold them both. Knox, who hoped at first that the young queen would prove pliable, soon reached a similar conviction. The first three of his audiences with Mary were polite skirmishes; in the fourth, battle was joined in grim earnest. Hearing that Mary was contemplating marriage with Don Carlos of Spain, a match that would have had fatal consequences for the Scottish Reformation and probably for England as well, Knox sounded the Protestant alarm. Mary, enraged at this intervention by a heretic preacher and commoner in affairs of state, berated Knox with hysterical fury and charged him with treason, but the Privy Council refused to convict him. Knox filled Mary's cup of bitterness in 1564 by marrying, without the royal assent, Margaret Stewart, a 17-year-old distant relative of the Queen.

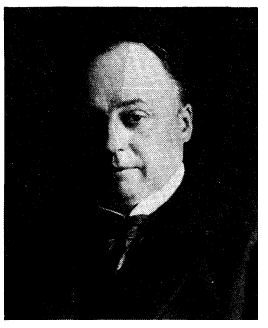
In 1564 Mary dismissed her Protestant advisers and undertook the mismanagement of her own affairs. For a time the Reformed Church was in real danger, but in 1567 came Mary's ruin and abdication, and Knox's old friend James Stewart, earl of Moray, became regent. In him the Reformed Church would have found a powerful patron, but he was murdered and the country plunged into a struggle between the supporters of the Queen and those of the regency. Knox was involved in the turmoil, but he suffered a paralytic stroke. When Edinburgh became a battleground between the factions in 1571, the leaders on both sides insisted on his removal to safety in St.

Andrews, from where he returned in 1572 to die. When the news of the St. Bartholomew's Day Massacre of French Protestants reached Scotland, Knox dragged himself to his pulpit in St. Giles' and drove home the lesson of that tragedy. He stood one last time in the pulpit of St. Giles' to introduce his successor.

Assessment. Knox was a controversial figure and his influence will always be variously assessed by men of differing religious and political views. Certainly his conviction that the Reformation was God's cause and must triumph, a conviction he had a remarkable power of impressing upon other minds, was the rock upon which the Reformed Church in Scotland was built. His power as a preacher lay in his capacity to fuse reason with emotion and to be a passionate logician in the pulpit. Intolerant he undoubtedly was, but his Calvinism was a good deal more moderate than that of a later age. He was more temperate in action than in speech, and his private letters reveal an unexpected tenderness. His single-minded, lifelong, and incorruptible devotion to what he believed to be his duty must command respect. There is ample historical testimony that his moral life was in keeping with his rigorous creed. (J.S.McE./Ed.)

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Knox, Philander Chase (b. May 6, 1853, Brownsville, Pa., U.S.—d. Oct. 12, 1921, Washington, D.C.), lawyer, Cabinet officer in three administrations, and U.S. senator.



Philander Knox, 1909

By courtesy of the Library of Congress, Washington, D.C.

After admission to the bar in Pennsylvania (1875), Knox became a successful corporation lawyer in Pittsburgh and as counsel for the Carnegie Steel Company had a prominent role in the organization of the United States Steel Corporation (1900–01). Appointed attorney general in 1901 by Pres. William McKinley, Knox remained in that office under Pres. Theodore Roosevelt, serving until 1904. At Roosevelt's direction, he instituted a number of suits under the Sherman Anti-Trust Act of 1890, most notably that which resulted in the dissolution of the Northern Securities Company (1902–04). Knox then served in the U.S. Senate (1904–09), resigning to become secretary of state in the administration of Pres. William Howard Taft.

The foreign policy of Taft and Knox, called "dollar diplomacy" by critics, sought to expand American political influence overseas by increasing American investments abroad, and to minimize the danger of European intervention in Central America or the Caribbean by persuading the nations in those regions to borrow from U.S. rather than European banks. It was a policy which had only minimum success, but it was widely misunderstood and widely condemned. Knox was returned to the U.S. Senate in 1917, where he was a leading opponent of the League of Nations.

Knox, Ronald (Arbuthnott) (b. Feb. 17, 1888, Kibworth Beauchamp, Leicestershire, Eng.—d. Aug. 24, 1957, Mells, Somerset), English author, theologian, and dignitary of the Roman Catholic Church, best known for his translation of the Bible.



Ronald Knox, pen and ink drawing by P. Evans, *c.* 1926; in the National Portrait Gallery, London

By courtesy of the National Portrait Gallery, London

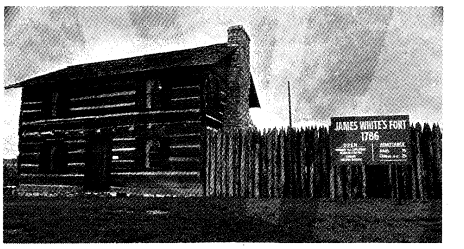
Born into an Anglican family, he was educated at Balliol College, Oxford, and in 1912 was appointed chaplain of Trinity College, Oxford. He became a Roman Catholic in 1917. From 1926 to 1939 he served as Roman Catholic chaplain to the university.

Knox gave witty expression to the perplexities that bedeviled him between his graduation and conversion in *Some Loose Stones* (1913) and in *Reunion All Round* (1914). He chronicled his struggle and its resolution in *A Spiritual Aeneid* (1918). The final expression of his position appeared in *The Belief of Catholics* (1927). Six volumes of Knox's sermons were published, including *Heaven and Charing Cross* (1935) and *Captive Flames* (1940). Knox also wrote inventive and complex detective novels; *Still Dead* (1934) is generally considered the best among them. His version of the New Testament appeared in 1945. His Old Testament and *On Englishing the Bible,* a penetrating examination of the problems of a translator, were published in 1949. These were followed by his *New Testament Commentaries* in 1953, 1954, and 1956. Evelyn Waugh's account of Knox and his writing, *The Life of the Right Reverend Ronald Knox,* was published in 1959.

Knox's Liturgy: *see* Common Order, Book of.

Knoxville, city, seat (1792) of Knox County, eastern Tennessee, U.S., on the Tennessee River, which is formed 4 mi (6 km) east by the confluence of the Holston and French Broad rivers. It is the centre of a metropolitan area that includes the cities of Maryville, Alcoa, and Oak Ridge.

When a treaty of 1785 with the Cherokee Indians opened the region to settlers, Capt. James White, a former Revolutionary War officer, established a frontier outpost called White's Fort (restored as a historic site). It was renamed Knoxville in 1791, after Henry Knox, secretary of war in Pres. George Washington's Cabinet, and became the capital (1792–96) of Territory South of the River Ohio and of the state of Tennessee (1796–1812, 1817–19).



The main building of James White's Fort, Knoxville, Tenn.

Brian D. Palormo—EB Inc.

During the Civil War, Knoxville was occupied by the Confederates until September 1863. In November 1863, Confederates under Gen. James Longstreet unsuccessfully besieged Gen. Ambrose E. Burnside's Federal forces in the city's only major engagement.

Two major events affected the city in the 20th century: creation of the Tennessee Valley Authority (TVA) during the 1930s and the establishment of Oak Ridge (*q.v.*), the "atomic city," 20 mi west, during the 1940s. The TVA headquarters are at Knoxville, and several of its projects (Douglas, Ft. Loudoun, Melton Hill, and Norris dams and lakes) are within a 30-mi radius; TVA electric power attracted industries, and its river navigation programs increased the city's transportation potential. Knoxville has developed a diversified economy based on agriculture (tobacco and livestock), manufacturing (notably textiles, clothing, auto seat belts, temperature controls, and chemicals), distribution, mining and quarrying (zinc ore and marble), lumbering, and educational facilities. Tourism, based on the Great Smoky Mountains National Park (southeast) and the Cumberland Mountains (west), is an added source of income. The city is the seat of the University of Tennessee (established as Blount College in 1794), Knoxville College (1875), and Tennessee School for the Deaf.

Historic buildings include the Confederate Memorial Hall (an antebellum mansion that served as Confederate headquarters during the siege of 1863 and is now maintained by the United Daughters of the Confederacy) and the colonial Blount Mansion (restored), built in 1792 for Gov. William Blount. The McClung Historical Collection in the Lawson–McGhee Library contains more than 12,000 volumes of regional history and genealogy. The Dogwood Arts Festival is an annual April event. The World's Fair in 1982 featured a number of restored and newly constructed buildings, among them the Sunsphere, a 266-ft (81-m)-tall structure, the U.S. Pavilion, the Tennessee Amphitheatre, a Technology and Lifestyle Center and a number of other structures. Inc. 1815. Pop. (1980) city, 183,139; metropolitan area (SMSA), 476,517.

Knuckles, mountains in Sri Lanka, running north–south to the north of the Mahaweli Ganga Valley, rising to 6,112 ft (1,863 m) at Knuckles Peak, about 10 mi northeast of Wattegama. The region receives an average rainfall of 100–200 in. (2,500–5,000 mm). Tea, rubber, rice, vegetables, and cardamon are grown in the area. Of irregular shape, the mountain range extends for 25 mi in length and reaches 15 mi in width.

Knud (Danish personal name): *see under* Canute.

Knudsen, William S(ignius), original name SIGNIUS WILHELM POUL KNUDSEN (b. March 25, 1879, Copenhagen—d. April 27, 1948, Detroit), Danish-born American industrialist, an effective coordinator of automobile mass production who served as president of General Motors Corporation (1937–40) and directed the government's massive armaments production program for World War II.



William S. Knudsen
By courtesy of the U.S. Army

After Knudsen immigrated to the United States in 1900, he worked at a variety of jobs. In 1902 he began working for Keim Mills, a Buffalo bicycle factory, which in 1904 began manufacturing parts for the Ford Motor Company. Ford purchased the factory in 1911, and Knudsen was eventually transferred to Ford's Detroit plant. In 1914, the year that he became a U.S. citizen, he began supervising the establishment of Ford assembly plants throughout the United States. He directed the firm's construction of submarine patrol boats and other war matériel for the U.S. Navy during World War I. In 1922, after a falling-out with Henry Ford, he joined the General Motors Corporation; he was appointed president and general manager of the Chevrolet division in 1924 and president of General Motors in 1937.

In 1940 President Franklin D. Roosevelt appointed Knudsen director of industrial production for the National Defense Research Committee. He continued to direct production of war matériel as head of the U.S. Office of Production Management (1941) and as lieutenant general in charge of production for the War Department (1942–45). He returned to private business in July 1945.

Knut (Norwegian personal name): *see under* Canute.

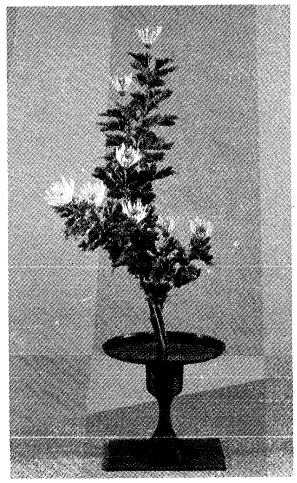
Knutsford, parish (town), Macclesfield district, county of Cheshire, England. It is located on the Cheshire Plain southwest of the city of Manchester. Knutsford received a market, free burgage (tenure from the crown), and power to elect a mayor from a charter of 1292, and a charter in 1332 provided for fairs on certain festival days. The Heath—about 30 acres (12 hectares) of common land—is still the site of the annual May Day festival. The principal shopping streets, King Street and Princess Street, contain buildings of historical and architectural interest. The 19th-century British writer Elizabeth Cleghorn Gaskell took Knutsford as the original for her novel *Cranford* (1853).

The modern town is predominantly residential, with some industry, including a paper works, sawmills, and nuclear-energy-design laboratories. The internationally important Manchester Airport at Ringway is 5 miles (8 km) to the northeast. Pop. (1981) 13,751.

Knyphausen, Wilhelm, Freiherr von (baron of) (b. Nov. 4, 1716, Luxembourg—d. Dec. 7, 1800, Kassel, Hesse-Kassel [Germany]), German soldier who after 1777 commanded "Hessian" troops on the British side in the American War of Independence.

A lieutenant general with 42 years of military service, Knyphausen went to North America in 1776 as second in command (under General Leopold von Heister) of German mercenary troops in the British service. Following Heister's recall in 1777, Knyphausen became their commander. He took part in the battles of Fort Washington and Brandywine, Pa., and Monmouth, N.J.; Sir Henry Clinton's absence from New York in 1779–80 left the area under the command of Knyphausen. An able soldier, he carried out the difficult task of holding together the mercenary forces under his command. He returned to Germany in 1782 and became military governor of Kassel.

Ko, also called KORYŪ, one of the four major schools of floral art in Japan. Dating from the Tokugawa period (1603–1868), the Ko school developed the *shōka* style of the earlier Ikenobō school into a more naturalistic type of arrangement. Calling the arrangements *seika* rather than *shōka,* the Ko school retained the tall, narrow-mouthed type of vase used in the *shōka* arrangements of the Ikenobō school.



Ko, or Koryū, school arrangement in the *seika* style using chrysanthemum flowers
By courtesy of the International Society for Educational Information, Tokyo

The mood of the arrangements was known as *nageire,* a fresh and spontaneous style that adheres only loosely to the classical rules of structure.

kō (in Japanese ethics): *see* hsiao.

Ko-chiu, Pinyin GEJIU, city in southern Yunnan *sheng* (province), China. Ko-chiu lies near the Vietnamese border and is the site of China's most important tin-mining industry.

Ko-chiu was originally a small mining settlement called Ko-chiu-chieh; mining of silver was begun there under the Yüan (Mongol; 1206–1368) and Ming (1368–1644) dynasties. Mining in Yunnan boomed in the late 17th and 18th centuries, but tin mining in Ko-chiu did not develop until the second half of the 18th century. In the 1880s the city was created a sub-prefecture under Meng-tzu County, about 19 miles (30 km) to the east. In 1889 Meng-tzu was opened as a treaty port, its trade being almost entirely with Hanoi and Haiphong in Indochina. One of the main purposes in constructing the French-built railway from Haiphong to K'un-ming (Yunnan), completed in 1910, was to service the mines. A branch line was built from Ko-chiu to Meng-tzu between 1915 and 1928. During the last years of the Ch'ing dynasty (1644–1911/12), the mines were organized by the Chinese Ko-chiu Tin Company, but the company was deficient in capital, technical skill, and managerial efficiency and was replaced by a joint state–private company, the Ko-chiu Tin-Mining Company, under which production boomed. By the 1930s, Ko-chiu tin accounted for 80 percent of the traffic exported on the railway. In 1938 tin production is said to have reached 10,000 tons.

Under the Communist government, management passed to the state Yunnan Tin-Mining Corporation, which by 1955 had reached and surpassed prewar production figures. In addition to tin, which remains the chief product, Ko-chiu has also become a major producer of lead. Coal for smelting is supplied to the city from K'ai-yüan to the north, located on the rail line to K'un-ming. There is some engineering and chemical production closely allied with Ko-chiu's metallurgical industries. Pop. (1985 est.) city proper, 189,900; city, 337,700.

Ko-erh-mu (China): *see* Golmud.

Ko Hung, Pinyin GE HONG, also called (Wade–Giles romanization) PAO-P'U-TZU (b. AD 283?, Tan-yang, China—d. AD 343, Tan-yang), perhaps the best-known Taoist alchemist of China, who tried to combine Confucian ethics with the occult doctrines of Taoism.

In his youth he received a Confucian education, but later he grew interested in the Taoist cult of physical immortality (*hsien*). His monumental work, *Pao-p'u-tzu* ("He Who Holds to Simplicity"), is divided into two parts. The first part, "The 20 Inner Chapters," discusses Ko's alchemical studies. Ko gives a recipe for an elixir called gold cinnabar and recommends sexual hygiene, special diets, and breathing and meditation exercises. He even prescribes a method for walking on water and for raising the dead. The second part of the book, "The 50 Outer Chapters," shows Ko as a Confucianist who stresses the importance of ethical principles for the regulation of proper human relations and who severely criticizes the hedonism that characterized the Taoist individualists of his day. A partial English translation of Ko's writings appeared in 1967 in James R. Ware's *Alchemy, Medicine, and Religion in China of A.D. 320, The Nei P'ien of Ko Hung.*

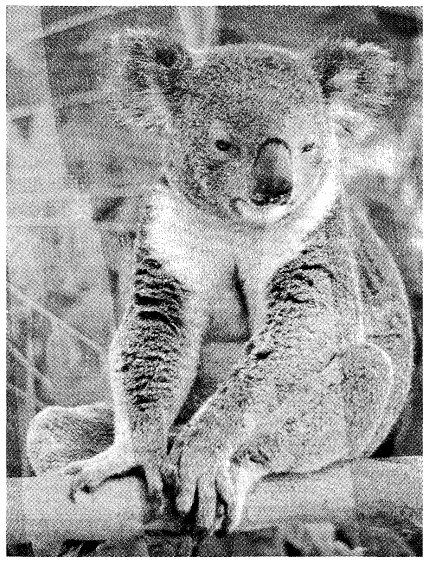
K'o-la-ma-i (city, China): *see* Karamay.

k'o-ssu, Chinese silk tapestry woven in a pictorial design. The designation *k'o-ssu,* which means "cut silk," derives from the visual illusion of cut threads that is created by distinct, unblended areas of colour.

The earliest surviving examples of *k'o-ssu* date from the T'ang dynasty (618–907), but it first became widely used during China's Southern Sung period (1127–1279). The technique became particularly popular during the Ming period (1368–1644) and thrived until the end of the Ch'ing dynasty in 1911/12. The *k'o-ssu* technique was often used to copy famous paintings.

k'o-t'ou: *see* kowtow.

koala (*Phascolarctos cinereus*), arboreal "bear" of coastal eastern Australia, a marsupial mammal belonging to the family Phalangeridae, sometimes considered a separate family, Phascolarctidae. The koala is about 60 to 85 centimetres (21 to 33 inches) long and virtually tailless, with a stout, pale gray or yellowish body; broad face; big, round leathery nose; small, yellow eyes; and fluffy ears. Its feet are strong-clawed, and the two innermost digits of the front foot in addition to the innermost digit of the hind foot are opposable. The koala feeds, very selectively, on eucalyptus leaves. To aid in digesting about 1.3 kilograms (3 pounds) of leaves daily, it has a caecum (intestinal pouch) about 7 metres (23 feet) long. Unlike other tree-dwelling marsupials, the koala has a pouch opening rearward. It bears one offspring at a time; the youngster remains in the pouch for as long as seven months, clings to the mother's back until it is about a year



Koala (*Phascolarctos cinereus*)
Anthony Mercieca—The National Audubon Society Collection/Photo Researchers

old, and is weaned on the mother's excreta. A koala may live 20 years in captivity.

Formerly killed for their fur and decimated further by disease, koalas are now rigidly protected by law; locally, they are maintaining or increasing their numbers. The greatest danger to these slow-moving animals is forest fire.

Kōami FAMILY (fl. 15th–19th centuries), Japanese lacquerware artists who were eminent for 19 generations in the Muromachi, Azuchi-Momoyama, and Tokugawa periods.

Michinaga (b. 1410—d. 1478) was a personal attendant to the military ruler Ashikaga Yoshimasa and excelled in two techniques of lacquer design. The *takamaki-e* technique consists of building decorative motifs with a mixture of lacquer putty, white lead, lampblack, camphor, and gold or silver foil in relief against a lacquer ground. In the *togidashi* method the decorative motif is drawn in lacquer, sprinkled with gold or silver flakes, and covered with a thin, translucent lacquer that is then baked and highly polished to bring out the underlying design. Michinaga is said to have started the practice of modelling the designs upon paintings by such well-known artists as Kanō Motonobu, Sōami, and Nōami.

His son Michikiyo (b. 1433—d. 1500) created his own designs for decorating the lacquered household furnishings of the emperor Tsuchimikado II (ruled 1465—1500). The fortunes of the family declined briefly after the campaigns of Ōsaka Castle in 1614–15 but revived when a member of the eighth generation established in Edo (now Tokyo) a well-known lacquerware school that lasted more than 300 years. The family reputation reached its height in 1637, when a member of the 10th generation, Nagashige (b. 1599—d. 1651), made what is considered by some to be the finest piece of Japanese lacquerware in existence: a set of stands presented as a wedding gift to the daughter of the military ruler Tokugawa Iemitsu.

kōan, in Zen Buddhism of Japan, a succinct paradoxical statement or question used as a meditation discipline for novices, particularly in the Rinzai sect. The effort to "solve" a *kōan* is intended to exhaust the analytic intellect and the egoistic will, readying the mind to entertain an appropriate response on the intuitive level. Each such exercise constitutes both a communication of some aspect of Zen experience and a test of the novice's competence.

A characteristic example of the style is the well-known *kōan* "When both hands are clapped a sound is produced; listen to the sound of one hand clapping." Sometimes the *kōan* is set in question-and-answer form, as in the question "What is Buddha?" and its answer, "Three pounds of flax."

Kōan (Chinese *kung-an,* literally "public notice," or "public announcement") are based on anecdotes of Zen (Chinese Ch'an) masters. There are said to be 1,700 *kōan* in all. The two most important collections are the *Pi-yen lu* (Chinese: "Blue Cliff Records"; Japanese *Hekigan-roku*), consisting of 100 *kōan* selected and commented on by a Chinese priest, Yüan-wu, in 1125 on the basis of an earlier compilation, and the *Wu-men kuan* (Japanese *Mumon-kan*), a collection of 48 *kōan* compiled in 1228 by the Chinese priest Hui-k'ai (known also as Wu-men). *Compare* zazen.

kob, antelope species of the genus *Kobus* (*q.v.*).

Kobayashi Hideo (b. April 11, 1902, Tokyo—d. March 1, 1983, Tokyo), one of the most influential critics in the Japanese cultural world.

He graduated in 1927 from the French department of Tokyo Imperial University, where he had concentrarted on French literature. In the early 1930s he was associated with the novelists Kawabata Yasunari and Yokomitsu Riichi on the journal *Bungaku-kai* ("The Literary Circle"); he became editor in 1935, after the arrest of its editor in the growing nationalist tide before World War II. At that time Kobayashi felt literature should be relevant to society, with literary critics practicing their social responsibilities. During the war he turned from modern literary criticism and social commentary to studies of Japanese classical art and later to music and philosophy. His major works include studies on Dostoyevsky, Mozart, and van Gogh, and on the Japanese literary genre of the *shishōsetsu,* the autobiographical novel. Following the war, his literary criticism concerned itself with the potential of the human spirit.

Kobayashi Kiyochika (b. Sept. 10, 1847, Asakusa, Edo [Tokyo]—d. Nov. 28, 1915, Kyōto), printmaker who adopted the effects of Western lithography and engraving in Japanese art, especially in his wood-block prints.

He first studied Japanese painting and later oil painting as well as photography. Initially under the influence of such masters of Ukiyo-e (paintings and wood-block prints of the "floating world") as Andō Hiroshige (1797–1858) and Utagawa Kuniyoshi (1797–1861), he later produced prints adopting various Western techniques, which he named *kōsen-ga,* or "pictures of sunbeams." Chiefly landscapes of Tokyo, they are notable for their subtle interplay of lights and shadows. After about 1882 he stopped Western painting as he came under the influence of Japanese nationalistic currents and produced educational cartoons and prints based on historical themes. His representative works are the series "Tokyo kinkō hyakkei" ("Tokyo and Its Suburbs") and "Gafu-ni-neko" ("Cat on the Canvas").

Kobayashi Kokei, original name KOBAYASHI SHIGERU (b. Feb. 11, 1883, Niigata Prefecture, Japan—d. April 3, 1957, Tokyo), painter who greatly contributed to modern Japanese painting.

Orphaned early in life, Kobayashi went to Tokyo when he was 17 and studied traditional Japanese painting with Kajita Hanko (1870–1917). He joined the Restored Nippon Bijutsu-in and became one of its most prominent members. He at first painted traditional subject matters such as "Taketori monogatari" ("Tale of the Bamboo Cutter," 1914), but soon switched to contemporary scenes and still life. His works are known for their serenity and classical poise, eloquently conveying subtle moods. Among his famous works are "Amida-dō" ("The Amitabha Hall," 1914), "Ideyu" ("Hot Spring," 1918), and "Kami" ("Tresses," 1931).

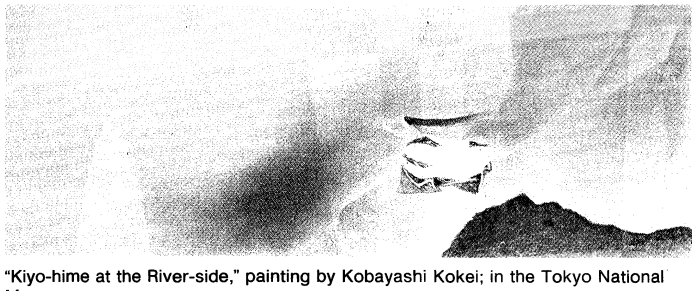
Kobayashi Masaki (b. Feb. 4, 1916, Otaru, Hokkaido, Japan), Japanese motion-picture director whose 9½-hour trilogy, *Ningen no joken* (*The Human Condition: No Greater Love,* 1959; *Road to Eternity,* 1959; *A Soldier's Prayer,* 1961), a monumental criticism of war, best exemplified his films of social concern.

Drafted into the military in 1942, he was taken prisoner on Okinawa. In 1946 he was released as a prisoner of war. Returning to Shochiku Motion Picture Company, Tokyo, he served as an apprentice director until he made his debut in 1952 with *Musuko no seishun* (1952; *My Son's Youth*). He followed with *Kabe atsuki heya* (1953; *The Thick-Walled Room*), which criticized the rigid social order that had characterized Japanese life, and *Anata kaimasu* (1956; *I'll Buy You*), an early film of social consciousness that exposed the commercialism of Japanese baseball.

The Human Condition established Kobayashi's reputation as a major director. It won recognition at international film festivals, as did *Seppuku* (1962; *Harakiri*), a film indicting the traditional warrior code of ethics, and generally considered his finest film; *Kaidan* (1964; *Kwaidan*), a quartet of fantastic ghost stories; and *Kaseki* (1974; "Fossil"), a dying man's reassessment of life.

Kobayashi Takiji (b. Oct. 13, 1903, Shimo Kawazoe, Akita Prefecture, Japan—d. Feb. 20, 1933, Tokyo), outstanding writer of the proletarian literary movement in pre-World War II Japan.

Kobayashi attended Otaru (Hokkaido) Higher Commercial School, where he showed literary promise. On graduation in 1924 he took a position with a bank in Otaru, while his interest in literature grew. Kobayashi was deeply impressed by the writings of Shiga Naoya, whose realism, as well as the humanitarianism of the Shirakaba ("White Birch") group with which Shiga was associated, provided a model for his own idealistic concern with social problems. In 1926 Kobayashi began to be drawn into the Otaru labour and Communist movements, and he participated secretly in several tenant farmer strikes and labour agitations. His intimate knowledge of



"Kiyo-hime at the River-side," painting by Kobayashi Kokei; in the Tokyo National Museum
By courtesy of the Tokyo National Museum

police brutality as a result of an arrest appeared in *Senkyūhyaku nijū hachinen sangatsu jūgo nichi* ("The Fifteenth of March, 1928"), recording the local events of an infamous national police crackdown. That story along with *Shimen no tameni* ("For the Sake of the Citizen"), *Fuzai-jinushi* ("Absentee Landlord"), and *Kani-kōsen* ("The Cannery Boat") established him as the best of the new proletarian writers. He was dismissed from the bank, and he went to Tokyo in 1930. There he participated in increasingly radical political activities and was elected chief secretary of the Japan League of Proletarian Writers. Subject to increased police harassment, Kobayashi went underground in 1932 but continued to publish under pseudonyms. Betrayed by a police spy, he was called in for questioning, and he died in jail the next day as a result of the brutality of the interrogation. He became a martyr for the labour movement, but his contribution to literature lies in his attempt to add literary value to political propaganda through the controlled realism with which he expressed his deep anger over social injustice. His work was published in English in 1933 as *The Cannery Boat and Other Japanese Short Stories.*

Kobayashi Yatarō: *see* Issa.

kobdas, magic drum used for trance induction and divination by the Lapp shaman, or *noiade.* The drum consisted of a wooden frame, ring, or bowl over which a membrane of reindeer hide was stretched. The hide was usually covered with figures of deities, tutelary spirits of the *noiade,* and otherworld localities, painted on with the juice of alder bark. Metal trinkets, pieces of bone, teeth, or claws might be strung on the underside of the drum or around its outer edges. When used for divination, the *kobdas* was beaten with a T- or Y-shaped hammer made of reindeer antler, which caused a triangular piece of bone or metal called *arpa* to move along the surface of the drum. The *arpa* might be in the shape of a brass ring or even a frog representing the tutelary spirit of the *noiade* that went out to discover the things he wanted to know. From the movements of the *arpa,* the *noiade* divined the nature of illness and the location of lost or stolen objects. The use of the drum was limited to the Lapps, Voguls, and Ostyaks among the Finno-Ugric peoples, but similar divinatory practices with the aid of a sieve were known among the Finns and other Balto-Finnic groups.

Kobdo (Mongolia): *see* Hovd.

Kōbe, city and capital of Hyōgo *ken* (prefecture), south-central Honshu, Japan. The city, its neighbouring city Ōsaka, and nearby Kyōto are the centres of the Keihanshin Industrial Zone (*q.v.*), the second largest urban and industrial agglomeration in Japan.

A brief treatment of Kōbe follows. For full treatment, *see* MACROPAEDIA: Ōsaka–Kōbe Metropolitan Area.

Kōbe is situated at the eastern end of the Inland Sea on Ōsaka Bay, about 20 miles (32 km) west of Ōsaka. The city is confined to a narrow shelf of land between the Rokkō Mountains to the north and the sea to the south. Kōbe's climate is temperate, with cool winters and hot, humid summers; annual rainfall is about 54 inches (1,360 mm). The area is subject to typhoons in September, which occasionally are disastrous.

The street pattern of Kōbe reflects its location between the mountains and the bay: main streets run east–west, crossed by short north–south streets. The coastline has been altered by reclamation for port facilities and industries. The central shopping street, Motomachi, runs between the city's two major railway stations, while the central business district is near the harbour.

Kōbe's port has long been one of the most important in Japan; in the early 1970s it was combined administratively with that of Ōsaka. In addition to its prominence in shipping, Kōbe is preeminent among Japanese cities in shipbuilding and steel production. The city is served by a dense network of freight and commuter rail lines, including Shinkansen "bullet" express trains. Express highways also link Kōbe with Ōsaka, Kyōto, and Nagoya.

There are several institutions of higher education in Kōbe, including Kōbe University and Hyōgo University of Education. The Inland Sea National Park in the Rokkō Mountains is accessible by motor road or by cable car; its recreational facilities include a golf course, ponds for swimming, and a spa at Arima. Area 209 square miles (542 square km). Pop. (1986 est.) 1,422,922.

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Kōbe Steel, Ltd., major Japanese manufacturer of iron and steel, nonferrous metal products, and machinery. Headquarters are in Kōbe with offices in Tokyo and Ōsaka.

Founded in 1905, the company by the late 1960s was one of Japan's largest steel producers. The company produces pig iron, milled and rolled steel products, steel tubes and pipes, aluminum and aluminum alloy products, copper and steel structures, nonferrous metal castings and forgings, cutting tools, and copper alloy products.

It is most noted for the manufacture of various kinds of machinery. Among them are machines for the chemicals, cement, and mining industries; welding; iron and steel production; rubber and plastic processing; construction; and plant setups. The company is also engaged in several joint ventures in foreign countries.

København (Denmark): *see* Copenhagen.

Koblenz, *Regierungsbezirk* (administrative district), central Rhineland-Palatinate *Land* (state), western Germany. Koblenz is bordered by the *Länder* (states) of North Rhine-Westphalia to the north, Hesse to the east, and Saarland to the southwest and the *Regierungsbezirke* of Rheinhessen-Pfalz to the southeast and Trier to the west. The largest of three districts in Rhineland-Palatinate, it occupies an area of 3,124 square miles (8,092 square km) and comprises a southern section of the larger historic regions of the Rhineland and Nassau (*qq.v.*). Its contemporary boundaries were created by an administrative reform in 1969 merging the former districts of Montabaur and Koblenz. Koblenz *Regierungsbezirk* takes its name from that of the largest city and administrative seat of the district.

Koblenz lies on the massif of the Middle Rhine Highlands and is crossed diagonally from southeast to northwest by the deeply cut valley of the middle Rhine River. The valley is spectacularly narrow and steep in the south, where it must cut through resistant quartzite rock, but it widens somewhat in the softer slate rocks to the north. The warmth and shelter provided by the valley protect Germany's most northerly wine-producing region. Famous for its small picturesque wine villages, terraced vineyards, and castle ruins atop steep hillsides, the middle Rhine valley is among the country's most popular tourist attractions. The lower Mosel (Moselle) River joins the Rhine from the southwest at the city of Koblenz in the Neuwied Basin, the district's chief agricultural region. Dry, fertile pumice and loess soils in the basin support large potato and sugar beet crops. The Lahn River meets the Rhine less than 7 miles (11 km) upriver from the Mosel. The settlement patterns along both tributaries are rural compared to those of the Rhine valley. The Mosel's winding course and narrow valley, with world-renowned vineyards lining the sunny south-facing slopes, have prevented the growth of large towns and industry.

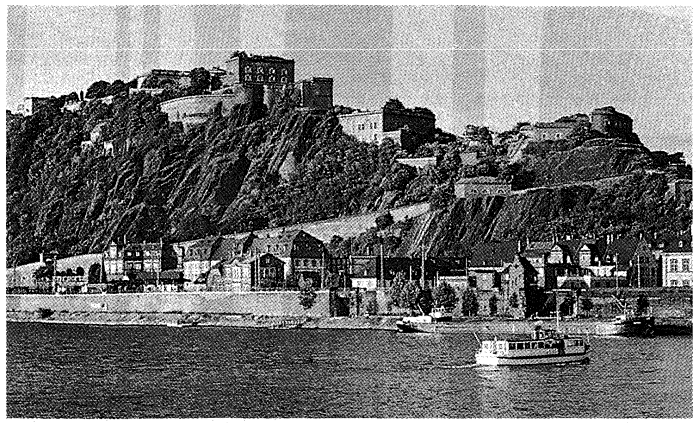
The Rhine, Mosel, and Lahn rivers divide the Middle Rhine Highlands into four distinct regions. Rising south of the Mosel River, the undulating Hunsrück plateau forms the most southerly section of the uplands. It has been cleared of much of its natural deciduous forest and is used for cattle rearing. The Rhine River divides the Hunsrück from the very similar Taunus plateau to the east. North and west of the Mosel and Rhine valleys, the Neuwied Basin and Maifeld form a transition to the wooded upland of the Eifel, averaging 2,000 feet (600 m) in elevation. Suitable only for forestry and cattle production, the Eifel landscape is dotted with funnel-shaped volcanic craters, most of which are filled by small scenic lakes. To the northeast is the rolling plateau of the Westerwald, which is composed mainly of slate with some higher, rounded basalt hills. The Westerwald is bounded to the north by the highly industrialized Sieg valley, which extends into Koblenz from North Rhine-Westphalia.

The Rhine valley north of the Lahn junction is the most populated region of the *Regierungsbezirk.* Ironworks and steelworks are concentrated in the industrial area surrounding the cities of Koblenz and Neuwied. Koblenz is an important traffic junction and a leading centre of wine trade on the Rhine. Pumice is mined from shallow pits in the Neuwied Basin and used in the production of light building blocks. The Kannenbäcker region of the Westerwald is famous for its pottery, and the town of Idar-Oberstein, located in the Nahe valley bordering the southern Hunsrück, is one of Germany's leading centres of trade in precious stones and the jewelry industry.

The native population of Koblenz *Regierungsbezirk* are descendants of the Franks, a Germanic people who lived in the Rhineland from the 3rd century AD. The people of the southern Hunsrück and Taunus uplands speak a Rhenish Franconian dialect, while in the Mosel valley and northern uplands Moselle Franconian is the dialect most commonly spoken. Roman Catholics and Protestants are about equally represented in the district. The predominant rural settlement pattern is one of irregular compact villages. Pop. (1989 est.) 1,356,439.

Koblenz, also spelled COBLENZ, city, Rhineland-Palatinate *Land* (state), western Germany. It lies at the junction of the Rhine and the Mosel (Moselle) rivers (hence its Roman name, Confluentes) and is surrounded by spurs from the Eifel, Hunsrück, Westerwald, and Taunus mountains. A Roman town founded in 9 BC, it was a Frankish royal seat in the 6th century and was given to the archbishops of Trier in 1018 by Emperor Henry II. It was chartered in 1214. After passing to Prussia in 1815, it was the capital (1824–1945) of the Prussian Rhine Province. After World War I it was the seat of the Inter-Allied Control Commission for the Rhineland (1919–29). Most of Koblenz was destroyed in World War II, but many of its historic buildings have been restored. Reconstruction has given the city a spacious, modern appearance.

The Ehrenbreitstein Fortress and suburb across the Rhine were incorporated into Koblenz in 1937. A castle, first built on the site in the 11th century, passed to the archbishops of Trier in the 12th century; blown up by the French in 1801 after a four-year siege, it was rebuilt (1816–32) into one of the strongest fortresses in Europe. Ehrenbreitstein now houses a history and folklore museum. The old fortress on the Mosel (1280–



Ehrenbreitstein Fortress, on the Rhine in Koblenz, Ger.
Malak—Shostal/EB Inc.

87) and the rebuilt Electoral Palace (1780–86) formerly belonged to the electors of Trier. Medieval churches include St. Castor's (836) and the Liebfrauenkirche (Church of Our Lady) and St. Florin's (both 12th century). The town hall (1690–1700) was once a Jesuit college. Other notable buildings include the rebuilt Deutschherrenhaus (1216), the Metternich house, where Austrian statesman Prince Clemens von Metternich (1773–1859) was born, and the municipal theatre (1787). The Middle Rhine Museum contains an important collection of art and historical artifacts.

The Mosel is crossed by the Baldwin Bridge (built by the elector Baldwin in 1343), and the point of land at the junction of the Rhine and Mosel, the Deutsches Eck (German Corner), was dedicated to German reunification in 1953. Weindorf (Wine Village) on the Rhine bank is a centre for the promotion of the German wine trade. Koblenz has several educational establishments, including technical institutes. The surrounding countryside, rich in woods and lakes, makes the city a centre of river traffic and a popular base for conferences and tourists. Koblenz has been an important commercial centre from early times, and its industries include the manufacture of furniture, clothing, and chemicals. Other industries cluster on the city's outskirts, and the rebuilt harbour on the Mosel is one of the larger mid-Rhine petroleum ports. Pop. (1989 est.) 107,286.

Kōbō Daishi (Buddhist saint): *see* Kūkai.

kobold, in German folklore, mischievous household spirit who usually helps with chores and gives other valuable services but who often hides household and farm tools or kicks over stooping persons. He is temperamental and becomes outraged when he is not properly fed. He sometimes sings to children.



Miners frightened by a kobold
Culver Pictures

Some kobolds have been called the spirits of caves and mines. Still others have specific names, such as Hödeken, who frightens unfaithful wives, and Goldemar, who sees the secret sins of the clergy. *See also* poltergeist.

koboz, also spelled KOMUZ, or KOBUZ, Turkish QŪPŪZ, short-necked lute of Middle East origin; it was known in Byzantium as the *pandourion* and made its way into neighbouring regions from Persia by means of Islāmic conquests and migrations. The Spanish Christians called it a Moorish guitar, and it was frequently pictured on Spanish miniatures of the 13th century. The *koboz* is carved out of a single piece of wood, with no distinct neck; the pegbox is bent backwards in a sickle shape and contains lateral pegs. There are three to five strings on the string holder, which is not frontal but on the lower end of the body. The Romanian version, the *cobza,* is a popular instrument with a mandolin-shaped body and small soundholes on its belly. It has from 5 to 12 strings, sometimes dividing into two courses at the bridge, and is played with either a plectrum or the bare fingers.

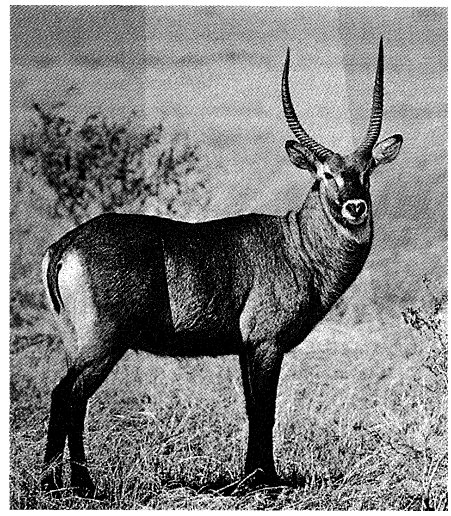
Kobuk Valley National Park, formerly KOBUK VALLEY NATIONAL MONUMENT, national park in northwestern Alaska, U.S., entirely north of the Arctic Circle. Proclaimed a national monument in 1978, it underwent boundary and title changes in 1980. The park preserves the natural features of the Kobuk River Valley, including the Kobuk, Salmon, and other rivers, a boreal forest, and the Great Kobuk Sand Dunes. Archaeological sites reveal more than 10,000 years of human occupation. The park includes critical caribou migration routes, grizzly and black bears, fox, moose, wolves, and waterfowl. The total area is 1,710,000 ac (692,300 ha).

Koburg (Germany): *see* Coburg.

Kobus, genus of antelopes, family Bovidae (order Artiodactyla), containing about six species—the waterbucks and lechwes, the kob, and the puku.

Members of this genus are native to Africa south of the Sahara. They usually live in herds and are generally found near water, in such places as plains, woodlands, swamps, and flood plains. Shoulder height ranges from 75–100 centimetres (30–39 inches) in the puku (*Kobus vardoni*) to about 130 cm in the common (*K. ellipsiprymnus*) and defassa (*K. defassa*) waterbucks. Males of all species have long, heavily ridged horns that curve backward and then upward.

The waterbucks are shaggy-haired, coarse-coated animals; the lechwes are short-nosed swamp dwellers with long hooves and long tails; and the kob (*K. kob*) is a graceful antelope with a short, sleek coat. The puku resembles the kob but has longer hair. Coat colour varies among these animals. Some, such as the puku, are brownish; some, such as the Uganda kob (*K. k. thomasi*) are reddish brown; others, such as the common waterbuck, are grayish. In some forms, among them the black and Nile lechwes (*K. leche smithemani* and *K. megaceros*), the male is dark blackish brown and the female reddish brown. Markings on these antelopes include patches of white, such as a white ring on the rump of the common waterbuck and black markings on the legs, as in the kob.



Defassa waterbuck (*Kobus defassa*)
Leonard Lee Rue III

kobuz (musical instrument): *see* koboz.

Kocaeli, *il* (province), of northwestern Turkey, with an area of 1,428 sq mi (3,698 sq km), bounded on the north by the Black Sea and on the west by the Sea of Marmara. It is drained by the lower course of the Sakarya River. It was once part of the kingdom of Bithynia (3rd century BC), and Hannibal was buried there (at modern Gebze) in 183 BC. The area was taken from the Byzantine Empire by the Ottoman Turks in the 14th century. Izmit (*q.v.*), lying on the Izmit Körfezi (gulf), is the capital and chief city. It serves as the main outlet for the agricultural (chiefly sugar beets and tobacco), forest, and industrial (mainly cement, paper products, textiles, and petroleum) products of the *il.* Pop. (1983 est.) 673,600.

Koch, also called RĀJBANŚĪ, ethnic group of the Bodo people, dispersed over parts of Assam and Bengal. While their original language is a Tibeto-Burman dialect, large sections of the group in the 20th century spoke Bengali or other Indo-Aryan languages. In the 16th century a Koch chief established the state of Cooch Behar, and they now call themselves Rājbanśī (Of Royal Blood), resent being called by the old tribal name, and follow Hindu customs. But their claim to the high status of the Kṣatriya class of Hindus is not generally admitted, and many of the endogamous subdivisions rank very low in the Hindu caste hierarchy. The caste is mainly agricultural, but there are also Rājbanśī carpenters, blacksmiths, and traders. Some sections of the group are less Hinduized than others, and there are considerable variations in customs and status.

In the 15th century the Koch's chief future homeland had been held by Khen kings; but early in the 16th century Cooch Behar became the centre of the kingdom of the Koch king Biswa Singh, invading from northeastern Bengal. The greatest monarch of the dynasty

was Nar Narayan, the son of Biswa Singh, who extended his power over a large part of Assam and southward over what became the British district of Rangpur. His son became tributary to the Mughal Empire. In 1772 the country was invaded by the Bhutanese, and an appeal for assistance was made to the British governor Warren Hastings. A detachment of Sepoys drove out all the Bhutanese, who were forced to sue for peace through the mediation of the Tashi Lama of Tibet. By the resulting treaty the Raja acknowledged subjection to the East India Company and made over to it one-half of his annual revenues.

Koch, Frederick Henry (b. Sept. 12, 1877, Covington, Ky., U.S.—d. Aug. 16, 1944, Miami Beach), founder of the Carolina Playmakers at the University of North Carolina and considered the father of American folk drama.

Koch received his B.A. from Ohio Wesleyan University in 1900 and his M.A. from Harvard University in 1909. In 1905 he began teaching at the University of North Dakota, forming the Dakota Playmakers in 1910. Called to the University of North Carolina in 1918, he introduced his course in playwriting and created the Playmakers, whose theatre became the first state-subsidized playhouse in America and whose company toured the Southeast presenting folk plays. He also founded and directed a Canadian playwriting school at Banff, Alta.

Koch's work had far-reaching effect. His students, among them Thomas Wolfe, Maxwell Anderson, and Paul Green, testified to his influence, and his ideas and activities were seminal in the Little Theatre movement in the United States and in the increasing respectability of theatre in the academic curriculum. Eleven volumes of folk plays appeared under his editorship.

Koch, Ilsa, byname WITCH OF BUCHENWALD, German HEXE VON BUCHENWALD (b. 1906?, Dresden, Ger.—d. Sept. 1/2, 1967, Aichach, W.Ger.), German wife of the commandant of Buchenwald concentration camp (1939–42), notorious for her perversion and cruelty, who collected lampshades, gloves, and book covers made from the tattooed human skin of dead inmates.

A sometime librarian, she married in 1936 SS Col. Karl Koch, then commander of the Sachsenhausen camp. In 1939 he was transferred to Buchenwald, where she acquired the reputation of a sadist and nymphomaniac, beating prisoners with her riding crop and requiring them to participate in degenerate orgies. Her husband was relieved of command in 1942, and in 1945 he was convicted of corruption and graft and executed by the SS.

In 1947 an Allied military tribunal tried and sentenced Ilsa Koch to hard labour for life, later commuted to four years' imprisonment on the grounds of insufficient evidence. (In prison, in 1947, she had a child, fathered by a prison guard.) In a subsequent trial (1949) before a West German court, she was sentenced anew to life imprisonment. In 1967, one night, she hanged herself with bedsheets tied to her prison bars.

Koch, Johannes: *see* Cocceius, Johannes.

Koch, Martin (b. Dec. 23, 1882, Stockholm—d. June 22, 1940, Hedemora, Swed.), Swedish novelist who was first among the "proletarian authors" to make a deep impression on Swedish readers.

Koch came from a lower middle-class family, which his father deserted when the children were very young. The young Koch worked as a labourer's helper, studied art, and became active in the Good Templars Lodge. His first publication was the novelette *Ellen* (1911). For more than a decade after that, he produced a steady stream of books, the most important of which are his three central novels, *Arbetare, en historia om hat* (1912; "Workers, A Story of Hatred"), *Timmerdalen, en historia om kultur* (1913; "The Timber Valley, A Story of Culture"), and *Guds vackra värld, en historia om rätt och Orätt,* 2 vol. (1916; "God's Beautiful World, A Story of Right and Wrong"). Just before his death a collection of autobiographical tales, *Mauritz* (1939), was published.

Koch, (Heinrich Hermann) Robert (b. Dec. 11, 1843, Clausthal, German free city—d. May 27, 1910, Baden-Baden, Ger.), German physician, one of the founders of the science of bacteriology, who discovered the tubercle bacillus (1882) and the cholera bacillus (1883). He won the Nobel Prize for Physiology or Medicine in 1905.

Early training. Koch attended the University of Göttingen, where he studied medicine, graduating in 1866. He then became a physician in various provincial towns. After serving



Robert Koch
By courtesy of the Nobelstiftelsen, Stockholm

briefly as a field surgeon during the Franco-Prussian War of 1870–71, he became district surgeon in Wollstein, in what was then Germany, where he built a small laboratory. Equipped with a microscope, a microtome (an instrument for cutting thin slices of tissue), and a homemade incubator, he began his study of algae, switching later to pathogenic organisms.

One of Koch's teachers at Göttingen had been the anatomist and histologist Friedrich Gustav Jacob Henle, who, in 1840, published the theory that infectious diseases were caused by living microscopic organisms. In 1850 the French parasitologist Casimir-Joseph Davaine, who was among the first to observe organisms in the blood of persons suffering certain diseases, reported the transmission of anthrax by the inoculation of healthy sheep with the blood of animals dying of the disease and the finding of microscopic rod-shaped bodies in the blood of the dead sheep. Inspired by the work of the French microbiologist Louis Pasteur, Davaine in 1863 showed that it was highly probable that, because the sheep did not become diseased in the absence of these rodlike bodies, anthrax was due to the presence of such organisms in the blood. The natural history of the disease was, nevertheless, far from complete.

Anthrax research. It was at this point that Koch began. He cultivated the anthrax organisms in suitable media on microscope slides, demonstrated their growth into long filaments, and discovered the formation within them of oval, translucent bodies—dormant spores. Koch found that the dried spores could remain viable for years, even under exposed conditions. This finding explained the recurrence of the disease in pastures long unused for grazing, for the dormant spores could, under the right conditions, develop into the rod-shaped bacilli that cause anthrax. The anthrax life cycle, which Koch had discovered, was announced and illustrated at Breslau in 1876, on the invitation of Ferdinand Cohn, an eminent botanist. Julius Cohnheim, a famous pathologist, was deeply impressed by Koch's presentation. "It leaves nothing more to be proved," he said. "I regard it as the greatest discovery ever made with bacteria and I believe that this is not the last time that this young Robert Koch will surprise and shame us by the brilliance of his investigations." Cohn, whose discovery of spores was published earlier in 1876, was also very much impressed and generously helped to prepare the engraving for Koch's epochal paper, which he also published. One of Cohn's pupils, Joseph Schroeter, found that chromogenic (colour-forming) bacteria would grow on such solid substrates as potato, coagulated egg white, meat, and bread and that these colonies were capable of forming new colonies of the same colour, consisting of organisms of the same type. This was the starting point of Koch's pure-culture techniques, which he worked out a few years later. That a disease organism might be cultured outside the body was a concept introduced by Louis Pasteur, but the pure-culture techniques for doing so were perfected by Koch, whose precise and ingenious experiments demonstrated the complete life cycle of an important organism. The anthrax work afforded for the first time convincing proof of the definite causal relation of a particular bacillus to a particular disease.

In 1877 Koch published an important paper on the investigation, preservation, and photographing of bacteria. His work was illustrated by superb photomicrographs. In this paper he described his method of preparing thin layers of bacteria on glass slides and fixing them by gentle heat. Koch also invented the apparatus and the procedure for the very useful hanging-drop technique, whereby microorganisms could be cultured in a drop of nutrient solution on the underside of a glass slide. In 1878 Koch summarized his experiments on the etiology of wound infection. By inoculating animals with material from various sources, he produced six types of infection, each due to a specific microorganism. He then transferred these infections by inoculation through several kinds of animals, reproducing the original six types. In this study, he also observed differences in pathogenicity for different species of hosts and demonstrated that the animal body is an excellent apparatus for the cultivation of bacteria.

Discovery of tubercle bacillus. Koch, now recognized as a scientific investigator of the first rank, obtained a position in Berlin in the German Health Office, where he set up a laboratory in bacteriology. With his collaborators, he devised new research methods. To obtain a pure culture outside the body, Koch mixed the organisms in melted gelatin; then, after solidification of the gelatin and growth of the organisms, portions of pure colonies were placed into separate tubes of broth or other media. Koch also concentrated his efforts on the study of tuberculosis, with the aim of isolating its cause. Although it was known that tuberculosis was due to an infective agent, the organism had not yet been isolated and identified. By modifying the method of staining, the bacillus was discovered and its presence established in preparations of tuberculous material. A fresh difficulty arose when, for some time, it proved impossible to grow the organism in pure culture. But, eventually, Koch succeeded in isolating the organism on a succession of media. Its etiologic role was now established. On March 24, 1882, Koch announced before the Physiological Society of Berlin that he

had isolated and grown the tubercle bacillus, which he believed to be the cause of all forms of tuberculosis.

Meanwhile, Koch's work was interrupted by the appearance of cholera in Egypt and the danger of its transmission to Europe. As member of a German government commission, Koch went to Egypt to investigate the disease; although he soon had reason to suspect a particular comma-shaped bacillus as the specific cause of cholera, he was frustrated by the cessation of the epidemic. Nevertheless, he discovered the cause of amoebic dysentery and the bacilli of two varieties of Egyptian conjunctivitis. Proceeding to India, where cholera is endemic, he completed his task, discovering the cholera organism and its transmission via drinking water, food, and clothing.

Resuming his studies of tuberculosis, Koch investigated what effect an injection of dead bacilli would have on a person who subsequently received a dose of living ones; he concluded that the local reaction produced might prove the means by which the disease could not only be diagnosed but, in the early stages, perhaps even cured. In his studies, he used as the active agent a sterile liquid produced from cultures of the bacillus. But this liquid (tuberculin, 1890) proved disappointing as a curative agent, and, consequently, its importance as a means of detecting a present or past tubercular state was not immediately recognized.

Additional work on tuberculosis came later in Koch's career, but, after the seeming debacle of tuberculin, he was occupied (1891–99) with a great variety of investigations into diseases of man and animals—studies of leprosy, rinderpest, bubonic plague, surra, Texas fever, and malaria. The spread of malaria was still a mystery; Koch had nearly satisfied himself that it was transmitted by mosquitoes when the British bacteriologist Ronald Ross published his findings pointing to the same conclusion.

In 1901 Koch reported work done on the pathogenicity of the human tubercle bacillus for domestic animals. He believed that infection of human beings by bovine tuberculosis is so rare that it is not necessary to take any measures against it. This conclusion was rejected by commissions of inquiry in Europe and America in an extensive and important work that was stimulated by Koch's theory, even though it proved to be partly wrong. But, in most cases, the successful measures of prophylaxis were those firmly laid down by Koch.

Assessment. Not an eloquent speaker, Koch was, nevertheless, by example, demonstration, and precept, one of the most effective of teachers, and his numerous pupils—from the entire Western world and the Orient—were the creators of the new era of bacteriology. His work on trypanosomes was of direct use to the eminent German bacteriologist Paul Ehrlich; this is only one example of Koch's instigation of epochal work both within and beyond his own immediate sphere. His discoveries and his technical innovations were matched by his fundamental concepts of the etiology of disease. He was awarded the Nobel Prize for his tuberculosis research. (L.G.S.)

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Koch, Rudolf (b. Nov. 20, 1876, Nürnberg—d. April 9, 1934, Offenbach, Ger.), German calligrapher, type designer, and teacher who was an important figure in the 20th-century revival of interest in calligraphy.

His father was on the staff of the Bavarian industrial museum, Nürnberg, and Koch went to high school there. As a youth he studied art in the evening while serving as an apprentice in metalworking at Hanau. After an unsuccessful effort to become an art teacher, he moved to Leipzig, an important printing centre. After several jobs and a period as a free-lance designer, in 1906 he joined the Klingspor foundry, Offenbach, an association that continued until his death. Beginning in 1908 he also taught lettering at the newly organized Kunstgewerbeschule (School of Arts and Crafts) in Offenbach. At that time his particular interest was handwritten books, and he produced a number of fine examples. He designed his first typeface shortly before World War I, in which he served as an infantryman.

In 1918 Koch and a few of his students formed a workshop community in which many outstanding calligraphers, including Fritz Kredel and Warren Chappell, were trained.

In addition to his activities in lettering and typography, Koch had a deep interest in handicrafts. In 1919 he made his first woodcuts and shortly afterward began making tapestries and rugs, for which he did the spinning and weaving. He also made objects for use in churches, including altar cloths, candlesticks, and chalices. Among his outstanding typefaces are Maximilian (1913), Neuland (1923), and Kabel (1927).

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Koch Bihār (India): *see* Cooch Behār.

Kochanowski, Jan (b. 1530, Sycyna, Pol.—d. Aug. 22, 1584, Lublin), Humanist poet who dominated the culture of Renaissance Poland and by his poetic style and spirit influenced future generations of Slavic poets.



Kochanowski, marble bust, *c.* 1610; in a private collection

By courtesy of the Muzeum Narodowe W Warszawie

Born to an aristocratic family, Kochanowski studied at the Jagiellonian University in Kraków and later at Padua. On his return to Poland in 1557 he served as royal secretary in Kraków. He married in 1575 and retired to his family estate, Czarnolas.

Kochanowski's first poems, mostly elegies, were written in Latin, but he soon turned to the vernacular. As there was no Polish literary language at that time, he invented his patterns and poetic syntax. His crowning achievement is *Treny* (1580; *Laments,* 1920), 19 poems inspired by the death (1579) of his infant daughter. Kochanowski was also the author of the first Polish tragedy, *Odprawa posłów greckich* (1578; *The Dismissal of the Greek Envoys,* 1918).

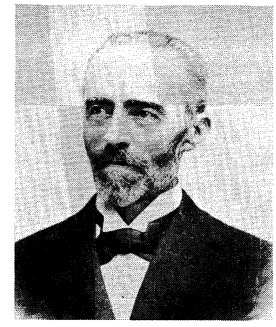
Kochańska, Prakseda Marcelina (singer): *see* Sembrich, Marcella.

Köchel, Ludwig, Ritter von (knight of) (b. Jan. 14, 1800, near Krems, Austria—d. June 3, 1877, Vienna), Austrian botanist and mineralogist who compiled the most complete chronological catalog of Mozart's works, which are identified almost universally by the letter "K." (for Köchel) or "K.V." (*Verzeichnis:* "catalog") and their numerical position in the catalog.

In his publication *Chronologisch-thematisches Verzeichnis* (1862, "Chronological Thematic Catalog"), Köchel numbered all of Mozart's works, including those of doubtful authenticity, to correspond to the chronology of the composer's life. Unlike most other composers, Mozart did not enumerate his works with a consecutive set of opus numbers. Köchel's listings of Mozart's authentic works extend from K. 1 (minuet for piano, 1762) to K. 626 (*Requiem Mass,* 1791). Alfred Einstein's third and definitive revision (1937) of the catalog lists all known, as well as doubtful, works of Mozart with thematic indexes and bibliographic information.

Kocher, Emil Theodor (b. Aug. 25, 1841, Bern—d. July 27, 1917, Bern), innovative Swiss surgeon who won the 1909 Nobel Prize for Physiology or Medicine for his work on the thyroid gland.

During his tenure as professor of surgery (1872–1917) at the University of Bern, Kocher became the first surgeon to excise the thyroid



Kocher, *c.* 1900

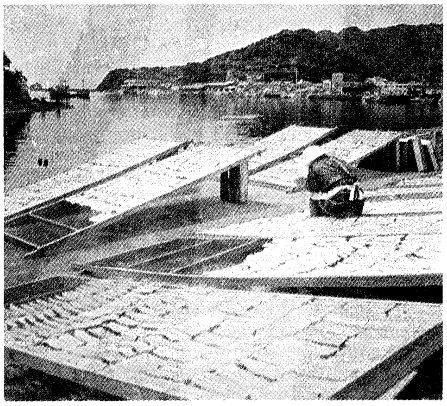
Archiv fur Kunst und Geschichte, West Berlin

gland in the treatment of goitre (1876). In 1883 he announced his discovery of a characteristic cretinoid pattern in patients after total excision of the thyroid gland; when a portion of the gland was left intact, however, there were only transitory signs of the pathological pattern. By 1912 he had performed 5,000 thyroid excisions and had reduced the mortality in such surgery from 18 percent to less than 0.5 percent. His other surgical contributions include a method for reducing dislocations of the shoulder and improvements in operations on the stomach, the lungs, the tongue, the cranial nerves, and for hernia. In surgical practice he adopted the principles of complete asepsis introduced by Joseph Lister.

Kocher devised many new surgical techniques, instruments, and appliances. The forceps and incision (in gallbladder surgery) that bear his name remain in general use. His textbook of operative surgery, *Chirurgische Operationslehre* (1892), was published in many editions and translations.

Kōchi, prefecture (*ken*), southern Shikoku, Japan, stretching in an arc around Tosa-wan (Tosa Bay) of the Pacific Ocean. It is the largest prefecture on the island, with an area of 2,744 sq mi (7,106 sq km). The population is concentrated on the Tosa plain, which, except

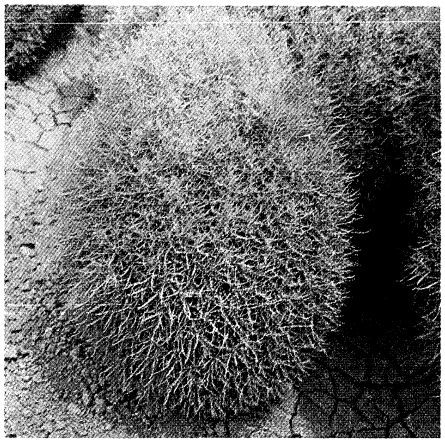
on the south, is surrounded by mountains. Although it is isolated by poor communications, there is a railway from Kōchi, the prefectural capital, to Takamatsu, Kagawa Prefecture, on the Inland Sea, and air service to Ōsaka and Tokyo on Honshu. Chief products



Drying fish at Nakamura port in Kōchi Prefecture, Japan
Imperial Press—FPG/EB Inc.

are agricultural machinery and implements, coral, processed seafood (especially dried bonito), paper, and raw silk. Kōchi city, at the head of Urado-wan, was the capital of former Tosa province. Kōchi Castle, constructed in 1603 and restored in the 18th century after its destruction by fire, is considered one of the most elegant in Japan. Pop. (1983 est.) city, 304,834; prefecture, 835,000.

Kochia, genus of annual plants, of the goosefoot family (Chenopodiaceae), native primarily to Eurasia. The commonly cultivated garden species is summer cypress (*K. scoparia*), sometimes known as standing, or Belvedere,



Burning bush (*Kochia*)
Derek Fell

cypress. The most widely grown variety is the red summer cypress, also called firebush or burning bush (*K. scoparia trichophylla*), an erect, often globe-shaped plant with many branches and untoothed, narrow leaves, often hairy. The leaves may be yellow, red, or green and all turn purplish red in autumn. It is often grown as an ornamental summer hedge.

Kochian Stage, lowermost and oldest major division of the Lower Cretaceous rocks and time in Japan (the Cretaceous Period began about 136,000,000 years ago and lasted about 71,000,000 years). The Kochian Stage precedes the Aritan Stage and is correlated with the lower portions of the Neocomian Stage, the worldwide standard lowermost Cretaceous stage. It is characterized by fossil ammonite cephalopods.

Kochowski, Wespazjan (b. 1633, Gaj, Pol.—d. June 6, 1700, Kraków), Polish poet and historian.

During his years in military service (1650–61), Kochowski fought against the Cossacks and the Swedes. He later became court historian for King John III Sobieski and was present at Sobieski's victory over the Turks at Vienna in 1683. Kochowski developed a deep sense of patriotism, which he best expressed in his epic *Psalmodia polska* (1645; "Polish Psalmody"). The major theme of the 36 psalms of the *Psalmodia* is that of Poland's messianic role in the salvation of the world. Although of minor artistic merit, the psalms inspired the Romantic nationalism dominant in 19th-century Polish literature.

Kock, Charles-Paul de (b. May 21, 1793, Passy, Fr.—d. April 27, 1871, Paris), prolific French author whose discreetly pornographic novels about Parisian life were, in his day, popular reading throughout Europe.

The son of a refugee Dutch banker who was guillotined during the Revolution, Kock became a bank clerk in 1808 but abandoned all thoughts of a business career that same year after publishing, at his own expense, his first book, *L'Enfant de ma femme.* His collected works were published between 1835 and 1844. Among his most successful books were *Georgette* (1820), *Gustave, ou le mauvais sujet* (1821), *La Femme, le mari et l'amant* (1829), and *Moeurs parisiennes* (1837). Kock's novels were composed hurriedly, and his style was careless, but his combination of vigour, coarseness, sense of plot, keen observation, sentimentality, brisk narrative, and descriptive power made his books widely appealing.

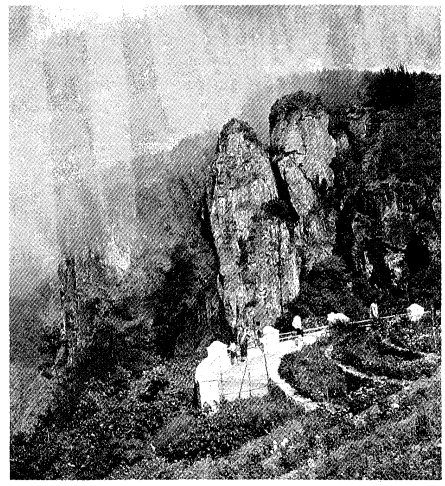
Koçu Bey, in full KURICALI KOÇU MUSTAFA BEY, Kuricali also spelled GÖRICELI, Koçu also spelled KOÇI (b. Korça, Ottoman Empire—d. *c.* 1650, Constantinople), Turkish minister and reformer, a notable early observer of the Ottoman decline. Originally from Albania, Koçu Bey was sent to Constantinople, where he was educated in the Imperial Palace. He later entered the service of a number of Ottoman sultans, finding particular favour with Murad IV (1623–40) and Ibrahim I (1640–48), whose adviser he became. Koçu Bey is best known for his treatise *Risale-i Koçu Bey* ("The Treatise of Koçu Bey"), a brilliant study of the decline of the Ottoman Empire. Written during a period when the empire was beginning to encounter serious problems at home as well as abroad, Koçu Bey's work sheds a great deal of light on the Ottomans' awareness of their plight. Unacclaimed at the time of their writing, this treatise and a similar later one are now regarded by scholars as some of the finest analyses of Ottoman decline.

Kōda Rohan, pseudonym of KŌDA SHIGEYUKI (b. Aug. 20, 1867, Edo, Japan—d. July 30, 1947, Ichikawa, Chiba Prefecture), Japanese novelist and essayist whose stories of heroic characters balanced the more romantic tendency of his rival, Ozaki Kōyō, in creating a new literature for early modern Japan.

Rohan's early education was strong in the Japanese and Chinese classics, and although he was graduated from a technical school in 1884, before long he had turned to a writing career. "Fūryū Butsu" (1889; "The Elegant Buddha"), a poetic tale of mystic ideal love, brought him fame. *Gojū no tō* (1891–92; *The Pagoda,* 1909) deals with the single-minded devotion that enables a simple artisan to accomplish an extraordinary feat. Rohan's aesthetic world emphasized strong will and the powers of imagination. *Sora utsu nami* (1903–05; "Waves Dashing against the Sky"), an uncompleted novel, showed a more realistic tendency. Rohan's interest in history grew through the years, and his last major work, an annotation of the works of the haiku master Matsuo Bashō, was completed the year of his death.

Kodagu (India): *see* Coorg.

Kodaikānal, town, Madurai district, Tamil Nādu state, southeastern India, at an elevation of 7,300 ft (2,225 m) in the Palni Hills. Created



Pillar Rock in the Palni Hills at Kodaikānal, Tamil Nādu, India
Foto Features

in 1845 by U.S. missionaries and British civil servants as a hill station to which administrative offices were moved during the summer, it is a popular resort, known for its scenery, 75-ac (30-ha) artificial lake, and recreational facilities. It also contains a meteorological observatory that engages in astrophysical research. The town serves as a collection and distribution centre for fruits and vegetables, especially potatoes and pears, which are sent to neighbouring cities on the plains. It has schools for foreign and Indian students, and a Jesuit seminary. Pop. (1981) 20,446.

Kodaira, city, Tokyo Metropolis (*to*), Honshu, Japan, in the Musashino Plateau, on the Shinjuku Line (railway). The surrounding area was developed as an agricultural region after the construction of a water supply system in the mid-1600s. The long, rectangular fields were planted with mulberry trees (for silk production) in the early 20th century, and Kodaira grew as a residential suburb of the Tokyo–Yokohama Metropolitan Area after World War II. Industry has since developed, with several factories producing automobile tires and electrical machinery. Pop. (1983 est.) 157,010.

Kodak Company: *see* Eastman Kodak Company.

Kodály, Zoltán (b. Dec. 16, 1882, Kecskemét, Hung.—d. March 6, 1967, Budapest), prominent composer and authority on Hungarian folk music. He was also important as an educator not only of composers but also of teachers and, through his students, contributed heavily to the spread of musical education in Hungary. He was a chorister in his youth at Nagyszombat (now Trnava), Czech., where he wrote his first compositions. In 1902 he studied composition in Budapest. He toured his country in his first quest for folk-song sources in the year before his graduation from Budapest University with a thesis (1906) on the structure of Hungarian folk song. After studying for a short time in Paris with the composer-organist Charles Widor, he became teacher of theory and composition at the Budapest Academy of Music (1907–41).

With Béla Bartók, whom he met in 1906, he published editions of folk songs (1906–21). His folk-song collection formed the basis of

Corpus Musicae Popularis Hungariae (established 1951).

Kodály created an individual style, Romantic in flavour and less percussive than Bartók, that was derived from Hungarian folk music, contemporary French music, and the religious music of the Italian Renaissance. His works, many of which are widely performed, include *Psalmus Hungaricus* (1923), written to celebrate the 50th anniversary of the union of Buda and Pest; *Háry János* (1926), a comic opera; two sets of Hungarian dances for orchestra, *Marosszék Dances* (1930) and *Dances of Galánta* (1933); a *Te Deum* (1936); a concerto for orchestra (1941); *Missa Brevis* (1942); an opera, *Cinka Panna* (1948); *Symphony in C Major* (1961); and chamber music, including two cello sonatas (1909–10; 1915), two string quartets (1908; 1916–17), and *Serenade,* for two violins and viola (1919–20).

Kodály's scholarly writings include *Die ungarische Volksmusik* (1956; *Folk Music of Hungary*), as well as numerous articles for ethnographic and musical journals.

Kodama Gentarō (b. March 16, 1852, Tokuyama, Japan—d. July 23, 1906, Tokyo) Japanese army general and statesman of the Meiji period.

Kodama, born into the samurai class, fought in several battles before enrolling in the Ōsaka Heigakuryō (military training school). He was commissioned in 1881, and, as bureau chief of the General Staff, he upgraded and modernized the army military system. While serving as president of the Army War College, Kodama toured Europe in 1891 to observe Western methods of military training. In 1892 he became vice-minister of war, and in 1898 he was appointed governor-general of Taiwan.

In the fourth cabinet of Itō Hirobumi (1900–01) Kodama served as minister of war. Under Prime Minister Katsura Tarō he retained that position, also serving concurrently as minister of interior and minister of education. During the Russo-Japanese War (1904–05) he was chief of staff for the Japanese forces in Manchuria, and in the following year he became chief of the General Staff.

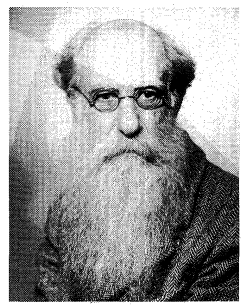
Kodiak bear (*Ursus arctos middendorffi*), variety of grizzly bear found on Kodiak Island, off the coast of Alaska. It is the largest of living land carnivores. *See* grizzly bear.

Kodiak Island, island, southern Alaska, U.S. It lies in the Gulf of Alaska and is separated from the Alaska Peninsula by Shelikof Strait. Kodiak Island is 100 miles (160 km) long and 10–60 miles (16–96 km) wide. It has an area of 3,588 square miles (9,293 square km). Heavily forested in the higher eastern regions and covered with grasses in lower areas, it is primarily hilly (exceeding 5,000 feet [1,500 m] near the eastern coast). The Japan Current (Kuroshio) brings warm, moist weather. The Kodiak National Wildlife Refuge (2,836 square miles [7,345 square km]), established in 1941, covers 75 percent of the island and is the habitat of the huge Kodiak, or Alaskan, brown bear. Main offshore islands are Afognak (north) and the Trinity Islands (south).

Discovered in 1763 by Stephan Glotov, a Russian fur trader, and known as Kikhtak (Eskimo: "Island"), it was renamed Kadiak in 1890 and Kodiak in 1901. The first settlement was made in 1784 by Grigory Shelekhov (Shelikof) at Three Saints Bay, on the island's southeastern part. During the 19th century the island was a base for seal and sea otter hunting and whaling. Russian control ended in 1867 with the U.S. purchase of Alaska. In the early 1900s the U.S. Department of Agriculture established an experimental cattle station, but the eruption (1912) of Novarupta Volcano near Mount Katmai blanketed the island with ash and interrupted agricultural activities. In 1964 a violent earthquake lowered the island by 5 to 6 feet (1.5 to 1.8 m), resulting in seismic waves that caused widespread devastation. The island has since recovered, and dairying, sheep and cattle raising, fishing (based on numerous indented harbours) and canning, fur trapping, and copper mining are the main economic activities.

The city of Kodiak is on Chiniak Bay (northeastern coast). Founded in 1792 by Aleksandr Andreyevich Baranov, manager in America for the Northeastern Company (later the Russian-American Company), it was first known as Pavlovsk Gavan or Paul's Harbor. Its replaced Three Saints Bay in commercial importance when it was chosen as the headquarters of the Russian fur-trading companies because of its good harbour. Prior to World War II, its economy was based upon cattle raising and herring and salmon fishing. After the war shellfish, the king crab, and dairying became additional economic assets. A Coast Guard station is located near the city. Pop. (1986 est.) Kodiak island, 13,800; city, 7,140.

Koechlin, Charles (b. Nov. 27, 1867, Paris, Fr.—d. Dec. 31, 1950, Le Rayol Canadel-sur-Mer, Var), composer and teacher who had a strong impact on his own and younger gen-

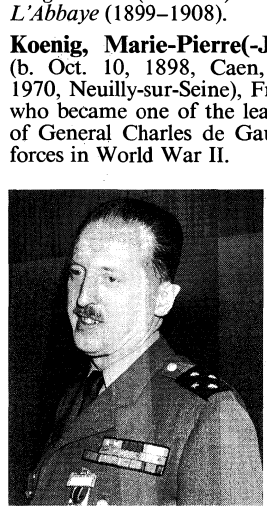


Koechlin
H. Roger-Viollet

erations of French composers, including the group called "Les Six" by critic Henri Collet.

Influenced by Jules Massenet, Gabriel Fauré, and André Gédalge, under whom he studied, Koechlin experimented with the techniques of polytonality (the use of two or more keys simultaneously) and of atonality and serialism, both of which abandon traditional tonality. Much of his music has a strong flavour of music written in the medieval modes. His writings include treatises on modal polyphony, harmony, and orchestration, and an essay on polytonal and atonal music. His works range from songs, piano works, and chamber music to symphonic and choral works, film music, and ballet. They include songs and symphonic poems on episodes from Rudyard Kipling's *Jungle Book* (1925–39) and the choral work *L'Abbaye* (1899–1908).

Koenig, Marie-Pierre(-Joseph-François) (b. Oct. 10, 1898, Caen, Fr.—d. Sept. 2, 1970, Neuilly-sur-Seine), French army officer who became one of the leading commanders of General Charles de Gaulle's Free French forces in World War II.



Koenig
By courtesy of the French Embassy Press and Information Division, New York

After active duty during World War I and later in North Africa, Koenig campaigned in Norway and France during the early part of World War II. Evacuated to England in June 1940, he joined de Gaulle's movement and rose steadily in the Free French forces, distinguishing himself in the conquest of Gabon in 1940 and in the defense of Bir-Hakeim against the Germans in North Africa in 1942. He then served as assistant army chief of staff and as French delegate to General Dwight D. Eisenhower's headquarters. In June 1944 he became head of the French Forces of the Interior, the anti-German Resistance army in occupied France. He had become commander of the French army in Germany by the end of the war. Koenig became inspector general in North Africa in 1949 and then vice president of the Supreme War Council in 1950. Retired soon after, he was elected to the National Assembly as a Gaullist deputy and served two short terms as defense minister (1954 and 1955).

Koepang (Indonesia): *see* Kupang.

Koerber, Ernest von (b. Nov. 6, 1850, Trent, Austria [now Trento, Italy]—d. March 5, 1919, Baden, near Vienna, Austria), statesman and prime minister of Austria from 1900 to 1904, who engaged in an ambitious economic expansion program for the Habsburg monarchy but fell because he could not resolve the crisis between Czech and German nationalists in Bohemia.

Entering the Austrian administration in 1874, Koerber rose steadily and became prime minister and minister of the interior in 1900. Unable to obtain a majority in Parliament, he governed by emergency decrees. A popular figure, he encouraged industry and commerce and introduced laws guaranteeing individual rights. Nationality crises in Bohemia and Hungary, however, caused his fall in 1904. During World War I he served as joint Austro-Hungarian minister of finance and, from October to December 1916, again as Austrian prime minister.



Ernest von Koerber
By courtesy of the Bild-Archiv Osterreichische Nationalbibliothek, Vienna

Koerber, Leila Marie (American actress): *see* Dressler, Marie.

Koestler, Arthur (b. Sept. 5, 1905, Budapest, Hung.—death reported on March 3, 1983, London, Eng.), Hungarian-born British novelist, journalist, and critic, best known for his novel *Darkness at Noon* (1940).

Koestler attended the University of Vienna before entering journalism. Serving as a war correspondent for the British newspaper *News Chronicle* during the Spanish Civil War, Koestler was imprisoned by the fascists, an experience he recounted in *Spanish Testament* (1937). This experience and those leading to his break with the Communist Party are reflected in *Darkness at Noon.* Published in 30 languages, it is the penetrating story of an old-guard Bolshevik who, during Stalin's

purge trials of the 1930s, first denies, then confesses to, crimes that he has not committed. Specifically dealing with the plight of an aging revolutionary who can no longer condone the excesses of the government he helped put in power, the novel is an examination of the moral danger inherent in a system that sacrifices means to an end. Other works of this period, during which he wrote most of his fiction, include *The Gladiators* (1939) and *Arrival and Departure* (1943). These books deal with similar questions of morality and political responsibility. Memorable essays are in *The Yogi and the Commissar and Other Essays* (1945); in the collection *The God That Failed* (1949; ed. R. Crossman), he wrote of his disillusionment with Communism. From 1940 Koestler wrote in English. He became a British citizen in 1948.

Koestler took stock of his early life in the memoirs *Arrow in the Blue* (1952) and *The Invisible Writing* (1954). His later works were concerned with science, creativity, and mysticism. *The Act of Creation* (1964), perhaps the best known book of his scientific and philosophical period, attempts to explain the processes underlying creativity in science and art. Other works of this period include *The Lotus and the Robot* (1960), an examination of Eastern mysticism; *The Ghost in the Machine* (1967), which discusses the effect of evolution on the structure of the human brain; and *The Thirteenth Tribe* (1976), a controversial study of the origins of the Jewish people. *Bricks to Babel,* a collection of his writings with new commentary by the author, was published in 1981.

In his later years, Koestler suffered from leukemia and Parkinson's disease. Believers in voluntary euthanasia, he and his wife Cynthia took their own lives.

Koetai (Indonesia): *see* Mahakam River.

Kōetsu (Japanese painter): *see* Hon'ami Kōetsu.

Koffka, Kurt (b. March 18, 1886, Berlin—d. Nov. 22, 1941, Northampton, Mass., U.S.), German psychologist and cofounder, with Wolfgang Köhler and Max Wertheimer, of the Gestalt school of psychology.



Koffka, *c.* 1928

By courtesy of Smith College Archives, Northampton, Mass.

Associated with the University of Giessen (1911–24), Koffka served as a subject (1912), along with Köhler, in experiments on perception conducted by Wertheimer. Their findings led Koffka, Wertheimer, and Köhler to stress the holistic approach that psychological phenomena cannot be interpreted as combinations of elements: parts derive their meaning from the whole, and people perceive complex entities rather than their elements.

Koffka conducted a great amount of experimental work, but perhaps he is best known for his systematic application of Gestalt principles to a wide range of questions. One of his major works, *Die Grundlagen der psychischen Entwicklung* (1921; *The Growth of the Mind,* 1924), applied the Gestalt viewpoint to child psychology and argued that infants initially experience organized wholes in the barely differentiated world about them. He first addressed U.S. psychologists directly in an article, "Perception: An Introduction to the Gestalt Theory" (1922).

In 1924 Koffka began a series of visits to several U.S. universities, and in 1927 he was appointed professor of psychology at Smith College, where he remained for the rest of his life. A major work, *Principles of Gestalt Psychology* (1935), dealt with a wide range of applied psychology but contributed mainly to the study of perception, memory, and learning.

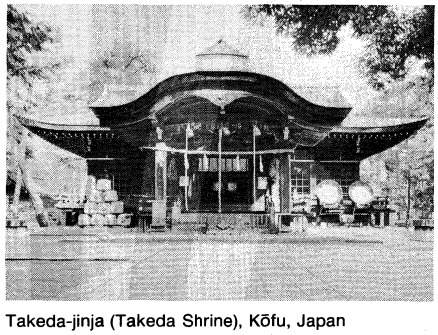
Köflach, town, *Bundesland* Steiermark (federal province of Styria), southern Austria, west of Graz. Although it received market rights in 1170, Köflach did not achieve town status until 1939. It is a rail terminus and has glass and porcelain works. Important lignite (brown coal) mines are nearby, and the Lipizzaner horses (originating from the former Austrian imperial stud at Lipizza, near Trieste) for the Winter Riding School in Vienna are bred at Piber, 2¼ mi (4 km) northeast. Pop. (1981) 12,009.

Kofoid, Charles Atwood (b. Oct. 11, 1865, Granville, Ill., U.S.—d. May 30, 1947, Berkeley, Calif.), U.S. zoologist whose collection and classification of many new species of marine protozoans helped establish marine biology on a systematic basis.

He was graduated from Harvard University (1894) and in 1900 began a long affiliation with the University of California at Berkeley; he became a full professor in 1910, and for most of the time until his retirement in 1936 he served as head of the department of zoology. He played an important part in the establishment of the Marine Biological Station at San Diego (now the Scripps Institution of Oceanography at La Jolla), serving as assistant director from 1907 to 1923. He is best known for his work on the dinoflagellates and tintinnids two important groups of planktonic protozoans. To collect these organisms, he invented two pieces of equipment that bear his name, the Kofoid horizontal net and the Kofoid self-closing bucket.

Koforidua, town, capital of Eastern Region, Ghana, West Africa, in the Densu River basin. Near the southeastern base of the Kwahu Plateau, the town is one of the country's oldest cocoa-producing centres. With the completion in 1923 of the Accra–Kumasi railway, it became an important road and rail junction. As cocoa production has moved westward to areas of virgin soil, Koforidua has become increasingly dependent upon its commercial and administrative functions. Industry is minor, though granite is available nearby for quarrying. Pop. (1982 est.) 69,309.

Kōfu, capital, Yamanashi Prefecture (*ken*), Honshu, Japan, in the fertile Kōfu-bonchi (Kōfu Basin), west of Tokyo. Long a centre of sericulture, the city adjusted to the decline in silk demand by producing other textiles,



Takeda-jinja (Takeda Shrine), Kōfu, Japan

Photos Pack—EB Inc.

increasing viticulture, and developing nearby hot springs. Locally mined rock crystal became the basis of a jewelry industry, but most rock crystal is now imported. The city houses the Shintō Takeda-jinja (Takeda Shrine). Pop. (1983 est.) 199,788.

Kofun (Japanese history): *see* Tumulus period.

Koga, city, Ibaraki Prefecture (*ken*), Honshu, Japan, at the confluence of the Omoi-gawa (Omoi River) and the Watarase-gawa. An important river port, Koga was a castle town and post town on the Nikkō-kaidō (Nikkō Highway) in the Tokugawa era (1603–1867). It became a major trade centre for the surrounding agricultural region after the opening of the Tōhoku Main Line railway in 1891. Silk manufacture, which was introduced in the late 19th century, has given way to heavier industries introduced from the Keihin Industrial Zone. Pop. (1980) 56,657.

Kogaku, one of three schools of Neo-Confucian studies that developed in Japan during the Tokugawa period (1603–1868). *See* Neo-Confucianism.

Kogălniceanu, Mihail (b. Sept. 6, 1817, Iaşi, Moldavia—d. July 1, 1891, Paris), Romanian statesman and reformer, one of the founders of modern Romanian historiography, who became the first premier of the nation of Romania formed by the union of the Danubian principalities Moldavia and Walachia.

In 1840 he undertook the publication of a national literary review (*Dacia literară*) and a scientific periodical devoted to history (*Arhiva românească*), and between 1845 and 1852 he published a three-volume edition of the ancient Moldavian chronicles. In 1843 his lectures in Romanian history delivered at Iaşi were suppressed by the Russian-Turkish government for their nationalistic content; and in 1848, after the publication of his nationalist pamphlet "The Wishes of the National Party in Moldavia," he was forced to seek temporary refuge in Bukovina (then belonging to Austria). A leader in the fight for unification of Moldavia and Walachia, he also distinguished himself as the champion of popular rural reform.

Kogălniceanu was appointed prime minister under the first prince of united Romania, Alexandru Ion Cuza, in October 1863. In that office he helped carry out the expropriation of monastic properties, the great land and social reforms of the Agrarian Law of 1864, and other reformist measures. Disagreements with the Prince and the landed aristocracy, however, led to his resignation in February 1865. From 1876 to 1880 he held office as foreign minister and represented Romania at the Congress of Berlin (1878–79). Thereafter he served at the Romanian legation in Paris.

Koganei, city, Tokyo Metropolis (*to*), Honshu, Japan, on the Chūō Main Line railway, west of Tokyo city. During the mid-Tokugawa era (1603–1867) several settlements were established in the area. The opening of the Musashi–Koganei Line railway station in 1926 prompted increased construction of housing and educational facilities. After World War II the population increased rapidly, and Koganei became a residential suburb of the Tokyo–Yokohama Metropolitan Area. The former military base northwest of the city contains a collective housing area, a research institute, and such higher educational institutions as the Tokyo University of Liberal Arts. Pop. (1983 est.) 103,387.

Køge, city, Roskilde *amtskommune* (county), eastern Sjælland (Zealand), Denmark, on Køge Bugt (bay) of The Sound (Øresund). First mentioned in the 11th century (chartered 1288), it became a market centre and base for herring fisheries in the late 13th century. In 1677 Adm. Niels Juel won a great

naval victory over the Swedes in the bay. Medieval remains include St. Nicholas Church (1324, rebuilt *c.* 1500), from the tower of which captured Wendish pirates ("Køge's Chickens") were hanged in the 14th century; the town hall (1570); and many old timbered houses (the oldest dates from 1527), one of which is the city museum. The Renaissance castle of Vallø, 4 miles (6 km) southeast, has, since 1738, served as a unique institution for elderly unmarried ladies of the nobility. Køge is also a popular bathing resort. Industries include rubber and paint factories and sawmills and chemical works. Pop. (1985 est.) 35,518.

kogok (jade ornament): *see* magatama.

Koguryŏ, the largest of the three kingdoms into which ancient Korea was divided until 668. Koguryŏ is traditionally said to have been founded in 37 BC in the Tongge River basin of northern Korea by Chu-mong, leader of one of the Puyŏ tribes native to the area, but modern historians believe it is more likely that the tribal state was formed in the 2nd century BC.

By the reign of King T'aejo (AD 53–146) a royal hereditary system had been established. With the promulgation by King Sosurim (reigned 371–384) of various laws and decrees aimed at centralizing royal authority, Koguryŏ emerged as a full-fledged aristocratic state. Its territory was extended greatly during the reign of King Kwanggaet'o (391–412) and further by Changsu (reigned 413–491). The entire northern half of the Korean peninsula, the Liaotung Peninsula, and a considerable portion of Manchuria (Northeast Provinces) were under Koguryŏ rule during the kingdom's peak period.

The central bureaucracy had 12 grades, with a *tae-daero* (prime minister) at the top who was elected by his fellow officials every three years. The officials ruled through a series of military garrisons erected at strategic points throughout the state.

As a result of Chinese influence, Buddhism was introduced in AD 372 as an ideological backing for the newly developed centralized bureaucracy, and, at about the same time, Confucian education began to be emphasized as a means of maintaining the social order. Taoism was also widespread in the later years. The numerous surviving tomb paintings give a good picture of the life, ideology, and character of the Koguryŏ people.

With the establishment of the unified Sui (581–618) and T'ang (618–907) dynasties in China, Koguryŏ began to suffer incursions from China. The kingdom was defeated in 668 by the allied forces of the southern Korean kingdom of Silla and the T'ang dynasty, and the entire peninsula came under the Unified Silla dynasty (668–935).

Koguryŏ style, Korean visual-arts style characteristic of the Koguryŏ kingdom (37 BC–AD 668) of the Three Kingdoms period. The Koguryŏ were a horse-riding northern people, and their art was powered by the forceful spirit of a hunter–warrior tribe. Their fresco paintings on the walls of tombs are characterized by movement and emotion rather than formal beauty and decorative visual effect. Outlines are bold and forceful to heighten the effect of movement and animation.

Buddhist sculpture tended to develop a schematic approach to emphasize a spiritual, expressive quality during the late Koguryŏ period. As a whole, Koguryŏ art is powerful and emotional compared with the arts of the two southern kingdoms, Silla and Paekche.

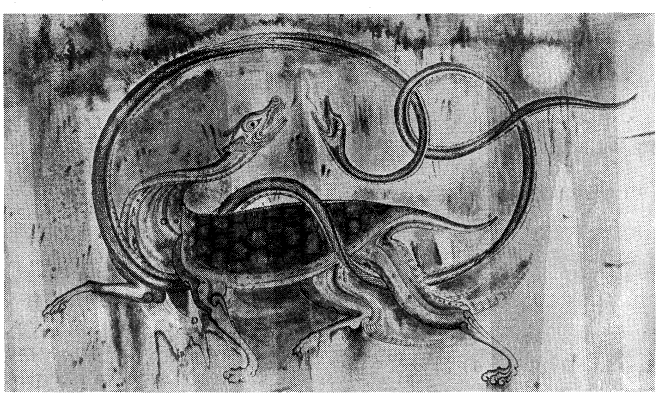
Koh Hui-dong (b. 1886, Korea—d. 1965, Korea), Korean artist who pioneered in the application of Western techniques to traditional painting styles. After World War II he became a member of the South Korean government of Syngman Rhee.

Born into a high-ranking aristocratic family, Koh in 1908 became the first Korean student to go to Japan to learn the new Western art of oil painting. After his return, however, he found that this new technique had not gained wide acceptance in his native land, and, to avoid the constant criticism directed at his work, he resumed painting in the traditional style, showing the influence of oil technique, however, in his use of shading and interplay of light and shadow.

In 1945 Koh became the chairman of the Korean Association of Artists, and in 1955 he was elected chairman of the Korean Academy of Arts. His political work soon overshadowed his artistic concerns, and in 1960 he became a minister of the House of Councillors. After a coup overthrew Syngman Rhee the following year, however, he retired from politics.

Koh-i-noor, also spelled KŪH-E NŪR, the diamond with the longest history for an extant stone, though its early history is controversial. Originally a lumpy Mughal-cut stone that lacked fire and weighed 191 carats, it was recut to enhance its fire and brilliance to a 109-carat, shallow, oval brilliant in 1852 at Garrards of London, with indifferent results.

According to some experts, Sultan ʿAlāʾ-ud-Dīn Khaljī is credited with having taken the jewel in 1304 from the Raja of Malwa, India, whose family had owned it for many generations. Other writers have identified the Koh-i-noor (meaning "mountain of light") with the diamond given to the son of Bābur, the founder of the Mughal dynasty in India, by the Raja of Gwalior after the battle of Panipat in 1526. Still others have contended that it came originally from the Kollur mine of the Krishna River and was presented to the Mughal emperor Shāh Jahān in 1656. Some claim that the stone was cut from the Great Mogul diamond described by the French jewel trader Jean-Baptiste Tavernier in 1665, but the Koh-i-noor's original lack of fire and shape make that unlikely.



Koguryŏ tomb painting of a tortoise and a serpent from U-hyonni, fresco, 6th century

By courtesy of the National Museum of Korea, Seoul

In any case, it most likely formed part of the loot of Nāder Shāh of Iran when he sacked Delhi in 1739. After his death it fell into the hands of his general, Aḥmad Shāh, founder of the Durrānī dynasty of Afghans. His descendant Shāh Shojāʿ, when a fugitive in India, was forced to surrender the stone to Ranjit Singh, the Sikh ruler. On the annexation of the Punjab in 1849, the Koh-i-noor was acquired by the British and was placed among the crown jewels of Queen Victoria. It was incorporated as the central stone in the queen's state crown fashioned for use by Queen Elizabeth, consort of George VI, at her coronation in 1937.

Kohala Mountains, volcanic range, northern Hawaii Island, Hawaii, U.S., extending 21 miles (34 km) north from Waimea to Upolu Point and reaching a high point at Kaunu-o-Kaleoohie (5,505 feet [1,678 m]). A rift valley ½ mile wide and 3 miles long crosses the summit; its dome, 22 miles long and 15 miles wide, covers an area of 234 square miles (606 square km). The younger western slopes have a thin soil covering, in contrast with the eastern slopes. Erosion has carved the deep Pololu and Waipio valleys, where sea cliffs are 1,200 feet high and soil is often 20 feet deep. The southern slopes have been buried under later Mauna Kea lavas forming the Waimea Plateau (2,875 feet [876 m]). The Kohala Ditch (*c.* 1920) tunnels water along the mountaintops to the northern sugarcane fields.

Kohāt, town, south-central North-West Frontier Province, Pakistan. The town lies just north of the Kohāt Toi River at the entrance to the Kohāt Pass, through which a military road was opened in 1901. The new town lies at some distance from the original 14th-century town, traditionally said to have been founded by the Buddhist raja Kohāt. It is connected by rail with Thal and the main rail (Peshāwar–Karāchi) line via Jand, across the Indus River, and by road with Peshāwar (30 miles [50 km] north), Rāwalpindi, and Bannu. Products manufactured in Kohāt include *lungīs* (cotton loincloths), turbans, textiles, shoes, and leather goods. Incorporated as a municipality in 1873, it has a hospital, a library, and a government college affiliated with the University of Peshāwar.

Much of the surrounding region is watered by the Tanda Dam project (1967), on the Kohāt Toi, near Kohāt. This project provides for the irrigation of 21,000 acres (8,500 hectares) under wheat and *bājrā* (pearl millet). Camels and goats are also bred extensively in the region. Inhabited by Bangash and Khaṭak Pashtun peoples from the 14th and 15th centuries, the area was briefly occupied by the Sikhs, annexed by the British in 1849, and became part of Pakistan in 1947. Pop. (1981 prelim.) town, 78,000.

kohen (Judaism): *see* cohen.

kohen gadol: *see* high priest.

Kohistān (Persian and Urdu: "Country of the Hills," or "Highlands"), section of mountainous or hilly tracts in Pakistan and Afghanistan.

In the North-West Frontier, Kohistān is that sparsely populated area of Pakistan which lies west of Chilas in Kashmir and the Kāgān Valley. The eastern part is known as Indus Kohistān (for the Indus River) and the western part, divided between Swāt Kohistān (also called Kālām) and Dīr Kohistān, extends across the northern part of the state to the Afghanistan border. The area comprises mountain ranges in the outer reaches of the Himalayas that are snowbound above 12,000 feet (3,700 m); forest- and grass-covered hills (5,000–6,000 feet); and the fertile Indus valleys. The inhabitants of this region are peoples of Turco-Iranian origin, including Pashtun tribes. Live-

stock (mainly sheep and goats) are raised, and grains and vegetables are grown.

Sind Kohistān, in the west of Sind province, Pakistan, is a barren hilly tract, consisting of outlying spurs of the Kīrthar Range. Cultivation is possible only along the numerous hill streams (*nalas*) that carry water during the rains. Cattle grazing is the principal occupation.

Afghan Kohistān (Kūhestān), in part highly cultivated, lies north-northeast of Kābul and extends to the Hindu Kush (mountains).

Kohl, Helmut (b. April 3, 1930, Ludwigshafen am Rhein, Ger.), chancellor of the Federal Republic of Germany from October 1982. He presided over the integration of East Germany into the Federal Republic on Oct. 3, 1990, and thus became the first chancellor of a unified Germany since 1945.

Kohl grew up in a conservative Roman Catholic family. As a teenager in wartime Germany, he was drafted and sent to basic training; but the war ended before he had to fight. His interest in politics manifested itself early: in 1947 he began working in a Christian Democratic Union (CDU) youth organization in his native town. Kohl earned a doctorate in political science at Heidelberg University (1958). He was elected in 1959 to the Rhineland-Palatinate state legislature and in 1969 to the state's post of minister president (prime minister), and he soon developed a reputation as a capable administrator. He also became the CDU's national deputy chairman in 1969, and he was elected chairman of the party in 1973.

Kohl entered the 1976 federal elections as the chancellor candidate of the CDU and its Bavarian sister party, the Christian Social Union (CSU), which was led by Franz-Josef Strauss. The coalition narrowly lost to the Social Democratic Party (SDP). SDP chairman Helmut Schmidt retained the chancellorship by virtue of a coalition of his party with the small Free Democratic Party (FDP). In the general election of 1980, Kohl yielded to Strauss as the coalition's candidate for chancellor, but Strauss lost decisively. Within two years disagreements with Schmidt's policies prompted many FDP members of the Bundestag (parliament) to desert the alliance. The combined forces of the CDU, the CSU, and the FDP defectors passed a vote of no confidence against Schmidt on Oct. 1, 1982, and immediately forced him from office by giving Kohl the required absolute majority in the ensuing vote for a new chancellor.

Kohl and the CDU-CSU-FDP coalition easily won the national elections held on March 6, 1983. Kohl was reelected in elections held on Jan. 25, 1987, though popular backing for the CDU-CSU coalition reached its lowest point since 1949. His government followed centrist policies that included modest cuts in government spending and strong support for West German commitments to NATO.

As the Soviet Union abandoned its control over eastern Europe in 1989–90, Kohl was in the forefront of those calling for the speedy reunification of West and East Germany, which came about in October 1990. In December 1990, in the first all-German parliamentary elections following reunification, Kohl's alliance won.

Köhler, Georges J.F. (b. April 17, 1946, Munich, Ger.), German immunologist who in 1984, with César Milstein and Niels K. Jerne, received the Nobel Prize for Physiology or Medicine for his work in developing the technique for producing monoclonal antibodies—pure, uniform, and highly sensitive substances used in diagnosing and combating a number of diseases.

Köhler obtained his doctoral degree in biology (1974) from the University of Freiburg in West Germany. From 1974 to 1976 he worked with Milstein at the Medical Research Council's molecular research laboratory in Cambridge, Eng. Together, in 1975, they discovered the technique for which they are known. Köhler worked at the Basel Institute of Immunology from 1976 to 1984, and in 1984 he was appointed one of three directors of the Max Planck Institute of Immune Biology in Freiburg.

Kohler, Josef (b. March 9, 1849, Offenburg, Baden [Germany]—d. Aug 3, 1919, Charlottenburg, Berlin), German jurist who made a significant contribution to the philosophy of law and helped to advance the study of the comparative history of law.

Kohler was educated at the universities of Heidelberg and Freiberg and became a doctor of laws in 1873. A year later he was appointed judge at Mannheim. In 1888 he obtained the post of professor at Berlin. Kohler was an early representative of the sociological school of jurisprudence, which focused on the social purpose of law. His major work, *Lehrbuch der Rechtsphilosophie* (1908; *Philosophy of Law*), was a study of the theory of justice, based on G.W.F. Hegel's philosophy of history. In addition to his philosophical and historical concerns, Kohler also wrote extensively on German copyright and patent law. He was the author of several volumes of poetry, a novel, and essays on the history of art.

Kohler, Kaufmann (b. May 10, 1843, Fürth, Bavaria [Germany]—d. Jan. 28, 1926, New York, N.Y., U.S.), German-American rabbi, one of the most influential theologians of Reform Judaism in the United States.

Although his upbringing and early schooling were Orthodox, Kohler was strongly affected by the teachings of Abraham Geiger (1810–74), one of the most prominent German leaders of Reform, the branch of Judaism that takes a broad, liberal attitude toward ritual and custom. Kohler's quest for the reconciliation of traditional faith with modern knowledge is reflected in his doctoral dissertation, *Der Segen Jacobs* (1867; "Jacob's Blessing"), on the story of Jacob found in chapter 49 of the Book of Genesis. The radicalism of this thesis, one of the earliest examples of the higher criticism of the Bible (analyzing Scripture in light of modern knowledge), excluded Kohler from the Jewish pulpit in Germany. He emigrated to the United States and was welcomed by the eminent Reform rabbi David Einhorn, whose daughter he married. He then became rabbi of Reform congregations in Detroit (1869–71), Chicago (1871–79), and, finally, New York City (1879–1903).

In 1885 Kohler convened the Pittsburgh rabbinical conference, which adopted a platform drafted by him. This platform, setting forth Reform positions on such topics as the idea of God, the Jewish mission, and social justice, remains the classic expression of Reform principles and is a landmark in the history of American Judaism.

From 1901 to 1906 Kohler served as a department editor of the monumental *Jewish Encyclopedia,* to which he contributed some 300 articles, including the principal ones on theological subjects. In 1903 he became president of the eminent Reform institution Hebrew Union College-Jewish Institute of Religion) in Cincinnati, Ohio, a position he retained until 1921. It was during this period that he wrote his most profound work, *Jewish Theology Systematically and Historically Considered* (1918). Prior to Kohler's work, the philosophical literature of the European Middle Ages and the rabbinical writings were the only available materials to serve the needs of the student. Kohler's book methodically and succinctly sets forth the teachings of Jewish theology. Although Reform principles are promulgated, Orthodox and Conservative concepts are also sympathetically treated.

A posthumous work, *The Origins of the Synagogue and the Church* (1929), concerns the relationship of the Jews and the early Christians and speculated that Jesus and John the Baptist were Essenes—members of a Jewish sect that believed that the messianic era was imminent.

Köhler, Wolfgang (b. Jan. 21 [Jan. 9, Old Style], 1887, Tallinn, Estonia, Russian Empire [now Estonian S.S.R.]—d. June 11, 1967, Enfield, N.H., U.S.), German psychologist and a key figure in the development of Gestalt psychology, which seeks to understand learning, perception, and other components of mental life as structured wholes.

Köhler's doctoral thesis at Friedrich Wilhelm University, Berlin (1909), was an investigation of hearing. As assistant and lecturer at the University of Frankfurt (1911), he continued his auditory research, which was often cited. In 1912 he and Kurt Koffka were subjects for important experiments on perception conducted by Max Wertheimer, whose report on the experiments launched the Gestalt movement. Thereafter Köhler was associated with Wertheimer and Koffka as the three endeavoured to gain acceptance for the new theory.

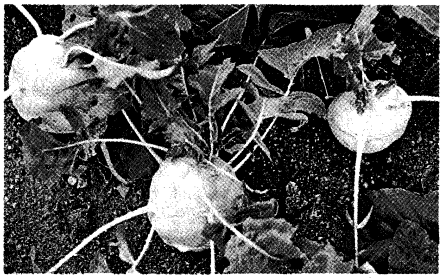
As director of the anthropoid research station of the Prussian Academy of Sciences at Tenerife, Canary Islands (1913–20), Köhler conducted experiments on problem-solving by chimpanzees, revealing their ability to devise and use simple tools and build simple structures. His findings appeared in the classic *Intelligenzprüfungen an Menschenaffen* (1917; *The Mentality of Apes*), a work that led to a radical revision of learning theory. Another major work, *Die physischen Gestalten in Ruhe und im stationären Zustand* (1920; "Physical Gestalt in Rest and Stationary States"), was based on an attempt to determine the relation of physical processes in nervous tissue to perception.

In 1921 Köhler became head of the psychological institute and professor of philosophy at the University of Berlin, directing a series of investigations that explored many aspects of Gestalt theory and publishing *Gestalt Psychology* (1929). Outspoken in his criticism of the Hitler government, he went to the United States in 1935 and was professor of psychology at Swarthmore College, Swarthmore, Pa., until 1955.

Kohlhase, Hans (b. *c.* 1500, Tempelberg, near Fürstenwalde, Brandenburg [Germany]—d. March 22, 1540, Berlin), German merchant turned brigand who spent the later 1530s in a feud with Saxony, causing considerable disruption until he was captured and executed.

While Kohlhase was on his way to the Leipzig fair in 1532, two of his horses were confiscated by a Saxon nobleman. Unable to obtain redress from Saxon courts, Kohlhase two years later issued a public challenge not only to the aggressor but to all of electoral Saxony. For the next six years he and the band that he had collected terrorized the border region between Saxony and Brandenburg. The elector of Saxony set a price on the head of Kohlhase, who, however, was always able to find sanctuary in Brandenburg. His downfall came when he also began operating in Brandenburg. Captured by the elector Joachim II in 1540, he and his principal associate were broken on the wheel in Berlin. Heinrich von Kleist celebrated Kohlhase—the man whom denial of justice turned to crime—in the story *Michael Kohlhaas* in 1810.

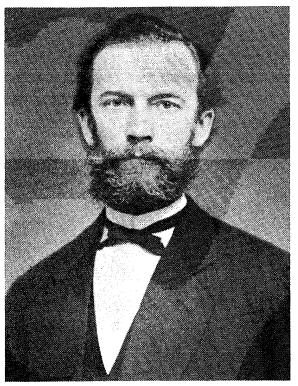
kohlrabi (*Brassica oleracea,* Gongylodes group), form of cabbage of the mustard family (Brassicaceae), first described in the 16th century, of European origin. Its most distinctive feature is the greatly enlarged stem just above



Kohlrabi (*Brassica oleracea*)
W.H. Hodge

the soil. It is best harvested for food when this enlargement is 5–6 centimetres (2–2.5 inches) in diameter. At this stage the enlargement is globular to slightly flattened, but if allowed to become old it becomes elongated. The flesh resembles that of the turnip but is sweeter and milder. Kohlrabi is not widely grown commercially but is popular in some regions as a kitchen garden vegetable; in Europe it is grown for stock feed. The young tender leaves may be eaten as greens; the thickened stem is served as a cooked vegetable.

Kohlrausch, Friedrich Wilhelm Georg (b. Oct. 14, 1840, Rinteln, Ger.—d. Jan. 17, 1910, Marburg), German physicist who investigated the properties of electrolytes (substances that conduct electricity in solutions by transfer of ions) and contributed to the understanding of their behaviour.



Kohlrausch
Bavaria-Verlag

Kohlrausch served as professor of physics at the University of Göttingen and at the School of Technology, Frankfurt am Main. In 1874 he demonstrated that an electrolyte has a definite and constant amount of electrical resistance. By observing the dependence of conductivity upon dilution, he could determine the transfer velocities of the ions (charged atoms or molecules) in solution. He became professor of physics at the University of Würzburg in 1875 and at the University of Berlin in 1895.

Kohlu, agency, a special tribal area attached to Sibi division, Baluchistan province, Pakistan. The agency is located in a semi-arid mountainous region; the ranges rise in a series of terraces west of the Sulaimān Range. The vegetation is mostly thorny scrub, including acacia trees. The bulk of the population consists of nomads of the Baluchi tribe who raise sheep and goats for their livelihood. The agency is accessible by four-wheel-drive vehicles from Dera Bugti in Sibi district. Pop. (1981 prelim.) 178,000.

Kohn, Fritz Nathan: *see* Kortner, Fritz.

Kohtla-Järve, Russian KOKHTLA-YARVE, city, Estonian Soviet Socialist Republic, near the Gulf of Finland. Founded in 1900 and incorporated in 1946, it lies on the Tallinn–Leningrad road and railway. Its principal industry is the processing of oil shales based on local deposits; shale gas pipelines were constructed to Leningrad in 1948 and to Tallinn in 1953. A related chemical industry in the city produces diverse petroleum products, and Kohtla-Järve also has a fertilizer plant. Pop. (1982 est.) 75,000.

Kohut, Alexander (b. April 22, 1842, Felegyhaza, Hung.—d. May 25, 1894, New York City), Hungarian-born U.S. rabbi and scholar who wrote a monumental Talmudic lexicon and helped found the Jewish Theological Seminary of America.

In 1865 Kohut assumed his first rabbinical pulpit, the beginning of a lifelong career as a rabbi. Excelling in Hungarian language and literature, he was appointed in 1867 to be superintendent of that nation's schools, the first Jew to hold that position. In 1872 he was elected chief rabbi of Fünfkirchen, Hung., where he remained for eight years.

In the meantime, Kohut began work on his dictionary of the Talmud, the rabbinical compendium of law, lore, and commentary. As the basis of his work, he chose to revise the classic *'Arukh* ("Lexicon"), a Hebrew and Aramaic dictionary compiled by Nathan ben Yehiel, a medieval Italian Hebrew lexicographer. Kohut worked on his magnum opus for some 25 years. During this period, he emigrated to the U.S. (in 1885), where he became rabbi of a congregation in New York. In 1886, with Rabbi Sabato Morais, he helped found the Jewish Theological Seminary of America in New York City and taught Talmudic studies there until his death. In 1892 the last volume of his *'Arukh ha-shalem* was published (the first volume had appeared in 1878), and the work brought him honours from learned Jewish bodies throughout the world.

koi (Egyptian religion): *see* ka.

Koidu, town, Eastern Province, east central Sierra Leone, West Africa, adjacent to Sefadu (the Kono District headquarters). It is a trade centre for rice, palm oil and kernels, and cattle (from Guinea). Much of the town's development is attributed to its location in the diamond-mining area leased by the Sierra Leone Selection Trust. Koidu has a government hospital and several schools. It has amalgamated with nearby New Sembehun to form the second largest populated centre in Sierra Leone. Pop. (1974) 75,846.

Koil (India): *see* Alīgarh.

koine, a compromise language made up, usually, of several dialects of the same language but often relying heavily on one dominant dialect. It comes from the Greek *koinē* ("common") and, as a proper noun, designates Attic Greek. Koines are characterized linguistically by expansion in content, by the admixture of several dialects, and by expansion in role. In fact, the initial stage in the standardization of a language is sometimes called "koineizing." Koines are never completely detached from the languages from which they issue. In all these respects koines differ from pidgins and creoles, which are limited in vocabulary and grammar, usually considered nonstandard, and represent the admixture of different languages, often from totally unrelated linguistic families. Koines may be written or spoken. Examples of koines include Standard Macedonian, the Italian of late 14th-century Naples, and the language of northern China in the 7th–10th centuries. A contemporary koine is the Belgrade-based standard variety (one of two) of Serbo-Croatian.

Koine, the fairly uniform Hellenistic Greek spoken and written from the 4th century BC until the time of Justinian (mid-6th century AD) in Greece, Macedonia, and the parts of Africa and the Near East that had come under the influence or control of Greeks or of Hellenized rulers. Based chiefly on the Attic dialect, the Koine superseded the other ancient Greek dialects by the 2nd century AD. Koine is the language of the Greek translation of the Old Testament (the Septuagint), of the New Testament, and of the writings of the historian Polybius and the philosopher Epictetus. It forms the basis of Modern Greek.

The divergences of the Koine from the classical norms gave rise in the 1st century AD to a purist movement known as Atticism, which had little effect on the everyday spoken language although it influenced the written language, causing it to have archaizing tendencies.

Koishikawa Botanical Garden, botanical garden and arboretum maintained by Tokyo University. It has more than 6,000 different plant species under cultivation on its 16-hectare (40-acre) site in Tokyo. Among its most notable outdoor collections are camellias, cherries, maples, Japanese primroses, bonsai trees, and alpine plants. One of the most important features of the garden is the arboretum, which abounds in coniferous and broadleaf tree species from East Asia as well as in many exotic varieties from other regions of the world. The large herbarium of Tokyo University, consisting of 1,250,000 dried reference specimens, is being gradually transferred from the university's botanical museum to Koishikawa Botanical Garden. Established in 1638 by the Tokugawa shogunate to grow medicinal herbs, the garden was reorganized into its present form in 1873 and was taken over by the Faculty of Science of Tokyo University four years later. Koishikawa Botanical Garden has a branch garden, 10.5 hectares (26 acres) in size, in Nikko, Tochigi Prefecture. The Nikko garden specializes in alpine plants but also has excellent collections of Japanese species and such varieties as cherries and rhododendrons.

Koiso Kuniaki (b. April 1, 1880, Utsunomiya, Japan—d. Nov. 3, 1950, Tokyo) Japanese army general and prime minister during the final phase of World War II.

Koiso graduated from the Military Academy in 1900 at the top of his class and served on active duty during the Russo-Japanese War. In 1916 he became chief of the Bureau of Military Affairs and in 1932 was appointed assistant to the minister of war. He later became commander of the 5th division and chief of staff of the Kantō-gun, the military operation in China. From 1935 to 1938 Koiso, as commander in chief, directed the military operation in Korea. During the Hiranuma (1939) and Yonai (1940) cabinets, he served as minister of overseas affairs.

At the onset of World War II Koiso returned to Korea as governor-general. After the fall of the Tōjō Cabinet in 1944, he was appointed prime minister to carry on the war effort. He resigned in April 1945 as U.S. troops landed in Okinawa. He was convicted of war crimes and died while serving a life sentence.

Koiter, Volcher: *see* Coiter, Volcher.

Kojiki (Japanese: "Records of Ancient Matters"), together with the *Nihon shoki* (*q.v.*), the first written record in Japan, part of which is considered a sacred text of the Shintō religion. It was compiled from oral tradition in 712.

The *Kojiki* is an important source book for ceremonies, customs, divination, and magical practices of ancient Japan. It includes myths, legends, and historical accounts of the Imperial court from the earliest days of its creation up to the reign of Empress Suiko (628). Much of Shintō thought is based on interpretations of the mythology contained in the *Kojiki.* It was written using Chinese characters to represent Japanese sounds, inasmuch as no means of recording Japan's developing spoken language had yet been devised. The religious and

ethical values of the *Kojiki* were rediscovered and reevaluated by Moto-ori Norinaga (1730–1801), who wrote the complete "Annotation of the *Kojiki*" in 49 volumes. The *Kojiki* was first translated into English in 1882.

Kojong, original name YI T'AE WANG (d. 1907, Seoul, Korea [now in South Korea]), the last real imperial ruler of Korea.

Kojong became king of Korea while still a young boy. During the first years of his reign, power was in the hands of his father, Taewŏn-gun, who as regent attempted to restore and revitalize the country. When Taewŏn-gun was kidnapped and taken to China in 1882, power passed to Kojong's queen, Min, who opposed all modernization efforts. She was assassinated by the Japanese in 1895. Two years later, in an effort to save the country, Kojong proclaimed himself emperor and changed the name of the country to Taehan ("Great Han"), actions symbolic of his independence from China. During the Russo-Japanese War of 1904–05, however, Japan invaded Korea and forced the emperor to sign a treaty allowing the Japanese to use the country as a military base and to place advisers in the government. After the war Japan set up a protectorate in Korea. In 1907, therefore, the king abdicated in favour of his son. Three years later Japan officially annexed Korea.

Kok III, Adam (b. 1811, southern Africa—d. Dec. 30, 1875, near Mzimkulu, Cape Colony [now in South Africa]), chief who led the people of the Griqua nation from their home in the Orange Free State (now in central South Africa) to found a new nation, Griqualand East, on the east coast of what is now South Africa. He considered himself an independent ally of the British, but colonial pressures ultimately led to the annexation of Griqualand East by the Cape Colony (now Cape of Good Hope province of South Africa).

In 1837 Adam Kok succeeded to the rule of the Griqua nation of Dutch-speaking former slaves and Africans of mixed descent. Friendly to the British administration in the Cape Colony, he received recognition of his sovereignty in 1848. Pressed seriously by Boer (Dutch) expansion in the Orange Free State, Kok accepted a British offer (1861) to resettle the Griquas in the eastern section of the Cape Colony, and he led his people on a two-year trek across South Africa. Although he aided the British in a campaign to subdue the rebellious Hlubi tribe in Natal (1874), in October 1874 they annexed his country to the Cape Colony.

Kök Turki alphabet, writing system used by Turkic-speaking peoples in central Asia from the 6th to the 8th century AD. It is sometimes called Kök Turki runes because of the resemblance of letter forms to those of the (Germanic) runic alphabet. The script occurred in two forms, monumental and cursive, and was written either vertically downward or horizontally from right to left. The monumental form has many symbols that resemble runic letters but represent entirely different sounds. The resemblance, therefore, must be assumed to be coincidental.

The script occurs in many inscriptions and a few manuscript fragments from eastern Turkistan, northwestern Mongolia, and southern central Siberia. The language of the inscriptions is the earliest recorded form of Turkic, and the alphabet is probably related to Pahlavik or Sogdian (two Persian scripts derived from the Aramaic alphabet). Kök Turki has 38 letters, 4 of them vowels; many of the consonants occur in several forms, depending on what vowel precedes or follows them.

kokako, also called WATTLED CROW (species *Callaeas cinerea*), New Zealand songbird of the family Callaeidae (order Passeriformes). The kokako is 45 cm (17.5 inches) long and



Kokako (*Callaeas cinerea*)
Painting by John P. O'Neill

has a gray body, black mask, and blue or orange wattles at the corners of the mouth. Surviving in a few mountain forests, the kokako lives mainly on fruits and has a mellow, deliberate song; "organbird" and "bellbird" are local names.

Kōkan (Japanese painter): *see* Shiba Kōkan.

Kokand, city, Fergana *oblast* (province), Uzbek S.S.R. It lies in the western Fergana Valley. The ancient town of Khavakend occupied the site from at least the 10th century and was situated on the caravan route from India and China. In the 13th century it was destroyed by the Mongols. The present city developed from a fort built in 1732 and in 1740 became the capital of the khanate of Kokand. It retained this status until its conquest by the Russians in 1876. Under the khans it was an important centre of trade and handicrafts as well as the religious centre of the valley, with more than 300 mosques. In 1918 a Muslim government established in opposition to the Soviet colonial government in Tashkent was suppressed by force. Kokand has textile, food, engineering, and chemical plants and is the main transport junction in the Fergana Valley. It has a teacher-training institute and a theatre. Pop. (1989 prelim.) 182,000.

Kokchetav, also spelled KOKČETAV, *oblast* (province), northern Kazakh S.S.R. It has an area of 30,155 square miles (78,100 square km). Steppe land, wooded in the northwest, rises in the south into the picturesque, hilly lake district of the Kokchetav Upland, the highest point of which is Mount Sinyukha, at 3,107 feet (947 m), near Borovoye, a health resort. The Ishim River flows through the western part of the *oblast,* and there are many lakes. The climate is continental, and annual precipitation is only about 10 inches (250 mm) on the plains. The economy is predominantly agricultural: crops, mainly food grains, are grown on the fertile soils, and sheep breeding and dairy farming are important. There are food, metalworking, and building-materials works and light industries, and gold is mined at Stepnyak. The *oblast*'s cities include Kokchetav, the capital, Shchuchinsk, and Stepnyak; and the population is two-thirds rural. Pop. (1989 prelim.) 664,000.

Kokchetav, also spelled KOKČETAV, city and administrative centre of Kokchetav *oblast* (province), Kazakh S.S.R. It lies along the southern edge of the Ishim Steppe. Kokchetav was founded in 1824 as an administrative outpost when the Russians extended their control over the Kazakhs. It became a district administrative centre in 1868 and an *oblast* centre in 1944, but its greatest expansion occurred in the 1960s following the campaign to open virgin lands in Kazakhstan to agriculture and the construction of important new factories in the region. It is now a substantial industrial centre and the junction of the Trans-Kazakhstan and Middle Siberian railways and has a teacher-training institute and two museums. Pop. (1989 prelim.) 137,000.

Kokemäen River, river in southwestern Finland. Its source is Lake Pyhä, from which it flows southwest and then northwest for about 90 miles (145 km) to enter the Gulf of Bothnia, near Pori. It is dammed for hydroelectric power.

Kōken, in full KŌKEN TENNŌ, also called (764–770) SHŌTOKU TENNŌ (b. 718, Nara, Japan—d. Aug. 28, 770, Nara), the last empress to rule Japan until the 17th century; she twice occupied the throne (749–758; 764–770). There had been many female rulers before her, but the power achieved by the Buddhist monk Dōkyō during her second reign caused the Council of Ministers to preclude female succession to the throne thereafter.

Kōken was the daughter of the emperor Shōmu; she ascended the throne in August 749, as the empress Kōken, when her father abdicated. Nine years later she abdicated in favour of Prince Oi, who ruled as Emperor Junnin. In 761 she met Dōkyō when he was lecturing at the imperial palace. Her attempts to promote the career of the priest, who was presumably her lover, brought him into conflict with Junnin's favourite minister, the powerful Oshikatsu.

In 764 the conflict erupted into a civil war in which Oshikatsu was killed and Junnin was deposed. Kōken then reascended the throne, ruling as the empress Shōtoku. Although Dōkyō attained virtual control of the government during her reign, his attempt to become emperor upon her death resulted in his banishment from the capital.

Kokhba, Bar: *see* Bar Kokhba.

Kokhtla-Yarve (Estonian S.S.R.): *see* Kohtla-Järve.

Kokka Shintō (Japanese cult): *see* State Shintō.

Kokkola, Swedish GAMLAKARLEBY, city, Vaasa *lääni* (province), western Finland. It lies along the Gulf of Bothnia, northeast of Vaasa city. Founded in 1620, Kokkola became the major seaport and trade centre of Ostrobothnia during the 18th century. In 1854 the British tried unsuccessfully to capture the city. Notable buildings include a 15th-century stone church of Kaarlela, the town hall (1845), and the Renlund Museum of painting, housed in a 17th-century building. The modern city lies a mile inland and is connected by rail to its outport, Ykspihlaja, 3 miles (5 km) west. Kokkola's local industries include lumber mills, machine shops, a tannery, and a state superphosphates factory. Almost half of the inhabitants are Swedish-speaking. Pop. (1988 est.) mun., 34,600.

Koko, town and port, Bendel state, southern Nigeria. It lies along the Benin River, in the western Niger River delta. A collecting point for palm oil and kernels as well as timber, it can be reached by vessels of 14-foot (4-metre) draft that navigate the 50-mile (80-kilometre) distance upstream to the port via the Escravos River entrance (opened 1940, on the Bight of Benin) and the Youngtown Crossing. Although its port was eclipsed by Sapele, 20 miles (32 km) upstream, the town still serves

as an agricultural trade centre for the Itsekiri people. It was reopened as a port of entry in 1958, and in the late 1970s the government rehabilitated its berths and promoted a fishing and shrimping operation in the town. Pop. (1972 est.) 19,994.

Koko Head, cape and landmark, Honolulu County, on the southeastern coast of Oahu Island, Hawaii, U.S., across from Diamond Head 9 mi (14 km) east on Maunalua Bay. Formed by secondary volcanic eruptions of the Koolau Range more than 10,000 years ago, the cape (whose place-name means "blood" or "red earth") is pocked by numerous tuff craters, relics of the island's last volcanic activity. These include Koko Head Crater, at an elevation of 645 ft (197 m) near Kawaihoa Point, and Koko Crater (1,204 ft), lying 2 mi northeast, once a temporary residence of the fire goddess Pele and site of a botanical garden. The cape's eastern section constitutes Koko Head Natural Park (1,319 ac [534 ha]).

Attractions on the coast include Hanauma Bay, an eroded crater, and the Blow Hole, a natural saltwater geyser north of the bay at Halona Point. The ancient Kuapa Fishpond, on the west coast of Koko Head and enclosed by beach parks and a marina crossed by Kalanianaole Highway, is fed by mountain streams from the north and tidal water from Maunalua Bay. To the west of Koko Head is Hawaii Kai, a residential area.

Koko Nor, Chinese CH'ING HAI, or TSING HAI, Pinyin QING HAI, English BLUE LAKE, lake, Tsinghai Province, China. It is the largest drainless mountain lake of Central Asia. It is situated at an elevation of 10,515 ft (3,205 m) in the Nan Shan (Nan Mountain) system of China in a depression at approximately 37° N, 100° E. Mongolians occupy the northern shores and Tibetans occupy the southern shores. There are some sizable settlements (Ch'iang-hsi-k'ou, Ta-la-ma-ho) lying on the Hsi-ning to Lhasa road, close to the southern shore of the lake. On the northern shore lies the small settlement of Kang-ch'a.

The length of the lake approaches 65 mi (105 km), the width 40 mi; the surface of the lake is approximately 2,300 sq mi (about 6,000 sq km) in area in years when the water level is high, and about 1,600 sq mi (4,200 sq km) in area when the water level is low. The greatest known depth is 123 feet. The water is azure in colour, the name deriving from the Mongolian term for sky blue.

The Koko Nor depression originated between the Pliocene and the Pleistocene epochs (some 2,500,000 years ago). The lake that formed in the depression originally drained into the Mach'u Ho, but the rise of the basin's mountainous frame made this impossible. Melting waters from ancient glaciers thus accumulated and formed a big, deep lake in the late Pleistocene (at least 10,000 years ago). At this time the ancient lake was nearly one-third larger than its present size, and its depth extended to almost 160 ft. The subsequent exhaustion of the glaciers brought about a reduction in the level of the Koko Nor to its present position.

The depression in which the lake is set is a plain more than 10,500 ft high. A rolling, hilly relief, with many low mountains, prevails in the north. In the south the depression is bordered by the Nan Koko Nor Shan (South Koko Nor Mountains), which form a narrow chain connecting with distinct peaks. These are continually snowcapped and go to the eastern edge of the lake. Further to the east the ridge drops sharply, becoming flat and opening out.

The depression is covered with mainly red and gray sandstone and light-gray and clay-like limestones. Traces of human activity are present in mountain loesses.

The shores of the Koko Nor open out gently; the delta of the Pu-k'o Ho (Pu-k'o River) empties into the western part of the lake. Along the shores woods spread in terraces, the highest of which extends up over the lake to a height of 160 ft. On the eastern shore there are many small, isolated lakes and a rising, wooded shore area. Numerous sandy islands dot the lake; the largest has a length of 5,410 feet and a width of more than 1,000 feet. Bottom deposits are formed mainly by silts—black, yellow, and pale yellow. In places sand can be found, but close to the shore there are pebbles. The mineral content of the water changes greatly from year to year, but sodium chloride is always present. The water is brackish and unsuitable for drinking. Twenty-three rivers and streams empty into the Koko Nor, the biggest being the Pu-k'o Ho. They flow fastest in summer, causing a rise in the lake level.

The Koko Nor basin is distinguished by a comparatively dry climate. During the winter, snowstorms rage through the first half of March. The amount of snow that settles, however, is not great. Most precipitation (more than 70 percent) occurs in July and August, partly by thunderstorm, partly by cloudburst. On the southwest shore of the lake and on the slopes of the Nan Koko Nor Shan there is an annual precipitation of 10 to 12 in. (250 to 300 mm); on the northern shore 14 to 16 in. fall annually, and there is an annual precipitation of up to 20 in. in the mountains to the north of the depression. During the summer, water in the lake warms to 64°–68° F (18°–20° C). From November to March the lake freezes over, the ice becoming as much as two feet thick.

Adjacent to the lake are luxuriant multigrain steppe grasses, providing one of the best grazing areas in the Nan Shan. The principal vegetation is of wormwood (absinthe) and derris. Nettles, hollyhocks, and asters are common, and numerous other plants are found. In the mountains there are fir forests.

Fish are found in the lake, mainly of the carp family. There are few large mammals in the neighbouring area because the territory is populated. The kulankiang (wild ass) and the Przhevalsky horse, however, are found there. The oaran-kukuyaman (blue sheep) live in the mountains, as do wolves. The waterfront and the adjacent slopes are inhabited by a large variety of birds, including skylarks, grouse, sandpipers, cormorants, falcons, eagles, gray geese, and a few types of duck and gull.

The chief occupation of the local population is nomadic cattle raising and tending of sheep, horses, and camels.

Kokomo, city, seat (1844) of Howard County, north central Indiana, U.S., on Wildcat Creek, 52 mi (84 km) north of Indianapolis. In 1844 David Foster, a trader, laid out the village of Kokomo (named for a Miami chieftain) on part of the reservation once held by Chief La Fontaine. The modern city dates from 1886, when natural gas was discovered along the creek. The subsequent 10-year boom, which attracted many industries, collapsed when the gas ran out. The city was revived economically through pioneer work in the design and manufacture of the "horseless carriage" by two local men, Elwood Haynes and Elmer Apperson. A monument east of the city marks the place where one of the first clutch-driven automobiles with electric ignition in the U.S. was given its initial road test on July 4, 1894. Metallurgical experiments by Haynes paved the way for other industries, including the manufacture of stainless steel and a durable cobalt–chromium–tungsten alloy known as Stellite. By the middle 1920s, competitors' mass-production techniques had forced Haynes and Apperson to close their factories. Local citizens laboured to bring in new concerns, and by the outbreak of World War II, Kokomo was again an important manufacturing centre (machinery, auto parts, aluminum die castings). It is the seat of Indiana University at Kokomo (1945). Grissom Air Force Base is 10 mi north. Inc. 1865. Pop. (1980) 47,808.

Kokoschka, Oskar (b. March 1, 1886, Pöchlarn, Austria—d. Feb. 22, 1980, Villeneuve, Switz.), Austrian painter and writer, one of the leading exponents of Expressionism. In his early portraits, gesture and miming intensify the psychological penetration of character; especially powerful among his later works are allegories of the artist's militant humanism. His dramas, poems, and prose are significant for their psychological insight and stylistic daring.

When Kokoschka was three years old, his father lost everything in a financial crash. The family was forced to move to Vienna, where his father worked as a travelling salesman, and his mother cared for the children on limited means. Tragedy entered Kokoschka's life early, when his eldest brother died in 1891. Kokoschka attended elementary and high school in Vienna and received his first artistic impressions from the stained glass and Baroque frescoes of the Piarist church where he sang in the choir.

At the age of 18, Kokoschka won a scholarship to the Kunstgewerbeschule (School of Arts and Crafts) in Vienna. Soon he became an assistant teacher, giving lessons at night and studying during the day. By 1907 he had also become a member of the Wiener Werkstätte (Vienna Crafts Studio), which supplied him with commissions until 1909. At the Kunstgewerbeschule he learned drawing, lithography, bookbinding, and other crafts. He was



"The Tempest," self-portrait with Alma Mahler by Oskar Kokoschka, oil on canvas, 1914; in the Kunstmuseum, Basel, Switz.

By courtesy of the Oeffentliche Kunstsammlung Basel, Switzerland

profoundly dissatisfied with the school, however, because it was devoted entirely to the decorative arts and completely omitted from its curriculum the study of the human figure. The Wiener Werkstätte, too, supported work only in the restrictive field of the decorative arts. From the beginning Kokoschka's primary artistic interest was the human figure; this interest is perhaps rooted in the deep concern for humanity that transcended even his concern for art. He tried to find practical means to pursue this interest. In his night classes he introduced the thin, muscular children of acrobats as models for his pupils, teaching the latter to make quick sketches—an innovation completely opposed to the aims of the school. He used the human figure as a decorative motif in the postcards, bookbindings, and bookplates he designed for Wiener Werkstätte commissions. Still, his real desire was to paint monumental pictures of people. He taught himself to paint in oils and executed some canvases; but economic necessity forced him to spend most of his time with decorative work, and the general artistic milieu in which he found himself continued in its failure to support his creative aspirations.

In 1908 he met the prominent Viennese architect Adolf Loos, who, having been impressed by one of Kokoschka's early paintings, took an active interest in the young artist. Like Kokoschka, Loos rejected the prevailing decorative ideal, and he enthusiastically launched Kokoschka's artistic career by introducing him to sympathetic artists, securing him commissions for paintings, and providing him with much-needed spiritual inspiration and support. During this early period Kokoschka painted mostly landscapes, developing a technique of vibrant, fluid lines and colours expressive of mood that formed the basis for all of his subsequent paintings. At first glance Kokoschka's landscapes seem to follow the principles of the Impressionist school because of their bright colours, ephemeral delineation of shapes, with tangled, multicoloured lines, and preoccupation with light. His vision, however, was different from that of the Impressionists, who sought, albeit in a revolutionary way, to represent only what strikes the eye. Kokoschka sought to express through his colours the inner sensibility of the observer viewing a scene. This aim is exemplified in one of his earliest paintings, "Dent du Midi," a snowscape in which the colours are warm, reflecting the response of the observer to the scene, rather than cool, evoking the actual light that must have emanated from the snow.

At about this time Kokoschka began his career as a writer, composing several plays that heralded the new Expressionist theatre and expressed his compassionately humanist philosophy. The most important of them was *Mörder Hoffnung der Frauen* (1907; "Murder Hope of Women"), a play that expressed his sensitivity to the moral crises of modern life and that was outspoken in condemning the political injustices of contemporary European society. He said in 1933 that in it he

> contrasted the callousness of our male society with my basic conception of man as mortal and woman as immortal; in the modern world it is only the murderer who wishes to reverse this state of affairs.

After a year in Berlin, where his first collective show was held, Kokoschka returned to Vienna in 1911, resuming his teaching at the Kunstgewerbeschule. At this point he used only models in motion for his classes. He exhibited paintings and drawings at Der Sturm gallery, along with works of the Russian Wassily Kandinsky, the Swiss Paul Klee, and the German Franz Marc. Soon public reaction to Kokoschka's plays caused such a scandal that he was dismissed from his teaching post.

In 1911 he met Alma Mahler, seven years his senior and the widow of the Austrian composer Gustav Mahler. He fell in love with her, and for three years they pursued a tempestuous affair that Kokoschka much later described as "the most unquiet time of my life." He succeeded in ending his involvement with her only with the outbreak of World War I and his enlistment in the Austrian Army.

Shortly before his return to Vienna, Kokoschka had begun to paint more portraits, which show an extremely sensitive preoccupation with the character of the subjects and an increasing concern with expressing this character through colour. The earlier of these portraits make use of delicate, agitated lines describing figures painted in relatively naturalistic colours; solid colours are varied with multihued highlights, and certain features and gestures characteristic of the sitters or expressive of their psychology are exaggerated. Later, these portraits, still concentrating on hands and faces, are painted with increasingly broader strokes of more varied colour and heavier outlines, which, however, are broken and no longer solidly enclose forms. Kokoschka's most important painting of this period ("The Tempest") shows the artist and Alma Mahler resting together in a huge cockleshell in the midst of a raging sea. In this virtually monochromatic composition, all the forms are described by large, loose strokes of colour, and the direction of the strokes seems to cause the entire composition to swirl and spin. In all of these paintings, as with the landscapes, the involvement of the artist with the subject is an essential element, and this element continued to be the basis of his art throughout his life. In 1962 Kokoschka was to say,

> Painting . . . isn't based on three dimensions, but on four. The fourth dimension is a projection of myself. . . . The other three dimensions are based on the vision of both eyes . . . ; the fourth dimension is based on the essential nature of vision, which is creative.

Kokoschka saw active duty in the war for only a short time. In 1916 he was severely wounded and was taken to a military hospital in Vienna, then to one in Dresden. While recovering in Dresden he wrote, produced, designed, and staged three plays. In *Orpheus und Eurydike* (1918; "Orpheus and Eurydice") he expressed the terror he had experienced after being wounded. This play was adapted as an opera in 1926 by the German composer Ernst Krenek. The war and the takeover of the Russian Revolution by the Bolshevik regime disillusioned Kokoschka, as it did many intellectuals who had identified revolution with humanitarianism. He began to see revolution as a purely destructive force, and in 1920 he wrote a "Dresden Manifesto," which denounced all militancy in politics for its lack of human concern. Political and humanitarian themes disappeared for several years from his writing and art. The next 10 years he taught, primarily as a professor of fine arts at the Dresdener Akademie (1919–23), and travelled in Europe, North Africa, and the Middle East.

In 1931 Kokoschka returned again to Vienna, where he completed his first political commission since the war, a joyful painting of children playing at an orphanage established by the Socialist city council. This painting was meant as a protest against the reactionary policies of the current Austrian chancellor. In 1934 he moved to Prague, where he met Olda Palkovska, his future wife. In Prague he was commissioned to do a portrait of the president of the Czech Republic, the philosopher Tomáš Masaryk. During the sittings he discussed with the aged statesman the philosophy of the 17th-century Moravian theologian John Amos Comenius, whose humanitarian views Kokoschka had admired from his youth. Kokoschka placed Comenius in the background of Masaryk's portrait, creating an allegory of the humanistic spirit from past to present. Comenius also became the subject of another play (*Comenius,* begun 1935).

In 1937 all of Kokoschka's works in Germany were removed by the Nazis from museums and collections as "degenerate art." This act outraged Kokoschka less for his own sake than because it boded ill for the future of culture and humanity. The same year, a great Kokoschka exhibition was held in Vienna, but Kokoschka was not encouraged. After the Munich Agreement between the English prime minister Neville Chamberlain and Adolf Hitler in 1938, he fled to London with Olda Palkovska.

Kokoschka's financial situation was so desperate in London that he was forced to paint mainly in watercolour. He completed a number of large canvases, however, entitled "The Red Egg," "Anschluss-Alice in Wonderland," "Loreley," "Marianne-Maquis," and "What We Are Fighting For," which were an anti-Fascist manifesto. They express his distress at the sufferings of humanity and are free from narrow ideological considerations, however; the series is an indictment of all the powers, not just the Fascist, that had caused suffering in World War II. In 1942 Kokoschka also painted a portrait of the Russian ambassador to London, Ivan Maysky, which contains a subtle warning against Soviet imperialism. The style of this painting is loose and expressive but calmer and more solid than that of his second Viennese period. He donated the fee for the portrait to the Red Cross for the care of German and Russian soldiers wounded at Stalingrad. He became a British subject in 1947.

After the war, beginning with a large but still basically unappreciated exhibition in Vienna, there began a series of shows of Kokoschka's works all over Europe and the United States. Kokoschka was financially secure for the first time. He continued to paint portraits and landscapes, and in 1950 he did his first great mythological composition, the three paintings of the "Prometheus Saga."

In 1953 Kokoschka moved to Switzerland and established a seminar called Schule des Sehens (School of Seeing) at the Internationale Sommerakademie für bildende Kunst (International Summer Academy for Visual Arts) in Salzburg. He continued to paint, completing in 1954 a second mythological trilogy, "Thermopylae." In the 1950s he designed tapestries and theatrical scenery and worked increasingly in lithography. He also continued his political art; his two moving posters of 1937 and 1945 protesting the effects of the Spanish Civil War and World War II on the children of Europe were followed in 1956 by a poster for Hungarian relief showing a stricken mother and a dead child.

Kokoschka's late paintings are perhaps best characterized by his "Herodotos" (1960–63), a luminously painted picture of the Greek historian inspired by visionary historical figures that appear in the space above his head. Kokoschka's late style is calmer, brighter, and more monumental than that of his early works. Although some critics missed in the late paintings the agitation and surface intensity of his early works, the art historian Hans Maria Wingler expressed a true understanding of this most mature development of Kokoschka's style:

> What will determine the verdict of history is that the promise of his brilliant opening notes was fulfilled in the mature works of his old age, in which Kokoschka is drawing the balance of all his insight and experience. His power of transforming the inner substance of his mind into pictorial terms has grown with the years.

(L.Go.)

MAJOR WORKS. "Dent du Midi" (1909; private collection, Zürich); "Still Life with Tortoise and Hyacinth" (1909; Österreichische Galerie, Vienna); "Adolf Loos" (1909; Staatliche Museen Preussischer Kulturbesitz, Berlin); "Portrait of Dr. Tietze and His Wife" (1909; Museum of Modern Art, New York City); "Double Portrait (Oskar Kokoschka and Alma Mahler)" (1912; Edgar Horstman Collection, Hamburg); "The Tempest" ("Die Windsbraut"; 1914; Kunstmuseum, Basel, Switz.); "Knight Errant" ("Der Irrende Ritter"; 1915; Solomon R. Guggenheim Museum, New York City); "The Power of Music" (1919; Stedelijk van Abbemuseum, Eindhoven, Neth.); "Dresden, Augustus Bridge with Steamer" (1923; Stedelijk van Abbemuseum); "London Bridge View of the Thames" (1926; Albright-Knox Art Gallery, Buffalo); "Tigon" (1926; Museum of Modern Art); "Adele Astaire (Lady Cavendish)" (1926; Kunsthaus, Zürich); "Venice. Santa Maria Della Salute II" (1927; private collection, Paris); "Courmayeur" (1927; Phillips Collection, Washington, D.C.); "Self-Portrait with Cap" (1932; private collection, Epsom, Eng.); "Tomaš G. Masaryk" (1935–36; Museum of Art, Carnegie Institute, Pittsburgh); "The Red Egg" (1940–41; Národní Galerie, Prague); "Anschluss-Alice in Wonderland" (1942; private collection, London); "Ambassador Maysky" (1942; Tate Gallery, London); "Loreley" (1942; private collection, Villeneuve); "Marianne-Maquis" (1943; private collection, Villeneuve); "What We Are Fighting For" (1943; private collection, Zürich); "Cathleen, Countess of Drogheda" (1944–47; private collection, London); "Prometheus Saga" (1950; Count Antoine Seilern Collection, London); "View of Hamburg Harbour" (1951; Museum of Modern Art); "Galatea" (1953; private collection, London); "Thermopylae" (1954; Universität, Hamburg); "Sir Stanley Unwin" (1959; George Allen and Unwin Ltd. Collection, London); "Double Portrait (Oskar Kokoschka and His Wife Olda)" (1963–64; private collection, Villeneuve, Fr.).

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Kokubunji, city, Tokyo Metropolis (*to*), Honshu, Japan, on the Chūō Main Line, east of Tokyo city. The city first developed around the Kokubun-ji (Kokubun Temple), built in the 8th century for a group of Buddhist nuns, and was an early cultural centre. During the Meiji era (1868–1912), it depended upon sericulture (silkworm culture), but after the destructive Kantō earthquake of 1923 destroyed much of central Tokyo, it grew as a residential suburb of the Tokyo–Yokohama Metropolitan Area. Agriculture in the surrounding area produces food for the metropolitan market. Pop. (1980) 91,010.

Kokugaku (Japanese: National Learning), movement in late 17th- and 18th-century Japan that emphasized Japanese classical studies. The movement received impetus from the Neo-Confucianists, who stressed the importance of Chinese Classical literature; the Mito school of scholars, for example, initiated a monumental work, the *Dai-nihon-shi* ("History of Great Japan"), based on the Chinese model of histories. Soon, though, the Kokugaku movement attempted a purge of all foreign influences, including Buddhism and Confucianism. The "national learning" movement culminated in the Fukko (Restoration) school of Shintō under the leadership of such men as Kamo Mabuchi, Motoori Norinaga, and Hirata Atsutane. The Shintō revival, Kokugaku movement, and royalist sentiments of the Mito school all combined in the Meiji period (1868–1912) in the restoration of Imperial rule and the establishment of Shintō as a state cult.

Kokuritsu kagaku hakubatsukan (Tokyo): *see* National Science Museum.

Kokuritsu seiyō bijutsukan (Tokyo): *see* National Museum of Western Art.

Kokuritsukindai bijutsukan (Tokyo): *see* National Museum of Modern Art.

Kol (India): *see* Alīgarh.

Kol Nidre (Aramaic: All Vows), a prayer sung in Jewish synagogues at the beginning of the service on the eve of Yom Kippur (Day of Atonement). The name, derived from the opening words, also designates the melody to which the prayer is traditionally chanted. Though equally ancient versions exist in Hebrew and Aramaic, the Aramaic is generally used in the predominant Ashkenazi and Sefardic rites. The prayer begins with an expression of repentance for all unfulfilled vows, oaths, and promises made to God during the year. Some Jewish authorities contend that even fulfilled vows are included since the act of vowing itself is considered sinful.

According to some historians, forced converts to Christianity in 7th-century Spain recited the Kol Nidre to annul oaths forcibly extracted from them by their persecutors. All that is known with certainty, however, is that the prayer was used as early as the 8th century. Rabid anti-Semites in the Middle Ages, brushing aside the repeated Jewish assertion that the absolution referred only to matters between God and man, used the prayer as a pretext to question the trustworthiness of all oaths taken by Jews in Christian courts. Fears of misunderstanding led to the elimination of the Kol Nidre from the Reform Jewish liturgy in the 19th century, but a revised form was reintroduced in 1945.

The melody to which the Kol Nidre is sung in the Ashkenazi (German) rite became famous when the Protestant composer Max Bruch used it (1880) as the basis for variations for cello. The melody is widely popular because of its plaintive and appealing qualities and can be heard in several variations in different localities. Its origin is unknown, although many unsubstantiated theories have been offered. The earliest known mention of a specific—rather than an improvised—melody dates from the 16th century. The earliest surviving musical notation is the work of an 18th-century cantor (*ḥazzan*), Ahron Beer, and is closely related to the version used by Bruch. Other composers, such as Arnold Schoenberg (1938), used the Kol Nidre melody as a basis for musical compositions. The Sefardic (Spanish), Italian, and Oriental Jewish traditions use their own distinct melodies that are unrelated to the Ashkenazi melody.

kola nut, caffein-containing nut of *cola acuminata* and *cola nitida,* trees of the cocoa family (Sterculiaceae) native to tropical Africa and cultivated extensively in the American tropics. The evergreen tree grows to 18.3 metres (60 feet) and resembles the chestnut. The five-centimetre- (two-inch-) long brown nut is hand collected and dried in the Sun for commercial use, mainly as an ingredient of soft drinks and medicine. Kola nuts are used locally as a medium of exchange. They are also commonly chewed by local labourers as a stimulant to diminish sensations of hunger and fatigue. Small pieces of kola nut chewed before meals act as an aid to digestion. In Brazil and the West Indies, the astringent-tasting nuts are used as a botanical drug to combat intoxication, hangover, and diarrhea.



Kola nut (*Cola nitida*)
W.H. Hodge

Kola Peninsula, large promontory in Murmansk *oblast* (administrative region), far northern Russian Soviet Federated Socialist Republic, covering some 40,000 sq mi (100,000 sq km) and extending across the Arctic Circle about 190 mi (305 km) north–south and 250 mi east–west, separating the White and Barents seas. The peninsula, geologically an extension of the Baltic Shield, consists of Precambrian granites and gneisses (more than 570,000,000 years old), much fractured by faulting and rifting to give upland blocks and rift valleys. Two laccoliths, massive intrusions of igneous rock, form the highest areas, the mountain massifs of Khibiny and Lovozorskye Tundry, which reach 3,907 and 3,674 ft (1,191 and 1,120 m), respectively. Along the northern Murmansk coast, a plateau slopes gently northward to a high, cliffed shore. Southward the land falls in a series of steps to the low, swampy Kandalaksha coast. The low cliffs of the Tersky coast at the eastern end of the peninsula overlook the narrow entrance to the White Sea, known as the Gorlo (Throat). There are numerous lakes on the peninsula; the rivers are broken by rapids, and several hydroelectric dams are planned.



Botanical garden on the Kola Peninsula, Russian S.F.S.R.
Novosti Press Agency

The winter climate is extremely severe, and summers are short and cool. Nearly all the peninsula is in tundra of mosses, lichens, and dwarf Arctic birch. In the south is swampy forest, or taiga, of birch, spruce, and pine. Sphagnum bogs are widespread everywhere. Soils are thin and very poorly developed, but a botanical garden has been preserved. The principal branch of the economy is mining, centred on the towns of Kirovsk and Apatity in the Khibiny Mountains. The Kola Peninsula has the world's largest deposits of apatite (rich in phosphorus and used for fertilizer production). Nephelinite (a source of aluminum), zirconium, and columbium are also mined; the aluminum is smelted on the peninsula and at Kandalaksha. The largest town is the

ice-free port of Murmansk (*q.v.*) on the eastern shore of the long, narrow Kola inlet on the northern coast. Elsewhere, the population is sparse, concentrated along the coasts, with fishing as the main occupation. In the interior a few thousand Lapps are engaged in reindeer herding. Some timber working takes place in the extreme south.

Kolāba (India): *see* Raigarh.

Kolār, town, administrative headquarters of Kolār district, southeastern Karnātaka (formerly Mysore) state, southern India, on the Kolār District Railway (a Southern Railway loop line from Bangalore city) and northwest of Kolār Gold Fields (*q.v.*). Manufactures include woollen blankets, leather goods, pencils, and handloomed silk and coarse cotton fabrics. The Kolār Gold Fields First Grade College is in the town.

Kolār district (3,174 sq mi [8,223 sq km]) is part of the undulating Deccan Plateau, broken by isolated hills between the Western Ghāts and Eastern Ghāts. Nandidurg Hill (4,851 ft [1,479 m]), a health resort to the northwest, is the watershed of seven rivers. Kolār is Karnātaka's dry zone, with scrub vegetation suitable for sheep raising. The Pālār River drains the central and eastern portions, and its basin, lined by irrigation tanks (shallow depressions), is brought under wet-crop cultivation. Silkworms are raised for raw silk, which, together with sugar, rice, tobacco, and garden crops, is exported, mainly to Bangalore. The main towns, apart from the district headquarters, are Kolār Gold Fields, Bangārapet, Robertsonpet, Chik Ballāpur, and Bāgepalli. Pop. (1981) town, 65,834; district, 1,905,492.

Where the same name may denote a person, place, or thing, the articles will be found in that order

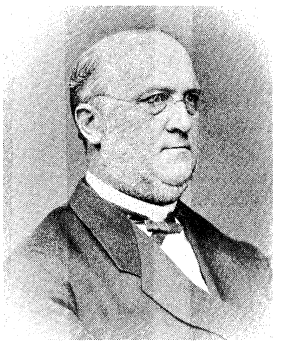
Kolār Gold Fields, town, Kolār district, southeastern Karnātaka (formerly Mysore) state, southern India, on a Southern Railway spur that loops from Bangārapet to Bangalore. Economic activities centre on the goldfields, which are the southern portion of a gold-bearing region that extends for 40 mi (65 km). The productive beds, 4 mi long and with an average width of 4 mi, were first mined in 1881. Within two years, four main veins (Champion, Oorgaum, Nundydorog, and Mysore) were opened. Oorgaum, the deepest, reached 9,664 ft (2,946 m) below sea level. Although the annual production in some years was more than 95 percent of India's gold output, the mines declined and were nationalized in the 1950s to prevent closure. Near the town are the industrial area of Marikuppam (tile and brick manufacture) and the residential area of Robertsonpet. Pop. (1981) town, 77,679; metropolitan area, 144,385.

Kolarovgrad (city, Bulgaria): *see* Shumen.

Kolbe, (Adolph Wilhelm) Hermann (b. Sept. 27, 1818, Elliehausen, near Göttingen, Hanover—d. Nov. 25, 1884, Leipzig), German chemist who accomplished one of the first syntheses of an organic compound from inorganic materials.

He began to study chemistry with Friedrich Wöhler (1838), became Robert Bunsen's assistant at Marburg (1842), and was later engaged in editing Liebig and Wöhler's *Handwörterbuch der reinen und angewandten Chemie* ("Dictionary of Pure and Applied Chemistry"). He succeeded Bunsen at Marburg and went to Leipzig (1865).

Kolbe believed that organic compounds could be derived from inorganic ones, directly or indirectly, by substitution processes.



Hermann Kolbe
Historia-Photo

He validated his theory by converting carbon disulfide, in several steps, to acetic acid (1843–45). Introducing a modified idea of structural radicals, he contributed to the establishment of structural theory. He also predicted the existence of secondary and tertiary alcohols.

He worked on the electrolysis of the salts of fatty and other acids and prepared salicylic acid, a building block of aspirin. With Sir Edward Frankland he found that nitriles can be hydrolyzed to the corresponding acids. As editor of the *Journal für praktische Chemie* (from 1869), he was sometimes severely, and tastelessly, critical of the work of others.

Kolbe, Saint Maksymilian Maria, original name RAJMUND KOLBE (b. Jan. 8, 1894, Zduńska Wola, near Lodz, Pol.—d. Aug. 14, 1941, Auschwitz; feast day August 14; canonized Oct. 10, 1982), Franciscan priest and religious founder martyred by the Nazis for aiding Jewish refugees during World War II.

Kolbe joined the Franciscan Conventuals in 1907 and in 1912 went to Rome, where he studied theology and philosophy at the Pontifical Gregorian University. Contributing significantly to the international Marian movement, he founded in 1917 the sodality (*i.e.*, devotional association) of the Militia of Mary Immaculate before being ordained priest (1918). Back in Poland, he began the popular Catholic monthly *Rycerz Niepokalanej* ("The Knight of Mary Immaculate") and founded (1927) the City of Mary Immaculate (Niepokalanów), a religious centre, which eventually contained some 700 friars and workers. A fervent advocate of devotion to the Virgin Mary's cult, he later founded sister institutions in Japan (1930) and India.

Returning to Poland, Kolbe became superior of the City of Mary Immaculate and director of Poland's chief Catholic publishing complex. For his anti-Nazism he was arrested by the Gestapo in 1939; released, he was again arrested in February 1941 on charges of aiding Jews and the Polish underground. He was imprisoned at Warsaw and then shipped to Auschwitz, where he volunteered his life in the place of the condemned inmate Franciszek Gajowniczek. First starved, he was finally injected with phenol and cremated.

On Oct. 17, 1971, Kolbe was beatified by Pope Paul VI, the first Nazi victim to be proclaimed blessed by the Roman Catholic Church. In 1982 Pope John Paul II canonized him, proclaiming also that he was to be venerated as a martyr. *The Death Camp Proved Him Real*, by M. Winowska, appeared in 1971.

Kolberg (Poland): *see* Kołobrzeg.

Kolchak, Aleksandr Vasilyevich (b. Nov. 16 [Nov. 4, old style], 1874, St. Petersburg—d. Feb. 7, 1920, Irkutsk, Siberia), Arctic explorer and naval officer, who was recognized in 1919–20 by the "Whites" as supreme ruler of Russia; after his overthrow he was put to death by the Bolsheviks.

At the outbreak of World War I, Kolchak was flag captain of the Baltic fleet. By August 1916, as a vice admiral, he was commanding the fleet in the Black Sea. In June 1917, after the February revolution, he resigned under pressure and went to the United States. Next he tried unsuccessfully to coordinate White Russian forces in Manchuria. In October 1918 he went to Omsk, where he became war minister in the non-Bolshevik government. On Nov. 18, 1918, a military coup d'etat at Omsk brought him absolute power there.

His armies, though at first successful, eventually were routed. When Omsk fell to the Red Army on Nov. 14, 1919, Kolchak transferred his headquarters to Irkutsk but soon (Jan. 4, 1920) was forced to resign when a Socialist Revolutionary–Menshevik group seized power in that city. He placed himself under Allied protection, but the Czechs handed him over to the Irkutsk authorities, from whom he was taken by the Bolsheviks. He was summarily executed and his body thrown into the Angara River.

Kolchugino (Russian S.F.S.R.): *see* Leninsk-Kuznetsky.

Kölcsey, Ferenc (b. Aug. 8, 1790, Sződemeter, Hung.—d. Aug. 24, 1838, Cseke), Hungarian poet, critic, orator, and an able parliamentarian, whose poem "Hymnus" became the national anthem of Hungary.

Though he studied law, his interest turned to the Hungarian literary revival started by Ferenc Kazinczy. Kölcsey's influence was threefold: in his critical essays he laid the foundation of systematic literary criticism and aesthetics in Hungary; in politics, as a member of the Diet between 1832 and 1834, he supported the liberal cause; and in his poems he displayed moral strength and devotion to his country. The first collected edition of his works appeared in 1886–87.

Kold, Kristen Mikkelsen (b. March 29, 1816, Jutland, Den.—d. April 6, 1870, Dalem), educator who did more than anyone else of his time to promote the folk high school movement in Denmark.

Kold was a shoemaker's son and was educated as a teacher, but he found himself unable to adapt to the highly formal educational system. Instead, he founded a residential school in 1851 at Ryslinge, where, living frugally with his students, he carried on most of his instruction orally and stressed moral development more than intellectual teachings. Many leaders of the modern Danish state were educated in his folk high schools and those modelled after them. The adaptations of these schools that eventually appeared throughout the world usually reflected Kold's intensely personal approach to education.

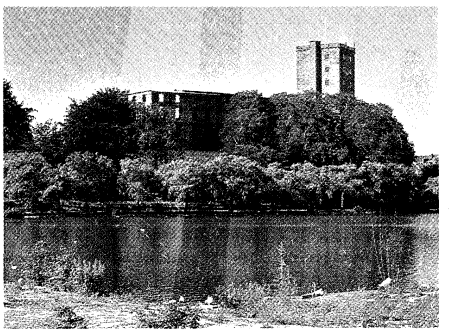
Koldewey, Robert (b. Sept. 10, 1855, Blankenburg am Harz, Brunswick—d. Feb. 4, 1925, Berlin), German architect and archaeologist who revealed the semilegendary Babylon of the Bible as a geographical and historical reality.

His activities as a field archaeologist began with visits to ancient Assus (Assos) in western Turkey (1882) and the nearby island of Lesbos (1885). Subsequent expeditions took him to Iraq (1887) and Zincirli Hüyük, Tur., site of the Hittite city of Samal (1888–92), where he prepared surveys, maps, drawings, and site reconstructions. He also participated in an extensive study of the Greek temples of southern Italy and Sicily and during 1887–97 taught architecture at Görlitz, Ger.

In 1897 he chose the site of Babylon in southern Iraq for a major excavation under the auspices of the German Orient Society. He began digging on March 26, 1899, and continued to work there with little interruption for the next 18 years. One of Koldewey's most dramatic discoveries was the foundation of the temple of Marduk, a ziggurat, or terraced structure surmounted by an astronom-

ical observatory. He believed he had found the remains of the Hanging Gardens of Babylon, one of the Seven Wonders of the World, when he uncovered an arched structure with a remarkably engineered well nearby. He also uncovered the great fortress wall of the city, evidence of the famed Ishtar Gate, and the processional avenue to the temple of Marduk. Results of the excavation were published in segments over a period of years; an English translation of one part, *The Excavations at Babylon,* appeared in 1914.

Kolding, city, Vejle *amtskommune* (county commune), eastern Jutland, Denmark, at the head of Kolding Fjord, north of Haderslev. The name occurs in the 10th century, but the earliest-known town rights date from 1321. It grew up around Koldinghus, a royal castle built in 1248 to defend the frontier. Kolding



The castle (Koldinghus) in Kolding, Den.
Le-Be

was the scene of a Danish victory over the Swedes in 1644 and of a Danish defeat by Schleswig-Holsteiners in 1849. The castle was severely damaged by fire in 1808 but has been partially restored. The large square tower was built by Christian IV (1588–1648).

The Church of St. Nicholas dates from the 13th century. The city is a rail junction and export and commercial centre with an excellent harbour. Industries include shipbuilding and the production of cement, machinery, and textiles. Pop. (1985 est.) city, 41,770; mun., 56,729.

Kolea, town, northern Algeria, located about 17 miles (27 km) southwest of Algiers, on the southern, inland slopes of the coastal hills overlooking the valley of Wadi Mazafran and the Mitidja plain. It was founded in 1550 by Khayr ad-Dīn (Barbarossa), the Barbary pirate, and was originally populated by Andalusian Moors. Kolea was held by Abdelkader's forces against the French from 1832 until they were subdued in 1843. Destroyed by an earthquake in 1825, the town was rebuilt along French lines. The 17th-century mosque of Sīdī Embarek was converted into a hospital, but the adjoining *qubbah,* or shrine, has remained an important place of Muslim pilgrimage. The town is noted for handmade embroidery and lace. Pop. (1987 prelim.) mun., 35,897.

Kolenté River (Sierra Leone): *see* Great Scarcies River.

Kolguyev Island, island, Arkhangelsk *oblast* (province), Russian S.F.S.R., in the Barents Sea. Kolguyev lies 45 miles (72 km) off mainland Soviet Union. About 3,220 square miles (5,200 square km) in area, it is a land of bogs and morainic hills, covered by vegetation characteristic of the tundra; the vegetation is sufficient to provide pasture for a few herds of reindeer owned by Nenets herdsmen. Foxes can be found on the island, and birds (mainly waterfowl) nest on Kolguyev during the summer. Pop. (latest est.) 300.

Kolhāpur, town, southwestern Mahārāshtra state, western India, on the Pāñcaganga River. It was the capital of the former princely state of Kolhāpur and seat of the British residency for Deccan states. An early centre of Buddhism, its 9th-century Mahālakṣmī temple is known as "the Vārānasi of the South." Kolhāpur is also an important commercial town. Industries include sugar processing and the manufacture of textiles and engineering products. Shivājī University was established there in 1962.

The surrounding area is composed of transverse ranges of high plateaus that to the east separate the valleys of several tributaries of the Krishna River. It is a prosperous agricultural region and one of the leading sugar-producing areas in India. Pop. (1981) town, 340,625; metropolitan area, 351,392.

Koli, large caste living in the central and western mountain area of India, numbering about 650,000 in the late 20th century. One of the most populous ethnic groups in western India, the largest group of Koli live in Mahārāshtra and Gujarāt states. Although identified as cultivators and labourers, many Koli survive only by gathering firewood and hiring out as labourers, subsisting on berries and mangoes in summer when food is scarce. The coastal Koli fish, and a few literate Koli are employed in Bombay schools or local government.

The Koli are organized into several theoretically exogamous clans and are largely Hinduized but retain some of their former animism. They believe sickness is caused by an angry spirit or deity and that a second marriage may awaken the spirit of the first spouse. Traditionally classified as a tribe, they have recently been designated as a low Hindu caste, containing the subcastes Agri and Ahir.

kolinsky, also spelled KOLINSKI, any of several species of Asian weasels. *See* weasel.

Kolkhida, Russian KOLKHIDSKAYA NIZMENNOST, English COLCHIS LOWLAND, coastal lowland plain of the eastern Black Sea, in the Georgian S.S.R. Named for the ancient kingdom of Colchis, it comprises the combined alluvial plains of the Rioni, Inguri, and other rivers rising in the Great Caucasus Range, which encloses the plain on the north, and the Little Caucasus, to the south. The Kolkhida has an average elevation of 330 to 500 feet (100 to 150 m) and a humid (about 60 inches. [1,500 mm] of rainfall annually) climate. Its subtropical conditions have supported cultivation since ancient times; citrus fruits, tea, and tung are still grown, mostly on the elevated foothills surrounding the plain, as the wetter lowlands at the Kolkhida's centre collect cold air, and frosts are too frequent for cultivation of more sensitive crops.

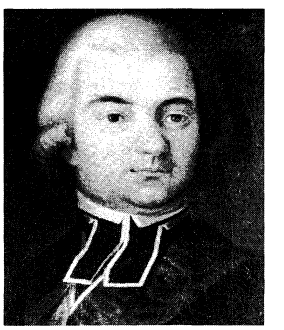
kolkhoz, also spelled KOLKOZ, or KOLKHOS, plural KOLKHOZY, or KOLKHOZES, abbreviation for Russian KOLLEKTIVNOYE KHOZYAYNSTVO, English COLLECTIVE FARM, in the Soviet Union, a cooperative agricultural enterprise operated on state-owned land by peasants from a number of households who belong to the collective and who are paid as salaried employees on the basis of quality and quantity of labour contributed. Conceived as a voluntary union of peasants, the kolkhoz became the dominant form of agricultural enterprise as the result of a state program of expropriation of private holdings embarked on in 1929. Operational control was maintained by authorities through appointment of kolkhoz chairmen (nominally elected) and (until 1958) through political units in the machine-tractor station (MTS), which provided heavy equipment in return for payments in kind of agricultural produce. Individual households were retained, and in 1935 they were allowed garden plots.

An amalgamation drive beginning in 1949 increased the pre-World War II average of about 75 households per kolkhoz to about 340 households by 1960. In 1958 the MTSs were abolished, and the kolkhozy became responsible for investing in their own heavy equipment. By 1961 their production quotas were established by contracts negotiated with the State Procurement Committee, in accordance with centrally planned goals for each region; the kolkhozy sell their products to state agencies at determined prices. Produce in surplus of quotas and from garden plots is sold on the kolkhoz market, where prices are determined according to supply and demand. *See also* collectivization.

Kollár, Ján (b. July 29, 1793, Mosovce, Slovakia [now in Czechoslovakia]—d. Jan. 24, 1852, Vienna), Slovak poet who played an important part in the national and literary revival of the Slavs in the early 19th century.

Educated at the University of Jena, Kollár was pastor (1819–49) to the Slovak community in Pest; the last three years of his life were spent in Vienna as professor of Slavonic archaeology. At Jena he came to realize the extent of the German inroads on what had once been Slavonic territory, and he witnessed the German endeavours to attain national unity and political freedom. Kollár devoted the rest of his life to the encouragement of cultural unity among the Slavonic peoples, notably in the lyric-epic poem *Slávy dcera* ("The Daughter of Sláva"). In an influential essay of 1837 Kollár advocated literary cooperation among the Slavonic peoples.

Kołłątaj, Hugo (b. April 1, 1750, Doderkały Wielkie, Volhynia, Pol.—d. Feb. 28, 1812, Warsaw), Polish Roman Catholic priest, reformer, and politician, prominent in the movement for national regeneration in the years following the First Partition of Poland (1772).



Kołłątaj, detail of a portrait attributed to Franciszek Smuglewics, 1793; in the Muzeum Uniwersytetu Jagiellońskiego, Kraków
By courtesy of Muzeum Uniwersytetu Jagiellonskiego, Krakow

After studying in Kraków, Vienna, and Rome, Kołłątaj returned home in 1775 to play a leading part in the new Commission for National Education (1773), especially in reforming the ancient University of Kraków, of which he became rector (1782–86). Given an administrative post, he devoted his abilities to preparing, with a group of intellectual and political followers called by conservatives "Kołłątaj's Forge," a program of reform to guide the Four Years' Sejm (1788–92) in its task of reconstructing Polish social and political institutions. The ideas that he put forward underlay the constitution of May 3, 1791, whereby the middle class was accorded a role in public affairs. He was then appointed vice chancellor. Deprived of authority after the defeat of the Poles by the Russians in 1792, he went into exile to Leipzig and Dresden but returned to Poland to join Tadeusz Kościuszko's insurrection against Russia in 1794. Inspired by the Jacobins of the French Revolution, he hoped to save his country's independence by introducing terror. When the uprising failed, Kołłątaj was imprisoned in Austria (1794–1802). On his release he re-

sumed his educational activities, founding the college of Krzemieniec in Volhynia, but he was imprisoned in Moscow in 1807–08. He welcomed the reforms associated with the introduction of the Code Napoléon and later became the patron of the younger men who formed the radical opposition in the Duchy of Warsaw.

Kołłątaj's works include *Prawo polityczne narodu polskiego* (1790; "Political Rights of the Polish Nation"), *O ustanowieniu i upadku konstytucji polskiej 3-go Maia 1791* (1793; "On the Promulgation and Fall of the Polish Constitution of May 3, 1791"), and *Nil desperandum* (1808).

Koller, Carl (b. Dec. 3, 1857, Schüttenhofen, Bohemia [now Sušice, Czechoslovakia]—d. March 21, 1944, New York City), Czech-born American ophthalmic surgeon whose introduction of cocaine as a surface anesthetic in eye surgery (1884) inaugurated the modern era of local anesthesia.

He was an intern and house surgeon at the Vienna General Hospital when his colleague Sigmund Freud, attempting to cure a friend of morphine addiction, asked Koller to review and investigate the general physiological effects of cocaine as a possible remedy. His experimental results convinced Koller that cocaine could be used as a local anesthetic in eye surgery, for which general anesthesia had proved to be unsuitable. He immigrated to the United States in 1888, where he maintained a successful ophthalmology practice in New York City until his death.

Kolleru Lake, also called COLAIR LAKE, lake in northeastern Andhra Pradesh state, southern India. It lies between the Godāvari and Krishna river deltas near the town of Elūru (Ellore). During the height of the monsoon season the lake may expand to 100 square miles (260 square km). Carp and prawns are fished commercially in the lake, and prawns are processed at the village of Akid.

Kölliker, Rudolf Albert von (b. July 6, 1817, Zürich—d. Nov. 2, 1905, Würzburg, Ger.), Swiss embryologist and histologist, one



Kölliker

By courtesy of the department of prints and drawings of the Zentralbibliothek Zurich

of the first to interpret tissue structure in terms of cellular elements.

Named professor of physiology and comparative anatomy at the University of Zürich in 1844, Kölliker in 1847 transferred to the University of Würzburg in the same capacity and two years later was named to the chair in anatomy. He played an influential role in the development of Würzburg as a leading centre of medical learning. In 1848 he founded (with Karl von Siebold) the *Zeitschrift für wissenschaftliche Zoologie.*

Kölliker's investigations covered such diverse subjects as the development of cephalopods (*e.g.,* octopus, squid), the structure of smooth muscle, the development and differentiation of red blood cells, and the significance of the germ layers in development. He described spermatozoa as cellular in origin and nature and emphasized the significance of sudden change in evolution as opposed to gradual change. Among his important works were *Handbuch der Gewebelehre des Menschen* (1852; "Handbook of Human Histology") and *Entwicklungsgeschichte des Menschen und der höheren Tiere* (1861; "Embryology of Man and Higher Animals").

Kollontay, Aleksandra Mikhaylovna, *née* DOMONTOVICH (b. March 31 [March 19, Old Style], 1872, St. Petersburg—d. March 9, 1952, Moscow), Russian revolutionary who advocated radical changes in traditional social customs and institutions in Russia and who later, as a Soviet diplomat, became the first woman to serve as an accredited minister to a foreign country.

The daughter of a general in the Imperial Russian Army, Aleksandra Mikhaylovna married an army officer, Vladimir Mikhaylovich Kollontay. In 1898, however, she abandoned her privileged social position, later became affiliated with the Russian Social-Democratic Workers' Party, and spread revolutionary propaganda among women workers. She toured the United States, making speeches against possible U.S. participation in World War I (1916).

She became commissar for public welfare in the Bolshevik government that assumed power after the October Revolution (1917) and used her position to remodel Russian society, advocating the practice of free love, the simplification of marriage and divorce procedures, the removal of the social and legal stigma attached to illegitimate children, and various improvements in the status of women. Accused of neglecting her official duties because of a love affair, she escaped execution only through Lenin's intervention.

Her affiliation with the Workers' Opposition—a group within the Communist Party (Bolsheviks) that demanded greater democracy within the party and a more decisive role for workers in party affairs—won her personal popularity among the general party membership but prompted the Central Committee to attempt her expulsion from the party. She subsequently joined the People's Commissariat for Foreign Affairs (1922) and was assigned to the posts of minister to Norway (1923–25), to Mexico, to Norway again (1927–30), and to Sweden (1930–45); after 1943 she held the rank of ambassador, and in 1944 she conducted the armistice negotiations that concluded Soviet-Finnish hostilities during World War II. *Selected Writings of Alexandra Kollantai* was published in 1978.

Kollwitz, Käthe, *née* SCHMIDT (b. July 8, 1867, Königsberg, East Prussia [now Kaliningrad Russian S.F.S.R.]—d. April 22, 1945, near Dresden, Ger.), German graphic artist and sculptor, an eloquent advocate for the victims of social injustice, war, and inhumanity.

Kollwitz grew up in a liberal middle-class family and studied painting in Berlin (1884–85) and Munich (1888–89). After 1890 she devoted herself primarily to graphic art, producing etchings, lithographs, woodcuts, and drawings. In 1891 she married Karl Kollwitz, a doctor who opened a clinic in a working-class section of Berlin. There she gained first-hand insight into the miserable conditions of the urban poor. Her first important works were two separate series of prints, respectively entitled "Der Weberaufstand" (*c.* 1894–98; "Weavers' Revolt") and "Bauernkrieg" (1902–08; "Peasants' War"). In these works she portrayed the plight of the poor and oppressed with the powerfully simplified, boldly accentuated forms that became her trademark. After 1910 she turned to making sculptures for a time. The death of her youngest son in battle in 1914 profoundly affected her, and she



"Self-Portrait with Hand on Forehead," etching by Käthe Kollwitz, 1910; in the National Gallery of Art, Washington, D.C.

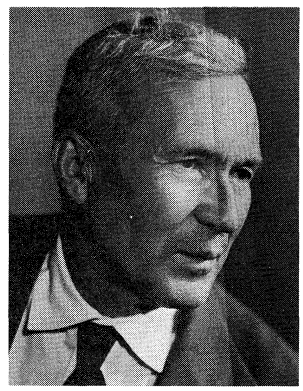
B-7792 "Self-Portrait with Hand on Forehead," Käthe Kollwitz, National Gallery of Art, Washington, D.C., Rosenwald Collection

expressed her grief in another cycle of prints that treat the themes of the mother protecting her children or the mother with a dead child. For many years Kollwitz also worked on a granite monument for her son, depicting her husband and herself as grieving parents. In 1932 it was erected in a cemetery in Flanders as a memorial.

Kollwitz greeted the Russian Revolution of 1917 and the German revolution of 1918 with hope, but she eventually became disillusioned with Soviet Communism. During the years of the Weimar Republic, she became the first woman to be elected a member of the Prussian Academy of Arts, where from 1928 to 1933 she was head of the Master Studio for Graphic Arts. Despite these honours, she continued to devote herself to socially effective, easily understood art. The Nazis' rise to power in Germany in 1933 led to the removal of her exhibited works in 1934 and 1936.

Kollwitz's last great series of lithographs, "Death" (1934–36), treats that tragic theme with ever starker and more monumental forms that convey a sense of drama. In 1940 Kollwitz's husband died. The aged artist's beloved grandson was killed in action in 1942, and the bombing of her home and studio in 1943 destroyed much of her life's work. She died a few weeks before the end of the war in Europe. Kollwitz was the last great practitioner of German Expressionism and was perhaps the foremost artist of social protest in the 20th century. *The Diary and Letters of Kaethe Kollwitz* was published in 1988.

Kolmogorov, Andrey Nikolayevich (b. April 25 [April 12, Old Style], 1903, Tambov, Russia—d. Oct. 20, 1987, Moscow), Russian mathematician whose work influenced several branches of modern mathematics. Notably, he presented some basic postulates for probability theory that have since served to make the subject an integral part of analysis.



Kolmogorov, 1966

Novosti Press Agency

At the age of 17 Kolmogorov was enrolled in the Moscow State University. In the autumn of 1921 he worked on complex problems—in the theory of trigonometrical series and operations on sets—closely tied with the basic directions of the Moscow mathematical school of that time, namely, with ideas in the theory of functions of real variables. In the spring of 1922 he completed a study in the theory of operations on sets (published in 1928).

In 1925 Kolmogorov was graduated from the faculty of physics and mathematics of Moscow State University and was appointed a research associate of the faculty. At this time he became interested in probability theory. His important "General Theory of Measure and Probability Theory," published in 1929, gave the first description of an axiomatic construction of probability theory based on measure theory. In 1933 Kolmogorov expanded the paper into the monograph *Grundbegriffe der Wahrscheinlichkeitsrechnung,* which in 1950 was translated into English under the title *Foundations of the Theory of Probability.*

In 1931 Kolmogorov was elected a professor of Moscow State University; two years later he was appointed a director of the Institute of Mathematics of the university. During the period of this appointment he elaborated the principles of stochastic processes, including the Markov processes, in the monograph "Analytical Methods of Probability Theory." Other contributions concerned aspects of functional analysis—a comparatively recent branch of mathematics in which the traditional techniques of algebra and calculus are applied to entire collections of functions. He also made contributions to studies of topology and turbulent flow of fluids.

In the study of probability theory, which is considered his basic speciality, Kolmogorov formulated two systems of partial differential equations that bear his name; they describe transition probabilities controlling a Markov process. The Kolmogorov equations provide a means of dealing with problems in the theories of Brownian motion and diffusion. The work marked a new period in the development of probability theory and its application in physics, chemistry, civil engineering, and biology.

This fundamental study in probability was succeeded by a fundamental study of Markov chains that embodied many new ideas in the theory of dynamic systems and served as a starting point for numerous works of other mathematicians.

Of considerable importance were Kolmogorov's investigations in problems of random stationary processes, which he related to the analysis of locally isotropic turbulent flow. Norbert Wiener, the founder of cybernetics (the theory of control and communication as applied to animals and machines), had independently investigated many aspects of stationary processes, particularly those identified with statistical prediction, and he pointed out that the investigations by Kolmogorov were relevant to the statistical theory of information upon which the science of cybernetics in part depended.

In topology, Kolmogorov, simultaneously with U.S. mathematician James Alexander but independently of him put forward certain considerations relating to an operator called the nabla operator and applied these to complexes and later to any topological space. Related algebraic structures called nabla groups turned out to be very effective and provided suitable instrumentation in the study of numerous problems of topology, including continuous maps. On this foundation, Kolmogorov put forward a conception of a homological ring, an important idea in topology. His formulation of the duality law (on equivalent representations of certain mathematical properties) was very important for the period from 1935 to 36. In this context the duality law concerned closed sets situated in a topological space that is locally bicompact and fully regular.

During the 1930s Kolmogorov also published the articles entitled "On Topological Group Formulation of Geometry" and "On Formulation of Projective Geometry," as well as others on the areas of functional analysis and the optimum approximation of functions.

Later Kolmogorov's interests broadened into problems of mathematical logic and the foundations of mathematics. In 1938, he published a large article, "Mathematics," in the first edition of the *Bolshaya Sovyetskaya Entsiklopediya* ("Great Soviet Encyclopaedia"), in which he described the development of mathematics from ancient to modern times and interpreted it in terms of dialectical materialism.

In 1939 Kolmogorov was elected an academician of the Academy of Sciences of the U.S.S.R. and, a little later, an academician-secretary of the department of physical and mathematical sciences of the academy; the department had been established to unite and direct scientific work of the most prominent researchers in this field.

In the mid-1950s Kolmogorov turned his attention to information theory, dynamic-system theory, interconnections of information theory with function theory, classical mechanics, the 13th Hilbert Problem (representation of functions of a large number of variables by functions of a lesser number of arguments), and complex theory.

Throughout the latter part of his life, Kolmogorov paid great attention to problems of mathematical education of schoolchildren. He was appointed chairman of the Commission for Mathematical Education under the Presidium of the Academy of Sciences of the U.S.S.R. Under his leadership a new state program of training in mathematics in the Soviet general school was developed and introduced.

Introductory Real Analysis (rev. Eng. ed. by Richard A. Silverman, 1970; reprinted 1975), by Kolmogorov and S.V. Fomin, contains a good bibliography.

Kolmogory (Russian S.F.S.R.): *see* Kholmogory.

Köln, *Regierungsbezirk* (administrative district), southwestern North Rhine-Westphalia *Land* (state), northwestern Germany. Köln is bordered by Rhineland-Palatinate *Land* to the south, Belgium and The Netherlands to the west, and the *Regierungsbezirke* of Düsseldorf to the north and Arnsberg to the northeast. The district occupies an area of 2,845 sq mi (7,369 sq km) and comprises the central portion of the larger historic region of the Rhineland (*q.v.*). Its contemporary boundaries were formed in 1972 when the smaller *Regierungsbezirke* of Aachen (west) and Köln (east) were merged. The district takes its name from Köln (Cologne), its largest city and administrative seat.

The southern Lower Rhinelands, part of the North German Plain, penetrate in a wide baylike formation into the northern edge of the Middle Rhine Highlands in Köln. Regional landforms trend in a north–south line, the most prominent being the Rhine River, situated along the extreme eastern edge of the lowland; the Erft and Rur rivers dissect the western section. The highly industrialized urban complexes of Cologne and Bonn are situated in the Rhine valley. Cologne is one of Germany's largest traffic junctions and a leading commercial centre. Bonn is the seat of the national government. Both areas have developed highly diversified industrial structures with oil refineries, petrochemical plants, and manufactures of motor vehicles, machinery, and electrical equipment. Fruits and vegetables are cultivated in the valley near the large city markets. West of the Rhine valley the Lower Rhinelands consist mainly of loess-covered, level, open plains composed of glacial gravels deposited by the Rhine and Maas rivers. As one of the state's most fertile agricultural lands, the plains are almost entirely cultivated, yielding large crops of sugar beets and wheat. The farmland is disrupted only by the wooded Ville ridge immediately west of the Rhine. Here a large seam of brown coal is mined from immense open pits and consumed primarily in the generation of electricity.

The northern Eifel and eastern Hohes Venn (French Haute Fagnes), both plateaus of the Rhenish Uplands, border the Lower Rhinelands on the south. Peat bog has accumulated on the flat plateau surfaces where rainfall exceeds 40 in. (1,000 mm) per year and drainage is poor. Dairy farms situated on the surrounding plateau slopes supply fresh milk and dairy products to the nearby Rhine valley urban areas. On the northern fringe of the Eifel and Hohes Venn is the Aachen urban industrial district, important for its electric power stations fueled by local brown coal deposits and for its highly diversified industrial structure. The most westerly city of Germany, Aachen is also a famous health spa with one of Europe's hottest brine springs.

The partially wooded plateau region of the Bergisches Land rises from the east bank of the Rhine, extending over an area that was once the county and duchy of Berg (*q.v.*). Although physically part of the Middle Rhine Highlands, the economy of the region is largely dependent on the Ruhr coalfield to the north. There are some cultivated fields and dairy farms in the deep east–west valleys of the Rhine tributaries, but the predominant economic activity is light forms of iron and steel processing, producing highly finished products such as tools, small machines, and precision instruments. Bergisch Gladbach is the chief city of the region and an important paper manufacturer. The volcanic rocks of the scenic Siebengebirge (Seven Hills) near the southern Köln border form the terminus of the Middle Rhine Plain where the river leaves the Rhenish Uplands.

Population densities in the district range from fewer than 130 persons per sq mi (50 per sq km) on the Eifel and Hohes Venn plateaus to densities averaging more than 2,600 persons per sq mi (1,000 per sq km) in the Rhine valley and Aachen district. The majority of the population are descendants of the Rheinfranken (Rhineland Franconians) and speak the Ripuarian dialect. Cultural identity in the urban areas, however, has dissipated due to heavy immigration from a variety of foreign areas, including eastern Europe, the eastern Mediterranean, and The Netherlands. About 70 percent of the people are Roman Catholics and 25 percent are Protestants. The predominant settlement pattern in the agricultural regions is one of large, irregular villages. Individual farmsteads are more common in the Eifel, Hohes Venn, and Bergisches Land. Major universities are located in Cologne, Bonn, and Aachen. Pop. (1989 est.) 3,905,797.

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Köln (city, Germany): *see* Cologne.

kolo, communal dance of Yugoslavia, the many variations of which are performed at weddings and other festive occasions. The name probably derives from the Old Slavic word for "wheel." The dance may be performed in a closed circle, in a single chain, or in two parallel lines. In some versions, solo dancers display their skill inside the circle. Tempo varies, sometimes within a single dance, but the kolo is usually spirited and fast moving. The kolo was probably danced in worship of the Sun long before the Slavs

arrived in the Balkan Peninsula. Closely related to the Romanian hora and the Bulgarian *horo,* it is one of many European chain dances surviving from ancient times.

Kołobrzeg, German KOLBERG, town, Koszalin *województwo* (province), northwestern Poland. It lies at the mouth of the Parsęta River on the Baltic Sea. It is a large port and health spa, with its economy relying on fishing and tourism.

Founded as a Slavic stronghold in the 8th century, the town was incorporated as Polish territory in the 10th century. It originally lay a short distance south of the present site on the Parsęta. The first church in western Pomorze (Pomerania) was built there. Kołobrzeg became an important commercial centre during the 13th century. Seized by the electorate of Brandenburg in 1648, it was restored to Poland after World War II. Most of the town was destroyed during the war but has been completely reconstructed. Pop. (1988 est.) 43,-100.

Kolokotrónis, Theódoros (b. April 1770, Messenia [Greece]—d. Feb. 15, 1843, Athens), prominent Greek patriot in the War of Greek Independence (1821–30).

As a member of the Greek revolutionary society Philikí Etairía, Kolokotrónis led Moreot bands during the War of Independence. His most brilliant action was his part in the defeat of Mahmud Dramali's Ottoman army in August 1822. He was imprisoned on Hydra for his defiance of the central government but was later released to help defend the Morea (Peloponnese) against the Egyptians. In 1825 he signed the Greek demand for British protection and invited Sir Richard Church to be Greek commander in chief. In 1828 he supported the president, Count I.A. Kapodístrias, and became one of the leaders of the pro-Russian party. After the count's assassination on Oct. 9, 1831, Kolokotrónis set up a rival administration favouring 17-year-old Prince Otto of Bavaria for the newly created Greek throne, and he later tried to overthrow the young king's regency, composed largely of Bavarians. For this, Kolokotrónis was condemned to death on June 7, 1834, but was later reprieved.

Koloman (Hungarian king): *see* Coloman.

Kolomenskoye, locality and former royal estate, on the right bank of the Moskva River, since 1960 part of the southeastern sector of the city of Moscow, central Russian S.F.S.R. The village of Kolomenskoye developed around an estate first mentioned in the 1339 will of Ivan Kalita, prince of Muscovy and Vladimir. In the 16th century Kolomenskoye became a favourite grand ducal and imperial summer residence. In the 17th century Kolomenskoye was the site of many political disturbances. It served as the headquarters for Ivan Bolotnikov, the leader of a peasant rebellion, in 1606. In 1648, crowds of Muscovites went there to voice opposition to the increased salt tax instituted by Tsar Alexis Mikhaylovich. His decree giving copper coins the same value as silver coins resulted in the 1662 Copper Mutiny, during which many protesters were massacred in the village of Kolomenskoye. Alexis expanded the royal estate and in 1667–71 built a magnificent wooden palace. His son, Peter I the Great, used Kolomenskoye as a refuge during the Streltsy Uprising, which in 1682 sought to unseat Peter I and give the throne to his half brother Ivan V. In 1767, Catherine II demolished the wooden palace built by Alexis.

The grounds of the former estate are today part of a 160-acre (400-hectare) conservation area with notable 600-year-old oak trees. The main gate, the clock, and water towers, part of the original palace complex, have survived. The five-domed Kazan Church, a prison tower from Siberia, and a mead brewery transported from the village of Preobrazhenskoye date from the 17th century. The log cabin in which Peter I the Great lived while in Arkhangelsk also has been moved to Kolomenskoye. The most striking structure is the Voznesenie (Ascension) Church (1532) built in the old Russian red brick and "tent" roof style. The Kolomenskoye Estate Museum, a branch of the State Historical Museum since 1923, houses exhibits depicting the peasant war of 1606–07 and the 1662 Copper Mutiny.

Kolomna, city, Moscow *oblast* (province), western Russian S.F.S.R. It lies southeast of Moscow near the confluence of the Moskva and Oka rivers. First mentioned in 1177, Kolomna formed a key stronghold on Moscow's southern frontier; it was sacked four times by the Tatars. Kolomna was one of the earliest Russian locomotive-building centres, and today diesel engines, heavy machinery, and synthetic rubber are produced. Pop. (1987 est.) 159,000.

Kolomyya, also spelled KOLOMYIA, or KOLOMYJA, city, Ivano-Frankovsk *oblast* (province), Ukraine, Soviet Union, on the Prut River. Documents first mention the city in 1240. It is now a trading centre for the surrounding area, and it has various light industries. Agricultural machinery is also manufactured, and there are paper and brewing concerns. Pop. (1987 est.) 63,000.

Kolowrat(-Liebsteinsky), (Franz) Anton, Graf von (count of) (b. Jan. 31, 1778, Prague, Austrian Empire [now in Czechoslovakia]—d. April 4, 1861, Vienna, Austria), Austrian statesman, longtime ministerial chief of domestic affairs in the Austrian Empire (1826–48), and the principal political rival of Prince Klemens von Metternich.

A member of an aristocratic Bohemian family, Kolowrat became mayor of Prague in 1807 and, in 1809, *Oberstburggraf* (governor) of Bohemia. For the next 15 years he directed the administration of that kingdom and cultivated the development of nascent Czech nationalism along cultural lines. Called to head the political section (1826) and later the financial section (1827) of the imperial government, he soon became Metternich's greatest rival for influence over the Austrian Empire's affairs of state.

Between the death of Emperor Francis I in 1835 and the revolutionary upheavals of March 1848, the two ministers divided the tasks of imperial administration between themselves, but their rivalry continued. Always somewhat in the shadow of Metternich, Kolowrat became chief minister only briefly during the revolutionary turmoil of 1848 (March–April), being soon forced into retirement for reasons of poor health and advancing age. Though only mildly liberal, he moderated some of the reactionary excesses of the twilight years of the old imperial system.

kolp'um (Korean: "bone rank"), Korean hereditary status system used to rank members of the official class of the Unified Silla dynasty (668–935).

The system originally began as a way of distinguishing the status and function of members of the Silla confederation, a union of the six major tribes of southeastern Korea. After the tribes conquered the rest of the Korean peninsula and established the Silla dynasty, the *kolp'um* became restricted to the residents of the capital of the kingdom, who constituted the bulk of the ruling class.

Various privileges and restrictions accompanied the *kolp'um.* Aside from the official grades, even the size and style of housing, furniture, and clothing were different according to status.

There were eight classes in the system: two *gol*s (*sŏnggol,* or "sacred bone," and *chin'gol,* or "true bone") and six *dup'um*s (or "head ranks"). The two *gol*s were from the royal and formerly royal families; the sixth *dup'um* through the fourth were from the general nobility, and the third down to the first from the commoners.

Of the eight classes, at first only the *sŏnggol* was entitled to the throne, but, with the gradual disappearance of the *sŏnggol* class, the *chin'gol* came to enjoy the prerogative. The *chin'gol* also held all the important official posts of the state and presided over the state conferences called *hwabaek.* The sixth down to the fourth ranks occupied the few lower posts. People below the third *dup'um* were excluded from officialdom.

Kölreuter, Josef Gottlieb (b. April 27, 1733, Sulz, Württemberg [Germany]—d. Nov. 12, 1806, Karlsruhe, Baden), German botanist who was a pioneer in the study of plant hybrids. He was first to develop a scientific application of the discovery, made in 1694 by the German botanist Rudolph Jacob Camerarius, of sex in plants.

Kölreuter was educated at the universities of Berlin and Leipzig, and at Tübingen, where he received his medical degree. Beginning in 1761 he published a series of papers on sex in plants and became a professor of natural history and curator of the Botanical Gardens at Karlsruhe (1764). Cultivating plants with the purpose of studying their fertilization and development, he performed experiments, particularly with the tobacco plant (*Nicotiana*), that included artificial fertilization and the production of fertile hybrids between plants of different species. The experimental results he obtained foreshadowed the work of the Austrian biologist Gregor Johann Mendel. Kölreuter recognized the importance of insects and wind as agents of pollen transfer in plant fertilization. He applied the sexual system of classification of the Swedish botanist and naturalist Carolus Linnaeus to lower plant forms. His work was not recognized or appreciated until long after his death.

Koltsov, Aleksey Vasilyevich (b. Oct. 15 [Oct. 3, Old Style], 1809, Voronezh, Russian Empire—d. Nov. 10 [Oct. 29], 1842, Voronezh), poet whose works describe the Russian peasant life in which he was brought up.

The son of a cattle dealer who treated him harshly and was unsympathetic to his interest in poetry, Koltsov began to publish in Moscow periodicals in 1831 and attracted the attention of the noted literary critic Vissarion Belinsky. With Belinsky's help a volume of Koltsov's poems was published in 1835. Although much of his work is derivative, being modeled on that of Aleksandr Pushkin and others, he is noted for his success in introducing into Russian verse the authentic language of the Russian peasant. His most successful works were his songs, on such themes as the sorrows and hardships of the peasant's life.

Kolwezi, city, southeastern Zaire. It lies near the Zilo Gorges of the Lualaba River (a tributary of the Congo) on the Lubumbashi–Lobito road and rail line and also has air transport facilities to Lubumbashi. Mineral deposits in the area were used by the local population before the Belgians arrived in the 19th century. Industrialization started around 1901 followed by the establishment in 1906 of the mining company, Union Minière du Haut Katanga (now Gecamines), and the city became a copper-mining centre. In 1978 Kolwezi and its airfield were attacked by Shaba rebels based in Angola, and the mines were flooded. Pop. (1984 prelim.) 201,382.

Kolyma River, river in northeastern Siberia, Russian S.F.S.R., rising in the Kolyma Mountains. It is 1,323 miles (2,129 km) long and drains an area of some 250,000 square miles

(647,000 square km). In its upper course it flows through narrow gorges, with many rapids. Gradually its valley widens, and below Zyryanka it enters the wide, flat, and swampy Kolyma Lowland and flows northeastward to discharge into the East Siberian Sea. The whole course below the mountains is meandering and braided, with many channels extending across a wide floodplain. In this lower course the edge of the Yukagir Plateau forms a steep, high right bank. Although hindered by a bar at its mouth, the river is navigable to the Bakhapcha confluence, but the ice-free period is short: freeze-up lasts from late September until early June in the lower course, and, because the more southerly upper reaches begin to thaw first, the breakup of the ice is accompanied by vast ice jams and widespread flooding. Almost one-half of the river's annual flow comes in late spring and early summer. The entire basin is covered by tundra or thin, stunted forest, and its sparse population comprises largely Yakut and Lamut (Even) peoples. The only significant economic activity is gold mining in the upper basin.

Kolyma Upland, Russian KOLYMSKOYE NAGORYE, mountain tract in northeastern Siberia, Russian S.F.S.R. It lies along the northeastern shores of the Sea of Okhotsk, which it separates from the extensive Kolyma Lowland that drains northward to the East Siberian Sea. A confused mass of ranges and uplands cut by deep river valleys and gorges, the area has several peaks over 5,000 feet (1,500 m). The sparsely populated area comprises desolate tundra, but gold mining is important in the valleys, especially that of the upper Kolyma River.

Kom Ombo (Egypt): *see* Kawm Umbū.

Komaki, city, Aichi *ken* (prefecture), Honshu, Japan, north of Nagoya. It was a post town during the Tokugawa period (1603–1867) and an agricultural trade centre for the surrounding region. The city later developed as a residential suburb of Nagoya. Komaki's most rapid industrial growth was between 1965 and the early 1970s when more than 100 factories were built, producing largely pottery, rubber, machines, and fibres. Later, production decreased because of the general economic recession following the 1973 oil price increases. The Nagoya Airport is south of the city. Pop. (1988 est.) 119,584.

Komandorskiye Ostrova, also spelled KOMANDORSKIJE, English COMMANDER ISLANDS, group of four islands, Kamchatka *oblast* (province), Russian S.F.S.R. It is situated in the southwestern part of the Bering Sea, about 110 miles (180 km) east of Kamchatka Peninsula. Both the group and its largest island are named for Commander Vitus Bering, the Russian navigator, who died there in 1741, and for whom the Bering Sea and Strait are also named.

The total area of the group is 714 square miles (1,848 square km). Bering, the most westerly island, is about 55 miles (88 km) long and 25 miles (40 km) wide. It rises to a maximum elevation of 2,464 feet (751 m) at Mount Stellera and also contains the largest settlement, Nikolskoye. Medny, the second largest island, is about 35 miles (56 km) long and 4 miles (6 km) wide. The island of Toporkov and the craggy Ary Rock complete the group. The climate is cold, averaging only 50° F (10° C) in August and 25° F (−4° C) in February, with about 20 inches (500 mm) of precipitation annually. Characteristic wildlife includes sea otters, fur seals, and numerous seabirds.

Komárno, German KOMORN, Hungarian KOMÁROM, town, Západoslovenský *kraj* (region), Czechoslovakia. It lies at the confluence of the Vah and Nitra rivers with the Danube River below Bratislava, at the Hungarian border. It is the Czech part of an urban area (including Komárom [*q.v.*] in Hungary) that was divided after the collapse of the Austro-Hungarian Empire: the two towns are still closely associated. First transferred to Czechoslovakia in 1920 by the Treaty of Trianon, Komárno reverted to Hungary in 1939; after 1945 it again became Czechoslovakian. The population includes both Slovaks and Magyars.

The town's strategic location gave it a military character from Roman times. It attained civil rights in 1265. In Magyar history and during the Austro-Hungarian period, Komárno became a noted strongpoint; there is a record of fortification at the time of Matthias I Corvinus (1440–90), during the critical defense of Germanic Europe against the Turks (1526–64), and in the late 17th and early 19th centuries. In 1848–49 Komárno was held by the Magyar nationalist forces, and it was the refuge for the Austrian National Bank treasure in 1866, when Vienna was threatened by the Prussians.

Komárno's role as a river port complemented and later superseded its function as a fortress. The port is an important reloading point for the trade in coal and oil between central and southeastern Europe. The town's potential as a port has been limited by its frontier position and by the damage to the Danube navigation channel in World War II. Fishing, textile, and machine industries are other economic activities. Pop. (1988 est.) 37,407.

Komárom, *megye* (county), northeastern Hungary, with an area of 869 square miles (2,251 square km) and extending southward from the Danube River and the Czech frontier. It has a mixed agricultural–industrial economic base. Sugar beets and peaches are important crops. There is a sugar beet mill at Ács. Tatabánya (*q.v.*), the *megye* seat, lies in the Gallei Valley and is Hungary's chief mining (lignite) centre. Considerable industrial activity is concentrated along the Danube. At Lábatlan cement, paper, and prefabricated building components are manufactured. Szőny has an oil refinery linked by pipeline with the Zala field.

Almásfüzitő also refines oil and has an aluminum works, while Nyergesújfalu specializes in plastics. Limestone is quarried at Dunaalmás and red marble at Süttő. Dorog and Oroszlány are coal-mining towns. Around Tata are woodlands and nature reserves, with a national sports centre, training camp, and athletic school nearby. The town of Komárom is a rail centre and Danube port. Pop. (1989 est.) 320,000.

Komarov, Vladimir Mikhaylovich (b. March 16, 1927, Moscow, Russian S.F.S.R.—d. April 24, 1967, Kazakh S.S.R.), Soviet cosmonaut, the first man known to have died during a space mission.

He joined the Soviet Air Force at the age of 15 and was educated in Air Force schools, becoming a pilot in 1949. He graduated from the Zhukovsky Air Force Engineering Academy, Moscow, in 1959, and was the pilot (Oct. 12–13, 1964) of Voskhod 1, the first craft to carry more than one human being into space.

Komarov became the first Russian to make two spaceflights when he blasted off alone on April 23, 1967, in Soyuz 1. During the 18th orbit he attempted a landing. Reportedly, the spacecraft became entangled in its main parachute at an altitude of several miles and fell back to Earth. Komarov's body was cremated, and his ashes were entombed in the wall of the Kremlin.

Komarov Botanical Institute, Russian BOTONICHESKY INSTITUT IMENA KOMAPOVA, major botanical research centre in Leningrad, Russian S.F.S.R. The 22-hectare (54-acre) garden has about 6,700 species of plants, many of which were obtained through a series of plant-collecting expeditions sent to all parts of the world. Its most important collections include those featuring cycads, palms, rhododendrons, mangroves, lilies, tulips, and lianas. The garden has 27 greenhouses; 22 are for display, and five are for service functions. It also has a sizable arboretum. The botanical garden was founded in 1715 by Peter the Great as a source of medicinal plants for his army, but since that time it has been expanded into an important centre of botanical studies with a large library and an herbarium consisting of more than 5,000,000 reference specimens, among which are numerous collections of special importance from the Soviet Union and northern and central Asia. The Komarov Botanical Institute, created by the union of the botanical garden and the city's botanical museum in 1931, published a monumental 30-volume study on the flora of the Soviet Union. The institute has produced several other important publications, including one on the flora of arctic regions of the Soviet Union.

Komati River, Portuguese RIO INCOMATI, river rising near Breyten in southeast Transvaal, Republic of South Africa. It descends from a plateau, cutting a valley 3,000 feet (900 m) deep in northwestern Swaziland before reaching the Lebombo Mountains, at which point it is joined by the Crocodile River and cuts another valley—the Komatipoort (700 feet deep)—through the Lebombo. Below the frontier township of Komatipoort, the river enters Mozambique, where it is called the Incomati River. It flows north in a great loop and spreads into Lake Chuáli, reaching the sea some 15 miles (24 km) northeast of Maputo (formerly Lourenço Marques). Its flow is perennial.

Komatsu, city, Ishikawa *ken* (prefecture), Honshu, Japan. It lies along the Kakehashi River. Founded as a castle town in 1639, it was a post town during the Tokugawa period (1603–1867). Komatsu has been expanding since the late 19th century, and since 1919 copper-mining machinery, construction machinery, and tanks have been built there. In 1940 Komatsu was designated the central city of southern Ishikawa prefecture. The production of silk in Komatsu was eclipsed after World War II by the manufacture of synthetic fibres. Pop. (1988 est.) 106,116.

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Komatsushima, city, Tokushima *ken* (prefecture), eastern Shikoku, Japan. Originally a small fishing village and a temple town of Ninna Temple in Kyōto, Komatsushima developed as a commercial town after the establishment of port facilities in 1899. Regular ferry service began operation there in 1913, connecting Shikoku island with major cities on Honshu, including Kōbe, Ōsaka, and Wakayama. A large spinning mill opened in Komatsushima in 1923. Designated a city in 1951, it is also a popular holiday resort. Pop. (1985) 43,998.

Kōmeitō (Japan): *see* Clean Government Party.

Komenský, Jan Ámos (educator): *see* Comenius, John Amos.

Komi, a Permic-speaking people living mainly between the Pechora and Vychegda rivers, southeast of the White Sea, in the northern European area of the Soviet Union. They speak a Permic language of the Finno-Ugric branch of the Uralic family.

The Komi comprise three major groups: the

Komi Zyryan of the Komi Autonomous Soviet Socialist Republic; the Komi-Permyaks (or Permyaks) of the Komi-Permyak National Okrug to the south; and the Komi-Yazua to the east of the *okrug* and south of the Komi A.S.S.R. The economic activities of the Komi vary from reindeer herding, hunting, fishing, and lumbering in the north (with a mining centre above the Arctic Circle at Vorkuta) to agriculture, industry, and mining in the south. The Komi have been nominally Russian Orthodox since the 14th century. The severity of the frigid climate and their inaccessible geographic location kept them culturally isolated until after World War II. The population is denser, more mixed with other groups, and more assimilated in the southern areas, and Russianization is increasing among the younger generation.

Komi Autonomous Soviet Socialist Republic, administrative division of the northwestern Russian Soviet Federated Socialist Republic, covering an area of 160,600 square miles (415,900 square km). Syktyvkar (*q.v.*) is the capital. The republic extends from the crest line of the Northern Urals on the east to the Timan Ridge and the upper basins of the Mezen and Vychegda rivers on the west. The republic lies mainly in the flat, featureless basin of the Pechora River.

Tundra vegetation—mosses, lichens, and dwarf shrubs—occurs in the extreme northeast; southward, stunted trees give way to a dense taiga, or coniferous forest. There are also extensive marshes and peat bogs. Soils are generally of low fertility. The climate is severe, with prolonged, cold winters and cool summers; at Syktyvkar the average January temperature is 5° F (−15° C), and the average July temperature is 62° F (17° C). Annual precipitation ranges from 20 inches (500 mm) in the lower Pechora River basin to 24–30 inches (610–760 mm) on the slopes of the Urals. The Arctic Circle crosses the north of the republic, and, correspondingly, winter days are short and summer days are long.

After Komi became a part of the Moscow principality in the 14th century, the area was penetrated by Russian fur hunters who used the rivers, with their low, easy portages, or overland passages, from one basin to the next as a route across the Urals into Siberia. When overhunting diminished its wealth of furs and easier, shorter routes to Siberia were found, the area decreased in importance until the 18th century, when the town of Syktyvkar was founded as a centre of Russian colonization, and the exploitation of Komi's forest and mineral resources began. In 1921 the republic was established as an autonomous *oblast* for the Komi, a Finno-Ugrian people, although today Russians constitute more than half of the population. It received its present status as an autonomous administrative division of the Russian S.F.S.R. in 1936. Chief cities are Syktyvkar, Vorkuta, Ukhta, and Sosnogorsk.

Industrial development in the republic centred upon its abundant forests and its deposits of coal from the Vorkuta and Inta areas of the Pechora River basin, oil from the Usinsk, Vozey, and Ukhta areas, and natural gas from Vuktyl. Wood products include veneers, prefabricated houses, and barges and rivercraft. After the construction of the Pechora railway from Kotlas to Vorkuta in the early 1940s, mining became the major branch of the economy. Other industries include chemical production, power engineering, machine building, metalworking, light manufacturing, and food processing.

Because of Komi's northerly location and poor soils, agriculture is little developed. Only a small area along the rivers in the south is cultivated in rye, potatoes, oats, barley, and vegetables. Stock raising (mostly cattle and reindeer) is more important. Fur trapping (squirrel and Arctic fox) is common in the forests. Apart from the many navigable rivers, which are closed by ice 180 to 220 days a year, the major line of communication is the Pechora railway, with a branch to Syktyvkar and a number of narrow-gauge feeders for timber exploitation. Syktyvkar has air connections with Moscow, Leningrad, and other cities of the U.S.S.R. Pop. (1987 est.) 1,247,000.

Komi-Permyak Autonomous Okrug, also spelled KOMI-PERMIAK, formerly (until 1977) KOMI-PERMYAK NATIONAL OKRUG, administrative area, northwestern Perm *oblast* (province), western Russian S.F.S.R. It was formed in 1925 for the Komi-Permyaks, a branch of the Finno-Ugrian Komi people. Its 12,700 square miles (32,900 square km) cover the low, rolling morainic hills of the Verkhne (Upper) Kama upland, which is bisected by the Kama River. Apart from the floodplain meadows along the rivers and peat bogs in depressions, the predominant landscape is dense, swampy forest, or taiga, of fir, pine, spruce, and birch. Timber working is the only important economic activity; the poor soils support only limited agriculture, chiefly rye and oats. Communications are few and poor. The only city is the capital, Kudymkar (*q.v.*), on the Inva River. Pop. (1987 est.) 161,000.

Komisarjevsky, Theodore, Russian FYODOR FYODOROVICH KOMISSARZHEVSKY (b. May 23, 1882, Venice, Italy—d. April 17, 1954, Darien, Conn., U.S.), Russian theatrical director and designer, one of the most colourful figures of the European theatre of his time. Of Russian parentage—his father was the opera singer Fyodor Petrovich Komissarzhevsky—he immigrated to England in 1919 and lived primarily in the United States after 1939.

Komisarjevsky studied architecture in Russia and Germany. In 1907 he began directing plays in St. Petersburg (now Leningrad) at the theatre of his sister, the actress Vera Komissarzhevskaya. Two years later, with Nikolai Evreinov, he founded his own theatre, some of whose productions bore the naturalistic stamp of the director Konstantin Stanislavsky. As a director in the Imperial and State theatres in Moscow, Komisarjevsky produced an international repertoire of plays and numerous operas before his move to England in 1919. There he won recognition first as a set designer and later as a producer of Russian and English classics.

A gifted and innovative designer, Komisarjevsky startled—and sometimes infuriated—the conservative audiences at the Shakespeare Memorial Theatre, Stratford-upon-Avon, with modernistic treatments of Shakespeare plays; his *Macbeth* (1933) was performed in 20th-century dress against a background of aluminum scenery. The culmination of his work at the Memorial Theatre was his outstanding production of *King Lear* (1936).

He was married briefly to the British actress Dame Peggy Ashcroft, who starred in many of his productions. Komisarjevsky wrote on various aspects of stagecraft, including a well-known book about theatrical costume.

Komissarzhevskaya, Vera Fyodorovna, GRAFINYA (Countess) MURAVYOVA (b. Nov. 8 [Oct. 27, Old Style], 1864, St. Petersburg [now Leningrad], Russia—d. Feb. 23 [Feb. 10], 1910, Tashkent, Russia [now in Uzbek S.S.R.]), Russian actress and producer whose career linked the practice of the aristocratic Russian theatre with many of those who would eventually establish the avant-garde theatre after the Russian Revolution.

Komissarzhevskaya's father, Fyodor, was a prominent opera star and teacher who numbered among his students the young Konstantin Stanislavsky. Fyodor trained Vera and her brother, Theodore (who would later become famous as a producer and director), for the stage. In 1891 she appeared as Betsy in the first Russian production of Leo Tolstoy's *Fruits of Enlightenment* under the direction of Stanislavsky. Tours of the provinces followed until 1896, when she was invited to join the imperial theatre (the Alexandrinsky) at St. Petersburg to appear as Rosy in *The Battle of the Butterflies* by Hermann Sudermann and as Larisa in A.N. Ostrovsky's *The Dowerless Girl.* She won instant acclaim, and for the next six years she stayed with the company, playing major roles such as that of Nina in the unsuccessful first St. Petersburg production of Anton Chekhov's *The Seagull.*

Aesthetic differences with the management of the Alexandrinsky led Komissarzhevskaya to break with the company in 1902, and in 1904 she opened her own theatre in St. Petersburg. During the next five years her productions included works by Maksim Gorky, Henrik Ibsen, Maurice Maeterlinck, and Aleksandr Blok. The venture was unprofitable, however, and an unsuccessful tour of the United States in 1908 led to the theatre's closing in 1909. Komissarzhevskaya died on a tour of the provinces that was intended to defray her enormous debts.

Komissarzhevskaya's career as producer, although brief, was one of the major influences upon the coming transformation of the Russian theatre. Among those who worked with her company was her brother, Theodore, as well as V.E. Meyerhold and Nikolay Evreinov.

Komitas, also spelled GOMIDAS, pseudonym of SOGHOMON SOGHOMONIAN, or SOLOMON SOLOMONIAN (b. Oct. 8, 1869, Kütahya, Ottoman Empire [now in Turkey]—d. Oct. 22, 1935, Paris, Fr.), ethnomusicologist and composer who created the basis for a distinctive national musical style in Armenia.

Orphaned at age 11, he was sent to study liturgical singing at a seminary in Vagarshapat (now Echmiadzin) in Armenia. He graduated in 1893 and adopted the name Komitas, that of a 7th-century Armenian hymn writer. He had already become interested in Armenian folk songs as well as church music, and he began composing his own music on Armenian motifs while studying composition in Berlin in 1896–99. Upon his return to Armenia he began collecting Armenian folksongs in earnest, and he eventually accumulated several thousand of them. He also published numerous papers on the subject and sang Armenian songs himself at concerts he organized in western Europe, arousing international interest in his countrymen's music. He settled in Constantinople (now Istanbul) in 1910, but the Armenian massacres of 1915 in Turkey so affected him that he had a nervous breakdown, and from 1919 until his death he lived in a hospital in Paris.

Komitas was the most important collector of Armenian folksongs, and his exact and detailed researches established Armenian musicology on a scientific basis. His own folk-based songs and choruses and his liturgical chants are still popular among Armenians, many of whom regard him as their foremost composer.

Kommamur Canal, also called BUCKINGHAM CANAL, canal in eastern Andhra Pradesh state and northeastern Tamil Nādu state, southeastern India. It was constructed section by section between 1806 and 1882 along the backwaters of the Coromandel Coast, which extends for a distance of 680 miles (1,100 km) from Cape Comorin northward to the Krishna–Godāvari deltas.

Although the canal was extensively rebuilt after 1880, it is of poor workmanship, and the expense of repairs is always high. It cannot be used by craft drawing more than 3 ft (1 m). Even so, it is the only main route by which bulky commodities, such as fuel, salt,

and dried fish, can be profitably brought to the city of Madras in Tamil Nādu state.

Kommunarsk, formerly (until 1931) ALCHEVSK and (1931–61) VOROSHILOVSK, city, Voroshilovgrad *oblast* (administrative region), Ukrainian Soviet Socialist Republic, on the railway from Voroshilovgrad to Debaltsevo. Originally called Alchevsk and, during the Stalinist period, Voroshilovsk, it was founded in 1895 with the establishment of the Donetsko-Yuryevsky ironworks. The plant has developed into a large, integrated ironworks and steelworks, which was expanded greatly in the 1950s and '60s. The city is a major bituminous-coal mining centre, and there are coke-chemical and metalworking industries. Kommunarsk presents an undistinguished appearance of modern apartment blocks, industrial enterprises, and old one-story houses. It has a mining and metallurgical institute. Pop. (1983 est.) 122,000.

Kommunisticheskaya Partiya Sovetskogo Soyuza: *see* Communist Party of the Soviet Union.

Kommunizma, Pik (Tadzhik S.S.R.): *see* Communism Peak.

Komodo, island of the Lesser Sunda Islands, Nusa Tenggara Timur *propinsi* (East Nusa Tenggara province), Indonesia. The island is approximately 200 sq mi (520 sq km) in area, rather hilly (2,700 ft [825 m] maximum), and lies between Flores and Sumbawa on the Selat (strait) Sape. The only village, Komodo, on a bay on the east coast, consists of a few score bamboo huts. The island is best known as the home of the giant monitor lizard, *Varanus komodoensis,* often called the Komodo dragon. Pop. (1971) 30,407.

Komodo dragon (*Varanus komodoensis*), largest extant lizard species, of the monitor lizard family Varanidae. It occurs on Komodo Island and a few neighbouring islands of the Lesser Sunda Islands of Indonesia. Almost extinct because of collectors, the lizard is now protected.

The animal grows to 3 metres (10 feet) in length, attains a weight of about 135 kilograms (about 300 pounds), and may live to an age of about 100 years. It digs a burrow as



Komodo dragon (*Varanus komodoensis*)
James A. Kern

deep as 9 m and lays eggs that hatch in April or May. The newly hatched young, about 45 centimetres (18 inches) long, live in trees for several months. Adult Komodo dragons eat smaller members of the species and sometimes even other adults. They can run swiftly and occasionally attack and kill human beings. Carrion, however, is the main diet, and the lizard may travel several kilometres (a few miles) from its burrow each day in search of food.

Komoé, Parc National de la, Komoé also spelled COMOÉ, national park, northeastern Ivory Coast. It was established as a national park in 1968 by extending and converting the former Bouna–Komoé game reserve. Comprising approximately 2,800,000 ac (1,140,000 ha) of wooded savanna, Komoé contains the country's largest concentration of wildlife. Antelopes, hippopotamuses, lions, monkeys, and other animals live in natural conditions with relatively little human interference. The Lobi people inhabit sections of Komoé, engaging in millet and sorghum farming and some illegal hunting.

Komoé River, Komoé also spelled COMOÉ, river, in West Africa, rising 25 mi (40 km) southwest of Bobo Dioulasso, Burkina Faso (formerly Upper Volta), and forming part of the Burkina Faso–Ivory Coast boundary before entering the Ivory Coast to flow southward and empty into its estuary on the Gulf of Guinea. Its total length is 466 mi. Its upper course flows through a savanna region and marks the western border of the Bouna Game Reserve, Ivory coast; its middle section enters tropical rain forest and is the traditional boundary between the Anyi (Agni) and Baule (Baoule) peoples; and its lower reach passes through a region noted for its timber (sipo and mahogany), pineapples, coffee, cocoa, and bananas. The river is navigable from Alépé, 30 mi upstream, to the coast.

komondor, large Hungarian sheep dog breed brought to Europe in the 9th century by the Magyars, who kept it primarily to protect, rather than to herd, their flocks. A powerful, heavy-boned dog, the komondor stands at least 24 inches (60 centimetres) tall and weighs 75 pounds (34 kilograms) or more. It is covered from head to tail in a heavy, shaggy white coat, which is woolly in texture and becomes matted if uncombed. The coat was left in this tangled, unkempt condition by the Hungarian shepherds, for it provided the dog with excellent protection from the fangs of wolves and other predators.

Komorn (Czechoslovakia): *see* Komárno.

Komotau (Czechoslovakia): *see* Chomutov.

Komotiní, agricultural town of western Thrace (Thráki), capital of the *nomós* (department) of Rodhópi, Greece, 14 mi (23 km) by road south of the Bulgarian border. In the Byzantine period it was known as Koumoutzina, or Komotinē (Turkish Gumuljína). The Treaty of London (1913) awarded it to Bulgaria, but the Treaty of Sèvres (1920) granted it to Greece. From 1941 to 1944 it was occupied by Bulgarian troops. A regional market centre for table grapes, tobacco, cereals, and hides, it is on the Thessaloníki–Alexandroúpolis railway. It is the seat of the metropolitan bishop of Marónia. Some light industry has developed, mainly clothing. Pop. (1981) 37,487.

Komparu Zempō, also called HACHIRO MOTOYASU (b. 1454, Japan—d. *c.* 1520, Japan), Nō dramatist and actor, grandson of Nō actor and dramatist Komparu Zenchiku. Zempō was one of the last dramatists of Nō's classic period. He wrote one play, *Hatsuyuki* ("First Snow"), in the restrained and poetic manner of his grandfather. Most of his work, however, such as *Arashiyama,* was written to appeal to a wide popular audience through the use of novelty, action-filled plots, and innovative schemes. While Zempō was head teacher of the Komparu school, which under his father had favoured a conservative style of performance called *shimogakari* and had waned in popularity, it revived and once again presented performances at the court in Kyōto.

Komparu Zenchiku, original name SHICHIRŌ UJINOBU (b. 1405, Japan—d. *c.* 1470, Nara, Japan), Nō actor and playwright who also wrote critical works on drama. Zenchiku, who married a daughter of the actor Zeami Motokiyo, was trained in drama by Zeami and Zeami's son Motomasa.

Zenchiku worked and performed in the Nara region and perhaps, therefore, was not as successful as Zeami's nephew, On'ami, who performed in Kyoto and was the leader of the Kanze school. Zenchiku was a talented actor, however, who passed on the teachings of Zeami to the Komparu family school of Nō drama. He wrote more than 20 plays, including the masterpieces *Basho, Tamakazura, Goon sankyoku shu,* and *Ugetsu,* all of which were influenced by Zen Buddhist thought. His major critical works—*Shidō yōshō, Rokurin ichiro no ki,* and *Shūgyoku tokka*—are important historical sources on the development of Nō drama.

Kompong ——— : *see under* Kâmpóng, for place names beginning with this word.

Komsomol, Russian abbreviation of VSESOYUZNY LENINSKY KOMMUNISTICHESKY SOYUZ MOLODYOZHI, English ALL-UNION LENINIST COMMUNIST LEAGUE OF YOUTH, organization for Soviet youth aged 14 to 28, which is primarily a political organ for spreading Communist teachings and preparing future members of the Communist Party. Closely associated with this organization are the Pioneers (All-Union Lenin Pioneer Organization), for ages 9 to 14, and the Little Octobrists for the very young.

The Komsomol was organized in 1918 to band together various youth organizations previously involved in the Revolution; many fought in the Civil War. When the military phase ended, a new purpose was set in 1922—to engage the members in health activities, sports, education, publishing activities, and various industrial projects. Komsomol membership in 1979 was more than 38,400,000. In Soviet society, members are frequently favoured over nonmembers in matters of employment, scholarships, and the like. Active participation in the Komsomol is also considered important for gaining membership in the Communist Party. All Komsomol cells are federated at levels paralleling those of the party.

Both the Pioneers and the Little Octobrists may be considered preparatory organizations for providing politically directed education and recreation to children ultimately destined for Komsomol membership. The Pioneers are organized into brigades, each attached to a local Komsomol cell.

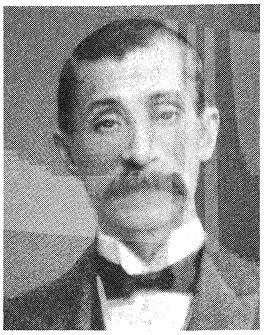
Komsomolsk-na-Amure, English KOMSOMOLSK-ON-AMUR, city in Khabarovsk *kray* (territory), eastern Russian Soviet Federated Socialist Republic, on the Amur River. Founded in 1932 on the site of the small village of Permskoye, the town was built by members of the Komsomol (Young Communist League), from which it derives its name. It rapidly developed into a major industrial centre, dominated by the Amurstal steelworks. With it are associated heavy engineering, machine building, and tinplate making; shipbuilding and ship repairing also are important. Oil from Sakhalin is refined, and there are also fishing, timber working, and light industries. A railway bridge across the Amur was completed there in 1975, reducing the route of the Trans-Siberian Railway to Vladivostok by 600 mi (960 km). The city has teacher-training and polytechnic institutes. Pop. (1983 est.) 284,000.

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Komsomolskaya Pravda (Russian: "Young Communist League Truth"), morning daily newspaper published in Moscow, the official voice of the Central Council of the Lenin Communist Youth Union, the league for young people 16 years of age and older. Founded in 1925, *Komsomolskaya Pravda* has historically had its main offices in Moscow, with those of *Pravda,* the Communist Party daily newspaper, but with its own editorial staff.

In 1953 *Komsomolskaya Pravda* began to use a livelier layout and a greater variety of material. Under its then editor, Nikita S. Khrushchev's son-in-law, Alexei Adzhubei, it introduced more travel articles, sports pieces, and short fiction and reduced the amount of propaganda. In the late 1980s *Komsomolskaya Pravda*'s circulation was about 17,600,000.

Komura Jutarō, KŌSHAKU (Marquess) (b. Nov. 5, 1855, Hyūga, Japan—d. Nov. 26, 1911, Hayama), Japanese diplomat of the Meiji period and negotiator of the Anglo-Japanese Alliance.



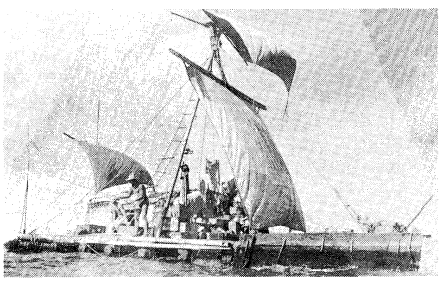
Komura Jutarō
Popperfoto

After graduating from Harvard Law School, Komura returned to Japan and entered the Japanese Ministry of Justice (1880), later transferring to the Ministry of Foreign Affairs. A year before the Sino-Japanese War (1893), he became a chargé d'affaires in Peking. Subsequently, Komura served in Korea, the United States, Russia, and again in China.

In 1901–05 Komura was minister of foreign affairs and tirelessly negotiated for the Anglo-Japanese Alliance (1905), a major basis of Japanese diplomacy in the ensuing years. As special envoy, Komura concluded the Treaty of Portsmouth (1905), which settled the Russo-Japanese War. Foreign minister again (1908) in the second Katsura Cabinet, he pursued treaty negotiations with Western nations and saw completion of the annexation of Korea. In 1910 he was created marquess.

komuz (musical instrument): *see* koboz.

Kon-Tiki, raft in which the Norwegian scientist Thor Heyerdahl and five companions sailed in 1947 from the western coast of South America to the islands east of Tahiti. Heyerdahl was interested in demonstrating the possibility that ancient people from America could have colonized Polynesia; to do so, he constructed *Kon-Tiki* (named for a legendary



Kon-Tiki at sea during its 1947 expedition
Thor Heyerdahl

Inca god) from locally available balsa logs at Callao, Peru, and in three and a half months traversed some 5,000 miles (8,000 km) of ocean. The *Kon-Tiki* has been preserved in a museum in Oslo.

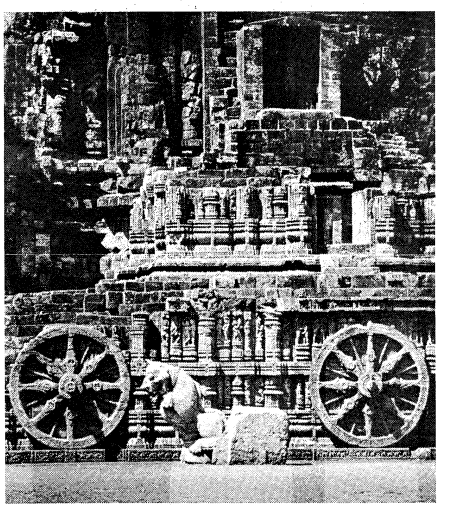
Kon Tum, also spelled KONTUM, Vietnamese CONG TUM, town on the central highlands, south-central Vietnam. In 1851 French Roman Catholic missionaries established the first Vietnamese settlement near Kon Tum, 140 miles (225 km) south-southeast of Hue. At an elevation of 1,720 feet (524 m), the town is a traditional trading centre for hides, horses, and sesame, and it ranks with Pleiku as one of the two most important highland centres. Linked to Pleiku, 45 miles (72 km) to the south, by a major highway, it has several hospitals and a large airfield. A secondary highway leads northeastward from Kon Tum through Chuong Nghia and Kon Plong. Pop. (latest est.) 33,554.

Kona (Hawaii, U.S.): *see* Kailua-Kona.

Konakry (Guinea): *see* Conakry.

Kōnan, city, Aichi *ken* (prefecture), Honshu, Japan, on the Kiso River, in the northern part of the Owari plain. Kōnan has been a centre of sericulture since the Tokugawa period (1603–1867) and includes Kochina, the oldest commercial centre in the district. After World War II the city became an important centre for the manufacture of synthetic fibres and textiles. Processed foods and machinery are also produced. Vegetables, fruit, and flowers are raised. Pop. (1985) 92,049.

Konārak, also spelled KANĀRAK, historic village, east-central Orissa state, eastern India, on the Bay of Bengal coast. It is famous for its 13th-century temple, the Sūrya Deula. Formerly called the Black Pagoda, it was used as a navigation landmark by mariners sailing to Calcutta. Never completed and falling into



Chariot wheels of the sun god Sūrya in the facade of the Sūrya Deula, Konārak, Orissa, India
Picturepoint, London

ruins before its restoration, the temple represents the culmination of the Orissan school of temple architecture.

The temple was dedicated to the sun god Sūrya; it was designed to represent his chariot, with 12 huge carved stone wheels and 7 stone horses around its base. The Sūrya Deula is about 100 feet (30 m) high and would have surpassed 200 feet high at its completion. The exterior is covered with sculptured decorations, many depicting erotic scenes. The village and the temple are associated with the legend of Sāmba, son of Lord Krishna, who was cured of leprosy by the sun god's blessings.

Konarski, Stanisław (b. Sept. 30, 1700, Zarczyce, near Kielce, Pol.—d. Aug. 3, 1773, Warsaw), Roman Catholic priest and political writer, who influenced the reform of education in Poland.

After entering the Order of the Piarist Fathers in 1715, Konarski studied at the Collegium Nazarenum in Rome and taught there in 1727–29. He then went to Paris to study educational methods and, becoming acquainted with the writings of John Locke, adopted his theory of education. He returned to Poland in 1731. In 1740 Konarski founded in War-



Konarski, miniature by Wincenty Lesseur, 1801; in the National Museum, Kraków, Pol.
By courtesy of the National Museum, Krakow, Pol.

saw the Collegium Nobilium, a school for the young men of ruling families, hoping that his pupils would be inspired to effect badly needed constitutional reforms. Stressing the teaching of the Polish language, hitherto neglected, Konarski emphasized the school theatre, writing a tragedy in Polish. His emphasis on patriotic education, the purity of the Polish language, and the natural sciences finally resulted in the Jesuits reforming their own schools accordingly.

Konarski's patriotic attitude also influenced his historical and political writings. He contributed to a collection of Polish laws, *Volumina Legum* (vol. 1–6, 1732–39; vol. 7–8, 1782), that is still a basic source. *O skutecznym rad sposobie,* 4 vol. (1760–63; "On the Means of Effective Counsels"), was aimed against the principle of the *liberum veto,* which, by empowering any single deputy to break up a diet or nullify its acts, made normal functioning of the state impossible and obstructed reform.

Konbaung DYNASTY (Myanmar [Burma]): *see* Alaungpaya dynasty.

Kond, also spelled KONDH (people): *see* Khond.

Kondílis, Geórgios (b. 1879, Proussós, Greece—d. Jan. 31, 1936, Athens), Greek general, one of a number of army officers who repeatedly intervened in, and disrupted the course of, parliamentary politics in Greece. Although a supporter of the republic when it was proclaimed in 1924, Kondílis was largely instrumental in securing the restoration of King George II in 1935.

Joining the army in 1896 as a private, Kondílis fought in the Cretan insurrection against Turkish rule the following year and was an officer in the Balkan Wars of 1912–13 and World War I. Promoted to general in 1922, he suppressed the royalist revolt of October 1923 and, after King George left the country in December, quit the army and entered politics, forming his own party, the National Republicans. In August 1926 he overthrew the military dictator Theodoros Pangalos in a bloodless coup d'état and, as prime minister, supervised the elections held in November; refusing to establish himself in place of Pangalos as military dictator, he retired from politics the following month.

Although until then largely identified with the liberals led by Eleuthérios Venizélos, Kondílis next gained political prominence as a supporter of the conservative Populist Party, serving as minister of war in a Populist government and suppressing a coup d'état initiated at Salonika by Venizélos in March 1935. Kondílis was then the most powerful man in Greece, proceeding both to purge the army and civil service of persons with republican sympathies and to condemn Venizélos in absentia to death. A plebiscite organized by Kondílis in November 1935 showed that

some 97 percent of the people wanted the king's return, though the figures were most likely manipulated by army officers. George II returned on November 25, with Kondílis as prime minister. When, however, he opposed an amnesty for political opponents that was favoured by the king, Kondílis was forced to resign.

Kondratev, Nikolay D(mitriyevich) (b. March 4, 1892—d. 1938?), Russian economist and statistician noted among Western economists for his analysis and theory of major (50-year) business cycles—the so-called Kondratev's waves.

Kondratev attended St. Petersburg University. He was a member of the Russian Socialist Revolutionary Party from 1917 to 1919. From 1920 to 1928 he taught at the Timiriazev Agricultural Academy and was director of the Institute for the Study of Business Activity. He established contact with foreign economic agencies, and in 1924 he lectured in the United States and Great Britain. During this period he helped to develop the first of the Soviet five-year plans, as well as devising methodology for the analysis of economic factors that would effect Soviet economic growth. Though he approved of Stalin's New Economic Policy, he opposed the total collectivization of agriculture and criticized the disproportionate development of industry and agriculture in the plan that was eventually adopted. In 1928 he was dismissed from his post in the institute. Two years later he was arrested and, in 1931, tried and sentenced to eight years in prison; in 1938 his sentence was reviewed, and he received the death penalty. The date and place of his death are unknown.

In 1987, together with many others tried on false accusations, Kondratev was cleared of all charges against him.

Konev, Ivan Stepanovich (b. Dec. 28 [Dec. 16, Old Style], 1897, Lodeino, Russia—d. May 21, 1973, Moscow), one of the outstanding Soviet generals in World War II, who was a leader in the offensive against the Germans.

Of peasant birth, Konev was drafted into the tsarist army in 1916. After the Russian Revolution, he joined (1918) the Communist Party and the Red Army. During the Civil War, he fought against the White Russian Army of Aleksandr V. Kolchak, organized guerrilla bands, and fought the Japanese. Konev participated in subduing the Kronshtadt Rebellion (1921) against Bolshevik rule. He finished his military training at the Frunze Military Academy, graduating in 1926.

Konev was a general in the army when the Germans invaded the Soviet Union in June 1941; it was he who led the first real counterattack of the war. He defeated the German tank expert General Heinz Guderian's advance on Moscow (December 1941) by employing the "Konev ambush"—a planned retreat of troops in the centre, with the flanks then snapping shut across the breach to trap the pursuing enemy. In the critical summer of 1942 he halted a large German force that had been sent to reinforce the German army pounding at Stalingrad. He was one of the generals involved in repelling Germany's third summer offensive (1943). After his entrapment of 100,000 Nazi troops in the Korsun salient, Konev was made a marshal of the Soviet Union (March 1944). In August 1944 his army was the first to carry the fighting beyond Soviet frontiers, crossing the Vistula River, and, after sweeping across Poland, it was the first to march onto German soil. Konev's 1st Ukranian Army advanced to the Oder River and, together with Marshal Georgy K. Zhukov's forces, entered and captured Berlin. His army linked with the U.S. forces under General Mark Clark at Torgau.

After the defeat of Germany, Konev became supreme commissar for Austria (1945), succeeded Zhukov as commander in chief of Soviet ground forces (1946–50), and thereafter held various military posts on the ministerial level, including commander in chief of the Warsaw Pact forces (1955–60). In 1961 he was temporarily recalled to act as commander in chief of Soviet forces in East Germany, stepping down in 1962 although still retaining a post in the defense ministry.



Konev, 1940s
Vail—Sovfoto

Kong River, Khmer TÔNLÉ KŎNG, Laotian XE KONG, river in Laos and Kampuchea (Cambodia) rising in the Annamitique Mountains in northern Vietnam southwest of Hue. It flows between the Bolovens Plateau of southern Laos and the mountains in a southwesterly direction for 300 miles (480 km), picking up the Sou and Kamane tributaries at Muong May. Entering Kampuchea east of the Mekong River, it continues southwestward across the northern Kampuchean plateau and is joined by the San River just east of Stœng Trêng, where it joins the Mekong.

konghou, Chinese multistringed, plucked instrument of the harp family. It first appeared in the Han period (206 BC–AD 220) and was popular as an orchestral and a solo instrument until about the 14th century, when its importance was largely superseded by other instruments. It became popular again, however, in the 20th century through its use by the Shanghai and the Central traditional orchestras.

The sound box of a *konghou* resembles that of a pi-pa but with a phoenix-headed neck. On each side of the sound box is a row of bridges over which 36 strings are stretched. Fixed to the bridges is a device coordinating the two groups of strings in movements of pressing, kneeding, trilling, and sliding. Its range usually includes five and one-half octaves centred approximately at middle C. Its music is characterized by tension-altering embellishments, glissandos, arpeggiated chords, and register contrast.

Kongmoon (China): *see* Chiang-men.

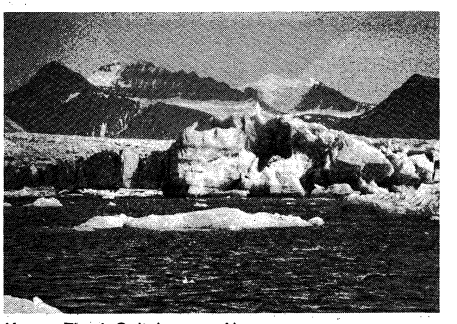
Kongo, also called BAKONGO, group of Bantu-speaking peoples related through language and culture and dwelling along the Atlantic coast of Africa from Pointe-Noire, Congo, in the north, to Luanda, Angola, in the south. In the east, their territory is limited by the Kwango River and in the northeast by Stanley Pool, in the Congo. The Kongo thus live in the Congo, Zaire, and Angola, and they numbered about 7,200,000 in the late 20th century. Their language is part of the Benue-Congo branch of the Niger-Congo languages.

The Kongo cultivate cassava, bananas, corn (maize), sweet potatoes, peanuts (groundnuts), beans, and taro. Cash crops are coffee, cacao, urena, bananas, and palm oil. Fishing and hunting are still practiced by some groups, but many Kongo live and work or trade in towns.

Descent is reckoned through the female line, and tribes are grouped in lineages. The main characteristic of their social organization is fragmentation: nearly every village is independent of its neighbours, and almost nothing remains of the ancient Kongo Kingdom (*q.v.*). The Kongo religion centres on ancestor and spirit cults, which also play a part in social and political organization. A strong tradition of prophetism and messianism among the Kongo has given rise in the 20th century to nativistic, political-religious movements, mostly xenophobic.

Kongo Kingdom, major Bantu-speaking kingdom astride the Congo River in west-central Africa, probably founded in the 14th century. It was governed by a king, the *manikongo,* whose economic power was based upon trade in ivory, hides, slaves, and a shell currency of western Africa. Within a few years after the kingdom was first encountered by the Portuguese in 1484, the sixth *manikongo,* Nzinga Mbemba (later Afonso I), converted to Christianity and extended diplomatic and economic relations with Portugal. The agreement soon collapsed, however, as the Portuguese extended their slave-raiding activities. By 1570 the power of the Kongo Kingdom had begun to decline, and severe internal tensions had developed. After the key Battle of Mbwila (1665), the kingdom broke up into a number of rival and warring chiefdoms. The concept of the Kongo kingship and identity lived on and still has political relevance in central Africa, though.

Kongs Fjord, Norwegian KONGSFJORDEN, inlet, Spitsbergen island, Arctic Ocean. Kongs Fjord is an arm of the Arctic Ocean measuring 16 miles (26 km) long and ranging in width from 4 to 9 miles (6 to 14 km). The head of the bay (southeast) receives the waters of the Kongsvegen glacier.



Kongs Fjord, Spitsbergen, Norway
A-Magasinet

Ny-Ålesund, a coal-mining town, is located on the inlet's southern shore. Kongs Fjord has been a base for a number of polar flights, including that of Richard E. Byrd (U.S.) with Floyd Bennett (U.S.) and that of Roald Amundsen (Norwegian) with Umberto Nobile (Italian), both in 1926.

Koniecpolski, Stanisław (b. *c.* 1591—d. March 12, 1646, Brody, Pol.), military and political leader of Poland who won major victories against the Turks, the Tatars, and the Swedes.

Appointed field commander of the Polish forces in 1619, Koniecpolski was captured during the Battle of Cecora (Ţuţora; 1620) by the Turks and held prisoner at Istanbul for three years. On returning to Poland, he defeated the Tatars (vassals of the Turks) at Martynów (1624), received the thanks of the Polish Sejm (Diet), and was made palatine of Sandomierz by King Sigismund III. In 1626 he was transferred to Prussia, where the Poles were engaged in a bitter conflict with the Swedish king Gustavus II Adolphus. Koniecpolski subsequently won a series of victories in 1627 at Puck, at

Hamersztyn (Czarne), and at Tczew. But he was also compelled to withdraw from strategic Polish strongholds in Prussia (1628), and, despite his victory over Gustavus at Trzcianka



Koniecpolski, engraving by Anton Tepplar after a painting by Martin Altomonte

By courtesy of the Museum Narodowe, Warsaw

(June 27, 1629), the Polish–Swedish Truce of Altmark (Sept. 25, 1629) acknowledged Sweden as the dominant power on the southern Baltic Sea coast.

Appointed commander in chief of the Polish forces in 1632, Koniecpolski played a major role directing political affairs after the death of Sigismund III Vasa (April 30, 1632) and became an influential adviser of the new king, Władysław IV Vasa, as well as castellan of Kraków (1633). Encouraging Władysław to direct Polish foreign policy against the Tatars, Koniecpolski repulsed a Tatar invasion (July 1633), held back a large Turko-Tatar force at Kamieniec (October 1633), and soundly defeated the Tatars again at Ochmatow (1644). Engaged also in subduing mutinous Cossacks in the Ukraine, Koniecpolski built the fortress of Kudak (on the site of the later Dnepropetrovsk) in 1635.

Koniecpolski gathered a fortune in lands in the western Ukraine; more than 100,000 people lived on his estates. He founded the market town of Brody, with a citadel and bastions (1633), and set up workshops producing Persian-type carpets there. He died on the eve of an expedition against the Turks.

König Rother (literary character): *see* Rother, König.

Königgrätz (Czechoslovakia): *see* Hradec Králové.

Königgrätz, Battle of, also called BATTLE OF SADOWA (July 3, 1866), decisive battle during the Seven Weeks' War between Prussia and Austria, fought at the village of Sadowa, northwest of the Bohemian town of Königgrätz (Czech, Hradec Králové) on the upper Elbe River. The Prussian victory effected Austria's exclusion from a Prussian-dominated Germany.

Austrian forces on the Bohemian front numbered about 241,000 men, who were equipped with muzzle-loading rifles and relied heavily on the bayonet charge. Their recently appointed commander, Gen. Ludwig August, Ritter von Benedek, had accepted the post with reluctance because of his unfamiliarity with both troops and local terrain. The Prussian forces, totalling some 285,000 men, were deployed mainly in three armies ranging in a 270-mile-long arc, from the border of Saxony to Silesia, under the general command of the chief of the general staff, Helmuth von Moltke, who was to test his new theories and methods in the encounter. The Prussian troops were armed with breech-loading needle guns and for the first time in European warfare fully enjoyed the advantages of railroad transport.

After a series of successes in the field, Moltke was able to unite the three armies on July 1. Because Prussian reconnaissance was faulty and Benedek was searching for better ground, both forces joined battle on July 3 from unfavourable positions. The Austrians lost about 40,000 men, nearly half that number having been taken prisoner, while the Prussians lost less than 15,000. Benedek's retreat to the southeast and the Prussians' failure to pursue allowed the Austrians to regroup at Olmütz (Olomouc) in Moravia. Both armies were again prepared for battle near Vienna when a truce was arranged at Nikolsburg (Mikulov) on July 26. Benedek was held responsible for the defeat and was retired. The Prussians learned profitable lessons for the future from their mistakes in this test of strength.

Königsberg (Russian S.F.S.R.): *see* Kaliningrad.

Königsberg, Albertus University of, German ALBERTUS-UNIVERSITÄT ZU KÖNIGSBERG, institution of higher learning founded in Königsberg, Prussia (now Kaliningrad, U.S.S.R.), in 1544. At first drawing its enrollment mainly from Prussia, Poland, and Lithuania, the university after the Thirty Years' War (1618–48) attracted students from all over the German-speaking world, of which it became a literary centre.

In 1740 Immanuel Kant, born in Königsberg, entered the university's theology school, soon transferring his interest to Newtonian physics, spending 15 years as a tutor, and finally becoming professor of logic and metaphysics. In 1810 Friedrich Wilhelm Bessel, who made important contributions to the measurement of the universe and to pure mathematics, became a professor and director of the university's observatory.

The city of Königsberg suffered severe damage in World War II, and the old university came to an end in 1945. Königsberg then, as Kaliningrad, became part of the Kaliningrad Oblast, R.S.F.S.R. In 1967 a state university, the University of Kaliningrad, was established there. There are faculties of physics, mathematics, history, philology, economics, law, geography, and chemistry and biology.

Königsmark, Maria Aurora, Gräfin von (countess of) (b. May 8, 1662, Stade, Bremen—d. Feb. 16, 1728, Quedlinburg, Brandenburg), German noblewoman and mistress of Augustus II the Strong, elector of Saxony and king of Poland. She was for many years a powerful figure at the Saxon court.

The beautiful and gifted daughter of an impoverished German nobleman in Swedish service, Countess Königsmark met the Saxon elector in Dresden while pursuing inquiries about her missing brother Philipp Christoph.



Maria Aurora von Königsmark, detail from an oil painting by David Klöcker Ehrenstrahl; in Marienburg Castle, Germany

By courtesy of the Niedersachsische Landesgalerie, Hannover

Augustus of Saxony soon made her his mistress, and the relationship resulted in the birth of a son (1696), Maurice de Saxe, the future marshal of France. In 1702 the Elector, who had meanwhile become king of Poland, sent her on an unsuccessful mission to arrange peace between himself and Charles XII of Sweden. After her fall from favour, she became coadjutor abbess and lady provost of Quedlinburg, but she preferred court life and seldom resided in her holdings.

Königsmark, Philipp Christoph, Graf von (count of) (b. March 14, 1665, Stade, Bremen—d. July 1, 1694, Hannover, Hanover), alleged German lover of Sophia Dorothea, consort to the Hanoverian electoral prince George, later King George I of England. The supposed relationship led to Königsmark's death and to Sophia Dorothea's lifelong imprisonment.

Born of a noble German family in Swedish service, Königsmark, whose sister Maria Aurora became the mistress of the elector Frederick Augustus I of Saxony (later Augustus II



Philipp von Königsmark, oil reproduction by K. Oesterley the Younger after a contemporary portrait; in the Bomann Museum, Celle, Germany

By courtesy of the Niedersachsische Landesgalerie, Hannover

the Strong, king of Poland), was a colonel in the Hanoverian service. Twice he aided the dissatisfied Sophia Dorothea in unsuccessful attempts to escape from Hanover. In 1694, before he could take up a new commission in electoral Saxony, he disappeared, probably having been murdered. George divorced Sophia Dorothea and imprisoned her.

Königssee, also called BARTHOLOMÄUSSEE, English ST. BARTHOLOMEW'S LAKE, lake, in Bavaria *Land* (state), southern Germany, just south of Berchtesgaden, 1,975 ft (602 m) above sea level. In a deep cut, surrounded by sheer limestone mountains rising to 8,200 ft, it is one of the most picturesque lakes in the Berchtesgadener Alps. It is 5 mi (8 km) long and from 500 yd (457 m) to more than 1 mi wide, and its greatest depth is 617 ft. The St. Bartholomew pilgrimage church and hunting lodge, on its west shore, formerly belonged to the prince-bishops of Salzburg and later to the kings of Bavaria. The lake, which is stocked with Alpine trout (saibling, or arctic char), and the surrounding area form a federal nature reserve.

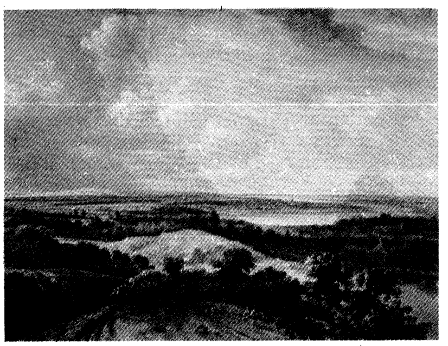
Königswinter, city, North Rhine-Westphalia *Land* (state), western Germany; it lies in the Siebengebirge (Seven Hills), on the right bank of the Rhine River, just south of Bonn. The Drachenfels (Dragon's Rock), a hill 1,053 ft (321 m) high, is crowned by a ruined castle built in the 12th century by the archbishop of Cologne and destroyed by the French in the 17th century. According to the Nibelungen legends, the Drachenloch (Dragon's Cave) in the hill sheltered the dragon slain by the hero Siegfried. The hillside quarries supplied stone for the building of the Cologne cathedral. Heister-

bach, a ruined Cistercian abbey, is nearby. The city is a centre for a resort area. Pop. (1989 est.) 34,136.

Konin, *województwo* (province), west central Poland, established 1975, comprising an area of 1,984 sq mi (5,139 sq km). It is bordered by the provinces of Bydgoszcz and Włocławek on the north, Płock on the east, Sieradz and Kalisz on the south, and Poznań on the west. In the north there are extensive wheat fields and numerous health spas. In the middle of the province, along the Warta River, there are coal mines, power plants, and factories producing building materials, porcelain, and glass. The southern part produces sugar beets, rye, and potatoes. Thermoelectric power plants located near Konin (*q.v.*) city, the provincial capital, are powered by local coke and lignite. Pop. (1982 est.) 444,300.

Konin, city, Konin *województwo* (province), west central Poland, situated on the banks of the Warta River, 61 mi (98 km) east of Poznań city and 60 mi south of Toruń city. Located on the Warsaw–Poznań railroad line, it has factories producing chemicals, building materials, and electrical machinery; several coking plants; and an aluminum-smelting works using local coal to process bauxite from the Konin Lignite Basin (Konińskiego Zagłębia Węgla Brunatnego). An excavated Roman milestone marks Konin as the halfway point on the ancient trade route between Kalisz and Kruszwica. It was first chronicled in the 13th century as a commercial centre. After being destroyed by the Teutonic Knights in 1331, Konin was rebuilt as a walled and fortified town and became an important centre for the textile industry and craftsmen's guilds. From 1793 to 1806 it was under Prussian rule; in 1815 Konin was returned to Poland. It received city rights in 1923. Gothic (dating from the 14th century) and Baroque churches, together with the 19th-century town hall, Masonic lodge, and synagogue, are points of interest. Pop. (1982 est.). 69,600.

Koninck, Philips, Koninck also spelled KONING, CONINGH, or CONNINGH (b. Nov. 5, 1619, Amsterdam—d. Oct. 4, 1688, Amsterdam), Dutch painter of the Baroque period, celebrated for his panoramic landscapes. The influence of Rembrandt is paramount in the art of the earliest phase of his career, and it has often been supposed, probably incorrectly,



"View over a Flat Landscape," oil on canvas by Philips Koninck, 1664; in the Museum Boymans-van Beuningen, Rotterdam

By courtesy of the Museum Boymans-van Beuningen, Rotterdam, The Netherlands

that Rembrandt was his master. However, Koninck was certainly a friend of Rembrandt and was associated with his artistic circle in Amsterdam. His works include portraits, biblical subjects, and genre scenes, but his characteristic works are vast views of level countryside with villages, trees, and waterways observed from some slight eminence; *e.g.*, "View over a Flat Landscape" (1664; Museum Boymans-van Beuningen, Rotterdam) and "An Extensive Landscape with a Hawking Party" (National Gallery, London). Contrasting areas of cloud shadow and sunlit landscape give life and variety to the simple compositions. Though sufficiently similar to Rembrandt in style and handling to have often passed under his name, Koninck's later landscapes show generally a blonder and greener colour range and were most influenced by the work of Hercules Seghers.

Konishi Yukinaga (d. Nov. 6, 1600, Kyōto), Christian general who spearheaded the Japanese invasion of Korea in 1592.

The son of a prosperous Sakai merchant, who was also an important official in the feudal administration of the noted warrior Toyotomi Hideyoshi, Konishi followed his father into Hideyoshi's service; he became one of the most trusted generals in Hideyoshi's successful attempt to unify Japan under central control.

When in 1592 Hideyoshi decided to invade Korea, Konishi's troops were the first to land on Korean soil. For his early victories, which included the conquest of most of southern Korea, he received much glory. His small Japanese force was soon overextended, however, and Konishi was forced to accept the offer of a truce from Korea's Chinese allies.

Negotiations dragged on inconclusively until 1597, when Hideyoshi launched a new invasion of Korea. Konishi's troops again met with early success, but just as they began to encounter stiff Chinese resistance, Hideyoshi died, and Konishi went home to participate in the civil wars to determine his successor. In the great Battle of Sekigahara (1600), his attempt to prevent control of the country from going to Tokugawa Ieyasu resulted in failure.

Both Konishi and his father were converts to Roman Catholicism and were frequently mentioned in Jesuit reports from Japan as two of the most prominent and zealous Japanese Christians. It was because of his religious beliefs that Konishi, in the humiliation of defeat, refused to take his own life as his peers would have expected; he was instead captured and executed.

Konkan, also called APARANTA, coastal plain of western India, lying between the Arabian Sea (west) and the Western Ghāts (east). The plain stretches approximately 330 mi (530 km) from the Daman Gangā River north of Bombay to the Terekhol River between Mahārāshtra and Goa, Daman, and Diu union territory in the south. Between 28 and 47 mi in width, the Konkan includes Thāna, Greater Bombay, Raigarh, and Ratnāgiri districts.

The region is traversed by seasonal rivers that drain the heavy monsoonal rainfall from the crest of the Sahyādri Hills. The generally uneven terrain is composed of eroded remnant ranges of the Ghāts that form low lateritic plateaus in the west and terminate in a coastline of alternating bays and headlands. Only about one-third of the land is cultivable, and the population lives mainly in the relatively fertile river valleys near the coast and in the newly developed industrial belts around Bombay, Thāna, Khopali, and Panvel. The barren hills are occupied by the pastoral Bhīl, Kathkari, and Kokana. The main crops are rice, pulses, vegetables, fruits, and coconuts, and fishing and salt manufacture are also important.

The industrial complex of Greater Bombay is the primary economic focus of the region. Nearly all trade is carried on with Bombay, and steady migration to the city has left rural Konkan depleted of manpower and skilled workers. Iron and manganese are mined and exported through the port of Reddi.

The ports of the Konkan were known to the ancient Greeks and Egyptians and to Arab traders. The spice trade brought prosperity to the ancient Hindu kingdoms of the area. The cave temples of Elephanta Island and Kanheri bear testimony to the prosperous culture of this era. With the advent of the Portuguese and British, the port cities were further developed and fortified but now have lost their former importance.

Konkanasth (Indian caste): *see* Citpāvan.

Konkō-kyō, Japanese religious movement founded in the 19th century, a prototype of the "new religions" that proliferated in post-World War II Japan. The movement was founded in 1859 by Kawate Bunjirō, a farmer who lived in present-day Okayama Prefecture. He believed that he was appointed by the deity Konkō (Bright Metal; new name for the formerly malevolent deity Konjin) to act as a mediator (*toritsugi*) between god and mankind. The mediator takes on the pain and sufferings of his followers and transmits them to god. Succession to the mediatorship is reserved for descendants of the founder in the male line. Konkō-kyō emphasizes the interdependence of god and man, which is likened to the relationship of parent and son. The group continues to be recognized as a denomination of Sect Shintō and in 1978 claimed about 480,000 followers.

Konkouré River, river, rising in the Fouta Djallon plateau of west central Guinea, West Africa, and flowing in a westerly direction to the Atlantic just north of Sangareya Bay. The river's 188-mi (303-km) course is much broken by rapids and waterfalls (with drops ranging from 80 to 1,350 ft [24 to 411 m]), which are a source of hydropower. Guinea's first hydroelectric dam began operation at Grandes Chutes on the Samou River (a small tributary) in 1954; it was the first of the Kalé-Grandes Chutes complex (1963) of dams on the Samou that provide electrical power to Conakry and Kindia. A second series of dams lies on the main course of the Konkouré upstream from Fria; both the Amaria and the Souapiti hydroelectric plants serve the nation's bauxite-processing industry.

Formerly a major hindrance to land transportation between Conakry and the towns of Boffa and Boké, the Konkouré is now bridged at Ouassou, its head of navigation.

Konoe Fumimaro, KŌSHAKU (duke, or prince), Konoe also spelled KONOYE (b. Oct. 12, 1891, Tokyo—d. Dec. 16, 1945, Tokyo), political leader and prime minister of Japan (1937–39, 1940–41), who tried unsuccessfully to restrict the power of the military and to keep Japan's war with China from widening into a world conflict.

Early life. Konoe was born to the foremost of the five families from among which regents (*sesshō*) and chancellors (*kampaku*) were cho-



Konoe Fumimaro

By courtesy of the International Society for Educational Information Tokyo, Inc.

sen. His father, Atsumaro, was a prominent statesman.

Konoe was an intelligent and sensitive child, but he tended to be nervous and timid; and he developed a cynical attitude toward society. He was educated with the intellectual elite of the nation, first attending Tokyo Imperial University and then Kyōto Imperial University, from which, during Japan's participation in World War I, he was graduated by the law faculty.

As a student he became intimate with Western philosophy, literature, sociology, and social and economic problems, particularly the problems of the poor. One of his major advisers at Kyōto University later became one of Japan's leading Marxist economists. During this period, Konoe translated into Japanese Oscar Wilde's essay "The Soul of Man Under Socialism" (1891), which was published in an intellectual journal. Its sale was prohibited by the government because it was judged dangerous to the public order.

Political career. Unlike most politicians in Japan before World War II, Konoe did not begin his political career either through civil-service examination or through membership in a political party. Instead, he entered (*c.* 1920) under the tutelage of the *genrō* (elder statesman) Saionji Kimmochi, a perceptive advocate of parliamentary government and a member of the court aristocracy.

After the war Konoe was an attendant of the Japanese delegation to the Paris Peace Conference. At this time he wrote an article rejecting the Anglo-American principle of pacifism as a convenient cover for maintaining the status quo by nations which, unlike Japan, already possessed extensive spheres of influence. He also vigorously criticized as impractical the principle of an international league as a means of abolishing economic imperialism and racial prejudice.

Konoe entered the upper house of the Diet by virtue of his rank as prince. He advocated reform of that house and of the peerage system, opposed Fascism, and called for reform of the army general staff to prevent army interference in foreign affairs. His goal was the expansion of parliamentary politics. From the outbreak of war with China in Manchuria (1931), Konoe felt that a complete political renovation of the Japanese militaristic power structure, carried out by political leaders, was required in order to realize the nation's destiny. After serving as vice president of the upper house, Konoe was appointed president in 1933.

Prime minister. He declined to form a Cabinet in 1936, when on Saionji's recommendation, he was asked to by the Emperor. But in June 1937 he agreed to form a nonparty Cabinet, which he hoped would gain the support of the nation. He decided to adopt the most reasonable of the army's demands while controlling its more reckless elements. He declared that he sought to realize social and international righteousness and to alleviate internal friction and discord.

In July Chinese and Japanese forces clashed near Peking, and the two countries soon were engaged in full-scale, although undeclared, war. Konoe made various unsuccessful efforts to end the conflict, and in January 1939 his Cabinet fell. He was appointed head of the Privy Council and was given a Cabinet post in the Hiranuma Kiichirō Cabinet.

Konoe's first Cabinet had been plagued by the separation of state affairs and the army's right of supreme command. He believed that to restrain the army and to settle the war required a government based on political power derived from a national organization. In June 1940 he resigned as head of the Privy Council, planning to develop such a mass national movement, but, before his plans were fully developed, he was persuaded to form his second Cabinet. His plan for a mass, popular organization was finally realized later that year with the formation of the Imperial Rule Assistance Association (Taisei Yokusan-kai).

That September Japan concluded a military alliance—the Tripartite Pact—with Germany and Italy. Meanwhile, amid steadily deteriorating relations with Great Britain and the United States, Konoe tried to prevent a widening of the Sino-Japanese conflict and thus avert American participation; in April 1941 he concluded a nonaggression pact with the Soviet Union.

Faced with a further deterioration of Japanese–U.S. relations and a U.S. encirclement of Japan, Konoe concluded that a solution to the Sino-Japanese conflict could be reached only through American mediation. Thus, from April 1941, he devoted all his energy to Japanese–U.S. negotiations, hoping to enter into discussions with the U.S. president, Franklin D. Roosevelt. In July the third Konoe Cabinet was formed in order to eliminate the foreign minister, Matsuoka Yōsuke, who opposed these negotiations. But in October Konoe resigned over differences with the army minister, Tōjō Hideki.

With the widening of the war following the Japanese attack on Pearl Harbor in December 1941, Konoe came under military surveillance and was forced to leave the centre of politics. In 1944 he cooperated with other leading political figures to bring about the collapse of the Tōjō Cabinet. After the war, in 1945, he became deputy minister of national affairs in the Higashikuni Cabinet. Later that year he was served with an arrest warrant by the occupation army on suspicion of being a war criminal, and on December 16, the day he was to report, he committed suicide by drinking poison. (Sh.H.)

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Konopnicka, Maria, original name MARJA WASIŁOWSKA, pseudonym JAN SAWA (b. May 12, 1842, Suwałki, Pol.—d. Oct. 8, 1910, Lemberg, Austria-Hungary), author of short stories and one of the important representative Positivist poets in Polish literature.

In exile from Russian-dominated Poland for much of her life, Konopnicka developed strong patriotic convictions, which are apparent in her work. Her sympathy with the oppressed peasantry, however, often led her into sentimentality. *Pan Balcer w Brazylji* (1892–1909; "Mr. Balcer in Brazil"), one of her most ambitious works, is a near-epic description of a Polish peasant emigrant's disillusionment with the New World. The poem cycle *Italia* (1901; "Italy") contains some of her most beautiful verses. In her short stories, considered among the best in Polish literature, she achieves great concentration; "Niemczaki" ("The German Children") and "Nasza Szkapa" ("Our Old Mare") are among the best known.

Konotop, city, centre of a *rayon* (district), Sumy *oblast* (administrative region), Ukrainian Soviet Socialist Republic. It was founded in 1652 as a fortress on Russia's frontier with Poland and the Crimean Tatars; it became a city in 1780. Rapid growth began in the early 20th century when the railway reached the city, which now has railway and electrical-engineering industries. There is a college of building technology, a medical school, and a local museum. Pop. (1983 est.) 88,000.

Konovalov, Aleksandr Ivanovich (b. 1875, Russia—d. 1948, New York City), liberal Russian factory owner and political figure; he played a supporting role in the provisional government that was overthrown during the Russian Revolution of November (October, old style) 1917, which was engineered by Lenin and the Bolshevik party.

Born into a prosperous family engaged in textile manufacturing, Konovalov was educated in England and later headed the stock society that controlled his family's holdings. Active in politics, he was leader of the Progressive Party and served as a deputy to the fourth state Duma, at one point acting as assistant chairman. In August 1915 he helped to organize the Progressive Bloc, a coalition of liberal parties in the Duma that issued a demand for sweeping reforms, which the Tsar and his ministers rejected. After the abdication of the Tsar in March (February, O.S.) 1917, he joined the Constitutional Democratic Party. He was appointed minister of trade and industry during the first two cabinets of the provisional government and served as Premier A.F. Kerensky's vice-premier during the last coalition. He was arrested along with other members of the provisional government on Nov. 7 (Oct. 25, O.S.), 1917, in the Winter Palace but was set free soon thereafter. Soviet historians claim that he was one of the organizers of the unsuccessful Kronstadt Anti-Soviet Revolt (1921) by members of the Russian Baltic fleet, but other observers dispute this. After leaving Russia, he participated in several anti-Soviet emigré organizations.

Konrad (German personal name): *see under* Conrad, except as below.

Konrad VON MARBURG, English CONRAD OF MARBURG (b. *c.* 1180, probably near Marburg, Thuringia—d. July 30, 1233, near Marburg), first papal inquisitor in Germany, whose excessive cruelty led to his own death. In 1214 he was commissioned by Pope Innocent III to press his crusade against the Albigenses, a heretical Christian sect flourishing in western Europe. The results of Konrad's efforts were a succession of bloody massacres. By 1226 he held an influential position at the court of Louis IV, landgrave of Thuringia. A year earlier he had become confessor to Louis's wife, St. Elizabeth of Hungary, whom he disciplined with physical brutality. In 1231 Elizabeth died, and Pope Gregory IX made Konrad the chief inquisitor in Germany; he was assigned to exterminate heresy, denounce clerical marriage, and reform monasteries. His method was so severe that a plea for his removal was made to Gregory by the German bishops. In 1233 he accused Count Henry II of Sayn (Bendorf-Sayn) of heresy. An assembly of bishops and princes at Mainz declared Henry innocent, but Konrad demanded a reversal of this sentence. As he rode from Mainz, he was murdered. Konrad is portrayed in a verse drama about Elizabeth, *The Saint's Tragedy* (1848), by the English author Charles Kingsley.

Konrad VON WÜRZBURG (b. *c.* 1225, Würzburg, Würzburg—d. Aug. 31, 1287, Basel, Switz.), Middle High German poet who, during the decline of chivalry, sought to preserve the ideals of courtly life. Of humble origin, he served a succession of patrons as a professional poet and eventually settled in Basel. His works range from love lyrics and short didactic poems (*Sprüche*) to full-scale epics, such as *Partonopier und Meliur*, on the fairy-lover theme, and *Der Trojanerkrieg* (*The Trojan War*), a tedious account of the Trojan War. He is at his best in his shorter narrative poems, the secular romances *Englehart*, *Dasz Herzmaere* (*The Heart's Tidings*), and *Keiser Otte mit dem Barte* (*Kaiser Otte with the Beard*) and the religious legends *Silvester*, *Alexius*, and *Pantaleon*.

Konrad's originality is one of form rather than content. Taking Gottfried von Strassburg, one of the masters of the epic of courtly life, as his model, he developed Gottfried's

stylized techniques often to the point of exaggeration. In one of his poems every syllable rhymes. The complexity and the explicitly didactic character of his poetry earned for him the esteem of his contemporaries. A century later the rising generation of artisan-poets known as Meistersingers named him as one of the "12 old masters" of medieval poetry from whom they claimed descent.

Konso, ethnolinguistic group located in the arid highlands of southwestern Ethiopia. Their sharply delimited traditional territory is surrounded by lands of Galla peoples, to whom the Konso are culturally and linguistically related. A Cushitic people, the Konso are of mixed Caucasoid and Negroid ancestry.

Unlike most Ethiopian peoples, the Konso live in large towns, each governed by an autonomous council of elders. The social status of all males, and of some females, is defined by a generation-grading system. Although a generation grade theoretically encompasses the men in an entire region, it does not actually function beyond each town's borders and therefore does not prevent conflicts between towns. Kinship is reckoned in nine exogamous, patrilineal clans and in lineages that are headed by priests and through which property is inherited. Craftsmen form a distinct social class. Although polygyny is accepted, few men can afford more than one wife.

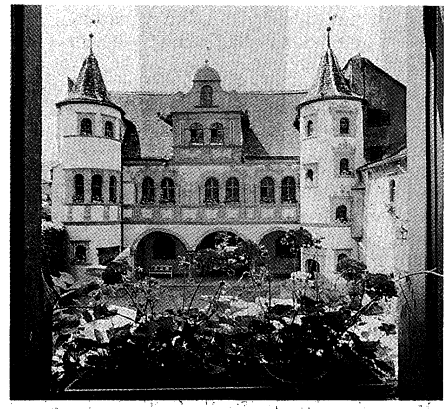
The economy of the Konso rests on an exceptionally intensive agriculture involving irrigation and terracing of mountain slopes. Corn (maize) and numerous varieties of sorghum are the staple crops, and cotton and coffee are cash crops. To protect the fields the Konso maintain their cattle in stalls and feed them by hand or supervise their grazing. They use both the milk and the meat of cattle and the meat of sheep and goats as food, and the animals' dung is collected for fertilizer. Numerous other animals are taboo as food.

The Konso are notable for the erection of *wagas,* memorial statues to a dead man who has killed an enemy or an animal such as a lion or a leopard. These stylized wooden carvings are arranged in groups, representing the man, his wives, and his vanquished adversaries.

Konstantinos (Greek personal name): *see under* Constantine.

Konstantinovka, city, Donetsk *oblast* (province), Ukrainian S.S.R., on the Krivoy Torets River. Before the October Revolution (1917) a small settlement with an ironworks, Konstantinovka developed in the Soviet era into a major industrial centre. In addition to an integrated ironworks and steelworks, there is a zinc smelter and associated chemical works producing sulfuric acid and superphosphate fertilizers. Konstantinovka is one of the most important glass-making cities of the U.S.S.R. Pop. (1989 prelim.) 108,000.

Konstanz, French CONSTANCE, city, Baden-Württemberg *Land* (state), southwestern Germany, where the Rhine flows out of Lake Constance (Bodensee), adjacent to (south of) Kreuzlingen, Switz. The site of a Roman fort, it was captured in the 3rd century by the Alemanni, who established a bishopric there in the 6th century. In 1183 Emperor Frederick I Barbarossa made peace with the Lombard states at Konstanz, which became a free imperial city in 1192. It prospered with the linen trade in the 13th century, freed itself from episcopal rule in the 14th, and became the head of a powerful confederacy of towns. During the Council of Constance, Jan Hus, the Bohemian religious Reformer, was tried and burned there (1415). The bishop transferred his see to Meersburg on the lake's north shore after Konstanz accepted the Reformation and joined the Protestant Schmalkaldic League (1531). With the defeat of the Protestants (1547), the city lost its free imperial status, became Roman Catholic again, and fell under Austrian rule until it was assigned to the duchy of Baden in 1805. Although many treasures and archives were removed, churches and monasteries suppressed, and most of the fortifications pulled down in the 19th century, the city remained the cultural and economic centre of the district.



Town Hall, Konstanz, Ger.
Archiv fur Kunst und Geschichte, Berlin

Notable buildings include the Konzilium, or Kaufhaus (1388; originally a merchants' hall), the Renaissance Town Hall, and the Gothic Rosgarten Museum (once the butchers' guildhouse). The 11th-century Romanesque-Gothic Münster was the cathedral until the bishopric was suppressed in 1821. The Insel Hotel, a former medieval Dominican monastery, was the birthplace (1838) of Ferdinand, Graf von Zeppelin, the builder of dirigibles. The city has an art museum and a university.

The modern residential and industrial areas are mostly situated north of the Rhine (there bridged) in the district of Petershausen and adjacent suburbs. Industries include textile, engineering, electrical, and chemical works. Konstanz, which lies at the end of the Black Forest and Upper Rhine railways, is connected to the Swiss railway network. It is the most popular tourist resort on the lake. Pop. (1989 est.) 72,862.

Konstanz, Lake (Switzerland): *see* Constance, Lake.

Konstanze (Holy Roman empress-consort): *see* Constance.

Kontagora, town and traditional emirate, northwestern Niger state, western Nigeria, on the south bank of the Kontagora River. Umaru Nagwamatse, an adventurer of the ruling Fulani house of Sokoto (186 miles [299 km] north), was named *sarkin sudan* ("king of the blacks") in 1859 by Ahmadu Zaruku, Sokoto's *sarkin musulmi* ("commander of the faithful"). Umaru then conquered a region mostly inhabited by the non-Muslim Kamberi people, founded the town of Kontagora (from *kwanta gora*—"lay down your gourds") as his kingdom's headquarters in 1864, and established himself as the first emir of Kontagora. Throughout his rule, continuing to 1876, he enlarged the emirate by conquests of Kamuku, Kamberi, Dakarki (Dakarawa), Dukawa, Yauri, Nupe, and Gbari (Gwari) towns and captured many slaves. In the first reign (1880–1901) of his son, Emir Ibrahim Nagwamatse, *sarkin sudan,* Kontagora again became notorious for slave raids that severely depopulated the region and left numerous walled towns in ruins, many of which are still visible (despite a 1949–57 government-sponsored resettlement program). Ibrahim's capture of the Zarian town of Birnin Gwari (98 miles [158 km] northeast) in 1899 forced the emir of Zaria to seek the protection of the British, a move that brought the first great Fulani emirate under British control. After Ibrahim threatened the British post at Jebba, 98 miles (158 km) south-southwest, in 1900, British forces occupied Kontagora town (1901) and removed him from office. Although he was reinstalled as emir in 1903, his territory, which had been incorporated as Kontagora province, and his powers were greatly reduced. When the province was broken up in 1925, the emirate became a separate division of Niger province; it was incorporated into North Western state in 1967, and since 1976 it has constituted an area of 13,219 square miles (34,237 square km) in Niger state.

The town is a collecting point for cotton and peanuts (groundnuts). In addition to these cash crops, Kontagora has considerable local trade in sorghum, millet, cowpeas, tobacco, beans, shea butter, gum arabic, kola nuts, sorghum beer, brass wares, gold artifacts, locally dyed and woven cotton cloth, cattle, goats, chickens, and guinea fowl. Modern industry includes a plant that manufactures plastic sacks. Besides the palace of the *sarkin sudan,* the town has a federal advanced teacher-training school and a hospital. Kontagora lies on the highway between Jebba and Kaduna and is also a junction for local roads. Pop. (1989 est.) town, 47,180.

kontakion, first important Byzantine poetic form, significant in early Byzantine liturgical music. The kontakion was apparently in use by the early 6th century, although the term occurs only in the 9th century, also designating a scroll and a stick around which were wound long rolls containing texts. The form seems to be of Syrian origin, having much in common with two Syriac poetic forms, *memrā* and *madrāshā.*

In its Byzantine form, the kontakion is a poetic homily, or sermon, consisting of 18 to 30 stanzas. They are chanted, and all follow the structural pattern set by the first model stanza. A refrain links all stanzas together. It is believed that a soloist sang the main stanzas, and the choir responded by singing the refrain.

The introduction of the kontakion into Byzantine religious practice is credited to St. Romanos Melodos (fl. first half of 6th century), of Syrian Jewish origin, who became one of the greatest early Christian poets after moving to Constantinople (now Istanbul). The kontakion flourished until a new form, the *kanōn,* became more prominent in the late 7th and 8th centuries. Since that time, complete kontakia have not been performed; only the preliminary stanza (*proimion,* or *koukoulion*) and the first stanza of the kontakion proper, with its refrain, remain in the morning office of the Greek Orthodox church, performed after the sixth section (ode) of a *kanōn.*

The melodies of the kontakia were transmitted orally, without musical notation, for several centuries. The earliest manuscripts with decipherable music are believed to date from the 13th century. Manuscripts containing soloists' sections are called *psaltika* (from *psaltēs,* "church singer"). Choral parts are preserved in *asmatika* (from *asma,* "song"). The musical settings tend to be melismatic—*i.e.,* elaborate melodies with many notes per syllable. Kontakia that have retained a special place in liturgical services are the Christmas kontakion by Romanos and the "Akathistos" hymn, a long hymn to the Virgin, sung in the fifth week of Lent.

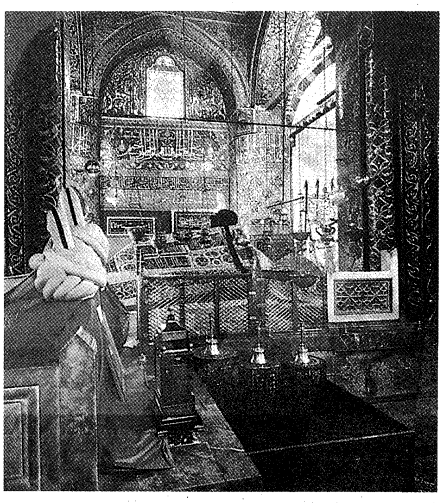
Kontum (town, Vietnam): *see* Kon Tum.

Konversationslexikon (German: "Conversation Lexicon"), German encyclopaedia begun in 1796 by Renatus Gotthelf Löbel and C.W. Franke. The *Konversationslexikon* was the forerunner of the Brockhaus encyclopaedias. Originally conceived as an encyclopaedia for women, it was to have been entitled *Frauen-*

zimmer-Lexikon. The encyclopaedia included history, biography, natural history, art, science, and political affairs. Although Löbel died in 1799, publication of the encyclopaedia continued, volume five appearing in 1806. In 1808 the copyright was purchased from the printer by Friedrich Arnold Brockhaus, who issued the sixth and final volume. The title was changed to *Brockhaus' Konversations-Lexikon* in the 13th edition and to *Der Grosse Brockhaus* with the 15th edition (1928–35).

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Konya, historically ICONIUM, city, capital of Konya *il* (province), central Turkey. The city lies at an altitude of about 3,370 ft (1,027 m) on the southwest edge of the central Anatolian Plateau, surrounded by a narrow, fertile plain; it is backed by the Bozkır Dağı (mountain) on the west and enclosed by the interior edges of the central Taurus ranges further south. The southwestern part of the city has been redesigned, and a wide avenue leads through the western suburbs to the railway station, but the old city still survives to the east of the acropolis.



Tomb of Jalāl ad-Dīn ar-Rūmī, founder of the Mawlawīyah order of mystics, Konya, Tur.
Fred J. Maroon—Photo Researchers

Konya is one of the oldest urban centres in the world; excavations in the Alâeddin Tepesi, a hill in the middle of the city, indicates settlement dating from at least the 3rd millennium BC. According to a Phrygian legend of the great flood, it was the first city to rise after the deluge that destroyed humanity. Still another legend ascribes its ancient name to the *eikon* (image), or the gorgon's head, with which Perseus vanquished the native population before founding the Greek city.

After the collapse of the Hittite Empire, the Phrygians established a large settlement there. It was Hellenized gradually from the 3rd century BC and became a self-governing city, largely Greek in language, education, and culture. Some of the citizens, however, retained their Phrygian culture, and it was probably among them that the Jewish community stirred up opposition to the Apostle Paul on his first visit in AD 47 or 48; he returned in 50 and 53. Iconium, included in the Roman province of Galatia by 25 BC, was raised to the status of a colony by the emperor Hadrian in 130 and became the capital of the province of Lycaonia *c.* 372.

Located near the frontier, it was subject to Arab incursion from the 7th to the 9th century. It was taken from the Byzantine emperor by the emerging Seljuq Turks in 1072 or 1081 and soon became the capital of the Seljuq sultanate of Rūm. Renamed Konya, it reached its greatest prosperity under their rule and was accounted one of the most brilliant cities of the world. Its enlightened rulers were also great builders and patrons of art who endowed the city with many buildings, including some of the best existing examples of Seljuq art. Now used as museums, these include the İnce Minare (built 1258), a former theological college housing the Seljuq Museum; the richly decorated Karatay Medrese (1251), which houses the ceramics museum; and the Sırçali Medrese (1242), which contains the museum of Seljuq and Ottoman antiquities. The palace of the sultans stands on the acropolis mound. Nearby are the mosque and *türbe* ("tomb") of Sultan 'Alā' ad-Dīn Kay-Qubād I, at whose invitation the Muslim Ṣūfī (mystic) Jalāl ad-Dīn ar-Rūmī settled in Konya and later founded the Mawlawīyah (Mevleviye) order of mystics, known in the West as the "Whirling Dervishes." The *tekke* ("monastery") of Rūmī, comprising a number of buildings and his mausoleum, lies south of the city centre; since 1917 it has been used as an Islāmic museum.

After the decline of the Seljuqs, Konya was ruled by the Il-Khanid Mongols and later by the Turkmen principality of Karaman until it was finally annexed to the Ottoman Empire *c.* 1467. The city was in decline during the Ottoman period but revived after 1896, largely through the building of the Istanbul–Baghdad railway, which passes through Konya. Improvements in the irrigation of the Çarşamba plain led to an increase in agricultural productivity. Until 1923 it was the most important city of central Anatolia, overshadowing Ankara. Present industries include a sugar-beet plant, flour mills, and carpet factories. Bauxite deposits were tapped by an aluminium-manufacturing centre established in the early 1970s. Konya is also the site of a teacher-training school; Yüksek Islam Enstitüsü, an institute of Islāmic learning founded in 1962; and Selçuk University, established in 1975.

With its orchards, gardens, and monuments, modern Konya attracts a growing tourist trade. Its association with the Dervishes makes it a place of pilgrimage. Christian monuments include the old church of Amphilochius inside the city and several shrines nearby. The town is linked by air with Ankara and by road with the principal urban centres of Turkey.

Konya *il,* with an area of 19,636 sq mi (50,857 sq km), is the nation's largest *il.* It includes much of the central Taurus Mountain range. The plains below the Taurus, with numerous oases, are the most prosperous parts of the *il,* and irrigation schemes have extended the cultivated area. To the north, the bare Anatolian steppe provides spring pasture and supports some dry farming. Cotton, cereals, wool, minerals, livestock, and livestock products are the chief exports. Lead is mined around Bulgar Dağ. Pop. (1980) city, 329,139; (1983 est.) *il,* 1,643,600.

Konya carpet, floor covering handwoven in or near the city of Konya, south central Turkey, former capital of the Seljuq sultanate of Rūm. The tradition of carpet weaving in Konya goes back at least to the 13th century, when the Italian traveller Marco Polo reported that the best and most beautiful carpets in the world were made in this area. Seven extant fragments of fine Konya carpets may date from that time.

The 19th-century rugs ascribed to this neighbourhood are undistinguished. One series of red, green, and yellow prayer rugs showing an arcade of three stilted arches above slender columns constitutes the latest, most debased version of the column Lâdiks, a type of prayer rug distinguished by the decorative use of an architectural motif.

Konza (people): *see* Kansa.

Konzertstück, also called CONCERTINO, or CONCERTSTÜCK, musical composition for solo instrument and orchestra, usually in one movement, less frequently in several movements played without pause. The genre arose in the early Romantic era (*c.* 1800) as an offshoot of the concerto. Frequently written in free musical form, it typically includes subsections varied in character and tempo. Examples of the form include the *Konzertstück for Piano and Orchestra* (1821) and the *Concertino for Clarinet and Orchestra,* Opus 26, by Carl Maria von Weber and Robert Schumann's *Introduction and Allegro Appassionato for Piano and Orchestra* (Opus 92).

Koobi Fora remains, hominid fossils found by Richard Leakey of the National Museum of Kenya and a large group of paleontologists from the University of California since 1969 along the eastern shore of Lake Turkana in Kenya. The Koobi Fora area represents one of the richest locations of hominid fossils ever found.

The finds—which include a complete skeleton, several complete skulls, a few dozen lower jaws, leg and arm bone fragments, and some teeth—provide the evidence, along with other African finds, for a species called *Australopithecus boisei,* which is estimated to have lived from nearly 1,000,000 to 2,000,000 years ago. It is a variant of *Australopithecus robustus,* remains of which were first recovered in South Africa. Additionally, Leakey and his team recovered another fossil hominid, called 1470 and classified as *Homo habilis,* and it is this fossil that is in association with the stone artifacts found at the sites. This creature lived about 2,000,000 years ago at Koobi Fora and is believed to be the direct ancestor of modern man, *Homo sapiens sapiens.*

Kook, Abraham Isaac (b. 1865, Greiva, Courland, Latvia—d. Sept. 1, 1935, Jerusalem), Jewish mystic, fervent Zionist, and first chief rabbi of Palestine under the League of Nations mandate to Great Britain to administer Palestine.

After serving as rabbi in a number of small towns in eastern Europe, in 1904 Kook became rabbi of the seaport city of Jaffa in Palestine, and he established a yeshiva, or Jewish academy, there. During World War I, Kook, who had left Palestine for a visit to Germany, was interned as an alien, but he escaped to England via Switzerland. He became rabbi of the congregation Machzike Hadath in London, where he aroused popular support for the Balfour Declaration (1917), which furnished the basis for the League of Nations Palestinian mandate. After the war, in 1919, Kook was appointed rabbi of the Ashkenazic (German and Polish) communities in Jerusalem and in 1921 was elected chief rabbi of Palestine, a post he held for the rest of his life.

According to Kook's philosophy of repentance, man's separation from God is not an objective fact but a consequence of human "forgetfulness" of a higher existence. Thus repentance, to be achieved through Torah, can restore man's unity with the divine.

A mystic by nature, Kook viewed Jewish national revival as part of the divine plan for strengthening faith against the rising tide of heresy. He expounded this philosophy in several cryptic essays, many of which were published posthumously under the title *Orot ha-qodesh,* 3 vol. (1963–64; "Lights of Holiness").

Other important works are *Iggerot ha Re'ayah* (1962–65; "Letters" [Re'ayah is a play on the letters of his name and the Hebrew word for "vision"]); *Orot* (1961; "Lights"); *Orot ha-Teshuvah* (1955; *Rabbi Kook's Philosophy of Repentance,* 1968); *Ẹretz Ḥefetz* (1930; "Pre-

cious Land"); *Eder ha-Yekar ve-Ikvei ha-ton* (1967; "The Precious Mantle and Footsteps of the Flock"); and (among a number of Halakhic writings) *Shabbat ha-Arez* (1937) and *Mishpat Kohen* (1966).

kookaburra, also called LAUGHING KOOKABURRA, OR LAUGHING JACKASS (species *Dacelo gigas*), eastern Australian bird of the kingfisher family (Alcedinidae), whose call sounds like fiendish laughter. This gray-brown, woodland-dwelling bird reaches a length of 43 cm (17 inches), with an 8- to 10-centimetre (3.2- to 4-inch) beak. In its native habitat it eats invertebrates and small vertebrates, including venomous snakes. In western Australia and New Zealand, where it has been introduced, the kookaburra has been known to attack chickens and ducklings. Defending their territory year-round, a monogamous pair of these birds lays two clutches of two to four white eggs in its nest in a tree hole. The young often remain with the parents and help raise the next year's brood.



Kookaburra (*Dacelo gigas*)

Bucky Reeves from The National Audubon Society Collection/Photo Researchers—EB Inc.

Also sometimes called the "bushman's clock," the kookaburra is heard very early in the morning and just after sunset. The related blue-winged kookaburra (*D. leachii*), which does not "laugh," is found across northern Australia.

Koolau Range, mountains paralleling for 37 miles (60 km) the eastern coast of Oahu Island, Hawaii, U.S. The range was formed by volcanic eruptions and has an average width of 13 miles (21 km). The original caldera, 6 miles (10 km) long and 4 miles (6 km) wide and the second largest in the state, is now a hill near the town of Kaneohe. The Diamond Head and Koko Head capes (east of Honolulu) resulted from the range's last volcanic activity, more than 10,000 years ago. Because of its wind-facing position, the Koolau (meaning "windward") Range traps precipitation, resulting in numerous streams and waterfalls. The range's most characteristic feature is a serrated precipice, the Pali (cliff), that rises abruptly on its eastern side and reaches varying heights (500–2,500 feet [150–750 m]), 2 miles (3 km) from the sea. The highest point in the range is Konahuanui, which is actually two peaks (3,150 feet and 3,105 feet [960 m and 946 m]) and lies at the head of the Nuuanu Valley. Two cliff passes—Nuuanu and Waimanale palis—cut through the range, there pierced by highway tunnels. The 1,200-feet (366-metre) Nuuanu Pali is associated with Kamehameha the Great's conquest of the isle in 1795, when his troops forced Oahu warriors up the valley and over the cliff to be dashed to death on the jagged rocks below. The Koolau's more gradual western slopes form a picturesque foothill background for Honolulu. Western lava flows created the Schofield plateau, a saddle (ridge) 14 miles (22 km) long and 5 miles (8 km) wide between the Koolau Range and the Waianae Range (which parallels the island's west coast).



Koolau Range, Oahu, Hawaii

By courtesy of United Air Lines; photograph, James E. McWayne

Kooning, Willem de (painter): *see* de Kooning, Willem.

Koopmans, Tjalling C(harles) (b. Aug. 28, 1910, 's-Graveland, Neth.—d. Feb. 26, 1985, New Haven, Conn., U.S.), Dutch-born American economist who shared—with Leonid Kantorovich of the Soviet Union—the Nobel Prize for Economics in 1975. The two men independently developed a rational method, called activity analysis, for allocating resources so as to attain a given economic objective at the lowest cost.

Koopmans was educated in mathematics and physics at the universities of Utrecht and Leiden, obtaining his Ph.D. in economics at Leiden in 1936. In 1940 he went to the United States, where he worked for the British Merchant Shipping Mission during World War II. In that position he was concerned with the selection of shipping routes that would minimize the total cost of transporting required quantities of goods, available at various locations in America, to specified destinations in England. He showed that the desired result is obtainable by the straightforward solution of a system of equations involving the costs of the materials at their sources and the costs of shipping them by alternative routes. He also devised a general mathematical model of the problem that led to the necessary equations.

In 1944 Koopmans joined the Cowles Commission for Research in Economics at the University of Chicago, where he extended his technique to a wide variety of economic problems. When the commission was relocated to Yale University in 1955, Koopmans moved with it, becoming professor of economics at Yale. He wrote a widely read book on the methodology of economic analysis, *Three Essays on the State of Economic Science* (1957). Koopmans became a naturalized U.S. citizen in 1946.

Kootenay (people): *see* Kutenai.

Kootenay National Park, park, in southeastern British Columbia, Canada. It occupies the western slopes of the Rocky Mountains, adjacent to Banff and Yoho national parks at the Alberta border. Established in 1920, the park extends about 5 miles (8 km) on either side of the Banff–Windermere Highway and occupies 532 square miles (1,378 square km). It is drained by the Kootenay, Vermilion, and Simpson rivers, and its scenery is characterized by snowcapped peaks (including the Verendrye, Stanley, and Deltaform mountains), glaciers, cascades, canyons, verdant valleys, and hot springs.

Kootenay River, also spelled KOOTENAI, stream in western North America, rising in the Rocky Mountains west of Banff, Alta., Can. It flows southward through Kootenay National Park in British Columbia, Can., breaking out of the Rockies to flow generally south in the Rocky Mountain trench. It swings southward into Montana, U.S., in a broad U-shaped loop and then northward into Idaho and back into Canada before broadening out into the long, narrow Kootenay Lake in British Columbia; from the western arm of the lake it flows into the Columbia River at Castlegar.

About 130 miles (210 km) of the 485-mile (780-kilometre) length of the river are in the United States. The Kootenay drops 365 feet (111 m) in the 25 miles (40 km) between Kootenay Lake and the Columbia River. In this section several dams supply power to the base-metal smelter and refinery at Trail, B.C. The river is navigable from Bonners Ferry, Idaho, to Nelson, B.C.

The Kootenay, explored in 1807 by the British fur trader David Thompson and once called the Flat Bow, derives its name from an Indian word meaning "water people."

Kópavogur, town, southwestern Iceland, on the southeast shore of Faxa Bay, just south of Reykjavík. A modern fast-growing residential suburb of the capital, by the early 1970s it was one of Iceland's largest towns. On a tiny peninsula in the bay west of the town is Bessastadhir, residence of the nation's president. Pop. (1988 est.) 15,535.

Kopeisk (Russian S.F.S.R.): *see* Kopeysk.

Koper, Italian CAPODISTRIA, seaport in Slovenia, Yugoslavia, southwest of Trieste. Formerly an island, it was connected to the mainland by a causeway (1825) and drainage works. The port's narrow streets and old houses reflect a Venetian influence. On Titov Trg, the main square, stand a cathedral and the former residence of the Venetian governors. Koper was known as Capris by the Romans before the growth of Slav settlements in the area in the 7th century. It was captured in 1279 by the Venetians from the patriarchs of Aquileia and refortified, after which it was made capital of Istria, whence "Capodistria." It was held by Napoleonic France (1797–1813), then by the Austrian Empire (1813–1918), and then by Italy. After World War II, Koper was part of the Free Territory of Trieste until it became part of Yugoslavia in 1954. As indicated by claims published in March 1974, Italy still disputes Yugoslav sovereignty over the city. Salt is obtained locally from seawater in Koper. There is a new port; industries include a radio factory and an automobile-assembly plant. Pop. (1981 prelim.) mun., 41,843.

Kopet-Dag Range, Russian KHREBET KOPET-DAG, Persian KOPPEH DĀGH, mountain range on the border between Turkmenistan (Soviet Union) and Iran. It runs northwest–southeast for more than 400 miles (645 km), from near the Caspian Sea (northwest) to the Tedzhen (Iranian: Harīrūd) River (southeast). Kūh-e Qūchān (10,466 feet

[3,191 m]), in Iran, is the highest point in the Kopet-Dag proper, although there are higher elevations in the range's outliers in Iran. The important Soviet city of Ashkhabad, capital



Harvesting potatoes at the foot of the Kopet-Dag Range, Iran
Per Gunvall, Stockholm

of the Turkmen S.S.R., lies in the foothills of the Kopet-Dag.

Kopeysk, also spelled KOPEJSK, or KOPEISK, formerly (until 1928) UGOLNYE KOPI, city, Chelyabinsk *oblast* (administrative region), west central Russian Soviet Federated Socialist Republic, in the southern Urals. Founded in 1920, it became a city in 1933. It is one of the centres of lignite (brown coal) mining in the Chelyabinsk coal basin. The population has been declining since the late 1960s because of mechanization of the mines. Mining and industrial colleges are in the city. Pop. (1983 est.) 134,000.

Köpfel, Wolfgang: *see* Capito, Wolfgang Fabricius.

Kopisch, August (b. May 26, 1799, Breslau, Silesia—d. Feb. 3, 1853, Berlin), German painter and poet known for his *Gedichte* (1836; "Poems") and *Allerlei Geister* (1848; "All Kinds of Spirits"), poetry based on legends and fairy tales and written with a simplicity and appeal that made it widely popular.

Kopisch studied painting and archaeology in Italy (1823–28) and in 1826 rediscovered, with Ernst Fries, the Blue Grotto at Capri, which though known in Roman times, had been forgotten for centuries. Upon his return to Germany he received a pension from the Prussian crown prince. An injury to his hand ended his career as a painter, and in 1847 he was given a court position at Potsdam, where he wrote a history of the royal gardens (1854). He is also known for his translation of parts of Dante's *Divine Comedy.*

Kopp, Hermann Franz Moritz (b. Oct. 30, 1817, Hanau, Hesse-Kassel—d. Feb. 20, 1892, Heidelberg, Baden), German chemist and historian of chemistry whose studies of the relation of physical properties to chemical structure pioneered physical organic chemistry.

Kopp became *Privatdozent* (unsalaried lecturer) at the University of Giessen in 1841. In that year he began work on one of his most notable achievements, the great *Geschichte der Chemie,* 4 vol. (1843–47; "History of Chemistry"). Although he spent his life gathering material for a second edition, it was never finished.

Extraordinary professor of chemistry at Giessen from 1843, in 1863 Kopp was appointed professor of chemistry at the University of Heidelberg. His research—especially on boiling point, specific gravity, specific heat, and thermal expansion—demonstrated that compounds differ in their physical properties according to the degree by which their structure differs.

Kopparberg, *län* (county) of central Sweden, centred on Siljan (lake). Its land area of 10,913 sq mi (28,264 sq km) contains the traditional *landskap* (province) of Dalarna and extends almost from the Gulf of Bothnia to the Norwegian frontier. The undulating terrain falls from 3,950 ft (1,204 m) in the northwest to less than 1,000 ft in the southeast. The *fjäll,* or uplands, are characteristically barren. Tributaries of Dalälven (Dal River) cut deep through the *län,* providing access to the west. Historically, inhabitants of the *län* were instrumental in freeing Sweden from Danish rule.

The region around Siljan is an agricultural area as well as a tourist centre. With its veins of iron, gold, silver, lead, copper, and other ores, Bergslagen district in the south is one of Sweden's largest mining regions. Lumbering, sawmilling, woodworking, and textile weaving are also important. Falun is the seat of the *län.* Pop. (1984 est.) 285,610.

Koppeh Dāgh (Asia): *see* Kopet-Dag Range.

Köppen, Wladimir (Peter) (b. Sept. 25, 1846, St. Petersburg, Russian Empire—d. June 22, 1940, Graz, Austria), German meteorologist and climatologist best known for his delineation and mapping of the climatic regions of the world. He played a major role in the advancement of climatology and meteorology for more than 70 years. His achievements, practical and theoretical, profoundly influenced the development of atmospheric science.

Köppen remained in Russia until he was 20. His grandfather was one of the German physicians invited to Russia by the empress Catherine the Great to improve sanitation in the provinces. He later became personal physician to the tsar. His father, Peter von Köppen (1793–1864), worked at the Academy in St. Petersburg as geographer, statistician, and historian. In gratitude for his services to Russian culture, Tsar Alexander II (reigned 1855–81) appointed him Academician, highest academic rank in Russia. He also granted him in 1858 a seaside estate called Karabakh on the south coast of Crimea.

His father's scholastic success and versatility inspired Köppen at an early age to apply his own intellect and perception to the varied environment of the Crimea. The complex geography of the low mountain ranges along the Black Sea coast provided the setting for his first explorations. While attending secondary school at Simferopol (1858–64), some 30 miles north of Karabakh, where the coastal ranges yield to extensive plains, he frequently travelled the mountain route inland from the sea. The floral richness and climatic variety of the region, he later emphasized, first awakened his lasting interest in the geography of the plant world and its relationship to climate.

In 1864 Köppen began his studies at the University of St. Petersburg, specializing in botany. Köppen returned to Karabakh many times, and the environmental changes he saw between the dark northern forests and the subtropical shores of the Crimea broadened his geographical perspectives.

In 1867 Köppen transferred to the University of Heidelberg, completed his doctoral dissertation on the relation of plant growth to temperature, and received his degree in 1870. A mark of Köppen's extraordinary integrity was his insistence on travelling for his final examinations from Heidelberg, where the faculty might have been prejudiced in his favour, to the University of Leipzig to assure the impartiality of his examiners. Following the Franco-Prussian War (1870–71), in which he served in the ambulance corps, Köppen returned to St. Petersburg as assistant at the Central Physical Observatory. Three years later he accepted a position with the German Naval Observatory at Hamburg as head of the newly established division of weather telegraphy, storm warning systems, and marine meteorology. In 1879 he was given the new title of meteorologist of the observatory, and in 1884 he produced a world map of temperature belts, ranging from polar to tropical latitudes, each distinguished by the number of months having temperatures above or below certain mean values.

A climax in geographical climatology was reached in 1900 when Köppen introduced his mathematical system of climatic classification. Each of five major climate types was assigned a mathematical value according to temperature and rainfall. Since then, many of the systems introduced by other scholars have been based on Köppen's work.

Köppen retired from his position at the Hamburg observatory in 1919 and moved to Graz, Austria, in 1924. In 1927 he undertook, with Rudolph Geiger, the editorship of a five-volume *Handbuch der Klimatologie* ("Handbook of Climatology"), which was nearly completed when he died.

Throughout his distinguished career Köppen retained his intellectual flexibility. Well-informed on a broad range of subjects, he was keenly receptive to new ideas and methods, especially those offered by youthful scientists, who found him a patient and constructive listener. Although he was not widely travelled, he knew a great deal about the world, and he saw his work and his nonprofessional interests in full global perspective. The deep concern he felt for his fellow man was evident in the time and energy he devoted to problems of land-use reform, school reform, improved nutrition for the underprivileged, alcoholism, and calendar reform. In the cause of world peace he strongly advocated widespread use of Esperanto, which he spoke as fluently as he did German and Russian. Between 1868 and 1939 he produced more than 500 publications, some of which he translated into Esperanto.

Köppen's fondness for children was well known. He was a founder of the Eimsbütteler Boys Home at Hamburg, where he was a frequent and regular worker. He also accepted into his family, which included his wife and their five children, a nephew and niece whose father had died. When a group of Russian students fled to Germany, he arranged housing for them in Hamburg and later assisted some of them to reach America. These selfless acts called for considerable sacrifice, for his means were limited.

Köppen was a small, dignified man. He was modest: he eschewed his inherited right to use *von* before his name, he rarely referred to his many honours, and he preferred to travel by third-class railway carriage. Köppen was one of the last scholars of an era when an erudite man could attain competence in, and make significant contributions to, many branches of natural science. Prominent among scholars of his own time, he helped to pave the way for the scientific specialists of the 20th century.

(G.R.R.)

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Koppers, Wilhelm (b. Feb. 8, 1886, Menzelen, Ger.—d. Jan. 23, 1961, Vienna), Roman Catholic priest and cultural anthropologist who advocated a comparative, historical approach to understanding cultural phenomena and whose investigations of hunting and food-gathering tribes produced theories on the origin and development of society.

A student of anthropologist Father Wilhelm Schmidt at the Mission Seminary of St. Gabriel, Mödling, Austria, Koppers later was associated with Schmidt for 18 years in editing the influential journal *Anthropos.* He was ordained in the Society of the Divine Word (S.V.D.) missionary order in 1911, but ill health precluded his entering missionary work. Focussing on ethnology and Sanskrit, he took his Ph.D. at the University of Vienna (1917), became a lecturer there (1924), and

was appointed professor of ethnology (1928). As head of the university's Institute of Ethnology (1929–38 and 1945–51), he made it one of Europe's finest research centres and influenced the careers of several anthropologists who rose to eminence, including Clyde Kluckhohn and Robert Lowie.

Although he later repudiated the concept, Koppers began as an exponent of the theory of *Kulturkreise*, or culture spheres, which posited the existence of distinct, ancient cultural complexes that successively spread widely and intermingled during man's early prehistory. By 1931 he had adopted a historical methodology that he considered applicable to any historical period and ethnological problem for evaluating cultural phenomena. Thus, he tried to elucidate the origin of the state and to interpret man's earliest social development on a worldwide, historical basis. He made field trips to Tierra del Fuego (1920–21) and central India (1938–39). His books included *Die Bhil in Zentralindien* (1948; "The Bhil of Central India") and *Der Urmensch und sein Weltbild* (1949; *Primitive Man and His World Picture*, 1952).

Kopřivnice, town, Severomoravský *kraj* (Northern Moravia region), Czechoslovakia. It is primarily an industrial town, headquarters and manufacturing centre of the Tatra enterprises, and is noted for production of automobiles and trucks—many of the latter for export. The area around Kopřivnice and Štramberk, just to the west, produces building stone, lime, and cement. Pop. (1983 est.) 20,753.

Köprülü Fazıl Ahmed Paşa (b. 1635, Vezirköprü, Anatolia, Ottoman Empire—d. Nov. 3, 1676, near Çorlu, Thrace), eldest son of Köprülü Mehmed and his successor as grand vizier (1661–76) under the Ottoman sultan Mehmed IV. His administration was marked by a succession of wars with Austria (1663–64), Venice (1669), and Poland (1672–76), securing such territories as Crete and the Polish Ukraine.

Köprülü Ahmed's father had chosen for him a career in the learned professions. At 16 he was made professor but entered the civil service when his father became grand vizier. He was made governor general of Erzurum (1659) and then Damascus (1660) before he was called as deputy grand vizier during an illness of his father.

Ahmed became grand vizier on Nov. 1, 1661, and proved to be as energetic and skillful as his father in asserting his authority. When, during his first campaign against the Austrians in 1663, he learned of a plot against himself fomented by Şâmî-zâde Mehmed, chief of the secretaries and member of the clique who brought his father to power, he did not hesitate to have him executed. Against those who belittled him and struggled against him he always had the unswerving support of the Sultan. Whenever Ahmed was away from the capital, Kara Mustafa, husband of his sister, was left there as his deputy. In the battlefield he also had the close cooperation of Gürcü Mehmed, Kaplan Mustafa, his brother-in-law, and other able generals.

The prestige of the empire that his father had reestablished was so great as to bring under his command during his campaigns in central Europe the auxiliary forces of the vassal principalities—Transylvania, Moldavia, Walachia, and the Crimean Khanate. He also followed his father's reforms aiming at reducing the number of the Janissaries (the core of the Ottoman standing army) and *sipahi*s (the Ottoman cavalry) and also made them more efficient by restoring discipline among them. Ahmed also placed emphasis on the age-old Ottoman policy of protection of the *reaya* (non-Muslim taxpayers), which was possible only under a strong central government. Though his failure at the Battle of St. Gotthard (Aug. 1, 1664) tarnished his earlier success against the Austrians—the capture of Érsekújvar in September 1663—he was able to make a treaty favourable to the Ottomans at Vasvár (Aug. 10, 1664). The Sultan received him in Edirne with great favours.

Ahmed won unparalleled prestige when he conquered Candia (modern Iráklion) in Crete (Sept. 27, 1669) after a siege of 28 months and thus terminated a long and dangerous war with Venice. An expedition against Poland in 1672 in which the Sultan himself took part was a great achievement for Köprülü. Under the Treaty of Buczacz (Oct. 18, 1672) Podolia was annexed to the empire, and the Ukraine was surrendered to the Cossacks under Ottoman suzerainty. Poland was also to pay a yearly tribute of 22,000 gold pieces. But the Poles under John Sobieski rejected these onerous conditions and took up a counteroffensive, which caused the war to continue four more years until the Treaty of Zórawno, Oct. 17, 1676. Russian intervention in the Ukraine led Ahmed to invade the region (summer 1674). Exhausted and for some time ill as a result of long expeditions and excessive use of wine, Ahmed died in November 1676. Contemporary Ottoman sources found in him all the qualities requisite for an Oriental statesman—wide knowledge, wisdom, justice, and generosity. He also distinguished himself in Islāmic law and Persian literature. He left a cash fortune of more than 300,000 gold pieces. Like other *paşa*s he maintained a private force of about 1,500 *sekban*s.

Köprülü Fazıl Mustafa Paşa (b. 1637, Vezirköprü, Anatolia, Ottoman Empire—d. Aug. 19, 1691, Slankamen, Serbia), Ottoman vizier and then grand vizier (1689–91) who contributed to the overthrow of the sultan Mehmed IV but was himself killed in the disastrous Battle of Slankamen (1691).

Fazıl Mustafa was the second son of the grand vizier Köprülü Mehmed Paşa. He received a theological education, but he spent most of his early years on military service with his brother Köprülü Fazıl Ahmed, the next grand vizier. After his brother's death (1676) the grand vizierate went to a brother-in-law, Kara Mustafa, whose failure to take Vienna (1683) in the great siege caused the collapse of the whole imperial edifice that the first two Köprülüs had erected. Fazıl Mustafa, vizier since 1680, had to resign. Later, however, when another brother-in-law, Siyâvuş, became grand vizier, he was made second vizier (Oct. 2, 1687), and they both played a major role in deposing Mehmed IV. But soon rebels turned against them, and Fazıl Mustafa saved his life only with the protection of the new sultan, Süleyman II.

In 1689, when the Austrian army advanced in the Balkans, Fazıl Mustafa was called to the grand vizierate. In the campaign of 1690 he liberated Nish and Belgrade from occupation; he was killed fighting an imperial army under Louis of Baden at Slankamen; Fazıl Mustafa was mortally shot while rushing to support his right wing.

It fell to Köprülü Mehmed's nephew Amcazâde Hüseyin Paşa, grand vizier between Sept. 13, 1697, and Sept. 29, 1702, to conclude the peace treaty with the allies at Carlowitz (Jan. 26, 1699).

Köprülü Mehmed Paşa (b. 1575–78?, Rojnik, near Berat, Alb.—d. Oct. 31, 1661, Adrianople, Thrace, Ottoman Empire), grand vizier (1656–61) under the Ottoman sultan Mehmed IV. He suppressed insurgents and rivals, reorganized the army, and defeated the Venetian fleet (1657), thereby restoring the central authority of the Ottoman Empire. He became the founder of an illustrious family of grand viziers and other Ottoman administrators prominent in the late 17th and early 18th centuries.

For more than half a century, power in the Ottoman state had been determined as a result of struggles and compromises between rival groups. Grand viziers who were supposed to represent the Sultan's absolute power had virtually become dependent on the palace and the Janissary corps, or provincial forces, with the result that there was a lack of authority and complete disorder in the administration. Faced with crisis, the palace chose Köprülü Mehmed, an old vizier in retirement, recommended to the Sultan's mother by a clique as the wisest and most experienced man available. A product of the peculiar Ottoman institution of trained palace pages, he came from a village in Albania. After his services and training in the palace, he became a governor general in the provinces of Trabzon (Trebizond; 1644), Egri (Eger; 1647), Karaman (1648), and Anadolu (1650) and sat as vizier in the imperial council for only a week in 1652, and then, dismissed, he retired to Köprü, his father-in-law's seat, a small town in northern Anatolia, thence his nickname Köprülü, of Köprü.

Well informed in the most complicated Ottoman politics, Köprülü, once grand vizier, began by placing his supporters at the key positions and mercilessly repressing opponents and rivals. When challenged by the *sipahi*s (the Ottoman cavalry), who wanted to put another man, a former leader of the Anatolian mercenaries, in power, Köprülü secured the support of Janissaries (the core of the Ottoman standing army) and the *shaykh al-islām,* head of the *'ulamā'* (scholars trained in Muslim religion and law), and thus nipped the rebellion in the bud. His second test came when he organized and led an expedition against the Venetians the next summer. His success in repelling the Venetian navy in the Dardanelles (July 19, 1657) and the subsequent recovery of Tenedos (September 4) and Lemnos (November 15) won him the prestige he needed to establish his authority. During this expedition, he was unusually severe against the Janissaries and others who had neglected their duties. Enjoying the absolute confidence of the palace, Köprülü tried to reestablish central authority over the vassal princes beyond the Danube and in the provinces of Anadolu, Syria, and Egypt. An expedition against George II (György Rákóczi), prince of Transylvania, resulted in Rákóczi's replacement by a new prince loyal to the court (1658) and later in the annexation of the provinces of Yanova (Jenö; Aug. 1, 1660) and Várad (Aug. 27, 1660). But the Ottoman expansion in Transylvania opened a period of rivalry and wars between the Ottomans and Habsburgs for the next four decades.

As a protest against Köprülü's unusually despotic government the principal governors general in Anatolia and Syria had not joined the imperial army in Transylvania. In the fall of 1658, while Köprülü was in the field, they rose up and marched toward the capital. Abaza Hasan, then *paşa* of Aleppo and chief of the rebels, held his power as the leader of the *sekban*s, unruly mercenary troops in Anatolia. The skillful tactics of the old vizier eventually made his rivals powerless, and all the rebel *paşa*s were executed (February 1659). In the summer of the same year Köprülü sent a general inspector to Anatolia with authority to exclude from the state registers all those from among the *reaya* (non-Muslim taxpayers) who claimed to belong to the military class. This measure, aimed primarily at the suppression of the *sekban*s, reestablished central authority in the region. By the time of his death, Köprülü had succeeded in restoring the central authority in the Ottoman Empire in accordance with its age-old principles of government.

Köprülüzade: *see* Mehmed Fuat Köprülü.

Koptos (Egypt): *see* Qift.

kora, long-necked harp lute of western Africa consisting of 21 leather or nylon strings, a gourd resonator, and a leather-covered sound board. It has a range of just over three octaves. The Gambia River valley is one of the main centres for the playing of this instrument, whose origins, although obscure, are traditionally associated with royalty, the ruling classes, or religious practices. Its main function is to accompany narrations, recitations, and songs in honour of a patron.

Koraïs, Adamántios (b. April 27, 1748, Smyrna, Anatolia [now İzmir, Turkey]—d. April 6, 1833, Paris, Fr.), humanist scholar, the father of Modern Greek literature, whose advocacy of a revived classicism laid the intellectual foundations for the Greek struggle for independence. His influence on the modern Greek language and culture has been compared to that of Dante on Italian and Martin Luther on German.

Koraïs, the son of a merchant, studied medicine at the University of Montpellier, France, and in 1788 moved to Paris to pursue a literary career. His first works were editions of ancient medical writers, particularly Hippocrates, and the *Characters* of the philosopher Theophrastus. His main literary works were a 17-volume *Library of Greek Literature,* collected between 1805 and 1826, and the 9-volume *Parerga,* collected between 1809 and 1827. The *Library* included historical, political, philosophical, and scientific works by classical writers, for which he wrote prefaces in Modern Greek. He also edited the first four books of Homer's *Iliad* and translated the historian Herodotus into Modern Greek.

Convinced that modern Greeks could find strength and unity only through a revival of their classical heritage, Koraïs made his writings an instrument for awakening his countrymen to the significance of that heritage for their national aspirations. His most enduring contribution was the creation of a new Greek literary language: purifying the vernacular (Demotic) of foreign elements, he combined its best elements with Classical Greek. His *Atakta,* composed between 1828 and 1835, was the first Modern Greek dictionary, and later Greek writers are indebted to him for his linguistic innovations.

A witness of the French Revolution, Koraïs took his primary intellectual inspiration from the Enlightenment, and he borrowed ideas copiously from the philosophers Thomas Hobbes, John Locke, and Jean-Jacques Rousseau, as well as from the historian Edward Gibbon, whose thesis that a new classicism must arise after the passing of the Dark Ages particularly attracted him. As an advocate of secular liberalism, Koraïs thus rejected both the Orthodox Christian heritage of the Byzantine Empire and the liturgical language of the church as a basis for a new Greek language. Although his influence in the Greek world was strong, his religious skepticism alienated him from Greek patriots who saw the war of independence as a struggle to restore the primacy of the church over the Muslims and to recapture Constantinople.

Koraïs remained in France throughout most of his life, and during the War of Greek Independence he wrote pamphlets, raised funds, and was one of the founders of the Paris Philhellenic Society. During the July revolution of 1830 in France, he suggested that the Marquis de Lafayette, a hero of the American War of Independence, be asked to assume the presidency of Greece.

Koran (Islāmic sacred scripture): *see* Qur'ān.

Koraput, town, southwestern Orissa state, eastern India. The town is located in the Eastern Ghāts range just east-southeast of Jeypore and lies at an elevation of more than 3,000 feet (900 m).

Most of the people of the surrounding area live in tribal communities and are engaged in agriculture, with rice, sugarcane, and oilseeds the biggest crops. The region also has rich mineral deposits, including aluminum ore, manganese, and limestone. The area was under the Cōḷa kings in the 10th and 11th centuries; later it was part of Madras, before being included in the new Orissa province in 1936. Pop. (1981) town, 31,665.

Korat Plateau (Thailand): *see* Khorat Plateau.

Korbut, Olga Valentinovna (b. May 16, 1956, Grodno, Belorussian S.S.R.), Soviet gymnast who won three gold medals (balance beam, floor exercises, and as a member of the U.S.S.R. team) and a silver medal (uneven parallel bars) in the 1972 Olympic Games at Munich.

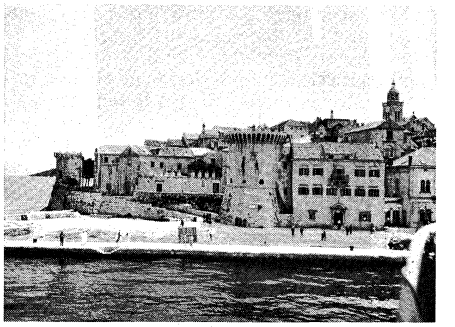
At the age of 11, Korbut entered a Soviet sports school of which Renald Knysh, who later became her coach, was head. He taught her the difficult backward somersault on the balance beam. Using this maneuver, she first competed in the 1969 U.S.S.R. championships, placing fifth. In the 1970 meet she won a gold medal in the vault. In 1972 she gave an exhibition at the world championships but was out of competition for much of 1972 before the Olympics owing to illness and injury. At the Olympics, her diminutive prettiness captivated the Munich audiences, and there she became the first person ever to do a backward somersault on the uneven parallel bars. In 1973 she won the Russian and World Student games and a silver medal in the European championships. In the 1976 Olympic Games at Montreal, she won a gold medal as a team member and a silver medal for the balance beam. She graduated from the Grodno Pedagogical Institute in 1977 and retired from Olympic competition thereafter.

Korçë, also spelled KORÇA, KORCHA, or KORTCHA, Old Slavonic KORITSA, Italian CORIZZA, city, southeastern Albania. It began as a feudal estate in the 13th century, and in 1484 the local lord, Koja Mirahor Ilyas Bey, a Muslim convert active in the Ottoman siege of Constantinople (1453), returned to the site and built the mosque that bears his name. In the 17th, 18th, and 19th centuries Korçë was a centre of commerce and trade. The first school to use the Albanian language opened there in 1887; its building is now a museum of education. Occupied by the Greeks in 1912, Korçë was awarded to Albania in 1920 by the International Boundary Commission, following a four-year French occupation. Enver Hoxha, the Albanian communist leader, attended and later taught at the lycée (public secondary school) that the French founded there in 1916. Used as a military base by the Italians for operations against Greece during World War II, the city was occupied by the Greeks in 1940–41 and then by the Germans. Korçë was restored to Albania in 1944.

Korçë lies on a fertile plateau, 2,800 feet (850 m) above sea level, that is surrounded by high, bare mountains. The plateau is one of Albania's chief wheat-growing areas; sugar beets, apples, and grapes are also grown and processed. Korçë has a brewery and other food-processing plants, as well as light industry producing knitted goods, rugs, and carpets. To the northwest is a sugar refinery at Maliq, a new town established in 1951. Coal is mined at Mborje in the mountains to the south. Pop. (1987 est.) town, 61,500.

Korčula, Italian CURZOLA, Greek CORCYRA MELAINA, island in the Adriatic Sea, on the Dalmatian coast, in Croatia, Yugoslavia. With an area of 107 square miles (276 square km), it has a hilly interior rising to 1,863 feet (568 m). The Greeks colonized it in the 4th century BC. Korčula was subsequently occupied by the Romans, Goths, Slavs, Byzantines, and Genoese; the kings of Hungary and Croatia and the Bosnian dukes resided there; and such powers as Russia, France, Britain, and the Austro-Hungarian Empire have held the island. It passed to Yugoslavia after World War I. Yugoslav Partisans recovered it from the Germans in 1944–45.

The inhabitants of Korčula earn their livelihood from fishing, agriculture (grapes and olives), and quarrying (white marble). Wild jackal hunting is an island specialty. The



Port of the old town of Korčula, on Korčula island
Harrison Forman

principal, though not the largest, settlement, Korčula, stands on a rock headland near the eastern end of the island. The old town is completely walled, and in the early 16th century it was inhabited by about 4,000 people. A plague devastated the town in 1529, depleting the population. The burned houses of infected persons, called *kućišta* (Serbo-Croatian: "clean house"), can still be seen as roofless shells. The old town is an almost perfectly preserved Venetian town of the 16th century with later Baroque additions. Korčula is the reputed birthplace of the traveler Marco Polo in about 1254 and is a popular tourist resort. Pop. (1981 prelim.) 18,399.

Korda, Sir Alexander, original name SÁNDOR LASZLO KELLNER (b. Sept. 16, 1893, Pusztatúrpásztó, Hung.—d. Jan. 23, 1956, London, Eng.), Hungarian-born British motion-picture director and producer who made major contributions to the development of Britain's film industry.

Before he was 20 years old he was working as a journalist in Budapest, and in 1914 he started the film periodical *Pesti Mozi* ("Budapest Cinema"). He made his first film in 1914, and by 1917 he had become the coowner and manager of Corvin, one of Hungary's largest production studios, and had directed or produced about 20 feature films. Korda left Hungary in 1919 during the political turmoil there and went to Vienna and then to Berlin, where he made several films for the Ufa studios and attracted the attention of Hollywood.

From 1927 to 1930 he directed films in Hollywood, notably *The Private Life of Helen of Troy* (1927), a historical romance that made his reputation in the American film industry. Korda returned to England in 1931 and founded his own production firm, London Film Productions. His film *The Private Life of Henry VIII* (1933) achieved international popularity. Korda's company followed up this success with a series of lavish productions, notable among them *Catherine the Great* (1934), *The Scarlet Pimpernel* (1935), *Elephant Boy* (1937), *The Ghost Goes West* (1936), and *Rembrandt* (1936).

By 1939 Korda had overextended himself financially, however, and he lost control of Denham Studios, the production facilities where many of Britain's best films of the 1930s had been made. He then went to Hollywood to produce films for a few years. In 1942 he re-

turned to England, where he received the first British knighthood ever conferred on anyone in the film industry. In the mid-1940s he revived London Film Productions and again assembled a talented production team. His company's later productions included *The Third Man* (1949), *The Wooden Horse* (1950), *Seven Days to Noon* (1950), *The Sound Barrier* (1952), and *Richard III* (1955). Despite recurrent financial setbacks, Korda kept on producing films until his death.

Consult the INDEX *first*

Kordestān, also spelled KURDISTAN, geographic region, northwestern Iran. It is bounded by the Iranian regions of Azerbaijan on the north, Gīlān and Hamadān on the east, and Kermānshāhān on the south. It borders Iraq on the west.

The name Kordestān means "Country of the Kurds," referring to the region's principal inhabitants. After the Turkish invasion of Iran in the 11th century AD (Seljuq period), the name Kurdistan was applied to the region comprising the northwestern Zagros Mountains. It was during the reign of 'Abbās I the Great of Iran's Ṣafavid dynasty (1501–1736) that the Kurds rose to prominence, having been enlisted by 'Abbās I to help stem the attacks of the marauding Uzbeks from the east in the early 17th century.

The western part of the region is in the Zagros Mountains, whose ranges run northwest–southeast. The eastern part of the region is a plateau lying at an elevation of about 5,000 feet (1,500 m). Parallel ridges of the Zagros, separated by lowland basins, increase in height to the east until they merge with the plateau. Cones of formerly active volcanos are a dominant feature of the plateau, some of them reaching an elevation of more than 12,000 feet (3,700 m). The plateau is mostly barren land consisting of sand or stone desert with hills and rugged, brilliantly coloured rocks. The higher slopes of the Zagros Mountains are forested with oak, beech, and sycamore and have a great variety of alpine flowers. At lower elevations and in the valleys, walnut, fig, and almond trees are found. The plateau enjoys fairly mild winters and hot summers, with occasional dust storms.

The population is predominantly both Kurdish and Sunnite Muslim. In the last few decades the Kurds have generally given up their pastoral life and migrated to towns and cities. Historically they have played a significant role in placing monarchs on the Iranian throne and in supplying soldiers for the army. They still retain a tribal form of social organization. The minorities in the region include Iranians, Jews, and Syrian Christians in the towns and Iranians and Azeri Turks in the villages around Qorveh.

The introduction of land reforms that changed peasant–proprietor relationships and created larger, mechanized farms, together with the extension of irrigation facilities, resulted in increased agricultural productivity in Kordestān. Wheat, barley, rice, corn (maize), tobacco, oilseeds, vegetables, and fruits are grown. Although agriculture still dominates the economy, its significance has declined. Formerly, the region's industries were largely based on agriculture (cotton ginning, flour and rice milling). In the 1960s and '70s the Iranian government followed a policy of allocating resources, building roads, and making power available to speed up industrialization in the region. Large-scale industries were established that now produce sugar, processed food, alcohol, electrical equipment, and tools. Sanandaj, the principal city in the region, has an airport and is connected by road with Mārivān, Bāneh, Bījār, Qorveh, Hamadān, and Bakhtarān and, via Saqqez, with Tabrīz and Mahābād.

Kordofan, also spelled KURDUFĀN, region constituting the central area of The Sudan. It lies between Darfur on the west and the valley of the White Nile River on the east.

Kordofan was originally inhabited by brown-skinned Nubian-speaking peoples, and the region's name may be derived from the Nubian word *kurta,* meaning "men." The region was perhaps under the control of the Christian Tungur dynasty from AD 900 to 1200, and later it formed part of the African trading empire of Kanem-Bornu. By the 14th century nomadic Arabs from Egypt had spread southward all over Kordofan, amalgamating with some of the indigenous inhabitants and driving the remnants into the hills. In the 17th century the Musaba'at sultanate was established in the region. In the 18th century both the Funj sultans of Sennar and the sultans of Darfur claimed to control Kordofan, but without permanent effect.

In the early 1820s Egypt established its government in the region. The slave trade was important in Kordofan until Sir Charles Gordon, governor-general of the Sudan, eradicated it, and this led to a brief rebellion in 1878. Kordofan remained under Egyptian rule until 1882, when the Muslim Sudanese leader known as al-Mahdī raised the Sudan to revolt. It was at Kazgeil in Kordofan that Colonel William Hicks and his Egyptian troops, sent to crush the Mahdist revolt, were annihilated (Nov. 3, 1883). In 1899, a year after the Battle of Omdurman, the Mahdī's successor met his death and the country passed to the Anglo-Egyptian Condominium, Kordofan becoming a province of the Sudan.

Kordofan covers an area of about 150,000 square miles (390,000 square km) in the central Sudan. The northern part of the region is desert and has sandy soils and little physiographic relief. There is some acacia scrub, desert grass, and thorny shrub; the landscape becomes increasingly more open and barren toward the north. The southern section of Kordofan is a level or gently undulating clay plain, with the scattered granitic Nubah Hills rising in the east to an elevation of about 3,000 feet (900 m). Water is somewhat more abundant around the Nubah Hills, which are covered with trees and other vegetation.

Severe water shortages restrict crop production in the northern part of Kordofan. Some cereal grains and other food crops are grown, but the arid land is more suited to raising camels, sheep, and goats. Traditional handicrafts are leather- and woodworking and carpet weaving. Local industries produce oils for soap-making from sesame seeds and peanuts (groundnuts). The southern part of Kordofan is somewhat more productive agriculturally, and grains, cotton, sesame, sorghum, and gum arabic are grown using shifting cultivation. The south's industries include cotton gins, oilseed mills, soap factories, and plants producing leather goods.

Most of the people in Kordofan are Arabs. Minorities include the Nubian, Beja, Daju, Zaghawa, and Darfunj peoples. The principal towns are Al-Ubayyiḍ in the north and Kāduqlī in the south.

Kordofanian languages, group of languages (usually 7 to 10, depending on the classification) that are spoken mainly in the Kordofan region of The Sudan. They are sometimes considered coordinate with the Niger-Congo languages (*q.v.*) to form a Niger-Kordofanian family.

kore, plural KORAI, type of freestanding statue of a maiden—the female counterpart of the kouros, or standing youth—that appeared with the beginning of Greek monumental sculpture in about 660 BC and remained to the end of the Archaic period in about 500 BC. Over this period the kore remained essentially the same, although, as in all Greek art, it evolved from a highly stylized form to a more naturalistic one.

Basically, the kore is a draped female figure—carved from marble and originally painted—standing erect with feet together or sometimes with one foot, usually the left, slightly advanced. The arms are sometimes down at the sides, but in most cases one is brought up closely across the front of the body or is extended, holding an offering; the other is lowered, often clasping a fold of drapery.

In the earliest korai, the bodies are so blocklike that they hardly seem to represent feminine form, the most artistically interesting feature being the bold patterns formed by the grooves of the drapery. Later, the drapery became more fluid, with a greater variation in the folds gained by having one hand of the kore pull the drapery tightly across thighs and buttocks. The garments worn by the kore figures changed from the heavy tunic, or peplos, to the lighter, more graceful chiton, also a tunic; the Ionian himation, a short, pleated mantle; and the *epiblēma,* a shawllike wrap. All the garments displayed pattern, either on borders or as single ornaments scattered over larger areas.



Kore, limestone figure, *c.* 650 BC; in the Louvre, Paris
Hirmer Fotoarchiv, Munchen

The representation of the figure's hair evolved also, from the early solid mass hanging at the sides and back of the head to the separation of the top and sides into tresses. The faces of early korai wear the Archaic smile, a rather artificial grimace achieved by sculpting the corners of the mouth with an upward turn; the kore's expression eventually became a fairly relaxed half-smile.

Like the kouros, the kore type was inspired by Egyptian and, to a lesser degree, Mesopotamian art; prototypes for the stance of the Greek maidens are found particularly in statues and statuettes of the Egyptian New Kingdom. In Egyptian and some Mesopotamian statues can be seen the same renderings of parallel, slanting, and radiating folds and ridges, as well as the archlike hemline that allows the feet to protrude.

Exactly what the kore represents is unknown. Those found in temples, in Samos, for ex-

ample, or on the Acropolis, did not have the attributes necessary to identify them as representations of the goddesses associated with those places. Because many of the figures seem to be gesturing in a manner suggestive of offering or gratitude, interpreters surmise that the korai were intended mainly as representations of young girls in the service of goddesses.

Korea, Korean CHOSŎN, or TAEHAN, byname HANGUK, peninsular historical country of East Asia that was bounded on the west by the Yellow Sea, on the south by the Korea Strait, on the east by the Sea of Japan, and on the north by the Yalu (Amnok-kang) and Tumen (Tuman-gang) rivers. Manchuria (northeastern China) and the Soviet Union border Korea on the north. (*See also* Korea, North; Korea, South.)

A brief treatment of the history of Korea follows. For full treatment, *see* MACROPAEDIA: Korea. For information about Korea's major arts, *see* East Asian Arts.

Stone artifacts indicate that the first settlements on the Korean Peninsula took place during the Paleolithic period. Korea's origins date to a mystical past, to Tangun, the legendary founder of "divine origin" who became the first king in 2333 BC. Korea dates historically from 57 BC, the beginning of the period of the Three Kingdoms of Silla (in the southeast), Koguryŏ (north), and Paekche (southwest). These kingdoms survived sporadic war with each other until the late 7th century AD, when Silla, the largest of these kingdoms, conquered the other two with Chinese aid and unified the peninsula under central rule. Silla rule began to disintegrate at the end of the 8th century; subsequently, the growing rival state of Later Koguryŏ under Wang Kŏn established the kingdom of Koryŏ in 936.

Mongols conquered Korea in 1259, their rule lasting for nearly 100 years. In 1392 General Yi Sŏng-gye, a former Koryŏ general, seized power and established the Yi dynasty. Under this dynasty, which governed until 1910, a centralized administrative system was set up, and Confucianism was adopted as the official ethical system.

An attempted Japanese invasion of Korea was driven off with Chinese aid in 1593. Beginning in the 1600s, Korea became the Hermit Kingdom, as its rulers, like those in Japan, closed the country to all foreign contact. In the 17th century the Manchus defeated the Ming dynasty, and Korea was forced to pay tribute to the new rulers of China. The peninsula continued to be an area of dispute and conflict between China and Japan through the 19th century.

Japan increased its influence in Korea following its successful war with China in 1894–95, and in 1910 it took over complete control of the peninsula. The Japanese administered Korea almost entirely to their own benefit, seizing land and businesses and establishing industries.

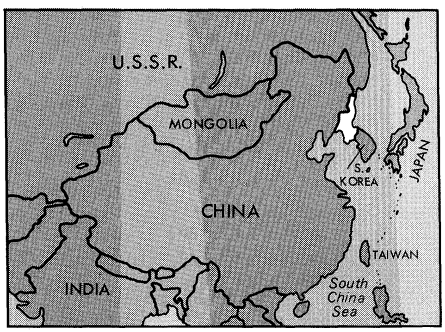
As part of the Japanese process of surrender after World War II, troops of the Soviet Union occupied Korea north of the 38th parallel, while U.S. forces occupied the South. The Soviet Union withdrew in 1948, and the United States withdrew the following year. Despite efforts by the United Nations, no agreement resulted on unifying Korea, and the North continued under a communist regime that the Soviets had helped establish, with the South operating as a republic with an elected government.

Korea, North, officially DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA, Korean CHOSŎN MINJUJUŬI IN'MIN KONGHWAGUK, country occupying the northern half of the Korean Peninsula in East Asia, covering an area of approximately 47,300 square miles (122,400 square km). The capital is P'yŏngyang. The country is about 445 miles (716 km) long from southwest to northeast and about 225 miles (360 km) wide from east to west. It is separated from China and the Soviet Union to the north by the Yalu and the Tuman rivers and is bordered by South Korea and the Yellow Sea to the south, by the Korean Bay to the southwest, and by the Sea of Japan to the east. The population in 1990 was estimated at 22,937,000.

A brief treatment of North Korea follows. For full treatment, *see* MACROPAEDIA: Korea.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. About 80 percent of North Korea's total land area consists of mountain ranges and uplands. The Kaema Plateau (average elevation 3,300 feet [1,000 m] above sea level) in the northeast is the largest (about 4,000 square miles [10,360 square km]) upland plateau on the Korean Peninsula. It includes the volcanic summit of Mount Paektu, which at 9,003 feet (2,744 m) is the highest peak in the country. The Nangnim Mountain Range runs from north to south through the middle of the country, and the Hamgyong Range extends along the eastern coast. Plains and lowlands cover about a fifth of the land; the P'yŏngyang and the Chaeryŏng plains in the southwest, each covering about 200 square miles (520 square km), are the major agricultural regions of the country, producing rice, corn (maize), wheat, vegetables, and fruits and supporting pigs, cattle, and poultry. The eastern coastal plains are less extensive, because the mountains on the eastern coast drop abruptly to the sea. The principal rivers of North Korea are the Yalu (501 miles [806 km] long) and the Tumen (323 miles [520 km] long). These and other North Korean rivers are economically important because they provide irrigation and hydroelectric power and, in their lower reaches, navigation.



North Korea

The country has a temperate continental climate with a long and cold winter and a wet summer. Average annual temperatures range from 43° F (6° C) in the north to 47° F (8° C) in the centre and 50° F (10° C) in the south. The summer monsoon (June–September) brings about two-thirds of the total rainfall (annual average 40 inches [1,000 mm]). Occasional typhoons occur in the early autumn (August–September). Forests, covering about three-fourths of the total area, consist of coniferous trees (such as Siberian fir, spruce, pine, and cedar) mixed with deciduous trees (oak, alder, and chestnut). Extensive deforestation took place during the Korean War (1950–53); government reforestation programs are slowly reestablishing this forestland. Fauna includes deer, antelope, bear, tiger, leopard, and panther and many migratory waterfowl, including heron and crane.

The country is rich in mineral resources; chief among them are extensive coal reserves (of which three-fourths is anthracite), concentrated in basins to the north and east of P'yŏngyang. Low-grade iron-ore deposits are mostly in the northeast and west. North Korea's magnesite deposits are among the largest in the world. Other minerals include lead and zinc in the southeast and copper and tungsten in the central north.

The people. Ethnically, the population is homogeneously Korean; they are believed to be descendants of a single racial stock with Mongoloid physical features. Korean, the official language, is probably an Altaic language and contains Chinese loanwords. About 80,000 Chinese lived in North Korea before 1945; their present number is unknown but believed to be not more than 50,000.

The Confucian system of ethical philosophy, Buddhism, Ch'ŏndogyo, and shamanism were formerly prevalent but have been officially repressed since 1945. Roman Catholicism and Protestantism were introduced during the 17th through the 19th century, but foreign missionaries were expelled from the country during World War II.

Between the late 1960s and the mid-1970s North Korea's annual population growth rate increased from 2.8 percent to 3.1 percent, but since 1974 its growth rate has dropped to 2.2 percent. Almost two-fifths of the country's population is younger than 15 years of age. The North Korean government originally encouraged a high birth rate, but since 1974 it has tried to lower the birth rate in response to the stagnant growth of the economy.

Industrialization since 1945 has been accompanied by significant rural-to-urban migration, and by the mid-1980s more than three-fifths of the population was urban. The coastal urban areas are the most populous. A northward migration of the population during the 1930s and '40s was reversed after the Korean War, and about 2,000,000 North Koreans emigrated into South Korea.

The economy. North Korea has a centrally planned economy based largely on heavy industries and agriculture. The gross national product (GNP) per capita remains low by world standards.

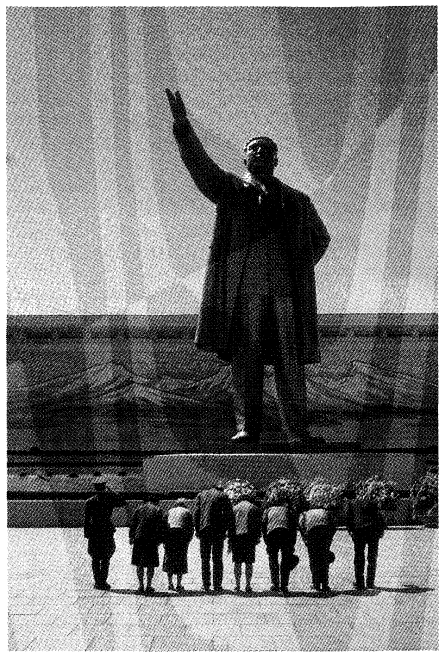
Agriculture accounts for up to one-fourth of the GNP and employs more than two-fifths of the work force. Most farmland is worked by cooperatives modeled after Chinese communes; individual households are allotted small private plots. Foodstuffs are rationed, and there are occasional shortages of corn (maize), wheat, and milk. Production of rice, which is the chief staple, ordinarily meets domestic demand. Pigs, poultry, and cattle are the most important types of livestock. Production of roundwood falls short of domestic demand and is supplemented by imports from the Soviet Union.

Mineral industries are dominated by the production of coal, which became a crucial source of foreign exchange after North Korea had defaulted on several international debts in 1975.

The manufacturing sector, which employs up to one-fourth of the work force, is dominated by heavy industries, and there are widespread shortages of consumer goods. Economic planning has favoured the manufacture of agricultural and industrial machinery; steel, chemicals, and fertilizers are also produced in large quantities. Most consumer goods are produced at local factories. Hydroelectricity produces three-fifths of the country's electric power; domestic fuels generate the remaining portion.

There is an acute shortage of labour, and the government has strongly encouraged the repatriation of North Koreans living in the People's Republic of China, Japan, and the Soviet Union. The General Federation of Trade Unions of Korea is strictly controlled by the (communist) Korean Workers' Party (KWP). The government sets wages.

North Korea's trade deficit has widened as a result of the nation's costly imports of



Statue of Kim Il-sung at the Museum of the Revolution in P'yongyang, North Korea
Edoardo Fornaciari—Gamma-Liaison

crude petroleum, coking coal, and industrial plants and machinery, including an increasing amount of technology and machinery from the West. North Korea's major exports consist of lead, magnesite, zinc, iron and steel, nonferrous metals, cement, and agricultural products. The Soviet Union and the People's Republic of China account for two-fifths of North Korea's external trade. Principal noncommunist trading partners include Japan (which renegotiated North Korea's trade debts in 1979) and Saudi Arabia.

Government and social conditions. The Democratic People's Republic of Korea is a socialist state governed by the communist KWP. Its constitution of 1972 specifically commits the country to the achievement of the reunification of Korea by peaceful means. According to the constitution, the unicameral Supreme People's Assembly, which consists of 655 members directly elected to four-year terms, is the highest organ of state power. The Assembly elects the Standing Committee to serve as its permanent organ. The Central People's Committee (CPC), headed by the president, who is head of state, is the highest policy-making body in government. Executive power is vested in the appointed Administrative Council, under the supervision of the CPC. In practice, however, all government institutions are subordinate to the KWP, which is headed by its 39-member Politburo, under the president's control. The judiciary is headed by the Central Court.

Social-insurance programs provide benefits for sickness, maternity, accidental injury, old age, disability, and survivor dependency. Medical care is free to all citizens. These provisions have contributed to a steady improvement in health conditions. The average life expectancy is almost 70 years. Modern medical facilities are widely available, but a shortage of personnel persists. Strong emphasis on preventive medicine has contributed to the control of many infectious diseases, although parasitic diseases remain a problem in rural areas. Cancer, heart disease, and high blood pressure are the leading health problems.

Education is free and compulsory between the ages of 5 and 16. The educational system includes one year of preschool, four years of primary school, and six years of secondary school. Higher education consists of two- to six- year programs; the major school is Kim Il-sung University in P'yŏngyang, and there are numerous specialized and technical schools, especially for adult education. Education is directly controlled by the state and serves as a process of indoctrination in communist ideology as well as a means to supply the labour needed to meet the government's economic goals.

The government owns and strictly controls the communications media. All newspapers are published by the government, the KWP, and its affiliated organizations. State-operated radio and television play a great role in ideological education.

Cultural life. North Korean cultural expression is characterized by its strict adherence to communist ideology. Writers and artists attempt to enhance class consciousness and propagate the superiority and independence of North Korean culture, while the government encourages the reintroduction of those Korean traditional arts (*e.g.*, group folk dances) that promote the proper socialist spirit. Literature is considered the preeminent art form, and contemporary works often worship the personality cult of President Kim Il-sung or explore themes of anti-imperialism.

History. The history of North Korea dates from World War II, when Japan—which had dominated the Korean Peninsula during the 20th century—surrendered Korea to the Allies. (*See also* Korea.) The country was divided into northern and southern regions along the 38th parallel; the Soviet Union dominated the North, the United States dominated the South. On Sept. 3, 1948, the Democratic People's Republic of Korea (North Korea) was established.

Seeking unification by force, North Korean troops invaded South Korea on June 25, 1950, initiating the Korean War. United Nations troops, composed primarily of U.S. soldiers, intervened on the side of South Korea, while Chinese soldiers reinforced the North Korean army. On July 27, 1953, an armistice was signed.

Since the establishment of a separate North Korea, political and governmental affairs have been dominated by Kim Il-sung. Both as premier (1948–72) and as president (from 1972), Kim continued to press for the reunification of Korea and the concomitant withdrawal of U.S. troops from South Korea.

Domestically, Kim transformed Korea into one of the most repressive and strictly regimented societies in the world, with the KWP controlling all aspects of life and using police terror to suppress the slightest dissent or opposition. North Korea's highly centralized, state-owned economy has consistently failed to produce adequate supplies of food and manufactured consumer goods for its citizens. Kim instituted an extensive personality cult of himself and in the 1980s designated his son, Kim Chong Il, as his political heir.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

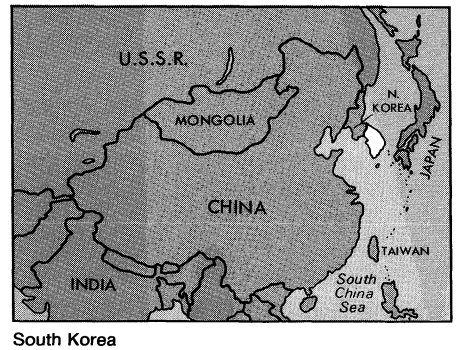
Korea, South, officially REPUBLIC OF KOREA, Korean TAEHAN MIN'GUK, country occupying the southern Korean Peninsula in East Asia. South Korea is situated about 120 miles (193 km) northwest of the Japanese islands of Honshu and Kyushu and covers an area of 38,316 square miles (99,237 square km), including Cheju Island, which is located about 60 miles (97 km) south of the peninsula. The capital is Seoul. The country is about 600 miles (965 km) long and about 135 miles (217 km) wide. It is bordered on the north by North Korea, on the east by the Sea of Japan, on the south by the Korean Strait, and on the west by the Yellow Sea. One of the most densely populated countries of Asia, South Korea had a population estimated in 1990 at 42,793,000.

A brief treatment of South Korea follows. For full treatment, *see* MACROPAEDIA: Korea.

For current history and for statistics on society and economy, *see* BRITANNICA WORLD DATA ANNUAL.

The land. About 75 percent of the total land area consists of mountains and uplands. The T'aebaek Mountains, paralleling the eastern coast for about 160 miles (257 km), give rise to several lower mountain ranges and spurs in the south. Mount Halla (6,398 feet [1,950 m] above sea level), an extinct volcano with a crater lake situated on Cheju Island, is the highest point of the country. The densely populated lowlands are heavily cultivated for wet rice; they occupy about 30 percent of the land area and are most extensive in the northwest (the Han River basin of about 10,000 square miles [25,900 square km]), in the southeast (the Naktong River basin with about 9,000 square miles [14,500 square km]), and in the southwest (the Yŏngsan River basin of about 1,000 square miles [2,600 square km]). Indented by numerous bays, the coasts are mountainous with a low tidal range (up to 3 feet [1 m]) in the east; in the west they are of complex channel and island structure with high tidal range (up to 30 feet [9 m]). The 318-mile- (512-kilometre-) long Naktong and the 303-mile (488-kilometre) Han are the principal rivers and provide extensive irrigation and navigation facilities.

South Korea has a moderate continental type of climate with cold winters and hot summers. The average January temperature ranges from 26° F (−3.6° C) in the extreme north to 35° F (2° C) in the southeast, and to 40° F (4.4° C) on Cheju Island. The average July temperatures range from 77° to 80° F (25° to 27° C) in the south to 70° F (21° C) in the northeast. The summer monsoons (June–September) bring about 40 to 55 inches (1,000 to 1,400 mm) of average annual precipitation. Occasional typhoons in late summer and cyclones in spring bring heavy rains and cause extensive damage to crops.



South Korea

Forests, covering about two-thirds of the total land area, consist of subtropical broadleaf forests on the southern coast, mixed forest (broadleaf and coniferous) in the middle region, and coniferous forest in the north. High population density has resulted in extensive deforestation, especially in the southwest. Large areas were reforested with pine and scrub oak in the early 1980s. Fauna includes bear, wild boar, deer, and lynx, found only in the remote areas in the north.

South Korea's chief mineral resources are anthracite coal, iron ore, and tungsten. Copper, lead, zinc, manganese, gold, and silver deposits are found in small quantities.

The people. Ethnically, the population is homogeneously Korean. Korean is the official language. Buddhism, Protestant Christianity, and Confucian philosophy, including ancestor worship, are widespread. Ch'ŏndogyo, a monotheistic religion that incorporates Bud-

dhist, Confucian, Taoist, and Christian concepts, has many adherents, as does Roman Catholic Christianity.

The average annual population growth rate has declined since 1960 and is about average for East Asia. Family-planning programs begun in 1965 have been mostly responsible for a sharp decline in the birth rate. The death rate also has decreased. About 30 percent of the population is younger than 15 years, and life expectancy at birth is about 69 years. Two-thirds of the population lives in urban areas.

Before World War II many Koreans migrated to Japan, China, and the Soviet Union, and 3,300,000 returned after 1945. Also at that time about 2,000,000 people migrated from North Korea to South Korea.

The economy. South Korea has a predominantly market economy based largely on services and light and heavy industries. Economic growth has been heavily dependent on exports of manufactures. The gross national product (GNP) is growing much faster than the population. The GNP per capita is similar to those of the other rapidly developing East Asian countries.

Agriculture accounts for about one-eighth of the GNP and employs one-fifth of the work force. Land reform was implemented after 1948 and has greatly reduced tenancy; small family farms predominate. Production of rice, which is the chief staple, meets all but a fraction of domestic demand. The government purchases most rice at subsidized prices through the accounts of agricultural cooperatives. Barley, apples, potatoes, soybeans, corn (maize), and wheat are other important crops. Raw silk and tobacco are produced for export. Pigs and cattle are the main livestock raised; the production of beef, however, has failed to keep pace with domestic demand. Fishing, which provides food and a surplus for export, has been promoted by the government; as a result, South Korea has become a leading ocean-fishing nation.

Mineral industries are dominated by the production of graphite, kaolin, pyrophyllite, talc, tungsten, and low-grade anthracite, which is used domestically for heating. Petroleum and most metals must be imported.

Manufacturing industries account for approximately one-fourth of the GNP and employ more than one-fourth of the work force. Most industries are run by families, and relatively few firms are listed on the nation's stock exchange. Some 20 conglomerates account for up to one-third of South Korea's manufacturing output, and they subcontract with small firms for ancillary goods and services. Industrial output is balanced between light and heavy industries and includes textiles, footwear, petrochemicals, electronic goods, steel (of which the country is an important producer), motor vehicles, and ships. Electricity is generated primarily by nuclear-power plants; less than half of the country's electricity is provided by fossil-fuel-burning power plants.

Exports of goods and services represent more than one-third of the GNP. Overseas construction contracts, particularly in the Middle East, awarded to South Korean firms have become an important source of foreign exchange. Major exports include machinery and transport equipment, mineral fuels and related products, and crude materials except fuels. Manufactured goods and machinery and transport equipment are the major imports. Principal trading partners include the United States (which receives more than one-third of South Korea's exports and supplies one-fifth of its imports), Japan, Germany, Saudi Arabia, and Hong Kong. South Korea has had considerable success in expanding exports to developing countries.

Government and social conditions. South Korea is a republic with a presidential system of government. The constitution that was promulgated in 1980 and amended in 1987 vests executive power in the president, who is elected by direct popular vote. The president's tenure is limited to one five-year term. The president governs with the assistance of the State Council, which includes the prime minister and the heads of executive ministries. The prime minister is appointed by the president with the approval of the National Assembly. Legislative power is vested in the unicameral National Assembly, consisting of more than 200 members, of which two-thirds are directly elected and the remainder are apportioned among the political parties. The independent judiciary is headed by the Supreme Court.

Government welfare activities are relatively new and limited in range. A national pension system was legislated in 1973 for later implementation. The health-insurance program, established in 1977, is limited in coverage, although it is gradually being extended.

Health conditions in South Korea have been improving, although they are still inadequate. The availability of health services has grown, but services remain concentrated in Seoul and Pusan, and costs are frequently prohibitively high. Since the 1960s, sanitation and hygiene have seen steady improvement as South Korea developed economically, and the incidence of serious infectious diseases has drastically declined.

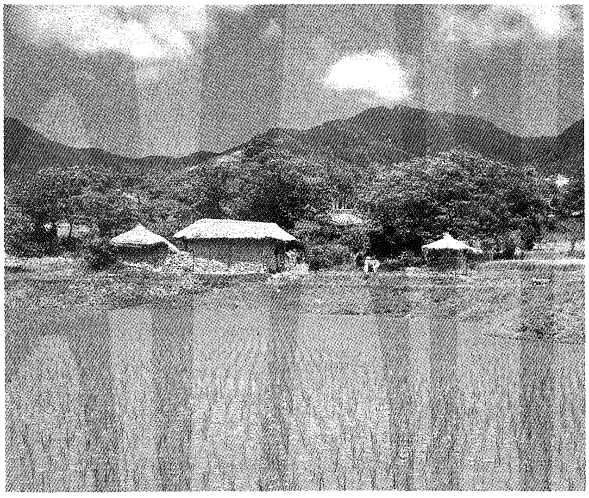
Six years of primary education is compulsory and free. Almost all school-age children attend primary schools, and about three-quarters attend three-year middle schools and three-year general or vocational high schools. Higher education is available at a number of universities and colleges, among them Seoul National University and the private Yonsei University, Korea University, and Ewha Women's University.

The government strictly controlled the news media throughout the 1970s and '80s, but the democratization of South Korea's political life in the 1990s brought a corresponding freedom to its press and other news media.

Cultural life. Shamanism, Buddhism, and the philosophy of Confucius constitute the most important elements of modern Korean culture. Modern literature, particularly poetry, commonly deals with social and political issues. With greater international exposure, modern Korean painting has developed surrealistic and abstract expressionistic styles, while traditional painting has also remained important. Korean architecture shows Chinese influence but is adapted to local needs and environment, utilizing wood and granite. Ceramic arts have flourished, and every province continues to produce its distinctive ceramic wares. Calligraphy is also a respected and flourishing art. Folk dances survive, and folk music, accompanied by native musical instruments, is performed occasionally at ceremonies and festive occasions.

History. The long history of the Korean people has been marked by the influence of China and, since the 19th century, of Japan and the Western powers. (*See also* Korea.) After World War II Japan was forced to surrender Korea, and the country was divided at the 38th parallel; Soviet forces occupied the northern zone, and the United States the southern.

A separate government emerged in each zone, and on Aug. 15, 1948, the Republic of Korea (South Korea) was established. On June 25, 1950, North Korean troops invaded South Korea, precipitating the Korean War. United Nations forces, predominantly from the United States, intervened on the side of South Korea; Chinese troops intervened on the side of North Korea. An armistice was signed on July 27, 1953. In 1960 Syngman Rhee's authoritarian regime in South Korea collapsed, and the country was dominated by military forces. Under the rule of presidents Syngman Rhee (1948–60), Park Chung Hee (1963–79), and Chun Doo Hwan (1980–87), South Korea experienced rapid economic growth while political stability was maintained by authoritarian rule. The national standard of living steadily rose during these years, and South Korea became one of the most dynamic export-oriented economies in the world. With prosperity and a general rise in educational standards came growing demands for democratic political reforms, which were enacted by President Roh Tae Woo in the late 1980s and early '90s.



Flooded paddy field in the region south of Seoul, South Korea
Shostal Associates

Korea Bay, also called WEST KOREA BAY, Chinese (Wade-Giles romanization) HSI CH'AO-HSIEN WAN, Pinyin XI CHAOXIAN WAN, Korean SŎJOSŎN-MAN, inlet that forms the northeastern arm of the Yellow Sea between Liaotung Peninsula (in Liaoning province), China, and western North Korea.

Korea Bay receives three of the major rivers of North Korea—the Yalu (which rises in Paektu Mountain and forms much of the China–North Korea border), the Ch'ŏngchŏn, and the Taedong—in addition to a number of China's smaller rivers. The bay is relatively shallow, seldom reaching depths greater than 164 feet (50 m). Its tidal range of 20 to 40 feet (6 to 12 m) is unusually high. Many wide sandbars extend along the coast, and the bay contains a number of rocky islands, including North Korea's Ch'o, Sŏk, and Sinmi islands and China's Ch'ang-shan and Ta-ch'ang-shan

islands. The major ports on Korea Bay are the North Korean cities of Namp'o and Sinŭiju and China's Lü-shun and Tan-tung.

Korea Strait, passage of the northwest Pacific extending northeast from the East China Sea to the Sea of Japan between the south coast of the Korean Peninsula (northwest) and the Japanese islands of Kyushu and Honshu. The strait, which is 300 feet (90 m) deep, is bisected by the Tsushima islands, the passage to the east being sometimes referred to as Tsushima Strait. The western channel was formerly referred to as the Chōsen Strait.

The warm Tsushima Current, a branch of the Kuroshio Current, passes north through the strait. Following the coasts of the Japanese islands, some of the current's waters continue north to flow into the Pacific and the Sea of Okhotsk at Sakhalin Island, while the remainder swirls counterclockwise to flow south along the Asiatic mainland. In 1905, during the Russo-Japanese War, a Japanese fleet annihilated a Russian force in the Battle of Tsushima Strait.

Korea Warm Current, East, surface oceanic current, the northward-flowing branch of the Tsushima Current in the Sea of Japan. After flowing along the coast of Korea, the East Korea Warm Current turns eastward and divides into the Tsugaru Warm Current and the Sōya Warm Current. The Tsugaru Warm Current enters the Pacific Ocean through the Tsugaru Strait, and the Sōya Current enters the Sea of Okhotsk through the La Perouse Strait, bending to the southeast along the coasts of Honshu and Hokkaido.

A list of the abbreviations used in the MICROPAEDIA *will be found at the end of this volume*

Korean art, visual art produced on the Korean Peninsula and generally characterized by simplicity, spontaneity, and naturalism.

A brief treatment of Korean art follows. For full treatment, see MACROPAEDIA: East Asian Arts.

A number of artifacts, including pottery and bronze and iron objects, indicate the early influence of China on Korean art. There is also evidence that Scythian, Siberian, and other non-Chinese cultures had an effect on the design and decoration of certain objects. The long history of continual Chinese influence on Korean culture began with the establishment in 108 BC of Chinese colonies in northwest Korea, the best-known of which, Lolang, was the centre from which advanced techniques in pottery making and iron smelting spread throughout the peninsula.

The first major period of Korean art during recorded history is that of the Three Kingdoms (*c.* 57 BC–AD 668). Northernmost of the Three Kingdoms was the Koguryŏ kingdom (37 BC–AD 668), into which the Buddhist religion was introduced from China in AD 372. This development (together with the subsequent conversion to Buddhism of the Paekche [18 BC–AD 660] and Silla [57 BC–AD 668] kingdoms) brought about a flowering of the arts on the Korean Peninsula, and, until the 15th century, Buddhism remained the major source of inspiration in Korean visual art.

Except for several small Buddhist images, little remains of the religious art of Koguryŏ. A number of striking polychrome wall paintings that are from the Koguryŏ kingdom exhibit a dynamism unique to Asian art of this early period.

The Paekche kingdom, which also produced notable tomb paintings, was first to use granite in the construction of pagodas. Three stone pagodas from this period still stand. Paekche also produced the most naturalistic and most typically Korean Buddhas of the period, characterized by what has come to be known as the "Paekche smile." The representative arts of the Silla kingdom in the southeast are the decorative arts (particularly jewelry and royal regalia) and a hard, grayish, unglazed stoneware that is entirely Korean in style.

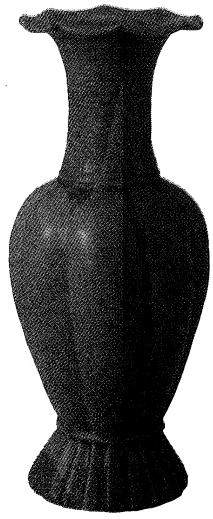


Gilt bronze bodhisattva, Paekche kingdom, second half of the 6th century; in the National Museum of Korea, Seoul

By courtesy of the National Museum of Korea, Seoul

The combined forces of the Silla king and the Chinese emperor brought down the Paekche (660) and Koguryŏ (668) kingdoms, ushering in the era that came to be known as the Unified, or Great, Silla period (668–935). One consequence of Silla ascendency was that the centre of artistic development moved to the southeastern portion of the peninsula. Granite pagodas, typified by the well-preserved Pulguk Temple east of Kyŏngju, were built throughout the region. Sculpture, also of granite, reached its peak of naturalism in the early 8th century; thereafter its quality declined. Four extant cast-bronze bells and many other bronze objects of this period reveal that bronzework was also of outstanding quality during the Unified Silla.

Architecture, sculpture, and painting that was produced during the Koryŏ period (918–1392) largely reflect the styles that were current in the Chinese Sung dynasty (960–1279), and most of the art of this period is considered to be inferior to that of the Unified Silla. Notable exceptions include exotic theatrical masks, printed books (chiefly Buddhist texts) of unexcelled quality, and porcelain with a celadon glaze. The first period of Koryŏ celadon (1050–1150) is characterized by a concern with the depth of the "secret" celadon colour, a greenish blue with a deep, lustrous tone. The Sung regarded the Korean mastery of celadon glaze as one of the "10 best things in the world." From 1150 to 1250, Korean potters further perfected a remarkable technique of inlaid celadon that was unique to Korean pottery of the 12th to the 15th century. The development of "inlaid" lacquerware—actually a polish-expose technique—also took place during the late Koryŏ period, as did the creation of some outstanding bronze censers and mirrors.



Celadon vase in the form of a muskmelon, Koryŏ period, early 12th century; in the National Museum of Korea, Seoul

By courtesy of the National Museum of Korea, Seoul

The renewal of the arts that occurred during the Yi period (1392–1910) was due in part to the spread of Confucianism. Decorative arts in particular reveal a more spontaneous, indigenous decorative sense than do those of the Koryŏ period. Many buildings of the Yi period remain standing, the largest of which is the Kyŏngbok Palace in Seoul. Paintings of the Yi period largely imitate northern Chinese painting styles. Certain painters, however, did attempt to develop a distinctly Korean approach, using non-Chinese techniques and taking Korean landscapes and genre scenes as their subjects. Decorative arts, especially the making of pottery and porcelain, flourished during the Yi period. Punch'ŏng pottery—a simplified form of slip-decorated celadon—was in great demand by Japanese masters of the tea ceremony. During the 15th century, white porcelain became popular among Koreans for daily use as well as for Confucian rites and ancestor worship.

Near the end of the Yi period, Western and Japanese influences were becoming more evident. The Japanese occupation of Korea (1910–45) made an irresistible impact on all of the Korean visual arts, and after 1945 many of the traditional media for the visual arts vanished into an increasingly international style.

Korean language, language spoken by more than 62,000,000 people in North Korea and South Korea, as well as by some 500,000 Koreans resident in Japan. Its linguistic affiliations are uncertain; it may be distantly related to Japanese (postulated because of grammatical similarities), but it more likely belongs to the Altaic language family (with which it shares many features of phonology and grammar).

A brief treatment of the Korean language follows. For full treatment, *see* MACROPAEDIA: Languages of the World: *Korean Language.*

Ancient Korean, written in Chinese characters, is preserved in 25 texts of songs from the kingdom of Silla (*c.* 57 BC–AD 935). Little is known of the language prior to the introduction of the native Korean alphabet in the middle of the 15th century, but a possible dating of the stages of the development of the language is as follows: Old Korean (before the 12th century), Middle Korean (from the beginning of the 12th century through the 16th century), and Modern Korean (from the beginning of the 17th century).

The native Korean alphabet was introduced in 1446 during the reign of Sejong, fourth king of the Yi dynasty. This alphabet, called Hankul, or Onmun (the common script), had 28 letters; though it was not employed by the literati, it gave rise to a body of premodern popular literature. It finally received general recognition at the beginning of the 20th century. Four of the original letters have gone out of use, leaving 10 vowels and 14 consonants. Two methods of writing Korean are in use today: the purely alphabetic method and the "mixed script" method, in which Chinese loanwords may be written in their original characters and read in their Korean pronunciation.

Korean sentences are made of subject and predicate; the main verb or adjective comes last in the predicate. The mood of the Korean sentence is specified by the ending on the verb or adjective that concludes the sentence. This ending is used to identify the sentence as a statement or question, as well as to mark the origin of the speaker's information and his degree of certainty. It also specifies the social relationship between the speaker and the person spoken to. This social relationship is one of three dimensions of a highly developed system of honorifics (forms showing deference). The second dimension reflects the relationship between the speaker and the person spoken about; the third concerns the speaker in speaking of himself before a senior.

Words from Chinese make up more than half the vocabulary of the Korean language. Sino-Korean and Sino-Japanese elements are the primary resources for new technical terms. Most Sino-Korean elements are used as nouns, but they can be made into verbs or adjectives by adding stems that mean "to do," "to be," and "to become."

Korean literature, the body of works written by Koreans, at first in classical Chinese, later in various transcription systems using Chinese characters, and finally in Hankul (Korean: Han'gŭl), the national alphabet promulgated in the mid-15th century. Koreans had their own language for several thousand years but did not invent a system of writing until comparatively late.

A brief treatment of Korean literature follows. For full treatment, *see* MACROPAEDIA: Korean Literature.

Poetry was probably the earliest Korean literary activity before 57 BC, when the ancient songs were concerned with farming activities and religious beliefs and expressed the people's closeness to the natural world. Later literary expressions indicate the changing Korean culture as mainland Chinese influences helped produce a shift from primitive to more sophisticated creative forms. Collective singing and dancing gave way to the personal and individual expression of emotions. The heroes in the literature, formerly tribal ones, now became individual personalities.

The three Korean kingdoms of this period were Koguryŏ, Paekche, and Silla (57 BC–AD 668). After the middle of the 7th century Silla absorbed the other two kingdoms, and the resulting stable political system enabled students to visit China, which brought cultural richness to Korea. The most highly developed form of literature became the short lyric poems known as *hyangga.* Usually having a 10-line form, *hyangga* were written in a delicate and mystical style, with Buddhist philosophy influencing the subject matter, which emphasized a future life.

The earliest Korean prose works included narrative myths about the sun and the moon and the lives of historic kings, legends of natural occurrences, and folk stories about heroes, prophecies, dreams, and animals. The oral literature is made up of all works orally passed on through generations—*i.e.,* ballads, legends, mask plays, puppet-show texts, and *p'ansori* ("story singing") texts.

After the Unified Silla period ended in 935, the literature of Koryŏ (935–1392) introduced a new poetry style called *pyŏlgok,* or *changga* ("special song"). These were intended for large stage performances on festive occasions involving worship of the local gods and of Buddha. Epic literature—based on myths, legends, and the history of Buddhism—also blossomed.

The longest-lasting and most representative Korean form of poetry is the *sijo,* a three-line stanza that originated in the 12th century and has continued to be used. *Sijo* most often concerns itself with Confucian ethical values but also deals with nature and love. Coexisting with *sijo* in the early stages was the *kasa,* a form of long poem that was eventually used for moral instruction, travel journals, or personal stories of woe.

During the early Chosŏn period (1392–1598) the promulgation of the Korean alphabet in the 1440s enabled writers to cast off their cultural dependence on the Chinese language. The *sijo* form of poetry rose to its peak at this time. Readers in Korea loved the *sijo* poetic form because it was at the same time both richly expressive and capable of great lyrical intensity. Like many other traditional Korean literary genres, *sijo* and *kasa* are performed to a particular type of musical accompaniment and are considered to be vital musical genres as well.

After the unsuccessful Japanese invasion of Korea (1592–97) the emphasis of literature shifted to prose. The later Chosŏn period (1598–1894) found practical idealism replacing Confucianism. Narrative prose (*sosŏl*) was embraced by the common people as a result of their disinterest in the old nobility and the old poetry. The most popular works, anonymous and about ordinary people, were written in a simple, natural style. The *sinsosŏl* ("new novel") spanned the period until the modern novel appeared in 1910; its elements were virtue triumphant over vice, a plot based on coincidences, and an entirely prose text (previous works had been partly in verse).

Modern Korean literature began to come of age in the 1920s with the young writers of the independence movement of 1919, who were angry at the Japanese massacre and internment of Koreans. Maturing in the 1930s, the literature embraced techniques used by contemporary Western writers, such as the stream-of-consciousness narrative technique. During this time the potential of the Korean language for poetry was particularly evident in Chŏng Chiyang's verse and in the poetic language of the stories by Yi Hyosŏ.

Korean literature, suppressed by the Japanese during World War II, made a fresh start in 1945 based on the advances of the 1930s, only to be interrupted again by the Korean War (1950–53). Literature following the war was heavily influenced by the division of the country, as writers searched for individual as well as national identity.

Korean music, a form of East Asian music derived initially from its indigenous peoples but influenced greatly by the Chinese and possibly by Mongolian invaders.

A brief treatment of Korean music follows. For full treatment, *see* MACROPAEDIA: East Asian Arts.

By the 3rd century AD there were written references to both singing and dancing at agricultural festivals among the tribes of northwestern Korea. Shamanistic ritual music also was part of the area's history. Court music seems to have begun with Chinese importations, and the earliest instruments were borrowings. Other instruments were indigenous, including the *taegŭm* (a long transverse flute), the *kŏmun-go* (a plucked six-string zither), the *haegŭm* (a two-stringed fiddle), and the *kayagŭm* (a 12-stringed board zither), and its *sanjo* variations. The *kayagŭm,* Korea's national instrument, is heard in both folk and classical Korean music and dance.

Though the traditions of Chinese music were preserved under the guidance of the court master of music, Pak Yon (1378–1458), new Imperial shrine music and Confucian ritual music were emphasized during the reign of Sejong (1419–50), as were musical settings of epics written in the newly developed Korean alphabet. A Korean mensural system, showing time and values, was created in the late 15th century; it gave a clearer indication of rhythm and tempo than had the Chinese system that had been used. Thereafter, Korean musicians maintained a balance between native and Chinese traditions.

Korean vocal music also has a long history. In one of the earliest forms, the *kagok,* a man and a woman sing 26 songs, each having five lines of varying length. The *sijo* is a classical three-line verse that is accompanied by the *changgo* (hourglass drum). In the *kasa* genre there are narrative songs that are accompanied by flute and drums, and, in the *p'ansori* (an operatic folk genre), a small ensemble accompanies the performer's stylized dance. The most striking aspect of the sound of the *p'ansori,* and of most Korean folk music and teahouse songs, is the female voice quality and ornamentation that is reminiscent of flamenco Spanish traditions.

Korean Provisional Government, government in exile organized in April 1919 in Shanghai by Korean patriots. The provisional government was formed in reaction to Japanese suppression of the March 1st Movement, the struggle for Korean independence from Japanese rule that had begun with a proclamation of independence issued by 33 prominent Koreans on March 1, 1919, and a number of massive demonstrations that occurred in Korea wherever the proclamation was read. Leading members of the Korean Provisional Government included such national leaders as Syngman Rhee, An Ch'angho, and Kim Ku.

With the establishment of the provisional government, Korea was able to make more concerted efforts toward achieving independence from Japan, and it made immediate contacts with various independence groups both at home and abroad. By 1922 all of the Korean resistance groups in Manchuria were unified under the provisional government's leadership. To help gain their aims, the leaders published a newspaper, *The Independent,* which greatly enhanced popular consciousness of political participation. They also sent delegations to the United States and Europe to draw attention to their cause.

Nevertheless, the Korean Provisional Government soon encountered insurmountable problems. Internally, the Japanese suppressed all nationalistic dissension in Korea; they even prohibited use of the Korean language in the later 1930s. Externally, the coalition that had formed the provisional government began to grow apart. Although Syngman Rhee was elected the nominal president, he remained in the United States, attempting to solicit Western moral support. The premier, Yi Tonghwi, began to seek Soviet military aid for revolutionary operations in Manchuria. Kim Ku drew close to the right-wing Chinese Nationalists of Chiang Kai-shek.

With the liberation of Korea from Japanese occupation at the end of World War II, the Korean Provisional Government came to an end. Its members returned to Korea, where they put together their own political organizations in what came to be South Korea and competed for power.

Korean War, conflict that began in June 1950 between the Democratic People's Republic of Korea (North Korea) and the Republic of Korea (South Korea), in which an estimated 3,000,000 persons lost their lives. The United Nations, with the United States as the principal participant, joined the war on the side of the South Koreans, and the People's Republic of China eventually came to North Korea's aid. After exceptional vicissitudes, the war was ended inconclusively in July 1953; it established a precedent for United States intervention to contain Communist expansion.

At the end of World War II, the Allies agreed that Soviet forces would accept the surrender of Japanese troops in Korea north of the 38th degree of latitude, while American troops would accept the Japanese surrender

south of that line. In 1947, after the failure of negotiations to achieve the unification of the two separate Korean states that had thus been created, the United States turned the problem over to the United Nations. The Soviet Union refused to cooperate with UN plans to hold general elections in the two Koreas, and as a result, a Communist state was permanently established under Soviet auspices in the north and a pro-Western state was set up in the south. By 1949 both the United States and the Soviet Union had withdrawn the majority of their troops from the Korean Peninsula.

On June 25, 1950, the North Koreans, with the tacit approval of the Soviet Union, unleashed a carefully planned attack southward across the 38th parallel. The United Nations Security Council met in emergency session and passed a resolution calling for the assistance of all UN members in halting the North Korean invasion. (The Soviet delegate, who was absent from the Security Council in protest against the UN's failure to admit the People's Republic of China, was not present to veto the council's decision.) On June 27, U.S. president Harry S. Truman, without asking Congress to declare war, ordered United States forces to come to the assistance of South Korea as part of the UN "police action."

Meanwhile, the South Korean army was overwhelmed by the North Korean forces, and the four ill-equipped American divisions that had been rushed into the battle were driven all the way southward across the Korean Peninsula to a small area covering the approaches to Pusan, on the peninsula's southeastern tip. The American forces there were heavily reinforced, however, and then on September 15, troops commanded by General Douglas MacArthur made a daring amphibious landing at Inch'ŏn, about 100 miles (160 km) below the 38th parallel and on a line with Seoul, the South Korean capital. This brilliant landing far north of the main battlefront succeeded in cutting the North Korean forces' lines; the North Korean army was then totally shattered by the convergence of Allied forces from north and south, and more than 125,000 prisoners were captured by the Allies.

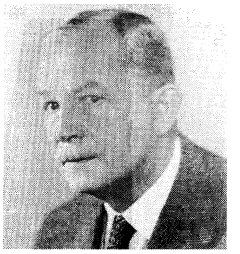
As the Allied forces now advanced northward back to the 38th parallel, the Chinese warned that the presence of UN forces in North Korea would be unacceptable to the security of the Chinese People's Republic and would force the Chinese to intervene in the war. UN forces, however, ignored the warnings and advanced into North Korea with the expressed intention of unifying the country. By mid-November the Allied forces were nearing the Yalu River, which marked the border between North Korea and Manchuria, the northeast part of China. The Chinese considered the approach of UN forces to the Yalu to be an unacceptable threat to Manchuria. On November 24 MacArthur announced his "Home by Christmas" offensive, in which his forces would boldly advance right up to the Yalu. The next day approximately 180,000 Chinese "volunteers" entered the war, and by December 15, after bitter winter fighting and a harrowing retreat, the Allied troops had been driven southward back to the 38th parallel. On Dec. 31, 1950, the Communists began their second invasion of South Korea with about 500,000 troops, but their attack soon faltered in the face of incessant Allied aerial bombing campaigns, and the front lines eventually stabilized along the 38th parallel.

Meanwhile, MacArthur was demanding the authority to blockade China's coastline and bomb its Manchurian bases. Truman refused, feeling that such a course would bring the Soviet Union into the war and thus lead to a global conflict. In response, MacArthur appealed over Truman's head directly to the American public in an effort to enlist support for his war aims. On April 11, 1951, President Truman relieved MacArthur as UN commander and as commander of U.S. forces in the Far East and replaced him with General Matthew B. Ridgway. On July 10, 1951, truce talks began while the North Koreans and Chinese vainly strove for further success on the battlefield. The negotiations dragged on for months, until after the U.S. presidential elections in the fall of 1952 and the victory of Dwight D. Eisenhower, who had criticized the unpopular war and announced his intention to visit Korea if elected. Eisenhower secretly informed the North Koreans and Chinese that he was prepared to use nuclear weapons and would also carry the war to China if a peace agreement was not reached. After a brief renewal of hostilities in June 1953, an armistice was concluded on July 27, and the front line was accepted as the de facto boundary between North and South Korea. The exchange and repatriation of prisoners soon followed.

The Korean War resulted in the deaths of about 1,300,000 South Koreans, many of whom were civilians; 1,000,000 Chinese; 500,000 North Koreans; and about 54,000 Americans, with much smaller numbers of British, Australian, and Turkish casualties on the Allied side. Several million Koreans temporarily became refugees, and much of South Korea's industrial plant was damaged, while North Korea was utterly devastated by American bombing campaigns.

Korfanty, Wojciech (b. April 20, 1873, Siemianowice, Upper Silesia, Ger. [now in Poland]—d. Aug. 17, 1939, Warsaw), political leader who played a major role in the national reawakening of the Poles of Upper Silesia and who led their struggle for independence from Germany.

The son of a miner, Korfanty became a journalist and a member of the secret nationalist society "Z," which resisted Germany's attempt to Germanize Upper Silesia's Polish population. He became Upper Silesia's first Polish member of the Reichstag (the German parliament) in 1903, being reelected in 1907 and 1918, and served in the Prussian Diet from 1904 to 1918—to the dismay of the Prussian administration, the Catholic hierarchy, and local capitalists. After World War I he led the Polish demand for an Upper Silesian plebiscite. Although the majority of Silesian voters decided in favour of remaining part of Germany, Korfanty's campaign efforts resulted in a pro-Polish majority in the southeastern industrial section of Upper Silesia (March 1921). After he had led an armed rebellion (May 1921), he induced the Allies to set the German–Polish border along a line in Silesia more favourable to Poland than previously intended.



Korfanty
By courtesy of T. Ullman

In the newly restored Poland, he sat in the Constituent Assembly (1919–22) and the Parliament (1922–30) as a leader of the national bloc. Opposed to Józef Piłsudski's dictatorial methods, he was imprisoned in 1930 but was soon released and entered the Senate. Having lived in Czechoslovakia from 1935, he returned to Poland on April 29, 1939, was arrested, and died soon after his release.

Korfanty Line, Polish–German boundary in Upper Silesia, proposed by Wojciech Korfanty. The line was never accepted as the official border but provided a basis for compromise that made the post-World War I Polish state economically viable.

When the Allied powers concluded the Treaty of Versailles with defeated Germany, they provided for a plebiscite in Upper Silesia, which contained a large Polish population, to determine whether that territory should remain a part of Germany or be attached to Poland. The plebiscite was finally held on March 20, 1921, after the Poles in Upper Silesia had staged two armed uprisings (August 1919 and August 1920) and a commission representing the Allies had taken over administrative control of the area from the Germans (February 1920). Of the almost 2,000,000 persons entitled to vote, about 700,000 voted to stay with Germany and 500,000 for unification with Poland; 682 communes declared themselves in favour of joining Poland, and 792 preferred Germany.

The treaty had declared that the commune vote was to be the basis for any division of the area; but after the plebiscite, Germany claimed all of Upper Silesia. In response, Korfanty, who was a native of the region and the Polish representative on the Allied commission, suggested that Poland receive the southeastern portion of Upper Silesia. This area, which included the major mining and industrial region of Upper Silesia, had given 59 percent of its votes for incorporation into Poland, and about three-quarters (673) of its communes also had voted in favour of union with Poland.

The commissioners, however, failed to reach a unanimous decision on the area's division, and the Poles staged a third uprising (May 2–3, 1921). Led by Korfanty, who had opposed the previous insurrections, they drove the Germans out and occupied almost all the southeastern territory within a few days. The Germans resisted bitterly for six weeks until British troops under the commission's command brought about a cease-fire. With the commission still unable to reach agreement, the dispute went to the Council of the League of Nations. The compromise accepted by the Allied powers on Oct. 20, 1921, was less favourable to the Poles than was the Korfanty Line. Germany got most of the territory and population of Upper Silesia, but Poland was allotted almost 1,300 square miles (3,400 square km), containing 1,000,000 inhabitants, three-quarters of Upper Silesia's coal-producing area, and two-thirds of its steelworks.

korfball, game similar to netball and basketball, invented in 1901 by an Amsterdam schoolmaster, Nico Broekhuysen. It was first demonstrated in The Netherlands in 1902 and was played on an international level, primarily in Europe, by the 1970s. It was devised as a game for both sexes. A national association was formed in 1903, and the game spread to Belgium, Indonesia, Suriname, Germany, Spain, New Guinea, and England. The Fédération Internationale de Korfball was formed in 1923.

Korfball is played outdoors by two teams of 12 (6 men and 6 women) on a rectangular field 295 feet long and 131 feet wide (90 m by 40 m). At either end of the field, a short distance inside the end line, is a goalpost supporting a cylindrical basket open at both ends, with the rim of the basket 11.5 feet (3.5 m) above the ground. The object of the game is to throw a ball so that it passes through the basket from above, scoring one point. The basket is about 16 inches (41 cm) in diameter and 10 inches (25.4 cm) high, and the ball is about 13.6 inches (34.5 cm) in circumference and 15–17 ounces (425–475 g) in weight.

The field is marked into three zones (de-

fense, centre, and attack), each occupied by two men and two women from both teams, their movement being restricted to their zone. A game consists of two 45-minute halves, and play begins with a free pass from centre. Action consists almost entirely of passing the

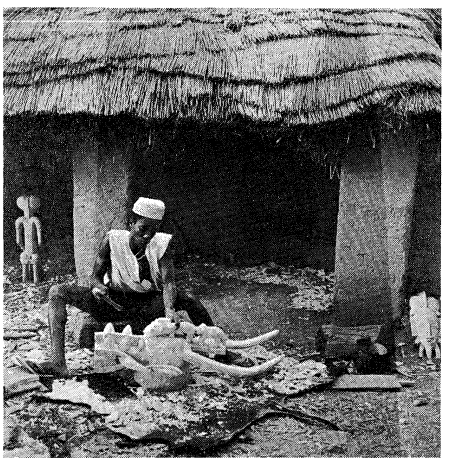


Korfball match for the Dutch championship between teams from Amsterdam and The Hague (1971)
Ger Dijkstra & Zn.

ball from hand to hand and from one zone to the next. Kicking, punching, handing off, and running with the ball are illegal, as is passing the ball over an intervening zone. Although no body contact is permitted, guarding is close, with players guarding opponents of the same sex. A penalty shot at goal from a penalty mark 13 ft away is awarded to the victim of a major violation of rules.

After two goals are scored, players move to the next zone: defense to centre, centre to attack, and attack to defense. Thus, players are thrust into a variety of playing situations.

Korhogo, town, administrative headquarters (since 1969) of Korhogo *département,* north central Ivory Coast. The town's traditional founder was Nangui (Nengué), a 14th-century Senufo (Senoufo) patriarch from Kong. Mod-



Senufo tribesman carving artifacts in Korhogo, Ivory Coast
Marc and Evelyne Bernheim—Woodfin Camp and Associates

ern Korhogo (Heritage) is the chief trade centre (corn [maize], manioc, millet, and yams) for the Senufo farmers of the savanna. Muslim Fulani herdsmen from the north also helped make it a major centre for livestock (cattle, sheep, and goats).

The town has cotton, sisal, and rice factories and a government veterinary research station. French Catholic missionaries established a church and school there in the late 19th century. Korhogo's Senufo wood sculptors, practitioners of a traditional art utilized by the Poro secret society, also create artifacts for the tourist market in Abidjan. The nearby village of Koni is known for its blacksmiths, who not only work iron but extract it from the soil. Pop. (1981 est.) town, 62,000; (1975 est.) *département,* 276,299.

Koriak autonomous okrug (Russian S.F.S.R.): *see* Koryak autonomous okrug.

Kórinthos, English CORINTH, *nomós* (department), straddling the junction of southern continental Greece and the Peloponnese. With an area of 884 sq mi (2,289 sq km), it is indented by the Saronic Gulf (southeast) and the Gulf of Corinth (northwest), which are linked via a navigable canal through the Isthmus of Corinth. Ephyra (Watchtower), is the ancient name of the plateau of Corinth, which has been inhabited since the Neolithic Period; the plateau narrows toward Xilocastron and terminates in a forest of fir. Mount Killini in the central western part of the department is the highest peak, at 7,795 ft (2,376 m), in the Peloponnese peninsula. Several navigable rivers with deep, straight valleys empty northward into the Gulf of Corinth. Some wheat, barley, citrus fruits, olives, and grapes are cultivated along the coasts. Dairy farming, vegetable growing, and raising of sheep and goats also number among the agricultural activities of the department. Forestry and food processing are the main industries. Recreational hunting (duck shooting) is done at the Stymphalian lake in the southwest. The main town is Corinth, the administrative centre of the *nomós,* located at the northeastern corner of the Peloponnese near the Isthmus. Acrocorinth, the ancient acropolis of Corinth, has buildings of the Christian, Turkish, and Venetian periods. To Corinth's south, the terraced hills produce small, dark currants and seedless sultanas for raisins. Loutraki is a seaside resort on the shores of the Gulf of Corinth. Nemea, home of the ancient Nemean Games, is celebrated for its red wine. The main highway runs between Athens (east) and Patrai (west) along the north shore of the Gulf of Corinth. Pop. (1981) 123,042.

Kórinthos (Greece): *see* Corinth.

Korínthou, Isthmós (Greece): *see* Corinth, Isthmus of.

Koritsa (Albania): *see* Korçë.

Kōriyama, city, Fukushima Prefecture (*ken*), Honshu, Japan, located at the junction of the Tohoku Line and the Ban-etsu Line (railways), north-northeast of Tokyo. It developed as an industrial and communications centre, producing textiles, chemicals, and machinery. Power is generated with coal from the nearby Jōban coalfield and by hydroelectric plants on the Nippashi-gawa (Nippashi River). Surrounding mountain ranges and the Inawashiro-ko (Lake Inawashiro) are included in Bandai-Asahi National Park. Pop. (1983 est.) 295,846.

Kōriyama-kingyo (Japan): *see* Yamato-Kōriyama.

Korkino, city, Chelyabinsk *oblast* (administrative region), central Russian Soviet Federated Socialist Republic, in the southern Urals. It is a centre of coal mining in the Chelyabinsk lignite (brown coal) basin; mining began in 1934, and the settlement became a city in 1942. Excavator and truck production reflect its mining orientation; other industries are ferroconcrete and building-materials manufacture. Pop. (1981 est.) 63,000.

Korku, tribal people of central India concentrated in the states of Mahārāshtra and Madhya Pradesh. They number about 285,000. Most are settled agriculturalists, and many have substantial farms; others shifted as recently as the late 19th century from slash-and-burn jungle cultivation (*jhum*) to forestry and field labour. The Korku live in villages of thatched houses. They have hereditary headmen and trace their descent along paternal lines. They speak a language of the Munda family.

In religion the Korku are Hindus. Their ceremonies resemble those of the low castes in that they employ their own priests and mediums instead of Brahmans. They regard themselves as ranking above the Gond and Bhīl peoples, although their dietary habits are considered unacceptable by most Hindus.

Kornberg, Arthur (b. March 3, 1918, Brooklyn, N.Y., U.S.), U.S. biochemist and physician who received (with Severo Ochoa) the 1959 Nobel Prize for Physiology or Medicine for discovering the means by which deoxyribonucleic acid (DNA) molecules are duplicated in the bacterial cell, as well as the means for reconstructing this duplication process in the test tube.

At the U.S. National Institutes of Health, Bethesda, Md. (1942–53), he directed research on enzymes and intermediary metabolism. He also helped discover the chemical reactions in the cell that result in the construction of flavine adenine dinucleotide (FAD) and diphosphopyridine nucleotide (DPN), coenzymes that serve as important hydrogen-carrying intermediaries in biological oxidations and reductions.

Appointed professor and director of the microbiology department at Washington University, St. Louis, Mo. (1953–59), he continued to study the way in which living organisms manufacture nucleotides (consisting of a nitrogen-containing organic base linked to a five-carbon sugar ring—ribose or deoxyribose—linked to a phosphate group), the building blocks for the giant nucleic acids DNA and RNA (ribonucleic acid, which is essential to the construction of cell proteins according to the specifications dictated by the "message" contained in DNA).

This research led Kornberg directly to the problem of how nucleotides are strung together (polymerized) to form DNA molecules. Adding nucleotides "labelled" with radioactive isotopes to extracts prepared from cultures of the common intestinal bacterium *Escherichia coli,* he found (1956) evidence of an enzyme-catalyzed polymerization reaction. He isolated and purified an enzyme (now known as DNA polymerase) that—in combination with certain nucleotide building blocks—could produce precise replicas of short DNA molecules (known as primers) in a test tube. Kornberg was professor of biochemistry at Stanford University, Palo Alto, Calif., from 1959. From 1959 to 1969 he was department chairman. His writings include *Enzymatic Synthesis of DNA* (1961).

Kornblit, Aleksandr: *see* Tairov, Aleksandr Yakovlevich.

Körner, (Karl) Theodor (b. Sept. 23, 1791, Dresden, Saxony—d. Aug. 26, 1813, Gadebusch, Mecklenburg), German patriotic poet of the war of liberation against Napoleon in 1813 whose death in Lützow's volunteer corps made him a popular hero.

His father, Christian Gottfried Körner, was a friend of Friedrich Schiller. Körner grew up in a house frequented by writers and scientists. He studied philosophy in Berlin, where he attended the lectures of the famous philosophers Fichte and Schleiermacher. By 1812 the Vienna Burgtheater had produced three of his dramatic works, the most ambitious of which, *Zriny* (1812), with its glorification of love for the fatherland, made him famous throughout Germany. His dramas, however,

are now largely forgotten. After his death at the age of 22, his father collected the best of his militantly passionate patriotic poetry in *Leyer und Schwert* (1814; "Lyre and Sword"), which was received enthusiastically. While the triumphant battle cries of his poetry filled his contemporaries with patriotic feeling, his lyrics are not currently thought to be outstanding as poetry.

Körner, Theodor (b. April 24, 1873, Komárno, Hung.—d. Jan. 4, 1957, Vienna), Austrian military officer during World War I and later a statesman who served as president of the second Austrian republic (1951–57).

A colonel in the Austro-Hungarian Army at the outbreak of World War I, Körner was subsequently appointed chief of staff (May 1915) and successfully helped to stem Italian offensives along the Italian-Slovenian border. Appointed inspector general of the new Austrian Army after the fall of the empire in November 1918, he retired two years later, joined the Social Democratic Party, and, between 1925 and 1934, sat as a delegate for Vienna in the Austrian Bundesrat (upper chamber in the federal parliament). During the early 1930s, as military adviser for the Schutzbund—a Socialist paramilitary organization—Körner steadily counseled against violent action despite the increasingly rightward drift of Austrian politics. He was nonetheless imprisoned after the Socialist rising of February 1934 for his Schutzbund activities.

Having resisted participation in Nazi politics after the Anschluss (incorporation of Austria into the German Reich, March 1938), he was, at the end of World War II, appointed mayor of Vienna by the Soviet occupation authorities. In May 1951 he was elected president of the second Austrian republic; he died in office.

Körner, Wilhelm (b. April 20, 1839, Kassel, Hesse-Kassel [Germany]—d. March 28, 1925, Milan, Italy), German organic chemist who in 1874 showed how to determine the relative positions of two substituents, such as methyl, on the benzene ring. For example, *o*-xylene forms two different mononitro derivatives; *m*-xylene forms three; and *p*-xylene forms only one. This method permitted further advances in the study and development of aromatic (benzene-derived) compounds.

A student and assistant of August Kekule at Ghent, Körner was appointed to the chair of chemistry at Bonn (1867) and to a chair of organic chemistry at Milan (1870). He prepared 126 aromatic compounds, including pyridine (1869). With Angelo Menozzi of Italy, he synthesized asparagine (1887).

Korngold, Erich Wolfgang (b. May 29, 1897, Brünn, Austria-Hungary—d. Nov. 29, 1957, Hollywood), American composer of Austro-Hungarian birth, best-known for his film music and the opera *Die tote Stadt* ("The Dead City").

A child prodigy, at age 11 Korngold composed the ballet *Der Schneemann* ("The Snowman"), which caused a sensation at its first performance in Vienna (1910). He was still a teenager when his operas *Der Ring des Polykrates* and *Violanta* were produced in Munich (1916). *Die tote Stadt* (Hamburg, 1920), one of the most successful operas composed in the 20th century, brought him international attention. Korngold went to Hollywood in 1934 to write film music and won Academy awards for the scores of *Anthony Adverse* (1936) and *The Adventures of Robin Hood* (1938). In 1975 *Die tote Stadt* was successfully revived in New York City.

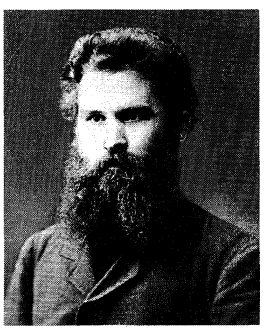
Kornilov, Lavr Georgiyevich (b. August 30 [August 18, Old Style], 1870, Karkaralinsk, Western Siberia, Russian Empire—d. April 13, 1918, near Ekaterinodar, Russia), Imperial Russian general who was accused of attempting to overthrow the provisional government established in Russia after the February Revolution of 1917 and to replace it with a military dictatorship.

An intelligence officer for the Imperial Russian Army during the Russo-Japanese War (1904–05) and a military attaché in Peking (1907–11), Kornilov became a divisional commander during World War I. Captured by the Austrians at Przemysl (March 1915), he escaped in 1916 and was placed in command of an army corps.

After the February Revolution Kornilov was put in charge of the vital military district of Petrograd (now Leningrad) by the provisional government. His determination to restore discipline and efficiency in the disintegrating Russian Army, however, made him unpopular in revolutionary Petrograd. He soon resigned, returned to the front, and participated in the abortive Russian offensive in June against the Germans in Galicia. On August 1 (July 18, Old Style) Prime Minister Aleksandr Kerensky appointed him commander in chief, but conflicts developed between Kornilov and Kerensky, owing to their opposing views on politics and on the role and nature of the Army. At the end of August, Kornilov sent troops toward Petrograd; Kerensky, interpreting this as an attempted military coup d'état, dismissed Kornilov and ordered him to come to Petrograd (August 27). Kornilov refused, and railroad workers prevented his troops from reaching their destination; on September 1 he surrendered and was imprisoned at Bykhov.

Kornilov later escaped, and, after the Bolsheviks seized power (October 1917), he assumed military command of the anti-Bolshevik ("White") volunteer army in the Don region. Several months later he was killed during a battle for Ekaterinodar.

Korolenko, Vladimir Galaktionovich (b. July 27 [July 15, Old Style], 1853, Zhitomir, Ukraine, Russian Empire—d. Dec. 25, 1921, Poltava, Ukraine), Russian short-story writer



Korolenko
Novosti Press Agency

and journalist whose works are memorable in showing compassion for the downtrodden.

Korolenko was expelled from two colleges for his revolutionary activities. In 1879 he was exiled to the Yakut region of Siberia, where he encountered the tramps, thieves, pilgrims, and social outcasts that were to figure prominently in his stories. Released after five years, he published his best-known story, *Son Makara* (1885; *Makar's Dream*), which conveys with sympathetic insight the world of a Yakut peasant. During his editorship (*c.* 1900) of the influential review *Russkoe Bogatstvo*, Korolenko championed minorities and befriended younger writers, including Maksim Gorky. Unwilling to cooperate with the Bolshevik government, he retired after the October Revolution in 1917 to the Ukraine, where he worked on an unfinished autobiography, *Istoriya moyego sovremennika* (1905–21; "The History of My Contemporary").

Korolyov, Sergey Pavlovich (b. Jan. 12, 1907 [Dec. 30, 1906, Old Style], Zhitomir, Russia—d. Jan. 14, 1966, Moscow), Soviet designer of guided missiles, rockets, and spacecraft.

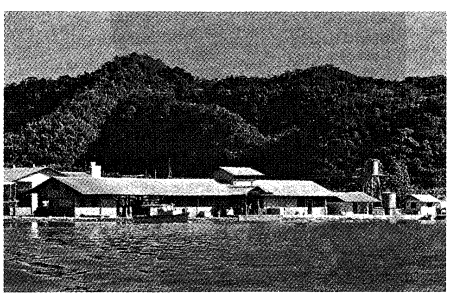
Korolyov was educated at the Odessa Building Trades School, the Kiev Polytechnic Institute, and the Moscow Higher Technical School, where he studied aeronautical engineering under the celebrated designers Nikolay Yegorovich Zhukovsky and Andrey Nikolayevich Tupolev. Becoming interested in rocketry, he and F.A. Tsander formed the Moscow Group for the Study of Reactive Motion, and in 1933 the group launched the Soviet Union's first liquid-propellant rocket.

During World War II Korolyov was held under technical arrest but spent the years designing and testing liquid-fuel rocket boosters for military aircraft. After the war he modified the German V-2 missile, increasing its range to about 426 miles (685 km). He also supervised the test firing of captured V-2 missiles at the Kapustin Yar proving ground in 1947. In 1953 he began to develop the series of ballistic missiles that led to the Soviet Union's first intercontinental ballistic missile. Essentially apolitical, he did not join the Communist Party until after Stalin's death in 1953.

Korolyov was placed in charge of systems engineering for Soviet launch vehicles and spacecraft; he directed the design, testing, construction, and launching of the Vostok, Voskhod, and Soyuz manned spacecraft as well as of the unmanned spacecraft in the Cosmos, Molniya, and Zond series. He was the guiding genius behind the Soviet spaceflight program until his death, and he was buried in the Kremlin wall on Red Square. In accordance with the Soviet government's space policies, his identity and role in his nation's space program were not publicly revealed until after his death.

Koromo (Japan): *see* Toyota.

Koror, formerly CORRORA, one of the Caroline Islands, western Pacific; it is the administrative headquarters of the Republic of Palau and lies just southwest of Babelthuap Island. Partly uplifted coral-limestone and partly volcanic in origin, it has a land area of 3 square miles (8 square km) and rises to 459 feet (140 m). A territorial centre under Japanese administration (before 1944), Koror was well-populated (about 30,000 people) and highly developed. Devastated during World War II,



The marina at Koror, one of the Caroline Islands
Paul Tzimoulis—Tom Stack & Associates

it subsequently developed as an increasingly important commercial and tourist centre. A copra-processing plant opened in 1976. Pop. (1986) 9,442.

Korošec, Anton (b. May 12, 1872, Wisserian, Styria, Austria-Hungary [now in Yugos.]—d. Dec. 14, 1940, Belgrade), Slovene political leader who helped to found the Yugoslav nation after World War I and briefly served as prime minister in 1928.

A Jesuit priest and a noted orator, he shared, and exploited politically, the Slovene fear of Italian expansion; his dislike of Italy outweighed his distaste for Serb domination of the Yugoslav government. Both before and after his premiership he held various offices

in the Yugoslav Cabinet, including the ministries of railways, the interior, and education. Because of his popularity among the Slovenes, he escaped punishment for his opposition to the dictatorship of King Alexander I and Petar Živković, premier from 1929 to 1932. In 1933–34, however, he was imprisoned for his insistence on Slovene autonomy.

Korosten, also spelled KOROSTEN', city, Zhitomir *oblast* (administrative region), north-central Ukrainian Soviet Socialist Republic. It lies along the west bank of the Uzh River about 80 miles (130 km) northwest of Kiev. The city, which was incorporated in 1926, is a small industrial centre, a railway junction, and an engineering centre. In addition, it manufactures equipment for the chemical industry and has woodworking, porcelain, food-processing, and clothing industries. Granite is quarried and processed on the city's outskirts. Pop. (1986 est.) 72,000.

Korsakoff's syndrome, also called KORSAKOFF'S PSYCHOSIS, or KORSAKOFF'S DISEASE, neurological disorder characterized by severe amnesia (memory loss) present in a background of clear perception and full consciousness. Many cases result from severe chronic alcoholism, while others are due to a variety of toxic or infectious brain illnesses, severe head injury, or a thiamine deficiency. Patients with Korsakoff's syndrome typically are unable to remember events in the recent or even the immediate past, and some can store information for only a few seconds before they forget it. The patient may also have forgotten a much longer time period in his life, extending back for as many as 20 years. Another feature that is sometimes present is confabulation; *i.e.,* the patient recounts detailed and convincing memories of events that never happened. Korsakoff's syndrome is often a transient manifestation of some other brain disorder, but some cases are chronic. *See also* memory.

Korsakov, city, Sakhalin *oblast* (administrative region), eastern Russian Soviet Federated Socialist Republic. It lies in the southern part of Sakhalin Island on the Aniva Gulf. Founded in 1853 as a fortified post, it was the first Russian military post on the island. Its port opened in 1909. The settlement was ruled by Japan from 1905 to 1945 and was called Ōtomari. In 1946 it became a city and was given its present name. It is the largest port on the island, with ship repairing and a fish-processing factory. Pop. (1974 est.) 40,000.

Kortcha (Albania): *see* Korçë.

Kortner, Fritz, original name FRITZ NATHAN KOHN (b. May 12, 1892, Vienna—d. July 22, 1970, Munich), famous stage and film actor of the 1920s German avant-garde who, following his return from exile in 1949, revitalized German theatre by his innovative concepts in staging and direction. He was known particularly for his unconventional interpretations of the classics.

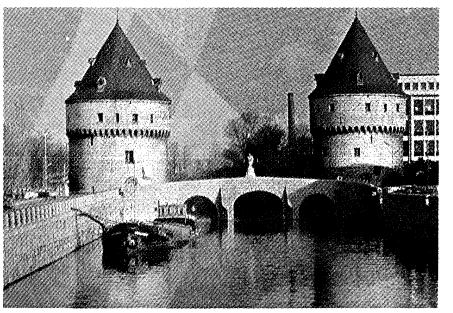
Kortner graduated from Vienna's Academy of Music and Dramatic Art. After working for various German theatres, he joined Max Reinhardt in Berlin in 1911 and Leopold Jessner in 1916. He started appearing in silent films in 1916, becoming one of Germany's most celebrated character actors by playing a variety of sinister or menacing roles. His explosive energy and impressive powers of delivery made him outstanding in the Expressionist drama of Jessner; among his most famous roles were Gessler in Friedrich Schiller's *Wilhelm Tell* and the conniving king in Jessner's directorial tour de force, Shakespeare's *Richard III.*

Forced to flee Germany after the Nazis came to power in 1933, Kortner eventually made his way to the United States, where he worked as a character actor in films and wrote and directed a few plays. He returned to Germany in 1949, becoming one of its most brilliant stage directors. He directed a series of meticulously detailed, scrupulously acted productions of plays by Gotthold Ephraim Lessing, Schiller, Molière, Tennessee Williams, and Samuel Beckett, among others. Among his more notable productions were *Richard III* (1964), which ended with the king crawling over heaps of corpses, and August Strindberg's *The Father* (1967). Kortner's work was widely acclaimed, and he was active in the theatre until his death.

Kortner appeared in more than 90 motion pictures, including the silent films *Danton* (1920 and 1931), *Die Hintertreppe* (1921; *Backstairs*) by Jessner, *Die Schatten* (1923; *Warning Shadows*) by Arthur Robison, *Orlacs Hände* (1925; *The Hands of Orlac*) by Robert Wiene, and G.W. Pabst's *Die Büchse der Pandora* (1928; *Pandora's Box*). He starred in *Beethoven* (1927; *The Life of Beethoven*). Among films he directed are *Die brave Sünder* (1931; *The Upright Sinner*) and *Die Stadt ist voller Geheimnisse* (1955; *City of Secrets*).

Kortrijk (Flemish), French COURTRAI, municipality, West Flanders province, western Belgium. It lies along the Leie (Lys) River and the Leie-Scheldt Canal. The Roman settlement of Cortracum was established there, and in the 7th century St. Eloi erected a chapel on the site of the present St. Martin's Church. Chartered in 1190, Kortrijk reached its peak in the Middle Ages as a centre of the linen damask industry.

In 1297 the French invaded the town as well as most of Flanders. In 1302, on Groeninghe Field just outside the town walls, the ill-equipped burghers and weavers of Flanders defeated a powerful cavalry of French knights; about 700 pairs of spurs were collected from the slain knights and hung in a church (since destroyed)—whence the name "Battle of the Golden Spurs." In 1382 Charles VI avenged the French defeat by sacking the town. It was taken again by the French in 1793. During World War I, it was occupied by the Germans and became an important base for the Ypres front. Kortrijk was severely damaged in World War II.



Broelbrug (bridge) and towers, across the Leie River, Kortrijk, Belg.

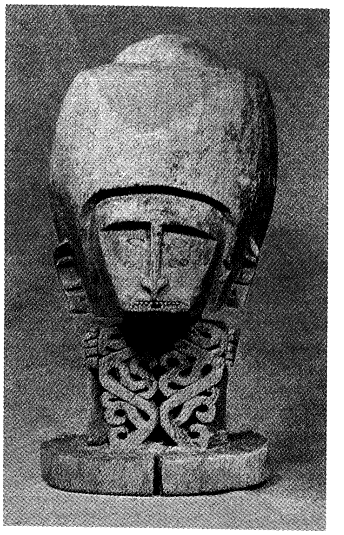
By courtesy of the Official Belgian Tourist Bureau; photograph, Esterhazy

A rail junction and the centre of a flax-growing region, Kortrijk is now one of the largest producers and exporters of linen fibres in western Europe. There are also furniture, wire, and cotton-weaving industries.

The Church of Notre Dame (Onze Lieve Vrouwkerk; 1191–1211), with the attached chapel of the counts of Flanders (1374), contains Anthony Van Dyck's "Elevation of the Cross" (1631) and a 14th-century statue of St. Catherine. Other historic landmarks include the Broelbrug (bridge; *c.* 1400), with its two massive towers; the Gothic St. Martin's Church; the 14th-century belfry; and the town hall (15th and 16th centuries) in the Flamboyant Gothic style. Pop. (1983 est.) city, 75,587; (1982) mun., 272,038.

Kortrijk, Battle of (1302): *see* Golden Spurs, Battle of the.

korwar style, type of carving of northwest New Guinea, particularly the Geelvink Channel region, in which bold, angular lines contrast with delicate, curvilinear, organic forms in the same piece of sculpture. The *korwar* style is found on canoe prows, headrests, and bamboo quivers, but its most typical expression is the *korwar* statue of this region, a figural image that is associated with ancestor



Wooden *korwar* figure with skull, from Pulau Biak, Teluk Sarera (Geelvink Bay), Irian Jaya (West New Guinea), Indonesia; in the Rijksmuseum voor Volkenkunde, Leiden, Neth.

Holle Bildarchiv, Baden-Baden, W.Ger.

worship and is believed to provide a residence for souls of distinguished persons. Generally carved in an erect or squatting posture with arms resting on the knees, the figures have heads overly large in proportion to their small bodies.

Frequently, *korwar* figures carry a shield that sometimes supports the chin of the statue. Melanesian artists use this form to display their masterly ability to carve delicate, repeated motifs—single and double spirals, scrolls, and S-curves—that dramatically contrast with the severe facial delineation, in which the lines are at right angles to one another. The combination of these divergent surface treatments represents a strictly local tradition that cannot be found outside the region.

Koryak, indigenous people of the Soviet Far East, numbering about 7,900 in the late 20th century and living mostly in the Koryak autonomous *okrug* (district) of the northern Kamchatka Peninsula. The Koryak languages belong to the Luorawetlan language family of the Paleosiberian group.

The Koryak are probably indigenous inhabitants of the northeastern shores of the Sea of Okhotsk, whence they spread eastward. At the time of the Russian annexation (late 17th to early 18th century) there were about 13,000 Koryaks. Some were nomadic reindeer keepers of the inland areas, while others were sedentary coastal dwellers who engaged in sea-mammal hunting and fishing and used dogsleds for transportation. Coastal Koryak settlements (some of them fortified) consisted of semisubterranean winter dwellings and summer tents on poles.

There was no public authority among the Koryak, or any tribal or clan organization. Their customs included monogamous patrilocal marriage and patrilineal kinship. Professional and family shamanism was practiced, "transvestites" being considered the effective shamans. Wolves were regarded by the Kor-

yak as their relatives, and an important place was accorded in their mythology to the raven.

Resistance to the Russians weakened the Koryak, and they became an easy prey to their nearest neighbours to the north, the Chukchi, whose raids, and a smallpox epidemic in the late 18th century, reduced the number of Koryak by half. The Koryak still largely follow their traditional occupations.

Koryak Autonomous Okrug, also spelled KORIAK, formerly (until 1977) KORYAK NATIONAL OKRUG, administrative area, Kamchatka *oblast* (province), far eastern Russian Soviet Federated Socialist Republic. It occupies an area of 116,400 square miles (301,500 square km) on the northern half of the Kamchatka Peninsula, the southern end of the Koryak Mountains, and the Penzhina Basin. The relief is rugged, and the climate is severe. Vegetation consists of tundra or thin birch forest. The *okrug* is very sparsely populated; there are no towns and only five urban districts, including the administrative centre, Pălana (*q.v.*). The chief occupations are fishing (especially for crab), fur hunting, and reindeer herding. A little coal is mined, and some timber is cut. The population of the *okrug* is composed of Russians (about 65 percent), Koryaks (about 20 percent), and small numbers of Ukrainians, Chukchis, and Itelmens. Pop. (1987 est.) 40,000.

Koryŏ DYNASTY, dynasty that ruled the Korean peninsula as the Koryŏ kingdom from 935 to 1392. During this period the country began to form its own cultural tradition distinct from the rest of East Asia, and it is from the name Koryŏ that the Western word Korea is derived.

The dynasty that ruled Koryŏ was formed by General Wang Kŏn, who in 918 overthrew the state of Later Koguryŏ, established in north-central Korea by the monk Kungye. Changing the name of the state to Koryŏ, he established his capital at Songak, present-day Kaesŏng. With the surrender of the kingdoms of Silla, in 935, and of Later Paekche, in 936, Wang Kŏn established a unified kingdom on the peninsula.

A centralized bureaucratic system was established during the reign (981–997) of King Sŏngjong to replace the old aristocratic tribal system that had governed the country. Education and civil-service examinations were used by the state as a means of selecting the most capable officials and of absorbing the provincial magnates into the central government in order to consolidate the central administration over the countryside.

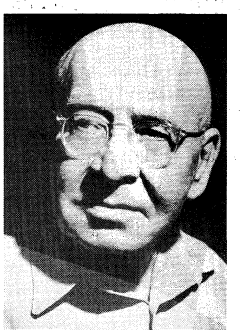
Confucianism exerted a strong influence on political life, but Buddhism was no less influential and widespread. The *Tripiṭaka,* the complete Buddhist canon, was published. The generally extravagant life of the aristocracy led to the flowering of art, particularly ceramics, such as the renowned Koryŏ celadon. Koryŏ visual art emphasizes decorative effect rather than mass. Its inclination toward elegance and technical perfection is sometimes attributed to the influence of Sung China, but Koryŏ art's contours are gentler.

Koryŏ generally enjoyed good relations with China and adopted its culture and political system. But it often clashed with the tribes on the northern frontier, for it maintained an isolationist policy toward them. Despite the practical needs for national defense, military officials were generally poorly treated, and this led eventually to a coup d'etat in 1170. Amid the subsequent disorder, one of the generals, Ch'oe Ch'ung-hŏn, was able to establish a military regime of his own that lasted from 1197 to 1258. The Ch'oe family, however, was content to rule behind the scenes, and it never actually usurped the throne. Hence, the dynasty continued to exist.

In the 13th century Koryŏ suffered from a series of invasions from the Mongols. King Kongmin (1352–74) attempted a set of reforms to drive out the invaders and their influence from the court, but without success. Finally, in 1392 the newly emerged Confucian scholar General Yi Sŏng-gye overthrew the shaky dynasty and founded the Yi dynasty (1392–1910).

Koryū (Japanese floral school): *see* Ko.

Korzybski, Alfred (Habdank Skarbek) (b. July 3, 1879, Warsaw, Pol., Russian Empire [now in Poland]—d. March 1, 1950, Sharon, Conn., U.S.), Polish-born American scientist and philosopher known as the originator of general semantics, a system of linguistic philosophy that attempts to increase man's capacity to transmit ideas from generation to generation (what Korzybski called man's "time-binding capacity") through the study and refinement of ways of using and reacting to language.



Korzybski, 1947
Kenneth S. Keyes, Jr.

During World War I, Korzybski served in the intelligence department of the Russian army general staff and in 1915 was sent on a military mission to the United States and Canada. With the collapse of the tsarist regime in 1917, he remained in the United States to serve as secretary of the French–Polish military mission, later becoming a U.S. citizen. His best-known work is *Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics* (1933).

Kos (Greece): *see* Cos.

Kosach-Kvitka, Larisa Petrovna: *see* Ukrainka, Lesya.

Kosala, large kingdom of ancient northern India, roughly corresponding to the historic region of Oudh, in what is now south-central Uttar Pradesh state. Kosala extended across both banks of the Sarayu River (modern Ghāghara) and north into what is now Nepal. According to the *Rāmāyaṇa,* Kosala was ruled by kings descended from the sun; one of these kings was Rāma, whose capital was Ayodhyā, near modern Faizābād.

Kosala rose in political importance early in the 6th century BC to become one of the 16 states dominant in northern India. It annexed the powerful kingdom of Kāśī; and, during the reign of King Prasenajit (Pasenadi), in about 500 BC, it was regarded as one of the four powers of the north (perhaps the dominant power). At that time Kosala could command the trade routes of the Ganges River basin. The Buddha, who was born in the Śākya (Sākiya) tribe of northern Kosala (*c.* 563 BC), often preached at the capital Śrāvastī (Sāvatthi), where he passed the rainy season during the last 25 years of his life.

There had been a matrimonial alliance between Kosala and Magadha, but, in about 490 BC, war broke out between them; as a result, Kosala seems to have been weakened and never regained its position of control. Kosala was absorbed into Magadha at some time during the reign of the latter's king Ajātaśatru (*c.* 491–*c.* 459 BC).

In later times Kosala was known as northern Kosala to distinguish it from a large kingdom to the south known variously as Kosala, southern Kosala, or "Great Kosala," on the upper Mahānadi River (now in eastern Madhya Pradesh state). This latter kingdom, with its capital at Sripura (later Sripur, Raipur), was founded, according to the *Rāmāyaṇa,* by Rāma's son Kuśa and known by this name until the 12th century AD.

Kosba, Simeon bar: *see* Bar Kokhba.

Kosciusko, Mount, Australia's highest peak (7,310 feet [2,228 m]), in the Snowy Mountains of the Australian Alps, southeastern New South Wales, 240 miles (390 km) southwest of Sydney. Located in Kosciusko National Park (2,493 square miles [6,458 square km]), it is near Mounts Townsend, Twynam, North Ramshead, and Carruthers (all exceeding 7,000 feet), whose melting snows feed the rivers and reservoirs that comprise the Snowy Mountains Hydroelectric Scheme. The region has been developed for winter sports. The mountain was named by Paul Strzelecki in 1840 in honour of Tadeusz Kościuszko, the Polish patriot.

Kościuszko, Tadeusz (Andrzej Bonawentura), English THADDEUS KOSCIUSKO (b. Feb. 4, 1746, Mereczowszczyzna, Pol. [now in Belorussian S.S.R.]—d. Oct. 15, 1817, Solothurn, Switz.), Polish army officer and statesman who gained fame both for his role in the U.S. War of Independence and for his leadership of a national insurrection in his homeland.

Early life. Kościuszko was born to a family of noble origin and was educated at the Piarist college in Lubieszów and the military academy in Warsaw, where he later served as an instructor. Kościuszko's outstanding abilities soon attracted the attention of King Stanisław II Augustus Poniatowski, who sent him to Paris for further study in military and civil architecture and in painting. Returning home in 1774, he taught drawing and mathematics to the daughters of a general, Józef Sosnowski; he fell in love with Ludwika, one of the daughters, and tried unsuccessfully to elope with her.

U.S. War of Independence. Facing the wrath of her father, he fled to France, and in 1776 he went to America where he joined the colonial forces fighting for independence from the British. That August he was transferred to the Pennsylvania Committee of Defense in Philadelphia, where he took part in planning fortifications to defend the residence of the Continental Congress against the British. For this work he was given the rank of engineer colonel. In spring 1777, he was



Kościuszko, detail of a lithograph by C. Motte, 1826
By courtesy of the Polish Museum of America, Chicago

assigned to the army of General Horatio Gates at Fort Ticonderoga, in northern New York. Beginning in July he became active in Gates's army, closing by fortifications all roads along the Hudson River and thus contributing to the capitulation of the British army under General John Burgoyne at Saratoga on October 17. He spent the next two years fortifying West Point, N.Y., where in March 1780 he was appointed chief of the engineering corps. That summer, serving under General Nathanael Greene in North Carolina, he twice rescued the army from enemy advances by directing the crossing of the Yadkin and Dan rivers. In the spring of 1781 in South Carolina, he conducted the Battle of Ninety-six and then a lengthy blockade of Charleston. At the end of the war he was given U.S. citizenship and was made a brigadier general in the U.S. Army.

Campaigns in Poland. In 1784 he returned to Poland. Because of his association with the Czartoryski family, then in opposition to the king, he could not secure an appointment in the Polish army. For five years he lived in poverty on a small country estate, in debt, moreover, because of his exceptional deed of freeing his serfs from part of their villein service. With the advent of liberal reforms in Poland, in 1789 he returned to military service. Under the protection of his former love, Ludwika, now the wife of Prince Lubomirski, and with the support of local nobility, on October 12 he was granted the rank of general major. At that time the 44-year-old general fell in love with an 18-year-old girl of noble birth, but again he was unable to win the father's permission for marriage.

In 1792 the Russian army of the empress Catherine II the Great invaded Poland in an attempt to end Polish internal reforms designed to liberate the nation from Russian influence. In the ensuing war Kościuszko rose to fame as a division commander during the bloody Battle of Dubienka (July 18). For this he was raised to the rank of general lieutenant by King Stanisław II Augustus Poniatowski, and the new Revolutionary government in Paris granted him honorary French citizenship. But, when the Polish king, fearing defeat, defected from the liberal cause, Kościuszko prepared to resume fighting. In Russian-occupied Poland, however, the reactionary party assumed power, forcing liberal statesmen into exile in Saxony. Kościuszko, against the king's wishes, gave up his commission and joined the exiles.

From Saxony, in January 1793, he was delegated to Paris to seek support for the Polish cause, first from the Girondists and then the Jacobins, pledging in return radical internal reforms in Poland and military diversion against Prussia and Austria, then at war with Revolutionary France. When he returned to Saxony in August, he faced new demands for starting an uprising in Poland in view of favourable indications there. Kościuszko agreed to command the national forces and went secretly to a place near Cracow (Kraków), but, finding preparations inadequate, he delayed the uprising and then went abroad again. His decision proved unwise because time allowed the enemy to undermine the conspiracy through widespread arrests and reduction of the army. Those left in the underground started the uprising on March 12, 1794. On their request Kościuszko arrived in Cracow on March 24 and, amid an enormous assembly of people, solemnly swore an act of national uprising against the occupying powers—chiefly Russia and Prussia. Undertaking all political responsibility and military leadership, he set up an insurgent administration and military force. To do so he had to compensate for the quality of the enemy army with the quantity of his own. Therefore, he introduced conscription to military service, enlarged existing units by incorporating recruits into them, and developed new formations. Having no war industry, his forces could not be equipped with conventional firearms; hence, he armed his peasant recruits with pikes and traditional war scythes.

After a smashing victory at Racławice (April 4), won by the scythe-bearing formations under his personal command, special new battle tactics were developed based on columns of men attacking on the run and backed by artillery fire. To win more army volunteers from the peasant masses, he issued the Manifesto of Połaniec, on May 7, suspending serfdom and reducing in half the existing villein service. This met with some resistance of the nobility. Defeats forced Kościuszko to retreat to his last stronghold, Warsaw. The defense of this city, besieged by Prussian and Russian armies for about two months, remains Kościuszko's greatest military success, both as strategist and engineer. He managed to use the city population to build earthworks and to defend the city alongside the regular army. In critical moments, he himself led the charge with fixed bayonets. Next, he stirred up an uprising in the occupied province of Wielkopolska, at the rear of the besieging armies, forcing the Prussian king Frederick William II to retreat. But Russian reinforcements retaliated quickly. Kościuszko was unable to concentrate adequate forces in time, and he suffered his greatest defeat at Maciejowice, where he was wounded and taken prisoner. Without its leader, the uprising collapsed, and the Third Partition of Poland ended the existence of the country.

Last years. Kościuszko, imprisoned in the Peter-Paul Fortress in St. Petersburg (now Leningrad), was slowly returning to health when, upon the death of Empress Catherine II, her son, the emperor Paul I, granted him freedom in 1796. Despite a crippling illness, Kościuszko returned to the United States. On Aug. 18, 1797, he arrived in Philadelphia, greeted enthusiastically by the people but held in suspicion by the incumbent Federalists. In the United States he led an active life in social circles and entered into a long-lasting friendship with Thomas Jefferson, who was then vice president; but, after receiving news of fresh possibilities to promote Poland's cause in France, he secretly left the United States on May 5, 1798. Before that he had appropriated some of his estate for setting free his black slaves and for educating them.

His return to France was a disappointment. A true republican, he distrusted Napoleon, and he refused to command Polish legions in a fight only for France, promising cooperation only if the liberation of his country would also be involved in the plans.

Hence, Kościuszko retired from public life and took up residence in Berville, near Fontainebleau. In 1806 Napoleon tried to gain Kościuszko's aid in the event of war with Russia. But Kościuszko again demanded political commitments, and Napoleon secured other, more agreeable Polish supporters for his plans. Kościuszko remained in exile when his country was rebuilt as the Grand Duchy of Warsaw (1807). Consequently, after Napoleon's fall in 1814, the Russian emperor Alexander I sought Kościuszko's help in bargaining for Poland's territories. After the Congress of Vienna and the formation of a new Polish realm under Russian rule in 1815, Emperor Alexander was anxious to be on good terms with Kościuszko and to have him return home. Kościuszko, however, again proposed unrealistic conditions, demanding social reforms and boundaries of the country reaching the Dvina and Dnepr rivers. When no answer came, he went to Solothurn, Switz., and freed all his serfs in Poland from villein service.

After Kościuszko died in 1817, his remains were carried to Kraków and were buried in 1819 among the kings' tombs in the cathedral. The people, reviving an ancient custom, raised a huge mound to his memory near the city. (S.He.)

BIBLIOGRAPHY. Miecislaus Haiman, *Kosciuszko in the American Revolution* (1943, reprinted 1975), is continued by his *Kosciuszko, Leader and Exile* (1946, reprinted 1977); both studies are based on American sources.

Kose Kanaoka (b. 802?—d. 897?, Japan), first major secular artist in Japan. Information concerning his life and works is sketchy, and his last documented painting was destroyed by fire in the 17th century.

Active during the formative days of the aristocratic culture of the Heian period (794–1185), he was reputed to have moved beyond Chinese-inspired subject matter and techniques and to have forged a new style of painting that was uniquely Japanese. As the scion of an aristocratic family, he held court rank and the office of director of the imperial garden. As a painter, he excelled in landscapes, portraits of officials, and animals. It is said that his lines, although thin and delicate, possessed much strength and vitality and that his horses and dragons were so realistic that they seemed to come to life and escape from the paintings. While there are no extant paintings that can be positively identified as his work, his name is so esteemed that many paintings of merit have been attributed to him, including the famed portrait of Sugawara Michizane, a contemporary scholar-statesman.

Kösem Sultan (b. *c.* 1585—d. Sept. 2, 1651), Ottoman sultana, said to have been of Greek origin and beautiful when young, who exercised a strong influence on Ottoman politics for half a century, first as the wife of Sultan Ahmed I and then as mother of Murad IV and İbrahim I and grandmother of Mehmed IV. The ambitious Kösem allowed the Janissaries to commit abuses and even to dethrone her son İbrahim. In 1651 she attempted to kill Mehmed IV but was herself strangled by men in the entourage of her daughter-in-law, Turhan Sultan.

Kosen (Japanese Communist leader): *see* Sakai Toshihiko.

kosher, Yiddish KOSHER, Hebrew KĀSHĒR ("fit," or "proper"), in Judaism, the fitness of an object for ritual purposes. Though generally applied to foods that meet the requirements of the dietary laws (kashruth), kosher is also used to describe, for instance, such objects as a Torah scroll, water for ritual bathing (mikvah), and the ritual ram's horn (shofar). When applied to food, kosher is the opposite of terefah ("forbidden"); when applied to other things, it is the opposite of pasul ("unfit").

In connection with the dietary laws, kosher implies (1) that the food is not derived from the animals, birds, or fish prohibited in Leviticus 11 or Deuteronomy 14; (2) that the animals or birds have been slaughtered by ritual method of shehitah (*see* below); (3) that the meat has been salted to remove the blood (Deuteronomy 12:16, 23–25, and elsewhere) after the carcass has been critically examined for physical blemishes and that the ischiatic nerve has been removed from hindquarters (Genesis 32:32); and (4) that meat and milk have not been cooked together (Exodus 23:19) and that separate utensils have been employed. In consequence of (2), the term terefah (that which has been torn by beasts; Genesis 31:39) is extended to all food violating the law, even, incorrectly, to admixtures of leaven on Passover, though *Kāshēr la-Pesach,* "fit for Passover," is fairly correct. So-called kosher wine is prepared under observation, to prevent libations to idols and, by Talmudic extension, to avoid handling by non-Jews. This last regulation is presently observed only by the ultra-Orthodox. A relic of Roman days, it once was common to both Judaism and early Christianity.

The special method of slaughtering animals, called shehitah, consists of an incision made across the neck of the animal or fowl by a qualified person especially trained for ritual slaughter, with a special knife that is razor-sharp and has a smooth edge with absolutely no nicks. The cutting must be made by moving the knife in a single swift and uninterrupted sweep, and not by pressure or by stabbing. The cut severs the main arteries, rendering the animal unconscious and permitting the blood to drain from the body. The slaughterer (shohet) recites a prayer before the act of shehitah.

Objection has sometimes been raised to this method of slaughter on grounds of cruelty. The sight of the struggling animal aroused the concern of humane societies, and in some European countries this resulted in legislation forbidding shehitah. Scientific opinion indicates, however, that severance of the carotid arteries and the jugular vein by one swift movement results in almost immediate loss of consciousness, and the afterstruggle is reflex muscular action.

In Orthodox Judaism the dietary laws are considered implications of the divine command to "be holy" (Leviticus 19:2), but in Reform Judaism their observance has been declared to be unnecessary to the life of piety. *See also* kashruth.

Koshigaya, city, Saitama *ken* (prefecture), Honshu, Japan, on the alluvial plain of the Naka and Edo rivers. The city was a post town and marketplace until it was connected to Tokyo by railway in 1899. After World War II it grew rapidly in conjunction with Sōka, to the south. Industrial products include chemicals, leather, and machinery. Pop. (1987 est.) 269,705.

Consult the INDEX *first*

Kosi River, river in Nepal and northern India, which with its tributaries drains the eastern third of Nepal and part of Tibet, including the country around Mount Everest. Some of its headstreams rise beyond the Nepalese border in Tibet. About 30 miles (48 km) north of the Indian–Nepalese frontier, it is joined by several major tributaries and breaks southward through the Siwālik Hills at the narrow Chatra Gorge. The river then emerges on the great plain of northern India on its way to the Ganges, which it enters south of Purnea after a course of about 450 miles (724 km). Because of its great outflushing of debris, the Kosi has no permanent channel. It has long been notorious for its devastating floods, which may rise as much as 30 feet (9 m) in 24 hours and which long made vast tracts of northern Bihār unsafe for habitation or cultivation. Now a dam across the Chatra Gorge at Barakakshetra controls floods, permits irrigation of the floodplain, provides hydropower, and supports fish hatcheries. Corn (maize) is extensively cultivated on the sandy Kosi soils.

Košice, German KASCHAU, Hungarian KASSA, capital of Východoslovenský *kraj* (region), Czechoslovakia, on the Hornád River.

Košice originated in the 9th century and was chartered in 1241; in the late Middle Ages it was one of the 24 trading settlements of the Polish-Slovak frontier, in which immigrant German merchants were prominent. In 1660 Benedict Kischdy, the Hungarian bishop of Eger (now Cheb), founded a university at Košice, later suppressed by the Austrians. There are remnants of the stout 17th-century fortifications, built as a defense against the Turks; particularly well preserved are the Hangman's Bastion (Katova bašta), now a museum, and the Mikluš Prison (Milušova väznica). The long medieval street known as Hlavná Ulica is still the centre of the city. In it stand the great Gothic Cathedral of St. Elizabeth, St. Michael's Chapel, Levoča House (the former warehouse of the trading-settlement merchants), and several other churches and palaces.

Košice developed rapidly after it became a part of the First Czechoslovakian Republic in 1920. In 1938 the city was occupied by the Hungarians; after liberation in 1945, it became the first seat of the Czechoslovakian government and of the Slovak National Council. Postwar foundations include Šafařík University (1959), named after the mid-19th-century Slovak scholar, and several scientific and research institutes. Since 1945 the population has more than doubled, and the city is now the political, economic, and cultural centre of southeastern Slovakia.

Košice lies between the mineral-rich Slovak Ore Mountains to the west (with iron ore, magnesite, and limestone) and a fertile agricultural plain to the east. It is both a centre for heavy industry and a market for farm products. The East Slovak Engineering Works and the East Slovak Iron Works, one of eastern Europe's largest integrated iron and steel complexes, are at Huko, just south of Košice. Nearby are several spas and villages, notably Herlany, Jasov, Jahodná, and Štós. Pop. (1987 est.) 227,601.

Košice, Pact of: *see* Koszyce, Pact of.

Košice government, Košice also spelled KOSZYCE, pro-Soviet Czechoslovak provisional government that inaugurated far-reaching socialist programs during the single year of its rule after World War II and made way for the eventual Communist domination of Czechoslovakia. Appointed by Edvard Beneš, the former president of prewar Czechoslovakia and the head of the Czechoslovak government-in-exile during the war, the government was formed at Košice, in Slovakia, on April 3, 1945. Its premier was the pro-Soviet Zdeněk Fierlinger, a former diplomat who had represented the Czechoslovak government in Moscow; its Cabinet contained ministers from four Czech and two Slovak political parties. The seven Communist ministers of the Košice government, however, not only formed the largest group from a single party but also controlled the key ministries of interior, agriculture, finance, education, and information.

After the Košice government assumed control of the liberated Czechoslovak lands, it organized people's committees to function as local governments and also developed a distinctly pro-Soviet foreign policy, on the basis of which it obtained the Teschen district from Poland (through Soviet intervention) but ceded sub-Carpathian Ruthenia to the Soviet Union. In addition, it approved the nationalization of key industries, power plants and networks, banks, and other financial, credit, and insurance institutions.

After parliamentary elections were held in May 1946, the Košice government, whose activities had increased the Communists' popularity, was succeeded by a new government, whose Communist premier, Klement Gottwald, retained many of the Communist ministers who had served in the Košice government.

Köslin (Poland): *see* Koszalin.

Kosmet (Yugoslavia): *see* Kosovo.

Kosogol, Ozero (Mongolia): *see* Hövsgöl Nuur.

Kosova (people): *see* Gusii.

Kosovo, formerly (1946–71) KOSOVO I METOHIJA (Kosmet), autonomous *pokrajina* (province), within the republic of Serbia, Yugoslavia, 4,203 square miles (10,887 square km) in area. There is a strong Oriental influence and a large Muslim population. About two-thirds of the inhabitants are Albanians; spoken languages include Albanian, Serbo-Croatian, and Turkish. In the late 1980s Kosovo's large Albanian population staged a number of sometimes violent protests over increased Serbian power.

The climate in Kosovo is moderate continental, though it is Mediterranean in the southern Beli Drim valley. Kosovo corresponds roughly with Kosovo Depression, which is drained by the Sitnica River. Unexploited mineral resources include lignite, asphalt, and magnesite. There is mining of lead, zinc, copper, silver, gold, and chromium, especially at Trepča and Nova Brdo. Principal cities are Priština (the administrative centre)—near which is the monastery of Gračanica, with 14th-century frescoes—and Kosovska Mitrovica. Metohija, in the west, corresponds to the upper basin of the Beli (White) Drim. Its principal cities are Peć and Prizren. The autonomous province is one of the least developed parts of Yugoslavia, though the land is among the most fertile in the Balkans and supports the cultivation of grains (wheat, barley, corn [maize]), vegetables, tobacco, hemp, apples, and grapes. There is forestry and sheepraising. Pop. (1987 est.) 1,848,000.



Monastery of Gračanica in Kosovo autonomous province, Serbia
Tanjugfoto BGD

Kosovo, Battle of, Kosovo also spelled KOSSOVO (June 15, 1389), battle fought at Kosovo Polje ("Field of the Blackbirds"), Serbia (now in Yugoslavia), between the armies of the Serbian prince Lazar and the Turkish forces of the Ottoman sultan Murad I (reigned 1360–89). The battle ended in a Turkish victory, the collapse of Serbia, and the complete encirclement of the crumbling Byzantine Empire by Turkish armies.

Murad captured many fortified places near Constantinople and used internal troubles in Byzantium and the Slavic states to extend Turkish conquests in the Balkan peninsula. Moving into Serbia, he marched as far as Kosovo, where he met Lazar's army.

At first, victory appeared to be on the side of the Serbs, when the sultan was killed by a Serbian noble, Milosh Obilic (or Kobilic), who made his way into the Turkish camp on the pretext of being a deserter and forced his way into the sultan's tent and stabbed him with a poisoned dagger. The confusion that followed was quickly quelled by Bayezid, Murad's son, who succeeded in surrounding the Serbs and inflicting a crushing defeat on their army. Lazar was taken prisoner and executed; the Serbs were forced to pay tribute to the Turks and promised to do military service in the sultan's army.

Kosovo, Battle of, Kosovo also spelled KOSSOVO (Oct. 17–20, 1448), battle between forces of the Ottoman Empire and a Hungarian-Walachian coalition led by the Hungarian commander János Hunyadi at Kosovo, Ser-

bia (now in Yugoslavia). The Ottomans won a decisive victory and thereby halted the last major effort by Christian crusaders to free the Balkans from Ottoman rule and to relieve Constantinople (Istanbul).

Following an Ottoman victory over the Crusade army at Varna (1444), the Ottoman sultan Murad II invaded the Morea (the Peloponnese) in 1446 and compelled its Greek rulers to be his vassals. Murad then turned against the Albanian leader Skanderbeg, who resisted the Ottomans and was assisted by forces of the pope and of the king of Hungary. In 1448 Hunyadi led an army of crusaders across the Danube to join forces with Skanderbeg, but he suffered a crushing defeat at Kosovo. That victory did not lead to the conquest of Albania, but it strengthened the Ottoman position on the Danubian frontier.

Kosrae, also called KUSAIE, formerly UALAN, or STRONG ISLAND, easternmost of the Caroline Islands in the Federated States of Micronesia, western Pacific Ocean. Kosrae is volcanic in origin and is hilly, rising to Mount Crozier (2,061 feet [628 m]). It has a land area of 42 square miles (109 square km). Fertile and well-watered, Kosrae produces taros, oranges, breadfruit, and bananas and has valuable stands of timber. There are deposits of bauxite and guano. Of its two harbours, Lele, an old whaling port, is the better. It has ruins of ancient stone walls and dikes. Pop. (1985 est.) 6,462.

Kossel, Albrecht (b. Sept. 16, 1853, Rostock, Mecklenburg [Germany]—d. July 5, 1927, Heidelberg, Ger.), German biochemist who was awarded the Nobel Prize for Physiology or Medicine in 1910 for his contributions to understanding the chemistry of nucleic acids and proteins. He discovered the nucleic acids that are the bases of the DNA molecule, the genetic substance of the cell.

After graduating in medicine (1878) from the German University (now the University of Strasbourg), Kossel did research there and at the Physiological Institute in Berlin. In 1895 he became professor of physiology and director of the Physiological Institute at Marburg, going in 1901 to a similar post at Heidelberg, where he eventually became director of the Heidelberg Institute for Protein Investigation.

In 1879 Kossel began studying the recently isolated substances known as "nucleins" (nucleoproteins), which he showed to consist of a protein portion and a nonprotein portion (nucleic acid). From 1885 to 1901 he and his students used hydrolysis and other techniques to chemically analyze the nucleic acids, thus discovering their component compounds: adenine, cytosine, guanine, thymine, and uracil. Kossel also discovered the amino acid histidine (1896), thymic acid, and agmatine.

Kossu-Aleksandravičius, Jonas (Lithuanian poet): *see* Aistis, Jonas.

Kossuth, Lajos (b. Sept. 19, 1802, Monok, Hung.—d. March 20, 1894, Turin, Italy), political reformer who inspired and led Hungary's struggle for independence from Austria. His brief period of power in the revolutionary years of 1848 and 1849, however, was ended by Russian armies.

Early career. Kossuth's father came of Slovak, his mother of local German stock. The family was noble and of ancient creation but not wealthy, and Kossuth's father earned his living as an attorney for local landowning families. The Kossuths were Lutherans, and young Lajos studied at the Protestant academy of Sárospatak. After applying unsuccessfully for a post in government service, he found employment in his native county of Zemplén as agent to one of his father's clients, Countess Etelka Andrássy, with whom he formed



Kossuth, lithograph, 1856

By courtesy of the trustees of the British Museum; photograph, J.R. Freeman & Co. Ltd.

an attachment. He did notable work during the great cholera epidemic of 1831 but found his life narrow and frustrating; he was also suffering, as he would all his life, from financial embarrassment. In 1832 his employer had him sent to the national Diet in Pozsony (now Bratislava) as substitute delegate for one of her relatives.

Political journalism. At this "long Diet" the new generation of Hungary's reformers was mounting its first full-scale offensive against the absolutist and obscurantist system under which Hungary was then ruled from Vienna, and in its excited atmosphere Kossuth developed his political and social philosophy of advanced radicalism. There was no postulate of the European liberalism of the day that he did not burn to see realized in Hungary—no abuse or injustice there left unremedied. But liberty meant for him, above all else, national liberty, and he felt passionately that, until Hungary enjoyed de facto the internal freedom to which its laws entitled it, no social or economic progress was possible. The first battle, therefore, must be the political one. Sanguine and impulsive, he was blind to the dangers involved in too strong a challenge to Vienna.

Kossuth's mandate did not entitle him to participate in the Diet's debates, but he found a way of voicing his views. At that time the Diet's proceedings were not published, and Kossuth hit on the idea of issuing letters describing them. These reports, which were not verbatim records but colourful impressions barely distinguishable from political pamphlets, were copied by hand by enthusiastic young helpers and circulated throughout Hungary. Brilliantly written, they were widely and avidly read, and, when the Diet ended in 1836, the county assembly of Pest invited him to write a similar series on its proceedings. Now, however, he was no longer protected by parliamentary immunity, and on May 4, 1837, he was arrested and, after 18 months' detention, sentenced to three years' imprisonment for subversion.

Released under an amnesty in 1840, Kossuth found himself a popular hero. The proprietor of a biweekly journal, the *Pesti Hirlap,* made him its editor. His articles were written in a fluent and beguiling style and gained him innumerable devotees at the same time that they alarmed the Austrian authorities, the Hungarian conservatives, and even Hungary's moderate reformers. He also antagonized the Croats and non-Magyars of Hungary by his chauvinistic insistence on the supremacy of its Magyar element. In 1844 his publisher dismissed him, and he was refused permission to start a journal of his own. Metternich offered him journalistic employment in the service of the government, but this he refused. His next enterprise, inspired by the writings of the German economist and industrial promoter Friedrich List, was to found a society for promoting Hungarian industry, with the ultimate objective of achieving greater economic independence. This program proved a fiasco but afforded him a platform for continued agitation.

The revolution of 1848. In 1847 the county of Pest elected Kossuth to represent it in the next Diet, in which he assumed leadership of the "national opposition," which had agreed on an extensive program of political and social reform. The reformers made a little progress in subsidiary fields, but deadlock had been reached on the central issue of political control when the news of the revolution in Paris (February 1848) gave Kossuth his opportunity. On March 3, in a speech of extraordinary power—for his tongue was as magical as his pen—he demanded the removal of the dead hand of Viennese absolutism as the only way to safeguard the liberties of Hungary and of all the peoples of the monarchy. He practically dictated to the Diet an address to the crown, embodying the reformers' program. When news of the revolution in Vienna reached the Diet on March 14, Kossuth expanded the address, and, as a member of the deputation that carried it to Vienna the next day, saw it accepted by the panic-stricken court.

Count Lajos Batthyány, the new Hungarian prime minister, allotted Kossuth the portfolio of finance in his government, a choice that proved dangerous, for the ultimate control of finance proved, with that of the defense services, to be precisely the chief bone of contention between Hungary and Vienna. Kossuth was soon at loggerheads with the new Ministry of Finance in Vienna—meanwhile, he had made himself the life and soul of the more extreme nationalist movement in Hungary, often to the embarrassment of his fellow ministers, who were striving to prevent a breach with Vienna. Kossuth often acted without consulting them or even in defiance of agreed decisions, appealing over their heads to the public in a journal edited and mainly written by himself. Yet they dared not dismiss him and could not even dispense with his services, for his nationwide popularity was their greatest asset.

It was Kossuth who, so far as any Hungarian did so, precipitated the final clash by persuading the Diet, in July, to tie the dispatch of Hungarian troops to Italy to political conditions obviously unacceptable to Vienna, at the same time calling for a big national force to defend Hungary against the danger he declared, not without reason, to be threatening it from the Croats and Serbs. When, in September, the Austrian-inspired Croat army invaded Hungary and Batthyány resigned, Kossuth became head of the committee of national defense appointed by the Diet as provisional authority. He was now virtual dictator of Hungary. The next months brought out all of his greatness and his weaknesses: his magnetism and his courage, his intolerance and his lack of realism, his wanton provocation of insuperable difficulties and his genius at overcoming them. No one but Kossuth could have given his people the heart to face the overwhelming odds against them, but he increased those odds by his intransigence and aggravated difficulties by his jealousy and suspicion of his best general, Artúr Görgey, and by his meddling in military affairs. The refusal of the Diet to recognize the abdication of the Austrian emperor Ferdinand I (December 2) was his work, as was the Diet's declaration of April 14, 1849, proclaiming the dethronement of "the perjured House of Habsburg-Lorraine." The Diet then elected Kossuth himself "governor" of Hungary, but when, after the arrival of the Russian armies, even he had to recognize the hopelessness of the situation, he resigned this post to Görgey (August 11) and took refuge in Turkey.

Exile. The Western powers put pressure on the sultan to refuse Austria's and Russia's demand for his extradition, and Kossuth spent

two years interned in Kütahya in Anatolia. The U.S. government invited him to visit America and sent a frigate. He stopped in England on the way, where he addressed a series of mass meetings, speaking in English, which he had learned from the Bible and Shakespeare during his confinement. He was received with unprecedented popular ovations, and his reception in the United States was equally favourable, but in neither country could he obtain official support for Hungary's cause. He then settled in London. In correspondence with his followers at home, he endeavoured to keep alive in them the spirit of resistance. At the persuasion of the Italian patriot Mazzini, with whom he became intimate, he joined his revolutionary committee. Having moderated his views on the question of nationalities, he discussed with various circles, including the Moldavian and Serbian courts, plans—never to be realized and perhaps never quite realistic—for uniting Hungary, Croatia, Serbia, and Romania in a Danubian federation.

In 1859, when war between Austria and France was imminent, the French emperor Napoleon III invited him in a personal interview to organize revolt in Hungary on the outbreak of war. Kossuth agreed, subject to certain safeguards and conditions. Military preparations were concerted with France and Piedmont, and Kossuth's own eloquence helped to deter Great Britain from intervening against France; but the plans collapsed when, in July, Napoleon concluded an armistice with Francis Joseph I, leaving the Hungarians to their fate.

The promising international conjuncture never recurred, and in the following years Kossuth, living abroad in Turin, had to watch Hungary, guided by Ferenc Deák, move toward reconciliation with the monarch. He did so with bitterness in his heart, and on the eve of the conclusion of the Austro-Hungarian Ausgleich, or Compromise of 1867, he published an open letter calling down woe upon the measure and its author. This "Cassandra letter" stirred the opponents of the Compromise but could not prevent its adoption and subsequent maintenance. He spent his last years in loneliness, near-poverty, and increasing infirmity, sadly aware that Hungary's new leaders rejected the tenets to which he remained unalterably attached. He died in 1894. His body was brought back to Hungary and interred there amid nationwide mourning.

In 1841 Kossuth had married Terézia Meszlényi, who died in 1863. Their son, Ferenc Kossuth, was for a time president of the Hungarian Party of Independence.

After his death, Kossuth remained a popular idol in Hungary, his name a symbol of the aspiration for independence. His legend grew with the years and was further cultivated after 1945, when Hungary had lost much of the independence for which Kossuth struggled.

(C.A.M.)

BIBLIOGRAPHY. There is no adequate full-length biography of Kossuth in any language. He himself produced one volume, published in English in 1880 as *Memories of My Exile.* It mainly concerns his activities in 1859–61 and contains valuable material on his interviews with Napoleon III, his dealings with the Italian statesman Cavour, and his correspondence with the Balkan courts in connection with his plans for a Danubian federation. There are several collections of Kossuth's articles and speeches, the most recent and most complete being *Összes Munkai,* 15 vol. (1948–61). Much has been written about Kossuth, including the two-volume *Emlékkönyv* (1952) and the articles listed in the bibliography of *Magyarország Története,* 2 vol. (1967).

Koster, Laurens Janszoon: *see* Coster, Laurens Janszoon.

Kosti (The Sudan): *see* Nīl, an-.

Kostrikov, Sergey Mironovich: *see* Kirov, Sergey Mironovich.

Kostroma, *oblast* (administrative region), western Russian Soviet Federated Socialist Republic, covering 23,200 sq mi (60,100 sq km) in the middle Volga River Basin. Most of the surface is a rolling, morainic plain, sloping to the Volga from the low hills of the Severnye Uvaly (Northern Rise), with many lakes and extensive peat bogs. The *oblast,* formed in 1944 and centred on Kostroma city, is heavily covered with swampy forest, or taiga, of spruce, pine, and birch, with fir in the northeast. Broad floodplain meadows fringe the rivers, and most soils are infertile. In general, the *oblast* is not well developed economically, having a poor communications network—apart from the Volga itself, which crosses the southwestern corner of the *oblast*—and having only 15 percent of its area under cultivation. Flax, fodder crops, rye, and oats are grown, and flax processing and linen making are widespread in the small towns. Small-scale timber working also is widespread. At Volgorechensk, on the Volga 25 mi (40 km) southeast of Kostroma, one of the world's largest thermal power stations was under construction in the early 1980s. Pop. (1983 est.) 796,000.

Articles are alphabetized word by word, not letter by letter

Kostroma, city and administrative centre of Kostroma *oblast* (region), northwestern Russian Soviet Federated Socialist Republic, on the middle Volga River about 200 mi (320 km) northeast of Moscow. It is believed to have been founded in 1152 by Yury Dolgoruky, but the first documentary evidence of the town dates from 1213. Kostroma's key position on the Volga trade route caused bitter struggles among Novgorod, Tver, and Moscow; it was annexed by Moscow in 1329. The cathedral, dating from 1239 and rebuilt in 1773, is situated in the kremlin and is a fine example of old Russian architecture. In the 19th century Kostroma became a major textile centre. The modern city has the largest flax-processing combine in the U.S.S.R., as well as linen mills and a textile-machinery plant. Pop. (1983 est.) 264,000.

Kostrowitzki, Wilhelm Apollinaris de: *see* Apollinaire, Guillaume.

Kosygin, Aleksey Nikolayevich (b. Feb. 20, 1904, St. Petersburg, Russia—d. Dec. 18, 1980, Moscow), Soviet statesman and premier of the Soviet Union (1964–80).

Kosygin joined the Red Army as a volunteer in 1919 and served in the Russian Civil War. Following the war he received some vocational training, joined the Communist Party (1927), and occupied several positions in the Leningrad city government and in industry. By 1939 he had been appointed people's commissar for the textile industry as well as a member of the party's Central Committee. In 1940 he became deputy chairman of the Council of People's Commissars (called Council of Ministers after 1946); he held that post, which gave him special responsibility for consumer industries, until 1953. During World War II Kosygin was premier of the Russian Soviet Federated Socialist Republic. He next served as minister of finance (1948) and as minister for light industry (1948–53). The party elected him to the Politburo in 1948.



Kosygin, 1970
Tass—Sovfoto

Kosygin was demoted to an alternate member when the Politburo was reorganized as the Presidium in October 1952. After Joseph Stalin died (March 1953), Kosygin lost his position on the party Presidium completely and was temporarily removed from his government post. He was reinstated as deputy chairman of the Council of Ministers in December 1953 but was removed once again in December 1956.

Although he continued from 1953 to hold a variety of ministerial and economic posts, Kosygin did not regain his former authority until June 1957, when, as a supporter of Nikita S. Khrushchev, he was readmitted to the party Presidium as an alternate member and was reinstated as deputy chairman of the Council of Ministers. Kosygin subsequently worked closely with Khrushchev on economic matters and served as chairman of Gosplan, the Soviet economic planning agency, from March 1959 to May 1960. He was then elected to full membership on the party Presidium and a first deputy chairman of the Council of Ministers (May 1960).

In October 1964 Kosygin replaced Khrushchev as chairman of the Council of Ministers, becoming the effective head of the Soviet government, although his role in Khrushchev's ouster is obscure. Nevertheless, when he announced in 1966 the new economic five-year plan to govern the Soviet Union from 1966 to 1970, he adhered to Khrushchev's policy of placing relatively high emphasis on production of consumer goods and altered Khrushchev's objectives only by setting more realistic target dates for various economic projects.

In the late 1960s and early 1970s Kosygin shared the power of governing with Leonid I. Brezhnev and Nikolay V. Podgorny. He apparently exercised a moderating influence on the other Soviet leaders. While visiting the United States in June 1967 to attend a meeting of the United Nations General Assembly, Kosygin met as well with U.S. Pres. Lyndon B. Johnson. Their meeting at Glassboro, N.J., was credited with improving relations between their two countries.

During the early 1970s Kosygin governed in a system of collective leadership with Brezhnev, first secretary of the Communist Party, and Podgorny, chairman of the Presidium. Kosygin's role, as well as Podgorny's, diminished, however, as Brezhnev's authority increased. On Oct. 23, 1980, Brezhnev, by then chairman of the Presidium and, in effect, president of the Soviet Union, announced Kosygin's retirement because of ill health.

Koszalin, German KÖSLIN, *województwo* (province), northwestern Poland, bordered by the Baltic Sea on the north and by the provinces of Słupsk on the east, Piła on the south, Gorzów Wielkopolski on the southwest, and Szczecin on the west. Koszalin has an area of 3,270 sq mi (8,470 sq km). Its physical features include a coastal plain and three coastal lakes separated from the Baltic Sea by narrow, sandy strips of land in the north. In the south there are morainal highlands and extensive forests dotted with marshes. The Parsęta, Radew, and Grabowa rivers flow northward to the Baltic Sea; the Drawa River flows south into the Noteć.

Koszalin is dependent economically upon

farming (wheat, rye, potatoes), food processing, light manufacturing, timber milling, and synthetic-textile production. Baltic seaports at Kołobrzeg and Darłowo and an airport outside the provincial capital of Koszalin (*q.v.*) city maintain the commercial importance this northern province has enjoyed since the 13th century, because of its location astride the Gdańsk–Szczecin trade route. Koszalin was part of the Polish territory of Pomorze (Pomerania) until the 17th century, when it was acquired by the Electorate of Brandenburg. It was returned to Poland in 1945. In 1975 the provinces of Piła and Słupsk were carved out of its area. Pop. (1982 est.) 465,300.

Koszalin, German KÖSLIN, city, capital of Koszalin *województwo* (province), northwestern Poland, on the Dzierżęcinka River. Koszalin is a resort and manufacturing town; local industry includes timber milling and woodworking, food processing, and machine works. The town, first chronicled in 1214, received municipal rights in 1266. It became an important trade centre through its position on the Gdańsk–Szczecin trade route and built its own merchant fleet. The bishops of Kamień and the Pomeranian dukes made it their headquarters during the 16th and 17th centuries. Koszalin was acquired by the electorate of Brandenburg in 1648 and was not returned to Poland until 1945. Pop. (1982 est.) 94,300.

Kosztolányi, Dezső (b. March 29, 1885, Szabadka, Hung., Austria-Hungary—d. Nov. 3, 1936, Budapest), poet, novelist, and critic, considered to be the outstanding impressionist in Hungarian literature.

Kosztolányi, the son of a headmaster, was from an intellectual family. He published his first volume of poetry in 1907 and joined the circle of the literary magazine *Nyugat* ("The West"; founded 1908). He won immediate recognition in 1910 with the publication of a cycle of poems, *A szegény kisgyermek panaszai* ("The Complaints of a Poor Little Child"), a small boy's subtle and moving impression of his surroundings.

Kosztolányi's work reveals him to be a sympathetic observer of human frailty with a gentle humour and a penchant for the macabre. He wrote lucid and simple poetry as well as accomplished short stories and novels. *Édes Anna* (1926; *Wonder Maid,* 1947), the tale of a servant girl, is perhaps his best novel. He translated poetry from several European languages and also from Chinese and Japanese. In his later years he devoted much effort to the preservation of the purity of the Hungarian language. Dedicated to the principle of art for art's sake, Kosztolányi was chiefly concerned with artistic form and took little interest in the social questions that absorbed most of the writers of the *Nyugat* circle.

Koszyce, Pact of, Koszyce also spelled (Slovak) KOŠICE, or (Hungarian) KASSA (Sept. 17, 1374), agreement made between the Polish nobility and their king, Louis I (ruled 1370–82), in which the nobles promised to accept the King's choice of successor in exchange for a charter that guaranteed their basic rights and privileges.

The last Piast king of Poland, Casimir III the Great (ruled 1333–70), left his throne to his Angevin nephew Louis I, who was already king of Hungary (ruled 1342–82); but because Louis had no sons and was anxious to secure the Polish throne for his own dynasty rather than allow it to revert to remote Piast cousins, he tried to gain the support of the Polish nobility.

In 1373 Louis called representatives from the Polish nobility and clergy to a conference at Koszyce in Hungarian Slovakia near the Polish border to convince them to accept one of his daughters as his heir. When no agreement was reached, he convoked another meeting the following year at which the Poles, despite the opposition of the Archbishop of Gniezno and his followers, consented to recognize a daughter designated by Louis as successor to the throne.

In return Louis granted them a charter that guaranteed their traditional rights and, among other provisions, exempted the nobility from any payment of taxes to the crown, except a minor duty on their lands, without their explicit approval. The charter also assured the nobility hat official posts in each Polish province would be filled by nobles from that province. But the nobility broke the pact after Louis's death by refusing to allow Louis's chosen heir, Maria, to assume the Polish throne and naming his other daughter, Jadwiga. The nobles also insisted that Jadwiga break her engagement to William of Habsburg and marry Jogaila (Polish Jagiełło), grand duke of Lithuania (later Władysław II Jagiełło of Poland). Nevertheless, subsequent kings of Poland were obliged to confirm and extend the charter granted by Louis, which became the legal basis for the nobles' privileged status and powerful position in Polish society.

Kota, one of the indigenous, Dravidian-speaking peoples of the Nīlgiri Hills in the south of India. They lived in seven villages totalling about 2,300 inhabitants during the 1970s; these were interspersed among settlements of the other Nīlgiri peoples, Baḍaga and Toda. A village has two or three streets, each inhabited by the members of a single patrilineal clan. Most adult Kota also speak Tamil, another Dravidian tongue.

They were traditionally artisans and musicians. Each Kota family was associated with a number of Baḍaga and Toda families for whom they provided metal tools, wooden implements, and pots. They also furnished the music necessary for the ceremonies of their neighbours. From its associated families the Kota family received a share of grain from the Baḍaga harvest and some dairy products from the Toda. The Kota also cooperated with the jungle-dwelling Kurumbas, who provided jungle products and magical protection. Because the Kota handled animal carcasses and had other menial occupations, their neighbours considered them to be of inferior rank.

Aboriginal Kota religion entails a family trinity of two brother deities and the goddess-wife of the elder. Each deity has a priest and a diviner in every village. The diviner becomes possessed on appropriate occasions and speaks with the voice of god.

After 1930 the traditional interdependence among the Nīlgiri groups was abandoned, and only a few Kota families continue to supply tools and music. Kota livelihood depends mainly upon the cultivation of grain and potatoes.

Kota, also spelled KOTAH, town, administrative headquarters of Kota district, Rājasthān state, northwestern India, just east of the Chambal River. Kota was founded as a walled city in the 14th century and became the capital of the princely state in 1625. Kota is a communications and industrial centre, the growth of which has resulted from the availability of electric power from the nearby Chambal Dam (part of the multipurpose Chambal Valley project). Major industries include oil, textile, paper, cotton, and bone mills; a distillery; and match, precision-instrument, nylon, strawboard, electric-cable, and rubber factories. An airport, several hospitals, gardens, and five colleges affiliated with the University of Rājasthān are located there.



Royal cenotaphs in Kota, Rājasthān, India
Baldev—Shostal Assoc./EB Inc.

Kota district (area 4,802 sq mi [12,437 sq km]), formerly a princely state, is on a high sloping tableland forming part of the Mālwa Plateau. It is drained by the Chambal River and its tributaries. The Mokandarra hills run from southeast to northwest. Jowar (sorghum), wheat, gram, corn (maize), cotton, and rice are the chief crops. The district has extensive game preserves and also numerous ruins, some bearing inscriptions dating from the 8th century.

Kota state, which was separated from Būndi state in 1625, engaged in extensive warfare with Jaipur state in the 18th century and came under British dominance by a treaty concluded in 1818. In 1948 it became part of the state of Rājasthān. Pop. (1981) town, 358,241; district, 1,559,784.

Kota Baharu, formerly KOTA BAHRU, capital of Kelantan state, West Malaysia (Malaya), on the east levee of the Sungai (River) Kelantan, near the Thai border and 8 mi (13 km) inland from the South China Sea. Located in a fertile agricultural area, Kota Baharu ("new fort") is the industrial nucleus of the state. It is inaccessible from the sea because of sandbars and relies on port facilities at nearby Tumpat. Kota Baharu is served by the airport at Peng Chepa and by a dense road network. Pasir Mas to the southwest is the terminal for both the east coast railway and the branch line north to Thailand. Kota Baharu was one of the first places seized (Dec. 10, 1941) by the Japanese in the Singapore campaign in World War II. Extensive industrial development undertaken around the city in the late 1970s included a major industrial estate at Pengkalan Chepa. Kota Baharu Teachers' College was established there (1954). Pop. (1980) 167,872.

Kota Kinabalu, formerly JESSELTON, capital of Sabah state, East Malaysia, on the northwest coast of Borneo. Although razed by bombing during World War II, the site was chosen in 1946 for the new capital of British North Borneo (later to become Sabah) because of the deepwater anchorage at Gaya Bay of the South China Sea; reconstruction and expansion, including reclamation of the bay's foreshore, followed. Residential and commercial buildings now crowd a narrow strip of land between a string of offshore coral islands and the Crocker Range.

The original settlement on nearby Pulau (Island) Gaya was burned in 1897 by Mat Salleh, an anti-British Muslim rebel, which may explain the capital's local name, Api-Api ("place of fire"); an alternative rendering of the name refers to a kind of mangrove tree found locally. Reestablished on its present site in 1899 as Jesselton (after Sir Charles Jessel, a director of the British North Borneo Company), it was renamed Kota Kinabalu (Fort of [Mt.] Kinabalu) in 1968.

Kota Kinabalu is a sprawling town inhabited mainly by Chinese, and government service is a major occupation. A railway line north from Tenom carries coastal rubber for export via the Gaya Bay Harbour, which can accommodate moderate-sized vessels. Light industry includes flour milling, woodworking, and the manufacture of furniture, soap, and plastics. The town has an international airport and forms the hub of Borneo's best road network.

Kota Kinabulu has a historical museum and is the site of Gaya College (1963), a teachers'

training institute. Kent Teacher Training College is at Tuaran to the north. The satellite town of Kampung Tanjong Aru is a beach resort. Pop. (1980) 55,997.

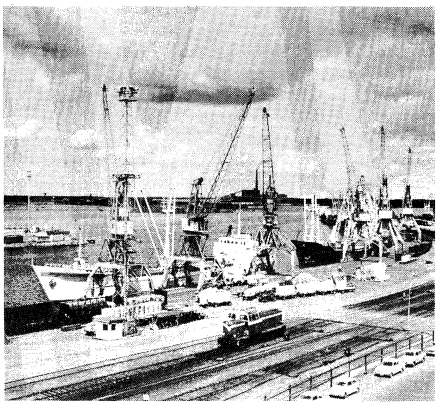
Kota Kota (Malawi): *see* Nkhotakota.

Kota Tinggi, town, West Malaysia (Malaya), on the Sungai (River) Johor, north of its estuary at the Singapore Strait. It was one of the river capitals (1685–99) of the Johore-Riau (Riouw) kingdom. The modern town is an administrative centre and petroleum depot for an area of rubber plantations and tin mining. It is linked by road to Johor Baharu and Mersing. Immediately north on Gunung (Mt.) Muntahak (2,080 feet [634 m]) are the scenic Kota Tinggi Waterfalls; the highest cataract drops 80 feet (24 m) into the Sungai Pelepah. The historic site of Johore Lama (Old Johore) is downriver from Kota Tinggi near the straits. Pop. (1980) 13,056.

Kothar, also called KHASIS, or KHAYIN, ancient West Semitic god of crafts, equivalent of the Greek god Hephaestus. Kothar was responsible for supplying the gods with weapons and for building and furnishing their palaces. During the earlier part of the 2nd millennium BC, Kothar's forge was believed to be on the biblical Caphtor (probably Crete), though later, during the period of Egyptian domination of Syria and Palestine, he was identified with the Egyptian god Ptah, patron of craftsmen, and his forge was thus located at Memphis in Egypt. According to Phoenician tradition, Kothar was also the patron of magic and inventor of magical incantations; in addition, he was believed to have been the first poet.

Köthen, city, Saxony-Anhalt *Land* (state), east-central Germany, north of Halle. First mentioned in 1115 and known as a market town in 1194, it was a medieval seat of the Ascanian counts of Ballenstedt; from 1603 until 1847 it was the capital of the princes and dukes of Anhalt-Köthen. Notable buildings are the residence palace (1597–1604) and the 15th-century St. Jacob's Church. Lignite (brown coal) mining, sugar-beet growing, and market gardening in the locality support chemical, sugar, and foodstuffs industries in Köthen; heavy engineering and textile production are also important. A chemical-engineering school and a teachers' training institute are in the city. Köthen is a rail junction and has an airport. Pop. (1989 est.) 34,289.

Kotka, city, Kymen *lääni* (Kymi province), southeastern Finland, on two islands, Hovinsaari and Kotkansaari, at the mouth of the Kymijoki (river) on the Gulf of Finland, east-northeast of Helsinki. Kotkansaari was fortified by the Russians between 1790 and 1800, and its main fort was destroyed by a British fleet in 1855. Kotka was founded in 1878 and was greatly developed during the late 1930s. A Greek Orthodox church (1795) is the oldest building in the city; there is also a Lutheran church (1898). The Kymenlaakso Museum, 10 mi (16 km) northwest, was originally built for Tsar Alexander III. Connected by rail and road to the mainland, Kotka is a major seaport for eastern Finland and an important industrial centre that specializes in lumber, pulp, cellulose, and phosphate exportation, as well as petroleum importation; the city also has sugar refining and flour milling. Pop. (1983 est.) mun., 60,163.



The port of Kotka, Fin.
Von Knobloch—Shostal/EB Inc.

Kotlas, city, Arkhangelsk *oblast* (administrative region), western Russian Soviet Federated Socialist Republic, at the confluence of the Northern Dvina and Vychegda rivers. It is a major focus of river and rail communications and a transshipment point, handling chiefly coal and timber. The city, chartered in 1917, has large sawmilling, shipbuilding, papermaking, pulp-making, and timber-working industries. Pop. (1983 est.) 65,000.

Kotlina Sandomierska (Poland): *see* Sandomierz Basin.

Kötlum, Jóhannes úr (Icelandic poet): *see* Jónasson, Jóhannes.

Kotlyarevsky, Ivan (Petrovich), Kotlyarevsky also spelled KOTLIAREVSKY (b. Sept. 9 [Aug. 29, old style], 1769, Poltava, Ukraine, Russian Empire—d. Nov. 10 [Oct. 29, O.S.], 1838, Poltava), author whose burlesque-travesty of Virgil's *Aeneid* was the first work written wholly in the Ukrainian language; it distinguished him as the father of modern Ukrainian literature. The *Eneida* (1798) transmutes Aeneas and the Trojans into dispossessed Cossacks of the period after the suppression of the Zaporizhska Sich (Cossack territory) in 1775. The work brings together valuable materials not only from the vernacular but also from various distinctive idioms; *e.g.,* those of seminarians, wanderers, and thieves. Kotlyarevsky held a position in Poltava's bureaucracy and also wrote several plays that still form a part of the classic Ukrainian repertoire.

koto, also called KIN, musical instrument, a Japanese 13-stringed board zither with movable bridges. Although derived from continental Asian models, it has developed structural and musical characteristics that make it specifically Japanese.



Koto (Ikuta school)
K.B.S. Photo

The paulownia-wood instrument is placed horizontally on the ground or on a low table and is played by plucking the strings with the thumb and first two fingers of the right hand, which are fitted with ivory attachments (*tsume:* "plectrum"). The left hand, in traditions after the 16th century, may alter the pitch or ornament the sound of each string by pressing or manipulating the strings on the other side of each bridge. Many tunings are used. The koto, long known as the national instrument of Japan, has enjoyed popularity from the earliest periods of Japanese musical history to the present day in ensemble, chamber, and solo music repertoires. It is related to the Korean *kum* and the Chinese *ch'in.*

Kōtoku Shūsui (b. Nov. 4, 1871, Nakamura, Kōchi Prefecture, Japan—d. Jan. 24, 1911, Tokyo), Socialist leader, one of the first proponents of radical political action in Japan. His execution resulted in the temporary abatement of the growing Socialist movement in Japan.

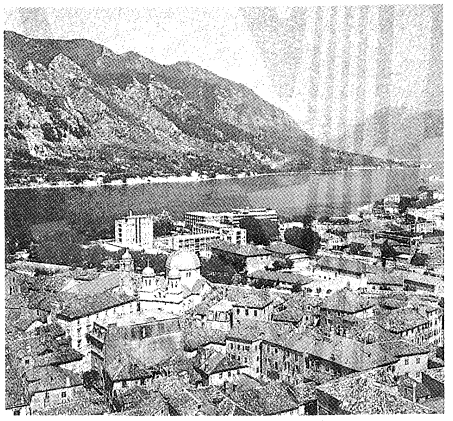
Of relatively humble origin, Kōtoku started work as a houseboy in the Tokyo home of Hayashi Yūzō, one of the most famous liberal politicians of his day. He obtained an education and in 1893 became a newspaper writer. One of the earliest advocates of Socialism in Japan, Kōtoku helped organize the Social Democratic Party in 1901. The party was immediately banned by the government, however, and Kōtoku, together with Sakai Toshihiko, then began his own newspaper, the *Heimin shimbun* ("Commoner's Newspaper"). After it opposed the Russo-Japanese War (1904–05), the paper was closed and Kōtoku was imprisoned. Released after five months, he toured the United States, where he was impressed by the direct action policies of a radical U.S. labour group, the "Wobblies" (Industrial Workers of the World).

Returning to Japan, he denounced parliamentary politics and began to organize workers for radical activities. This movement was crushed, however, when in 1910 hundreds were arrested on charges of being involved in a plot to assassinate the Emperor. Although Kōtoku had withdrawn from the conspiracy, and at the end only four men were shown to be actually involved, Kōtoku was included among the 11 who were imprisoned and subsequently executed. The backlash resulting from the plot ended the Socialist movement as a major force in Japan for almost a decade. Kōtoku spent the last months of his life writing articles denouncing Christianity.

Kotor, Italian CATTARO, walled town, seaport, and resort at the south end of Kotor Bay, one of four bays comprising the Gulf of Kotor (Boka Kotorska), on the Adriatic coastline of Montenegro, Yugoslavia. The town lies at the foot of the sheer Lovćen massif, rising to 5,738 ft (1,749 m). Kotor was founded by the ancient Romans as Acruvium. In the 10th century it was an autonomous city ruled from Byzantium, and from 1186 to 1371 it was a free city of medieval Serbia. It was Venetian and Hungarian for brief periods, an independent republic from 1395 to 1420, and then again Venetian until 1797. The town suffered periodic damage from Turkish assaults and from earthquakes. French occupation in 1807–14 was followed by Austrian domina-

tion until 1918; in that year Slav sailors in the Austro-Hungarian navy mutinied at Kotor. Also in 1918, the town became part of Yugoslavia.

Kotor has a number of historic buildings, the largest and most beautiful of which is



The town and bay of Kotor, Yugos.
Art Resource—EB Inc.

the 12th-century St. Tryphon Cathedral. An industrial suburb, Skaljari, has soap and ball-bearing factories, and a naval academy is located nearby. The oldest town in Montenegro, Kotor is now a state-protected historical monument. In 1979 a major earthquake seriously damaged the town. Pop. (1981 prelim.) mun., 20,455.

Kotor, Gulf of, Italian BOCCHE DI CATTARO, Serbo-Croatian BOKA KOTORSKA, winding, fjordlike inlet of the Adriatic coast, Yugoslavia. A fine natural harbour, it comprises four bays linked by narrow straits. The stark mountains around the bay slope steeply to a narrow shoreline on which citrus fruits and subtropical plants grow and tourist facilities are developing.

A road follows the outline of the inlet, connecting several small settlements and resorts, the oldest of which is Risan, which existed as an Illyrian town in the 3rd century BC before being taken by the Romans. There are remains of many Roman villas and other buildings in the area of the gulf. At the strategic entrance to the gulf system is Hercegnovi, founded in 1382 and occupied at various times by Turks, Spaniards, Venetians, Russians, French, and Austrians. East of Hercegnovi is Savina Monastery, dating from 1030, which contains historic treasures. In the Middle Ages, a "Boka Navy" was created with ships from the town of Kotor and other gulf ports; initially a trading guild, it became involved in naval battles and campaigns against pirates until the 19th century.

Kotosh, pre-Columbian site, near the modern city of Huánuco in present-day central highland Peru, known for its early temple structures. These earliest buildings, some of which have interior wall niches and mud-relief decorative friezes, date to the end of the Late Preceramic Period (*c.* 2000–1800 BC). The site also contains remains of later cultures in the area. The Initial Period is represented by overlying temple structures and a style of pottery known as the Wairajirca. These buildings and ceramics are, in turn, overlain by Chavín materials (Early Horizon; 1000–400 BC).

kotow: *see* kowtow.

Kotri, town, south-central Sind Province, southeastern Pakistan, on the west bank of the Indus River. An important railway junction, Kotri is connected by bridge with Hyderābād on the opposite bank. Incorporated as a municipality in 1854, it has jute mills and factories that produce telephone and telegraph equipment. The Ghulām Muḥammad (Kotri) Barrage (1955), 4½ miles (7 km) above Kotri, controls the Indus floods, generates hydroelectricity, and irrigates about 2,800,000 acres (1,100,000 hectares) in the region. Wheat, cotton, and rice are cultivated. The project also involved the formation of Kalri Lake (41 square miles [106 square km]) just north of Tatta town, providing fisheries and water for Karāchi. The Kotri thermal power station was commissioned in 1978. Pop. (1981 prelim.) 38,000.

Kotromanić DYNASTY, royal house that ruled Bosnia from the late 13th to the mid-15th century. The dynasty was founded by Stephen Kotroman, a vassal of the Hungarian king and the ruler of a portion of Bosnia from 1287 to 1316. His son Stephen Kotromanić became the independent lord of all Bosnia in 1322. Extending his domain southward, Stephen Kotromanić incorporated both the land of Hum (1325; later called Hercegovina) and the Adriatic coastline between Split and the Neretva River. Although challenged by Hungarian aggression and internal uprisings, his nephew and successor, Tvrtko I (reigned 1353–91), established firm control over a reduced Bosnia by 1370; he then recovered Bosnia's lost territory, extended his lands along the Adriatic coast and into Serbia, and in 1377 crowned himself "king of the Serbs, of Bosnia, and of the coast." By 1390 he had also claimed the titles "king of Dalmatia and Croatia" and had made Bosnia the dominant power among the South Slavs.

Under Tvrtko's successors, however, constant dynastic quarrels and the increased influence of a few magnates diminished the authority of the throne; Hungarian and Turk intervention also reduced the size and undermined the independence of the Bosnian state until the Turks incorporated it into their empire (1463) and executed the last Kotromanić king, Stephen Tomašević (reigned 1461–63).

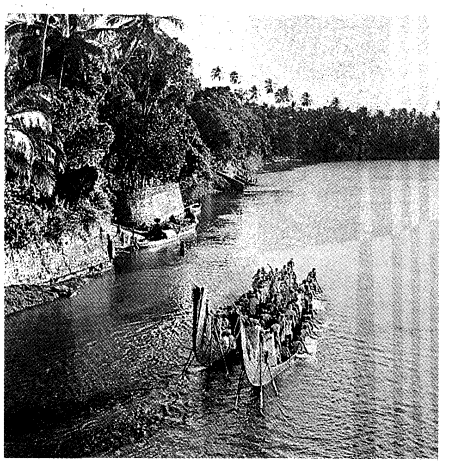
Tvrtko's successors were his brother Stephen Dabiša (reigned 1391–95), Dabiša's widow Jelena Gruba (1395–98), Tvrtko's illegitimate son Stephen Ostoja (1398–1404 and 1409–18), Tvrtko's son Tvrtko II (1404–09 and 1420–43), Ostoja's son Stephen Ostojić (1418–20), Ostoja's illegitimate son Stephen Tomas Ostojić (1443–61), and Stephen Tomašević.

Kotsyubinsky, Mikhaylo (Mikhaylovich), Kotsyubinsky also spelled KOTSIUBINSKY (b. Sept. 17 [Sept. 5, Old Style], 1864, Vinnitsa, Ukraine, Russian Empire [now Ukrainian S.S.R.]—d. April 25 [April 12], 1913, Chernigov, Ukraine), novelist and short-story writer whose work was one of the highest achievements of Ukrainian modernism.

Kotsyubinsky graduated from Shargorod Seminary in 1880. He did not begin to publish his writing until 10 years later, working in the interim as a teacher and statistician. Kotsyubinsky's philosophical and stylistic evolution from populist realism to impressionism was the result of western European influences and reflected his concern that Ukrainian writing be integrated into the European literary mainstream. His greatest novel, *Fata morgana* (1904–10), represented a new approach to the traditional theme of social conflict in a small village; subsequent work used the abortive 1905 revolution as the background for psychological investigations of men at the extremity of emotional experience.

Kotsyubinsky had a great influence on later Ukrainian writers, and his works were translated into many languages. A number of his writings were also adapted for film.

Kottayam, town, southern Kerala state, southwestern India, near Vembanād Lake at the mouth of the Minachil River south-southeast of Cochin. The town is a centre of the



Backwaters near Kottayam, Kerala, India
Vidyavrata

Syrian Christian community, which traces its origin to the apostle Saint Thomas, who is believed to have visited Kerala in AD 53 and to have established seven churches on the Malabar Coast. Kottayam developed into an important market centre in the early 20th century after tea and rubber plantations were established in the nearby Anaimalai Hills. It is also an educational and cultural centre, with several schools, including three Christian colleges (two of which are for women) and two professional colleges, all affiliated with the University of Kerala. Pop. (1981) 64,431.

Kottbus (city, Germany): *see* Cottbus.

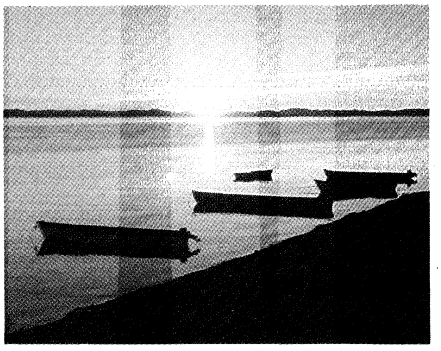
Kotte, town, southwestern Sri Lanka, southeast of Colombo, of which it is a suburb. An urban council governs Kotte and the neighbouring town of Nugegoda. Despite the town's urban character, it contains a number of rice paddies and plantations.

Kotte was the capital of the Sinhalese kings from 1415 to 1565, largely because of the lagoons, rivers, and swamps that still encircle it and provide a natural defense. Its partition at the beginning of the 16th century culminated in Portuguese domination of Ceylon. When the first Portuguese envoys were taken from Colombo to Kotte in 1505, the Sinhalese led them on a circuitous three-day trip to conceal the capital's location. "To go to Kotte" subsequently became a Sinhalese synonym for a roundabout route. With the overcrowding in Colombo, Kotte has been accommodating the overflow for several years. Since the early 1980s the capital designate of Sri Lanka has been Sri Jayawardenapura-Kotte, and Colombo remained a commercial capital. Pop. (1984 est.) 102,000.

Kōṭṭe, Sinhalese monarchy that flourished in Ceylon during the 15th century; its king—Parākramabāhu VI (1412–67)—was the last native sovereign to unify all of Ceylon under one rule. By 1450, Parākramabāhu VI had, with his conquest of the kingdom of Jaffna in northern Ceylon, unified all of Ceylon. By 1477, however, 10 years after the death of Parākramabāhu VI, both Jaffna and the other powerful kingdom, Kandy, had thrown off the suzerainty of Kōṭṭe.

In 1505, with the arrival of the Portuguese, the king of Kōṭṭe agreed to pay tribute to Portugal, thus becoming the first Sinhalese king to accept the suzerainty of a European king. The kingdom of Kōṭṭe continued to exist nominally until 1597, when—with the death of its last ruler, Don Juan Dharmapāla—sovereignty officially passed to the king of Portugal, by a written agreement between Portuguese officials and native Sinhalese chiefs at the Convention of Malvana.

Kotzebue, city, northwestern Alaska, U.S., at the northwestern end of Baldwin Peninsula,



Midnight sun over Kotzebue Sound, Alaska, north of the Arctic Circle
Josef Muench

on Kotzebue Sound, which was named for the Russian explorer Otto von Kotzebue, who searched for the Northwest Passage (1815–18). Since its establishment *c.* 1897, it has been an important Eskimo trading centre for a number of widely scattered villages above the Arctic Circle; it also provides governmental, including health, services. Seasonal fishing is economically important. Inc. city, 1958. Pop. (1984 est.) 2,412.

Kotzebue, August (Friedrich Ferdinand) von (b. May 3, 1761, Weimar, Saxony [Germany]—d. March 23, 1819, Mannheim, Baden), German playwright widely influential in popularizing poetic drama, into which he instilled melodramatic sensationalism and sentimental philosophizing.



Kotzebue, detail of an engraving
By courtesy of the Bibliotheque Nationale, Paris

Kotzebue's first comedy, written while he was a law student at Jena, gave him entrée into court literary circles in Weimar, but in 1781 he was forced to go into exile for a reason that is not clear. Entering government service in Russia (1783), he became president of the magistracy of the province of Estonia in 1785 and was ennobled. Some of his greatest successes—*Adelheid von Wulfingen* (1788), *Menschenhass und Reue* (1789–90; *The Stranger*), *Die Indianer in England* (1790; *The Indian Exiles*)—were written while he lived there. His *Spanier in Peru* (1796) was adapted by the English playwright Richard Brinsley Sheridan as *Pizarro* (1799) and also proved a great success. Kotzebue traveled abroad and spent some time writing for the municipal theatre of Vienna. Upon his return to Russia he was arrested, inexplicably, and exiled to Siberia. The emperor Paul I, just as capriciously as he had exiled Kotzebue, had him released a few months later. Kotzebue was given an estate in Livonia and made director of the German theatre in St. Petersburg (Leningrad).

In 1801 he returned to Weimar, but he was not on good terms with Johann Wolfgang von Goethe or with the Romantics; he went back to Russia in 1806. In 1817 he was again sent abroad by the emperor Alexander to report on current Western ideas in politics, finance, and education. Execrated by political radicals as a spy in the pay of a reactionary power, Kotzebue was assassinated by Karl Sand, a member of a radical student association. The assassin was executed and the universities placed under strict control as a result.

As a dramatist Kotzebue was prolific (he wrote more than 200 plays) and facile, but dramatically adroit. He is at his best in such comedies as *Der Wildfang* (1798; "The Trapping of Game") and *Die deutschen Kleinstädter* (1803; "The German Small-towner"), which contain admirable pictures of provincial German life. He also wrote some novels as well as historical and autobiographical works.

Kotzebue, Otto von (b. Dec. 30, 1787, Reval, Estonia, Russian Empire [now Tallinn, Estonian S.S.R.]—d. Feb. 15, 1846, Reval), Russian naval officer who completed three circumnavigations of the Earth, charted much of the Alaskan coast, and discovered and named Kotzebue Sound, off western Alaska, as well as several islands in the Society and Marshall groups in the Pacific.

A son of the dramatist August von Kotzebue, he accompanied the first Russian-sponsored circumnavigation (1803–06). Nine years later he embarked for Oceania in command of his own expedition. He entered the South Pacific via Cape Horn and visited Easter Island as well as many Polynesian islands in the Tuamotu Archipelago. Subsequently, in the course of charting the Alaskan coast, he located and named Kotzebue Sound. Unable to navigate the Asiatic Arctic waterway to the Atlantic, Kotzebue returned to Russia by way of the Marshall Islands and reached the mouth of the Neva River in August 1818. On his third circumnavigation (1823–26), he again proceeded to the South Pacific via Cape Horn and visited the Society Islands and the Kamchatka Peninsula of Siberia. The English translations of his travel accounts are *A Voyage of Discovery into the South Sea and Bering's Straits for the Purpose of Exploring a North-East Passage, Undertaken in the Years 1815–1818* (1821) and *A New Voyage Round the World in the Years 1823–1826* (1830).

Kotzeluch, Leopold: *see* Koželuch, Leopold.

K'ou Ch'ien-chih, Pinyin KOU QIANZHI (d. AD 448, Northern Wei Empire, China), Taoist who organized many of the ceremonies and rites of the Taoist cult and reformulated its theology. His influence was such that he had Taoism established as the official state religion of the Northern Wei dynasty (386–534/535); this act, however, embroiled Taoism in long and often bloody factional political struggles.

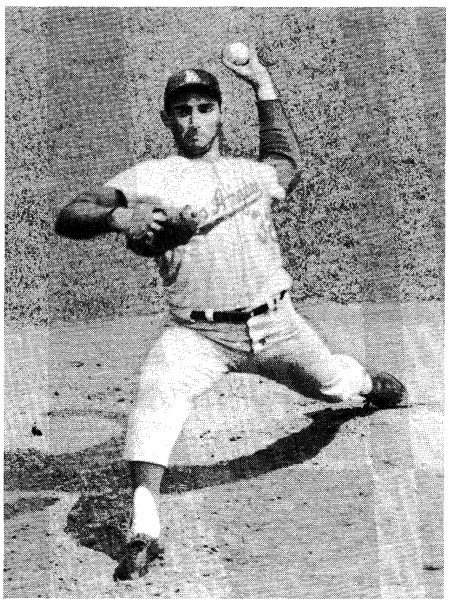
K'ou apparently began his career as a Taoist physician and hygienist. But in 415 he had a vision: a spirit appeared before him and told him that since the death of Chang Ling (34?–156), the great founder of the Taoist Church, the cult had been perverted by false doctrines. K'ou was awarded Chang Ling's old title of *t'ien-shih* ("celestial master") and was charged in the vision with eliminating excesses in Taoist rituals. Accordingly, K'ou began to attempt to curb the orgiastic practices and mercenary spirit that had become associated with Taoist rites and to place greater emphasis on hygienic ritual and good works.

K'ou gained many adherents and, by making Taoism into a more orthodox doctrine, attracted the attention of Emperor T'ai-wu ti (reigned 423–452). In 423 K'ou had the title of *t'ien-shih* conferred upon himself by Imperial decree, thereby establishing the "Taoist papacy": the title was passed to the church's leader from generation to generation in an unbroken line. By conspiring with certain court officials, K'ou was able to have Buddhism, Taoism's chief competitor, proscribed from the realm and all its practitioners subjected to a bloody persecution. Taoism then became the official religion of the empire.

But K'ou's efforts were only temporarily effective: Buddhism soon returned to China, stronger than ever. Moreover, because orgiastic Taoist rites were still noted as late as the T'ang dynasty (618–907), many observers view his reforms as transitory.

Koudougou, town, central Burkina Faso (formerly Upper Volta), western Africa. It lies on the railway between Ouagadougou and Abidjan, Côte d'Ivoire (Ivory Coast), which gives landlocked Burkina Faso access to the coast. There is some peanut (groundnut), tobacco, and cotton production in the area, and the town has a large textile mill. Pop. (1985 est.) 59,644.

Koufax, Sandy, byname of SANFORD KOUFAX (b. Dec. 30, 1935, New York City), American professional baseball player who, despite his early retirement due to arthritis, was ranked among the sport's greatest pitchers. A left-hander, he pitched for the Brooklyn



Koufax, 1966
AP/Wide World Photos

Dodgers in the National League from 1955 to 1957, continuing, after they became the Los Angeles Dodgers, from 1958 to 1966, winning 165 games and losing 87.

During his career Koufax struck out 2,396 batters in 2,324 innings; his average of more than one strikeout an inning is a rare accomplishment. In each of three seasons, 1963, 1965, and 1966, he struck out more than 300 hitters; his 382 strikeouts in 1965 set a major-league record that remained unbroken until 1973. Twice he struck out 18 batters in a nine-inning game. From 1962 through 1965 Koufax had the lowest earned run average in the National League. In his last season, 1966, he won 27 games and posted a 1.73 earned run average, both figures being the best of his career. On Sept. 9, 1965, he pitched his fourth no-hit game, then (and until 1981) a major-league record; the fourth no-hitter, against Chicago, was also a perfect game (no player reached first base). Koufax was elected to the Baseball Hall of Fame in 1971, the first year that he was eligible.

Kouilou River, stream in western Congo, formed at Makabana by the confluence of the Niari and Louesse rivers and flowing west to empty into the Atlantic Ocean near Kayes, northwest of Pointe-Noire. It is navigable for about 40 mi (65 km) below Kakamoéka and is also used to float logs from the Mayombe lumbering region to the coast. It is sometimes treated as the lower course of the Niari River (*q.v.*).

Koula carpet: *see* Kula carpet.

Koulikoro, town, southwestern Mali. Situated about 35 miles (56 km) northeast of Bamako, the national capital, the town serves as a centre of transportation. It is the upper river terminus for large boats on the 1,000-mile (1,600-kilometre) navigable section of the middle Niger River and the last stop on the rail line linking Dakar, Senegal, with this navigable section of the river. Industry in Koulikoro is centred on the production of peanut (groundnut) oil, cottonseed oil, and soap. The relief in the surrounding region varies from about 800 feet (250 m) in the sandy plains of the north to about 1,950 feet (600 m) in the hard sandstone plateau of the southwest. The Soninke tribe in the dry north cultivates millet and sorghum, and the Bambara and Malinke peoples in the much wetter south grow peanuts, corn (maize), cotton, and mangoes. Pop. (1987) town, 20,354.

Koumba (Cameroon): *see* Kumba.

Koumbi Saleh (western African site): *see* Kumbi.

Koumoundhoúros, Aléxandros (b. 1814, Sélitsa, Greece—d. February 1883, Athens), politician who was nine times prime minister of Greece between 1865 and 1882. He was known for his strong anti-Turkish policies.

A native of the Peloponnese, Koumoundhoúros fought in the Cretan insurrection against the Turks (1841) and was elected to the Greek Chamber of Deputies in 1851, becoming its president in 1854. As a member of the moderate wing of the Constitutional Party, he was minister of finance in 1856–57 and 1859 and took part in the overthrow of the first Greek king, Otto, in 1862, serving in the interim government that was in power until the accession of King George I. He was prime minister three times between March 1865 and January 1868. After the Cretan insurrection of 1866 against Turkish rule, he refrained from direct intervention but attempted to make alliances with Romania, Serbia, Montenegro, and Egypt against Turkey. In 1867 he concluded an alliance with Serbia acknowledging the right of self-determination of the different nationalities in the Christian East.

Urged by Great Britain, King George I dismissed Koumoundhoúros in January 1868 for mobilizing the Greek armed forces after the outbreak of a new revolt in Crete against the Turks. He nevertheless headed three more governments between 1870 and 1877, advocating Greek intervention in the Russo-Turkish War in 1877 and sending troops to aid insurgents in Turkish-occupied Thessaly and Macedonia. He was last appointed prime minister in October 1880. When Thessaly and the Arta district of southern Epirus were awarded to Greece in May 1881, his government gained great popular acclaim, but he was disappointed at not being able to annex the cities of Ioánnina (Janina) and Preveza as well. Opposed by the new Thessalian deputies, he resigned in March 1882.

Koundara, town, northwestern Guinea. It lies on the road from Labé to Senegal and at the intersection of roads from Youkounkoun and Guinea-Bissau. It has replaced Youkounkoun, 15 miles (24 km) northeast, as the chief trading centre for cattle, chickens, rice, peanuts (groundnuts), millet, and cotton. A government hospital serves the town. The surrounding region is mostly savanna and is mainly inhabited by the Konyagi, Bassari, Badiaranke, and Fulani (Peul) peoples. Pop. (1983 prelim.) town, 17,941.

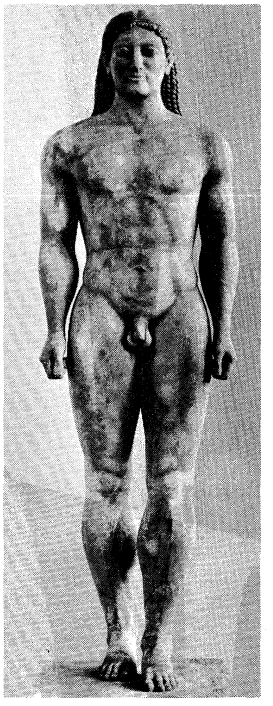
kouprey (species *Bos sauveli*), extremely rare wild ox of southeastern Asia; it was unknown to science until 1937. Classification of the kouprey is still uncertain. Some zoologists believe the animal to be a genuine wild ox, while others suggest that it may have been domesticated for several centuries and then become feral. Still others suggest that it is a hybrid.

In size, the kouprey falls between the gaur and the somewhat smaller banteng. Its thin, long-legged body also possesses a large dewlap. Its horns—about 80 cm (31.5 inches) long in the male and about half that in the female—are similar in shape to those of the wild yak. Koupreys live in scattered forests with undergrowth and in light savannas, often traveling in the company of bantengs. Like the banteng, the kouprey is said to be shy. It is on the verge of extinction; scientists believe that fewer than 200 koupreys exist in isolated areas of Vietnam, Laos, and Kampuchea.

kouros, plural KOUROI, archaic Greek statue representing a young standing male. Although the influence of many nations can be discerned in particular elements of these figures, the first appearance of such monumental stone figures seems to coincide with the reopening of Greek trade with Egypt (*c.* 672 BC). The kouros remained a popular form of sculpture until about 460 BC.

The large stone figures began to appear in Greece about 615–590 BC. While many aspects of the kouroi directly reflect Egyptian influence, they gradually took on distinctly Greek characteristics. Unlike the Egyptian sculptures, the kouroi had no explicit religious purpose, serving, for example, as tombstones and commemorative markers. They sometimes represented the god Apollo, but they also depicted local heroes, such as athletes.

Another difference between the Egyptian and Greek figures is evident shortly after the first appearance of archaic Greek statues: the Egyptians had developed a formula for the human figure that—with rare exceptions—they followed strictly over a period of thousands of years; distinctions between individuals were indicated chiefly by facial features. The earliest kouroi closely followed the Egyptian geometric norm (considered to be based on the hieroglyph): the figures were cubic, starkly frontal, broad-shouldered, and narrow-waisted. The arms were held close to the sides, fists usually clenched, and both feet were firmly planted on the ground, knees rigid, with the left foot slightly advanced. The Greeks, however, had no hieroglyphic tradition, and, as Greek understanding of human anatomy increased, the kouroi became increasingly naturalistic. By the end of the kouros period, the figures were no longer frontal, nor were the arms and legs rigid. Having mastered the anatomy of the human figure and the problem of balance, Greek sculptors turned their sights to gesture and the depiction of action. *See also* kore.



Kouros from Anávissos, marble statue, *c.* 540–515 BC; in the National Archaeological Museum, Athens
Hirmer Fotoarchiv, Munchen

Kourou, coastal town, north-central French Guiana, on the Kourou River. From 1854 to 1944 it served as a French penal colony. In the 19th century about 15,000 French settlers, imagining the town to be the legendary El Dorado (City of Gold), moved there; but all died, either from disease or starvation, within two years. Kourou town assumed some importance after 1970 with the completion nearby of the European Launcher Development Organization's Equatorial Space Range. Open for use by all friendly nations for satellite launchings, it is used for research programs (such as weather studies) and for telecommunications. The local area's economy is basically agricultural, with coffee, cacao, and tropical fruits being grown. Pop. (1982) mun., 7,061.

Kourouma, Ahmadou (b. after 1927, Boundiali, Côte d'Ivoire), African novelist and playwright, one of the most prominent post-independence "disillusionist" writers.

Kourouma spent his early years in Guinea and attended secondary school in Bamako, Mali, until he was expelled and was drafted into the army by the French. He was sent to Indochina and served in Saigon. Later he continued his education at Lyon, Fr., became an actuary in Algiers, and entered an insurance and banking career in France and Cameroon.

Kourouma's novel *Les soleils des indépendances* (1968; *The Suns of Independence*) satirizes contemporary African politics. Narrated in a French flavoured with pungent Malinke folk aphorisms, the story follows the last of a line of tribal princes as he is mistreated by French colonial as well as postindependence African authorities. Kourouma's play *Tougnantigui ou le diseur de vérité* ("Tougnantigui, or The Speaker of Truth") was first performed in Abidjan in 1972.

Kouroussa, town and river port, east-central Guinea. It lies at the head of navigation of the upper Niger River and along the railroad and road from Conakry to Kankan. Kouroussa is the chief trading centre for the rice, onions, millet, peanuts (groundnuts), sesame, cotton, and cattle raised in the surrounding area. The region is mostly savanna and is mainly inhabited by the Muslim Malinke and Dialonke peoples. Kouroussa has a monument to René Caillié, its 19th-century visitor who was the first European to reach and return from Timbuktu. Formerly an important collecting point for wild rubber and gold, the town now processes and exports rice grown in the Niger valley. Pop. (1983 prelim.) town, 11,722.

Koussevitzky, Serge, original name SERGEY ALEKSANDROVICH KUSEVITSKY (b. July 26 [July 14, Old Style], 1874, Vyshny Volochyok, Russia—d. June 4, 1951, Boston, Mass., U.S.), Russian-born American conductor and publisher, champion of modern music who commissioned and performed many important new works.

Koussevitzky studied the double bass in Moscow, becoming a virtuoso, and in Russia, Germany, and England gave recitals at which he played his own compositions; his double bass concerto (1905) became a repertory piece. He first conducted in 1908 in Berlin and left the following year to form his own orchestra in Moscow and to found a publishing firm for Russian music; its catalog included works by Scriabin (whose music Koussevitzky especially championed), Rachmaninoff, Stravin-



Koussevitzky
By courtesy of The Koussevitzky Music Foundation

sky, and Prokofiev. After the Russian Revolution (1917) he directed the State Symphony Orchestra in Petrograd, but in 1920 he left Russia. In Paris (1921) he organized annual concerts, conducting many new works by Russian and French composers.

From 1924 to 1949 he conducted the Boston Symphony Orchestra and gave first performances of works by Aaron Copland, Roy Harris, Walter Piston, and other American composers. In 1931, for the orchestra's 50th anniversary, he commissioned works by Ravel, Prokofiev, and Gershwin, and Stravinsky's *Symphony of Psalms.* He later assumed direction of the Berkshire Music Festival and in 1940 established the Berkshire Music Center, at which summer courses were given by outstanding American and European musicians. In 1942 he organized the Koussevitzky Foundation to commission and perform new works.

His conducting style was highly individual. His interpretations of the works of Tchaikovsky, Sibelius, and other Romantic composers were marked by rhapsodic animation, and he imparted a similar quality to compositions of the modern school.

Koussi, Mount, also called EMI KOUSSI, highest summit (11,204 feet [3,415 m]) in the Sahara, situated 109 miles (176 km) north-northwest of Faya in the Tibesti massif, northwestern Chad. It is an extinct volcano with a crater approximately 12 miles (19 km) wide and 4,000 feet (1,200 m) deep.

Kouvola, city, capital of Kymi *lääni* (province), southeastern Finland. It lies near the Kymi River, north of Kotka. The city is an important rail junction connecting Kotka, a primary seaport, with inland cities and transportation routes. Situated close to a major paper and cellulose production complex, Kouvola is connected by a special rail line to large factories and a hydroelectric power station, 4 miles (6.5 km) northwest. Pop. (1988 est.) mun., 31,933.

Kovalevskaya, Sofya (Vasilyevna) (b. Jan. 15, 1850, Moscow, Russia—d. Feb. 10, 1891, Stockholm, Swed.), mathematician and novelist who made valuable contributions to the theory of differential equations.

The daughter of an artillery general, she married a young paleontologist, Vladimir Kovalevsky, in 1868, and the two went to Germany to continue their studies. In 1869 she studied under the German physicist Hermann von Helmholtz at the University of Heidelberg. Since public lectures were not open to women, she studied privately with the German mathematician Karl Weierstrass at Berlin between 1871 and 1874. The University of Göttingen granted her a degree in absentia in 1874 for a thesis on partial differential equations, one of her most remarkable works.



Sofya Kovalevskaya, *c.* 1875–80
Novosti Press Agency

In 1884 Kovalevskaya accepted an invitation to become lecturer at the University of Stockholm, where five years later she was appointed professor of higher mathematics. In 1888 she was awarded the Borodin Prize of the Academy of Sciences for a paper on the rotation of a solid body around a fixed point. So remarkable was this work that the value of the prize was doubled. She also gained a reputation as a novelist for such works as *Vera Vorontzoff* (1893), depicting her life in Russia.

Kovalevsky, Aleksandr Onufriyevich (b. Nov. 19 [Nov. 7, Old Style], 1840, Shustyanka, near Dvinsk, Russia—d. Nov. 22 [Nov. 9], 1901, St. Petersburg), Russian founder of comparative embryology and experimental histology, who established for the first time the existence of a common pattern in the embryological development of all multicellular animals.

Kovalevsky received a doctor of science degree from the University of St. Petersburg (1867) and taught there (1867, 1891–93) and at the universities of Kazan (1868–69), Kiev (1869–74), and Odessa (1874–90). He also went on lengthy expeditions to the Red Sea and to the coasts of the Mediterranean Sea.

Kovalevsky's demonstration of a common development pattern in the embryos of a wide variety of vertebrates and invertebrates provided important evidence of the evolution of living organisms, as shown in his *Development of Amphioxus lanceolatus* (1865) and *Anatomy and Development of Phoronis* (1887). In 1890 he was elected to the Russian Academy of Sciences.

Koven, (Henry Louis) Reginald De: *see* De Koven, (Henry Louis) Reginald.

Kovno (Lithuania, U.S.S.R.): *see* Kaunas.

Kovrov, city, Vladimir *oblast* (province), western Russian S.F.S.R. It lies along the right bank of the Klyazma River just above the latter's confluence with the Uvod. The city has been a centre of the textile industry since the 18th century, specializing in cotton cloth, but the most important industry now is heavy engineering. Excavators, motorcycles, milling machinery, and weighing machines also are made. Pop. (1989 prelim.) 160,000.

kovsh, Russian drinking vessel with a boat-shaped body and a single handle. It is thought that many of the earliest examples, which date from the 16th century, were presented by the tsars to loyal supporters; they are sometimes engraved with the royal double-headed eagle and are inscribed around the rim with the name and an account of the recipient. The vessels were usually made of silver and, until the 18th century, were of fairly simple design. One example, dating from sometime after 1563 and said to have been the gift of Peter I the Great to Augustus the Strong of Saxony, however, is of gold, niello (inlay of black metallic alloy), sapphires, and pearls. Russian goldsmiths in the 19th century were still producing the *kovsh* in traditional styles.



Silver-gilt and enamel *kovsh* with gems, by Paul Fabergé, late 19th century
Helga Studio photo for A la Vieille Russie, Inc., New York

kowari: *see* crest-tailed marsupial rat.

Kowloon Peninsula, also spelled KAULUN, or KAULUNG, part of the British crown colony of Hong Kong, on the Chinese mainland north of Hong Kong Island. Its area is 3.5 square miles (9 square km). The chief city is Kowloon, which since the 1950s has expanded greatly, become a centre of industry (particularly of textile manufacturing), and has come to rival Victoria as the tourist centre of the colony. Hong Kong's international airport is located just east, and the city's harbour accommodates oceangoing vessels. Pop. (1986) Kowloon area, 2,301,691.

kowtow (Chinese: "knock the head"), also spelled KOTOW, Wade-Giles romanization K'O-T'OU, Pinyin KETOU, in traditional China, the act of supplication made by an inferior to his superior by kneeling and knocking his head to the floor. This prostration ceremony was most commonly used in religious worship by commoners who came to make a request of the local district magistrate and by officials and representatives of foreign powers who came into the presence of the emperor. By the Ming period (1368–1644), the ritual, especially as made to the shrine of Confucius by the emperor and to the emperor by his officials and foreign envoys, involved "three kneelings and nine prostrations." To representatives of foreign countries seeking trade and relations with China, performance of the kowtow before the emperor signified that nation's acknowledgement of the Chinese emperor as the "son of heaven" (*t'ien-tzu*) and of China as the Central Kingdom (Chung-kuo) in the world. As such, performance of the kowtow was increasingly resisted by the Western trading nations in the late 18th century. Perhaps the most famous instance of Western nonconformity to the ceremony occurred during the mission of the British envoy Lord Macartney to the court of the Chinese emperor in 1793. Macartney refused to kowtow and went down on only one knee, as he would before the British ruler. After the so-called Opium Wars, the trading conflicts between China and the West in the mid-19th century, the kowtow requirement was abolished for Western envoys. With the fall of the Ch'ing dynasty in 1911/12, it fell into disuse.

Koxinga: *see* Cheng Ch'eng-kung.

Kòyong language: *see* Halăng language.

Koyter, Volcher: *see* Coiter, Volcher.

Koyukuk River, river in central Alaska, U.S., a major tributary of the Yukon River. It rises from several headstreams on the south slope of the Brooks Range and flows southwestward for about 500 miles (800 km) to join the Yukon near the village of Koyukuk. Named for the Koyukon, a local Indian tribe, the river was visited by the Russian explorer Lavrenty Zagoskin in 1842–44. Placer deposits in the upper Koyukuk basin, discovered in 1898 during the gold rush, have continued to be worked near the settlements of Wiseman and Allakaket, though they are not of commercial importance.

Kozáni, town, capital of the *nomós* (department) of Kozáni, western Greek Macedonia, at the crossroads of routes to Greek Epirus and Yugoslavia. It lies on the edge of a fertile basin between the Vérmion and Voúrinos mountains and has tobacco, cereal, potato, and vegetable cultivation, as well as cattle and

dairy production. Founded in the Middle Ages under Turkish rule, it was a centre of Greek culture; a library of books and manuscripts survives.

The town is important for the services it provides to the 1,376-square-mile (3,565-square-kilometre) *nomós,* largely a dry mountain and plateau region that averages 2,000 feet (600 m) in elevation in the north and west, with several peaks reaching more than 6,000 feet (1,800 m). It is bounded by the Pindus Mountains (west), by Thessaly (south), and by the forested Vérmion and Piéria massifs (east), between which flows the Aliákmon River. Lignite, which is mined in the area, powers several thermal stations in Ptolemaís, built there since 1959. Kozáni is an active commercial centre trading in grains, livestock, and hides. There is some manufacture of textiles and agricultural tools, as well as asbestos and chromite mining in the vicinity. The town is linked by railway to Thessaloníki (Salonika) via Ptolemaís and Edessa and serves as the seat of a metropolitan bishop. Pop. (1981) town, 31,333; *nomós,* 147,051.

Koželuch, Leopold (Anton), Koželuch also spelled KOTZELUCH (b. Dec. 9, 1752, Velvary, Bohemia [now Czechoslovakia]—d. May 7, 1818, Vienna), Czech composer of ballets, operas, and symphonies.

Koželuch studied composition in Prague with his uncle Jan Koželuch and piano with F. Dussek and became known as a composer of ballets in the 1770s. In 1778 he went to Vienna, where he became a fashionable piano teacher. Koželuch succeeded Mozart as court composer in Vienna in 1792. His compositions also include approximately 50 piano concerti, sonatas, and arrangements of Scottish songs for the Edinburgh collector George Thomson.

Kozhikode, formerly CALICUT, town, northern Kerala state, southwestern India, on the Malabar Coast, 414 miles (666 km) west-southwest of Madras by rail. A once-famous cotton-weaving centre, Calicut is remembered as the place of origin of calico, to which it gave its name. The place was visited by Arab traders, who first settled there in the 7th century. Vasco da Gama, the Portuguese discoverer of the sea route to India, reached Calicut in 1498. The Portuguese built a fortified trading post there in 1511, but it was abandoned in 1525.

An English expedition visited Calicut in 1615, but not until 1664 did the British East India Company found a trading post at Calicut. The French followed in 1698 and the Danes in 1752. Hyder Ali, the 18th-century Indian ruler and military commander of Mysore (now Karnātaka), captured the town in 1765 and destroyed it. In 1790 the British occupied Calicut, and it passed into their hands by treaty in 1792.

The port is virtually closed during the monsoon season, and ships must lie 3 miles (5 km) offshore at other seasons. Besides coconut products, the city exports pepper, ginger, coffee, tea, and other crops. Its industries include sawmills and tile-making, coffee-curing, and hosiery works. Kozhikode is the seat of Calicut University (1968), which includes colleges of arts and sciences, medical and teacher-training colleges, and a marine-research institute. Pop. (1981) town, 394,447; metropolitan area, 546,058.

Koziba, Bar: *see* Bar Kokhba.

Kozienice, town, Radom *województwo* (province), east-central Poland. Located 20 miles (32 km) northeast of Radom city, the provincial capital, and 5 miles (8 km) southwest of the Vistula River, Kozienice has an economy based on the production of resin and turpentine, paper, and chemicals; it is the site of Poland's largest hard-coal-burning power plant. Kozienice was first chronicled in the 12th century as the location of the Norbertine monastery and cloister; town rights were received in 1549. During the late 18th century it had an ammunition and small-arms factory. A German concentration camp was located there during World War II. Pop. (1987 est.) 18,900.

Kozlov (Russian S.F.S.R.): *see* Michurinsk.

Kozyrev, Nikolay Aleksandrovich (b. Sept. 2, 1908, St. Petersburg [now Leningrad]), Russian astronomer who first discovered volcano-like activity on the Moon, thus challenging the long-held theory that the Moon is a dead and inert celestial body.

In 1931 Kozyrev joined the staff of the Pulkovo Astronomical Observatory, near Leningrad, where he studied the planets and auroral phenomena. These studies gained him distinction, but he was imprisoned by the Stalin regime in 1937 and was not released until 1948.

In 1954 Kozyrev made a much-disputed report of an aurora, similar to the Earth's Aurora Borealis, on the planet Venus. The existence of such an aurora would mean that Venus has a magnetic field much like Earth's, and the study of Venerian phenomena would thus provide much new information on geomagnetic storms. (The U.S. space probe Mariner 10, passing within 3,600 miles [5,800 km] of Venus in February 1974, found no detectable magnetic field.)

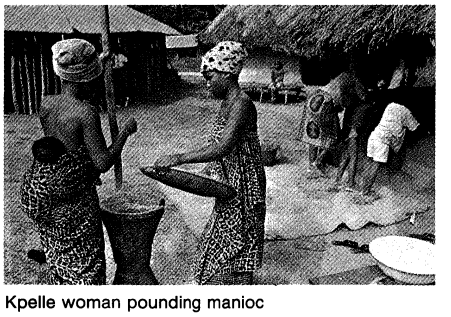
While investigating Alphonsus, a lunar crater whose floor was reportedly covered by a mist, he recorded what he interpreted as a volcanic eruption in 1958 and confirmed his observations the following year, but his conclusion that volcanic activity was the cause of the disturbance has been disputed by some astronomers. Nonetheless, observations led to a new focus in lunar research.

In 1963 Kozyrev startled astronomers with his discovery of hydrogen in the thin atmosphere of Mercury. This gas should have escaped the Mercury's light gravitational field long ago. From further studies Kozyrev concluded that the hydrogen comes from the Sun in the form of hydrogen nuclei.

Kpalimé (Togo): *see* Palimé.

Kpelle, also called GUERZE, people occupying much of central Liberia and extending into Guinea, where they are sometimes called the Guerze; they speak a language of the Mande branch of the Niger-Congo family.

The Kpelle are primarily farmers. Rice is their staple crop and is supplemented by cassava, vegetables, and fruits; cash crops include rice, peanuts (groundnuts), sugarcane, and kola nuts. They practice slash-and-burn agriculture. The wards, or quarters, into which the villages are divided are landholding units. The



Kpelle woman pounding manioc
Jacques Jangoux

household consists of a man, his several wives, and their children; they live either in rectangular wattle-and-daub huts with thatched roofs or in the more traditional round huts with conical thatched roofs. The household is the usual farming unit, but some farm work is also performed by a voluntary cooperative work group.

The Kpelle are organized under several paramount chiefs, who, as government officials, serve as mediators between the people and the modern government, as well as performing their traditional duties of settling disputes, preserving order, and maintaining roads. The chiefdom is divided into districts; the head of each district serves as a liaison between the paramount chief and his people. Each town also has its own chief, as does each quarter.

The *poro* and the *sande* are, respectively, male and female secret societies that meet in sacred groves in the forest. The *poro,* the more important of the organizations, is personified by the Great Masked Figure, or Grand Master, a person who only appears in public disguised by a mask, costume, and falsetto voice. He represents both the political power of important landowners and the ritual power of supernatural authorities. The *poro* functions to enforce social norms through its court, to socialize young people through its initiation schools, and to provide bonds that unite members from different kin, territorial, or even tribal units.

Kra, Isthmus of, Thai KHOKHOK KRA, narrow neck of southern Burma and Thailand, connecting the Malay Peninsula to the Asian mainland. The isthmus lies between the Gulf of Thailand to the east and the Andaman Sea to the west. It is 25–30 miles (40–48 km) wide at its narrowest point, between Chumphon and Kra Buri (both in Thailand). Kra Buri, for which it was named, is at the head of the Pakchan River estuary, an inlet of the Andaman Sea.

Since the late 19th century the Isthmus of Kra has frequently been proposed for canalization, with the aim of decreasing travel and shipping time between Europe and East Asia by eliminating the voyage around Singapore. There is a road from Chumphon to Kra Buri and Phuket, and in 1942 the Japanese built a railway (later dismantled) over part of this route.

Kra Peninsula (Southeast Asia): *see* Malay Peninsula.

kraal, enclosure or group of houses surrounding an enclosure for livestock, or the social unit that inhabits these structures. The term has been more broadly used to describe the way of life associated with the kraal that is found among some African, especially South African, peoples. Among certain peoples of Natal, for example, the kraal consists of a number of huts arranged in a circle around a cattle corral. Polygyny is common, and each wife has her own hut within the kraal. The head of the kraal may have custody of the property attaching to the houses of his several wives.

The term has also been used to describe the encampments of the pastoral Masai of East Africa. The household may consist of an elderly father, his wives, and his married sons. This group migrates as a unit. During seasonal migrations, small, temporary kraals are built; there are also more permanent settlements. Women are responsible for the construction and maintenance of the kraal, and here too each wife has her own hut.

The word kraal has also been applied to an elephant corral in Sri Lanka, India, and Thailand.

Krabi, port town, southwestern Thailand. Krabi is situated on the Strait of Malacca on the Andaman Sea and is a departure point for fishing and for travel to nearby islands.

The surrounding region is widely planted in coconuts. Most settlements are coastal fishing villages, and shell reefs, beaches, botanical gardens, underground streams, and caves are

found in the region. Pop. (1985 est.) town, 16,422.

Krâchéh, also spelled KRATIE, town, northeastern Kampuchea (Cambodia). Krâchéh is located on the eastern bank of the Mekong River, at the head of Mekong navigation. It has a port and is linked to Phnom Penh, the national capital, and to neighbouring areas by a national highway. There are slate quarries near the town, and the region is also a source of white and yellow clays.

The surrounding region is traversed by the Mekong River and borders on Vietnam (southwest). It traditionally has had a multiethnic population including both lowland and upland Khmer (Khmer Kandal and Khmer Loeu), and Cham. Agricultural products include rice, grown mostly along the Mekong, and rubber, grown in the rich red earth zones around Snuŏl and Krâchéh. Corn (maize), potatoes, various vegetables, bananas, mulberry, cotton, and sugarcane are also grown. Upland areas have a dense forest cover, including such good-quality hard woods as rosewood and teak, as well as wild date, mahogany, bean and berry, and rubber trees. There are also vast bamboo groves. Regional industry includes the small-scale manufacture of agricultural machinery. Pop. (1971 est.) town, 14,765.

Kraepelin, Emil (b. Feb. 15, 1856, Neustrelitz, Mecklenburg-Strelitz [Germany]—d. Oct. 7, 1926, Munich), German psychiatrist, one of the most influential of his time, who developed a classification system for mental illness that influenced subsequent classifications. Kraepelin made distinctions between schizophrenia and manic-depressive psychosis that remain valid today.

After receiving his M.D. from the University of Würzburg (1878), Kraepelin continued his studies under several German neuroanatomists as well as with the experimental psychologist Wilhelm Wundt. Kraepelin employed Wundt's experimental techniques to study the effects of drugs, alcohol, and fatigue on psychological functioning and in 1881 published a study of the influence of infectious diseases on the onset of mental illness. He then began his *Compendium der Psychiatrie* (1883), in which he first presented his nosology, or classification of disorders. Kraepelin divided mental illnesses into exogenous disorders, which he felt were caused by external conditions and were treatable, and endogenous disorders, which had such biological causes as organic brain damage, metabolic dysfunctions, or hereditary factors and were thus regarded as incurable.

Appointed professor at the University of Dorpat (now Tartu, Estonian S.S.R.) in 1885 and then at the University of Heidelberg six years later, Kraepelin continued to refine his classification, issuing several revisions of his psychiatry textbook, which has now grown to several volumes. In the sixth edition (1899), he first made the distinction between manic-depressive psychosis and dementia praecox, now called schizophrenia. He believed that manic-depressive disorders and melancholia (depression) were exogenous and thus were treatable, while dementia praecox fell among the endogenous, incurable illnesses. Kraepelin attributed dementia praecox to organic changes in the brain. He further distinguished at least three clinical varieties of the disease: catatonia, in which motor activities are disrupted (either excessively active or inhibited); hebephrenia, characterized by inappropriate emotional reactions and behaviour; and paranoia, characterized by delusions of grandeur and of persecution.

Kraepelin became professor of clinical psychiatry at the University of Munich in 1903 and remained there until 1922, when he became director of the Research Institute of Psychiatry in the same city. Throughout his career, he continued to refine his classification and was working on the ninth edition of his textbook when he died.

The concepts embodied in Kraepelin's classification system did not originate with him, but he was the first to synthesize them into a workable model that could be used to diagnose and treat mental patients. His classification was particularly influential during the early 20th century.

Consult the INDEX *first*

Krafft-Ebing, Richard, Freiherr von (baron of) (b. Aug. 14, 1840, Mannheim, Baden [Germany]—d. Dec. 22, 1902, near Graz, Austria), German neuropsychiatrist who was a pioneering student of sexual psychopathology.

Educated in Germany and Switzerland, Krafft-Ebing was appointed professor of psychiatry at Strasbourg at the age of 32. His interests ranged from genetic functions in insanity and sexual deviation to epilepsy, paralysis agitans, and hemicrania. He also established the relationship between syphilis and general paresis and performed experiments in hypnosis. Krafft-Ebing is best-known today for his *Psychopathia Sexualis* (1886), a groundbreaking examination of sexual aberrations.

Kraft, Adam, Kraft also spelled KRAFFT (b. *c.* 1455–60, Nürnberg [Germany]—d. 1508/09, Schwabach), sculptor of the Nürnberg school who introduced restraint into German late Gothic sculpture.

Nothing is known of Kraft's training, but his earliest-known work, a triptych depicting Christ's Passion and Resurrection (1490–92; St. Sebaldus, Nürnberg), shows a maturity of conception and execution. His masterpiece, the tabernacle for the Church of Sankt Lorenz



Kraft, self-portrait (detail from the "Shrine of the Sacrament"), sandstone, begun 1493; in the church of Sankt Lorenz, Nürnberg, Ger.

Marburg—Art Resource/EB Inc.

(1493–96; Nürnberg), incorporated an imaginative architectural setting and is particularly notable for the naturalistic, vigorously modeled figures of Kraft and his assistants. In such reliefs as those executed for the Pergenstörffer family (*c.* 1498; Frauenkirche, Nürnberg), Kraft's predilection for simple, uncluttered composition may be seen. His final work, seven reliefs depicting the Stations of the Cross (1505–08), achieved a high sense of drama despite its quiet, dignified rhythms.

Kraft, Inc., subsidiary of Philip Morris Companies Inc., and a major American manufacturer and marketer of food products; it is a leading producer of cheese and other dairy products. The firm's headquarters are in Glenview, Ill.

Kraft, Inc., grew out of a wholesale cheese-delivery business established in Chicago in 1903 by James L. Kraft. Three years later he and his brother Charles began processing cheese for distribution to area retailers. Two other brothers later joined the firm, and in 1909 it was incorporated as J.L. Kraft Bros. & Company. The brothers patented a spoil-resistant processed cheese, which was sold in great quantities to the U.S. Army during World War I. In 1930 the company was acquired by National Dairy Products Corporation (established 1923), which adopted the name Kraftco Corporation in 1969 and Kraft, Inc., in 1976. From 1980 to 1986 the company was merged with Dart Industries, Inc., a diversified company manufacturing goods including home appliances, plastic products, and batteries. When Kraft Inc. split off in 1986, it retained the batteries division for two years. In 1988 the company was taken over the Philip Morris Companies Inc.

kraft process (from German *kraft:* "strong"), chemical method for the production of wood pulp that employs a solution of caustic soda and sodium sulfide as the liquor in which the pulpwood is cooked in order to loosen the fibres. The kraft process differs from the sulfite process in that the cooking liquor is alkaline and therefore is less corrosive to iron and steel, so that the digesters in which the process takes place need not be lined, and because the pulp produced is stronger than that produced by cooking with caustic soda alone. A further advantage of the kraft process is its capability of digesting pine chips; the resinous components dissolve in the alkaline liquor and can be recovered in the form of tall oil, a valuable by-product. Recovery of the sodium compounds is important in the economy of the kraft process.

In kraft mills constructed in the 1970s, operations were completely enclosed; former waste streams, including bleach effluents, are recycled and reused, eliminating water pollution. *Compare* sulfite process.

Krag, Jens Otto (b. Sept. 15, 1914, Randers, Den.—d. June 22, 1978, Skiveren), one of Denmark's foremost Socialist politicians, who twice served as prime minister (1962–68, 1971–72).

Krag joined the Social Democratic Party's youth organization in 1930 and quickly rose in the ranks of the party. In 1940, after having earned a master's degree in political science, he joined the Danish directorate of supply and served as coordinator of the labour movement's economic council. Elected to Parliament in 1947, he became minister of commerce and supported Denmark's change from neutrality to a strong defense policy. After serving as economic adviser to the Danish embassy in Washington, D.C. (1950–52), he reentered Parliament in 1952 and was appointed minister without portfolio and then minister of the new department of foreign economic affairs (1953–58) and foreign minister (1958–62).

During Krag's terms as prime minister he worked toward the goal of European economic cooperation. He resigned from the post after Denmark joined the European Economic Community (EEC) in 1972 and spent two years as a lecturer at the University of Århus before heading the EEC delegation to Washington, D.C. (1974). He then returned to Denmark, where he wrote a newspaper column.

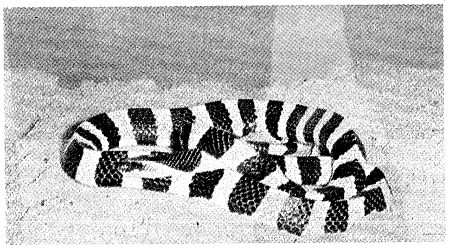
Kragujevac, city in Serbia, Yugoslavia, on the Lepenica River, a tributary of the Morava. It is the chief city of the Šumadija region, in

which at the beginning of the 19th century Karageorge led the first Serb uprising against the Turks. It was the capital of Serbia from 1818 to 1839, during which time a high school, a theatre, a military school, and a printing press were established. The first newspaper in Serbia, *Novine Srbske,* was published there. In 1941 German military authorities executed 7,000 males between the ages of 14 and 70 from the area of Kragujevac and Kraljevo; a monument recalls the massacre.

Kragujevac is linked by rail to southern Yugoslavia and to the main trans-Yugoslav line at Lapovo. It lies in fertile country, which produces fruit and vegetables for canning. Livestock is fattened for the meat-processing industry. Kragujevac has an important automobile plant, the Zavodi Crvena Zastava, producing about 140,000 vehicles annually (about three-quarters of Yugoslav production) in the late 1970s. In 1972 the first Yugoslav-designed car went into production. There are also pharmaceutical and chemical plants. Pop. (1981 prelim.) mun., 164,823.

Krain (Yugoslavia): *see* Carniola.

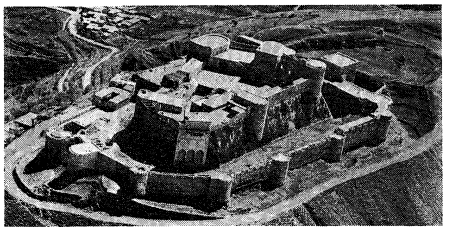
krait (*Bungarus*), any of 12 species of highly venomous snakes belonging to the cobra family, Elapidae. Kraits occur in open country of southern Asia. They have shining scales and are strongly patterned, typically with black-and-white or black-and-yellow bands. They are mostly nocturnal; their usual prey is other snakes.



Banded krait (*Bungarus fasciatus*)
Cy LaTour at the Detroit Zoo

The common, or blue, krait (*Bungarus caeruleus*) of Pakistan, India, and China may be almost 1.5 metres (5 feet) long. Although it comes near houses, it rarely bites humans; of those it does bite, however, about half die, despite antivenin treatment. The banded krait, or pama (*B. fasciatus*), of Indochina may be slightly larger; it is so docile that it is considered quite harmless, and few bites have been reported.

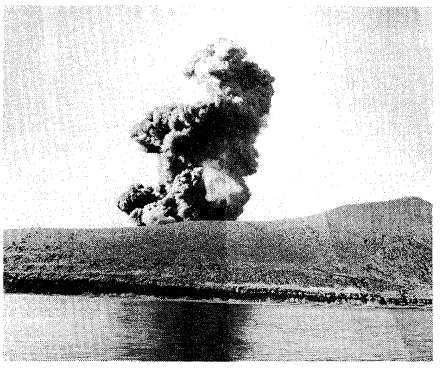
Krak des Chevaliers (French-Arabic: Castle of the Knights), greatest fortress built by European crusaders in Syria and Palestine, one of the most notable surviving examples of medieval military architecture. Built at Qal'at



Krak des Chevaliers at Qal'at al-Ḥiṣn, Syria
Annan Photo Features

al-Ḥiṣn, Syria, near the northern border of present-day Lebanon, Krak occupied the site of an earlier Muslim stronghold. It was built by the Knights of St. John (Hospitallers), who held it from 1142 till 1271, when it was captured by the Mamlūk sultan Baybars I. It has two concentric towered walls separated by a wide moat and could accommodate a garrison of 2,000 men.

Krakatoa, Bahasa Indonesia KRAKATAU, volcano on Pulau (island) Rakata in the Sunda Strait between Java and Sumatra, Indonesia. Its eruption in 1883 was one of the most catastrophic in history. Sometime within the past 1,000,000 years, the volcano built a



Krakatoa eruption, 1960
By courtesy of the Geological Survey of Indonesia; photograph, D. Hadikusumo

cone-shaped mountain composed of flows of volcanic rock alternating with layers of cinder and ash. From its base, 1,000 ft (300 m) below sea level, the cone projected about 6,000 ft above sea level. Later, the mountain's top was destroyed, forming a caldera, or bowl-shaped depression, 4 mi (6 km) across. Portions of the caldera projected above the water as four small islands: Pulau Sertung (Verlaten) on the northwest, Lang and Polish Hat on the northeast, and Rakata on the south-southwest. Over the years, three new cones were formed, merging into a single island. The highest of the three cones rose to 2,667 ft above sea level.

The only known eruption prior to 1883 occurred in 1680; it was only moderate. On May 20, 1883, one of the cones again became active; ash-laden clouds reached a height of 6 mi, and explosions were heard in Batavia (Jakarta), 100 mi away, but by the end of May the activity had died down. It resumed on June 19 and became paroxysmal by August 26. At 1:00 PM of that day the first of a series of increasingly violent explosions occurred, and at 2:00 PM a black cloud of ash rose 17 mi above Krakatoa. The climax was reached at 10:00 AM on August 27, with tremendous explosions that were heard 2,200 mi away in Australia and propelled ash to a height of 50 mi. Pressure waves in the atmosphere were recorded around the Earth. Explosions diminished throughout the day, and by the morning of August 28, the volcano was quiet. Small eruptions continued in the following months and in February 1884.

The discharge of Krakatoa threw into the air nearly 5 cu mi (21 cu km) of rock fragments, and large quantities of ash fell over 300,000 sq mi (800,000 sq km). Near the volcano, masses of floating pumice were so thick as to halt ships. The surrounding region was plunged into darkness for two and a half days because of ash in the air. The fine dust drifted several times around the Earth, causing spectacular red sunsets throughout the following year.

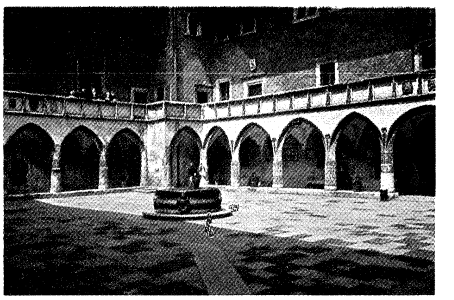
After the explosion, only a 2,667-ft-high islet remained in a basin covered by 900 ft of ocean water. As much as 200 ft of ash and pumice fragments had accumulated on Verlaten and Lang islands and on the remaining southern part of Rakata. Analysis of this material revealed that very little of it consisted of debris from the former central cones: the fragments of old rock in it represented less than 10 percent of the volume of the missing part of the island. Most of the material was new magma brought up from the depths of the Earth, most of it distended into pumice by expansion of the gas it contained or completely blown apart to form ash. Thus, the former volcanic cones were not blown into the air, as was first believed, but instead, sank out of sight as the top of the volcano collapsed because of the removal of a large volume of magma from the underlying reservoir.

The volcano's collapse triggered a series of tsunamis, or tidal waves, recorded as far away as South America and Hawaii. The greatest wave, which reached a height of 120 ft and took 36,000 lives in nearby coastal towns of Java and Sumatra, occurred just after the climactic explosion. All life on the Krakatoa island group was buried under a thick layer of sterile ash, and reestablishment of plant and animal life did not begin for five years.

Krakatoa was quiet until Dec. 29, 1927, when a new eruption began on the seafloor along the same line as the previous cones. By Jan. 26, 1928, a growing cone had reached sea level and formed a small island called Anak Krakatoa (Child of Krakatoa). Sporadic activity continued until, by 1973, the island had reached a height of 622 ft above sea level. It was still in eruption in the early 1980s.

Krakatoa winds, layer of winds that encircle the Earth in the lower stratosphere, at altitudes from 20 to 40 kilometres (about 12 to 25 miles), between latitudes 15° N and 15° S. They blow at velocities of 25 to 50 metres per second (about 55 to 110 miles per hour). They are alternately easterly and westerly, reversing about every 13 months. Their name comes from their role in transporting dust thrown into the atmosphere by the explosion (1883) of Krakatoa, a volcanic island in Indonesia.

Kraków, also spelled CRACOW, city and *miasto-województwo* (city province) surrounded by Kraków *województwo* (province), southern Poland, on both sides of the upper Vistula River. The third largest city in Poland, it is a



Courtyard in Jagiellonian University in Kraków, Pol.
FPG—EB Inc.

major rail junction with connections to Warsaw, Berlin, Prague, Vienna, and the U.S.S.R.

Modern Kraków has a rapidly expanding economy founded upon the major industrial complex at Nowa Huta (formerly located to the east, now part of the city province), but the city is known primarily for its grand historical style and cultural leadership. Its marketplace, Rynek Główny (Main Square), has existed since the 13th century, and a modern landscaped area is laid out on the site of past fortifications.

Kraków was the home of the Wiślanie tribe (Vistulans), who occupied Małopolska (Little Poland) until the 10th century. From 988 to 990 King Mieszko I united the southern and northern territories to form a powerful kingdom; and his son, Bolesław I the Brave, made Kraków the seat of a Polish bishopric. The city expanded rapidly as a trade centre, becoming capital of one of Poland's major principalities in 1138. It was devastated by Tatar invasions during the 13th century but was quickly rebuilt, receiving "Magdeburg rights," which consisted of a municipal constitution, in 1257.

When King Władysław I the Short reunited Poland, he made Kraków his capital in 1320, after which the kings of Poland were traditionally crowned in Wawel Castle and entombed in Wawel Cathedral, both on Wawel Hill. Throughout the 14th century Kraków served as Poland's economic and political centre and as a major trading point between England and Hungary. The city's architectural development was remarkable. The many surviving medieval structures include the Jagiellonian University, founded by Casimir I the Restorer in 1364. The university is the second oldest in central Europe, and it once made Kraków one of Europe's foremost cultural centres.

By 1600 Kraków had begun to decline. The Jagiellon dynasty came to an end, and in 1609 King Sigismund III Vasa moved his capital from Kraków to Warsaw, thus reducing the former's importance. The devastating Swedish wars of the 17th century left the city economically impoverished. In 1794, Tadeusz Kościuszko led an anti-Russian insurrection that started in Kraków. Between 1795 and 1918 the city was controlled by Austria, except from 1809 to 1815, when it existed as part of the Grand Duchy of Warsaw, and from 1815 to 1846, when, with its surrounding territory, it formed an independent republic. During the latter half of the 19th century the city redeveloped under relaxed Austrian control until it regained its former stature.

In 1918 Kraków was returned to Poland, only to be taken by the Germans at the beginning of World War II. The German governor, who made his headquarters in Wawel Castle, executed the university's teaching staff and sent some 55,000 Jews from the city to the Auschwitz-Birkenau death camp. In 1945 Kraków was liberated in a surprise attack made by Soviet forces, thus preventing destruction of the town by the Nazis. After the war Kraków rebuilt its industry, which includes textile milling and chemical works, based on nearby salt and limestone deposits; there is also food processing and stone cutting. The creation of the giant Nowa Huta steelworks at Mogila, a few miles from the city, sealed Kraków's transformation from a university city to an industrial centre.

A vast number of historic buildings remain in the city. Some 60 old churches have notable architecture. Among the most renowned is the Church of the Virgin Mary (Mariacki church), whose main section dates from 1497. It contains a stained-glass window from 1370 and a magnificent altar (1477–89) by Veit Stoss. Wawel Cathedral (built *c.* 1018; rebuilt 1142 and 14th century) was renovated in 1712 in the Gothic style. Kraków's more modern cultural attractions include many museums (especially the National Museum), theatres, and an opera house.

The Kraków urban-industrial agglomeration includes the nearby industrial towns of Skawina, Wieliczka, and Niepotomice. Pop. (1986 est.) 744,046.

Kraków, Republic of, also called FREE CITY OF KRAKÓW (1815–46): *see* Cracow, Republic of.

Kraljević, Marko: *see* Marko Kraljević.

Kraljevo, city in Serbia, Yugoslavia, lying along the north bank of the Ibar River in a fertile agricultural region. The city's heavy industry includes the manufacture of railway rolling stock, trucks, wagons, ceramics, and firebrick. There is also a museum with a fresco gallery specializing in the art of the Raska school monasteries, several of which are located nearby.

Just 3 miles (5 km) southwest of Kraljevo is Žiča Monastery, built in 1207–20 as the seat of the first Serbian archbishop and containing fine frescoes of the Raska school of painting; in it Serbian kings were crowned in the early Middle Ages. Žiča was partially damaged during World War II. The famous monastery of Studenica is about 15 miles (24 km) southwest of Kraljevo, under the shadow of Golija Mountain, amid beautiful scenery; one of the oldest and best-known Serbian medieval monasteries, it comprises three churches dating from the 12th to the 14th century. The Church of the Virgin, built in 1190 by Stephen Nemanja, founder of the Serbian state, is a diminutive church of white marble with delicate ornamentation; its frescoes date from the beginning of the 13th century. The King's Church, built by King Milutin in 1315, also has fine frescoes. Pop. (1981 prelim.) mun., 121,622.

Kramatorsk, city, Donetsk *oblast* (administrative region), eastern Ukrainian Soviet Socialist Republic. It lies on the bank of the Kazyonny Torets, which is a tributary of the north Donets River. The city developed from the end of the 19th century with the growth of its metallurgical industry. Modern Kramatorsk makes iron and steel and is one of the largest centres in the U.S.S.R. for heavy machinery and machine tools for the metallurgical, mining, power, and chemical industries. Manufactured goods include presses, cranes, turbine rotors, and self-propelled excavators. There are railway repair shops, ceramic works, and coke-chemical and cement-making undertakings. Pop. (1986 est.) 195,000.

Kramer, Jack, byname of JOHN ALBERT KRAMER (b. Aug. 1, 1921, Las Vegas, Nev., U.S.), American champion tennis player who became a successful promoter of professional tennis.

Kramer was selected to represent the United States in the 1939 Davis Cup doubles against Australia. However, in spite of an excellent record in the United States, he was not considered a major world-class player until 1947, when he won the Wimbledon singles; he was men's doubles winner at Wimbledon in 1946 and 1947. He also won the U.S. singles (1946–47), men's doubles (1940–41, 1943, 1947), and mixed doubles (1941) and was on the winning Davis Cup team in 1946.

After he turned professional in October 1947, Kramer beat then-champion Bobby Riggs in a series of matches across the United States. He won the 1948 U.S. pro championship. Bothered by an arthritic back from 1952, Kramer became a promoter known for the high quality of the matches he arranged and for inducing many amateur champions to turn professional. As open tennis began in 1968, due in large part to his efforts, Kramer played a major role in setting up the Grand Prix, a series of tournaments leading to a Masters Championship, with prize money shared by top players, first played in 1970. He played a large role in the organization of the Association of Tennis Professionals, a union for men players, and became its first executive director in 1972. From 1950 Kramer was a television analyst for most major tennis championships. He was named to the International Tennis Hall of Fame in 1968.

Kramer, Josef, byname BEAST OF BELSEN, German BESTIE VON BELSEN (b. 1907—d. Dec. 13, 1945, Hameln, Ger.), Nazi German commander of the Bergen-Belsen concentration camp (1944–45), notorious for his cruelty.

Joining the Nazi Party on Dec. 1, 1931, Kramer volunteered for the SS the following year. He served at various camps, including Auschwitz, Mauthausen, and Dachau, and commanded Birkenau compound, one of the biggest of Germany's mass murder camps, before being transferred to Bergen-Belsen in December 1944. Although Bergen-Belsen had no gas chambers, thousands were gassed in improvised shower rooms. In the last weeks of the war, thousands of new prisoners arrived, and overcrowding produced mass starvation, filth, and disease, to which Kramer added beatings and torture, setting dogs on prisoners and machine-gunning others at burial pits. Captured by the British in April 1945, he was tried by a British military court, sentenced on November 17, and hanged.

Kramer, Dame Leonie Judith, *née* GIBSON (b. Oct. 1, 1924, Melbourne), Australian literary scholar and educator.

Kramer studied at the University of Melbourne and at the University of Oxford and thereafter taught on Australian literature at various universities, serving as professor at the University of Sydney from 1968. She wrote several authoritative works on the Australian novelist Henry Handel Richardson and was the editor of *The Oxford History of Australian Literature* (1981). She was also a prominent figure in several Australian educational, literary, and broadcasting organizations. She was created D.B.E. in 1983.

Kramer, Stanley (b. Sept. 29, 1913, New York City), American film producer and director who was noted for well-crafted films that touched on, without exploiting or exploring deeply, unconventional or controversial topics.

After gaining experience in various of the trades associated with filmmaking, Kramer began writing scripts for movies and radio programs in the late 1930s. His first production experience was with the films *So Ends Our Night* (1941) and *The Moon and Sixpence* (1942). Kramer's success as an independent producer with such films as *So This is New York* (1948), *Champion* (1949), *Home of the Brave* (1949), and *The Men* (1950) established him as a major figure in Hollywood. Notable among the other films he produced were *Death of a Salesman* (1951), *High Noon* (1952), *The Member of the Wedding* (1952), *The Wild One* (1954), *The Caine Mutiny* (1954), and, as producer and director, *The Pride and the Passion* (1957), *On the Beach* (1958), *Inherit the Wind* (1960), *Judgment at Nuremberg* (1961), *It's a Mad Mad Mad Mad World* (1962), *Ship of Fools* (1965), *Guess Who's Coming To Dinner* (1967), *Oklahoma Crude* (1973), and *The Runner Stumbles* (1979).

Kramers, Hendrik Anthony (b. Dec. 17, 1894, Rotterdam—d. April 24, 1952, Oegstgeest, Neth.), Dutch physicist who, with Ralph de Laer Kronig, derived important equations relating the absorption to the dispersion of light. He also predicted (1924) the existence of the Raman effect, an inelastic scattering of light, and showed (1927) that the complex form of the mathematical functions in dispersion theory, concerning collisions of subatomic particles, results from the inability of a signal to be propagated faster than the speed of light.

Kramers' research on X rays resulted in his development of equations to determine the efficiency and intensity of X-ray production.

Kranjska (Yugoslavia): *see* Carniola.

Krapina remains, skeletal hominid fossils of at least 13 adults and children, consisting of skulls, teeth, and post-cranial bones found in a rock shelter near the Krapinica River in Yugoslavia between 1899 and 1905. The remains are estimated to derive from the early last glacial period, about 40,000 to 75,000 years ago, and are identified as being transitional from Neanderthal to modern man. Some skulls have strong Neanderthal features such as heavy sloping foreheads, powerful jaws, and a small mastoid process, though others display the high skull vault and frontal regions characteristic of modern man. The limb bones are indistinguishable from those of modern man.

The evidence at Krapina suggests that this

early species may have practiced cannibalism. The skulls had been smashed, bones had been split, and there was evidence of charring, suggesting that human meat had been cooked.

Krasicki, Ignacy (b. Feb. 3, 1735, Dubieck, Polish Ruthenia—d. March 14, 1801, Berlin), greatest Polish poet of the 18th century.

Born to an aristocratic but impoverished family, Krasicki was educated at Warsaw Catholic



Krasicki, detail of an oil painting by Per Krafft, 1767; in the National Museum of Warsaw

By courtesy of the Muzeum Narodowe W Warszawie

Seminary and became bishop of Warmia (Ermeland) at age 32. He served as chaplain to King Stanisław II Poniatowski and in 1795 was named archbishop of Gniezno.

Krasicki was scholarly, skeptical, and critical but fundamentally optimistic and never cynical. His fables are among his best work. They are told in concise, unambiguous language and reflect the author's skepticism about human nature, tempered by sympathetic understanding. His satires (first collection published in 1779) concentrate on vices such as drunkenness and greediness. In *Pijaństwo* ("Drunkenness"), Krasicki portrays the gradual process of alcohol addiction. His mock-heroic poems include *Monachomachia* (1778; "War of Monks"), a satirical attack on ignorant and dissolute monks.

Krasicki also introduced the modern novel to Poland with *Mikołaja Doświadczyńskiego przypadki* (1776; "The Adventures of Nicholas Try-all"). Influenced by Defoe, Swift, and Rousseau, it was written in the form of a diary.

Krasiński, Zygmunt, hrabia (count) (b. Feb. 19, 1812, Paris—d. Feb. 23, 1859, Paris), poet and dramatist, with Adam Mickiewicz and Juliusz Słowacki a member of Poland's triad of Romantic messianic poets.



Krasiński, detail of an oil painting by Ary Scheffer, 1850; in the National Museum of Warsaw

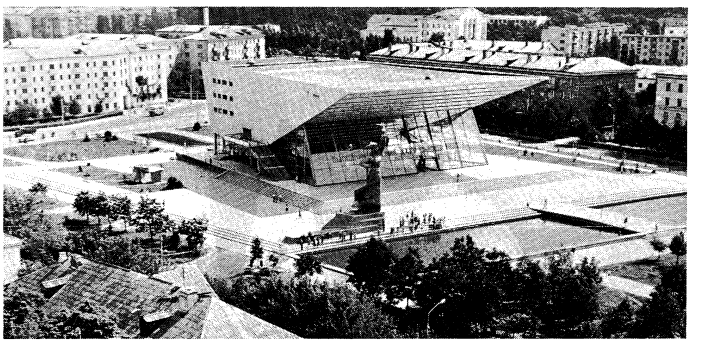
By courtesy of the Muzeum Narodowe w Warszawie

The son of a leading aristocratic family, Krasiński studied law at Warsaw University before taking up studies in Geneva in 1829. He lived most of his life abroad and published his work anonymously. The conflict of loyalty arising from his father's support of Russian imperialism and his son's desire for Poland's independence is central to the poet's thought.

Krasiński's reputation rests primarily on two tragic dramas. In *Nie-Boską Komedią* (1835; *The Undivine Comedy,* 1924) he presents a future struggle between the masses and the privileged that represents the first literary expression of class war. In his second important play, *Irydion* (1836; Eng. trans., 1927), the story of a Greek who seeks vengeance on imperial Rome, Krasiński denies the validity of hatred as a source of righteous action.

Krasiński's best known poem, *Przedświt* (1843; "The Moment Before Dawn"), was an inspiration to his countrymen in trying times. It pictures Poland's partition as a sacrifice for the sins of the entire world but optimistically predicts Poland's resurrection and emergence as a world leader because of its sacrifice.

Krasnoarmeysk, also spelled KRASNOARMEISK, or KRASNOARMEJSK, formerly (until 1938) GRISHINO, city, Donetsk *oblast* (administrative region), Ukrainian Soviet Socialist Republic. It is an old coal-mining centre of the Donets Basin coalfield, and mining began there in 1884. It also has a railway-servicing industry and a construction materials industry. It is the centre of a significant agricultural area. Pop. (1983 est.) 63,000.



Cinema theatre in Krasnodar, Russian S.F.S.R.

Novosti Press Agency

Krasnodar, *kray* (territory), southwestern Russian Soviet Federated Socialist Republic, occupying an area of 32,300 sq mi (83,600 sq km) extending northward from the crestline of the Caucasus across the plains east of the Black Sea and Sea of Azov as far as the Gulf of Taganrog. The plains, crossed by the Kuban and other rivers flowing to the Sea of Azov, form two-thirds of the *kray.* Their steppe grass vegetation on rich soils has been almost entirely ploughed. Widespread salt marshes and lagoons line the Azov coast. The southern third of the *kray* is occupied by the western Caucasus Mountains, which reach 12,431 ft (3,789 m) in Mt. Psysh and fall gradually in height westward as they run parallel to the Black Sea, from which they are separated by a narrow coastal plain. Their lower slopes are covered by deciduous forest; higher up are conifers and alpine meadows.

The *kray* was established in 1937 with its headquarters at Krasnodar city in an area originally occupied by Kuban Cossacks. The population is overwhelmingly Russian (nearly 90 percent in 1979), but also includes the Adygey, who have their own autonomous *oblast* (administrative region) within the *kray,* and some Ukrainians, Armenians, Belorussians, and Tatars.

The northern plains form a major agricultural region. State and collective farms produce grains, especially winter wheat and, in the south, winter barley. Along the lower Kuban, much swamp has been reclaimed for rice growing. Industrial crops, notably sunflowers, tobacco, and sugar beets, are important, as are vegetables along the Kuban and fruit and vines on the Caucasus foothills. Large numbers of cattle, pigs, and poultry are kept. Petroleum and natural gas are exploited around Maykop (*q.v.*), on the Taman Peninsula, and in the north. Novorossiysk and Tuapse are major oil exporting ports. There is an oil refinery at Krasnodar and a chemical complex at Belorechensk. Pop. (1983 est.) 4,924,000.

Krasnodar, formerly (until 1920) YEKATERINODAR, or EKATERINODAR, city and administrative centre of Krasnodar *kray* (territory), southwestern Russian Soviet Federated Socialist Republic, on the Kuban River. Founded *c.* 1793 as a Cossack guardpost on the Kuban frontier, it developed as a military town. In 1867, after the Caucasian wars, it became a civilian town and centre of the fertile Kuban region, and its prosperity increased after the arrival of the railways in the 1890s. Industries are largely concerned with processing the agricultural products of the region; there are also considerable engineering industries. Petroleum is refined and lubricants are produced. The city has a gridiron pattern of streets densely lined by poplar, acacia, and plane trees. Institutions include five teaching establishments (pedagogic, medical, agricultural, cultural, and food industry); research institutes for agriculture, tobacco, vegetable fats, canning, and the petroleum industry; and several theatres and museums. Pop. (1983 est.) 595,000.

Krasnodon, formerly (until 1938) SOROKINO, coal-mining city and centre of a *rayon* (district), Voroshilovgrad *oblast* (administrative region), Ukrainian Soviet Socialist Republic, on the Bolshaya Kamenka River. Krasnodon was incorporated in 1938. It is important for the mining of bituminous coal. A local museum commemorates the defense of the city during World War II by local youths. Pop. (1972 est.) 70,400.

Krasnogorsk, city and centre of a *rayon* (district), Moscow *oblast* (administrative region), western Russian Soviet Federated Socialist Republic, a few miles west of Moscow. Situated in the Moscow greenbelt, it was known as Banki before its incorporation as a town in 1940. It now produces cameras and is important for building machinery and plasterwork. The newer, planned part of the city contrasts markedly with the older part. Pop. (1983 est.) 84,000.

Krasnogvardeysk (Russian S.F.S.R.): *see* Gatchina.

Krasnoje Selo (Russian S.F.S.R.): *see* Krasnoye Selo.

List of Abbreviations

A.B.	bachelor of arts (Latin *artium baccalaureus*)
ac	acre(s)
Ac	actinium
AC	alternating current
A.C.T.	Australian Capital Territory
AD	in the year of the Lord (Latin *anno Domini*)
Adm.	Admiral
Afg.	Afghanistan
Ag	silver (Latin *argentum*)
AG	Limited-liability Company (German *Aktiengesellschaft*)
AH	in the year of the hijrah (hegira), or Muslim era (Latin *anno Hegirae*)
Al	aluminum, aluminium
Ala.	Alabama
Alb.	Albania
Alg.	Algeria
Alta.	Alberta
Am	americium
AM	before noon (Latin *ante meridiem*)
AM	amplitude modulation
A.M.	master of arts (Latin *artium magister*)
Ar	argon
Arg.	Argentina
Ariz.	Arizona
Ark.	Arkansas
As	arsenic
A.S.S.R.	Autonomous Soviet Socialist Republic
At	astatine
Au	gold (Latin *aurum*)
Aug.	August
b.	born
B	boron
Ba	barium
B.A.	bachelor of arts
BC	before Christ
B.C.	British Columbia
BCE	before the Christian era, or Common Era
Be	beryllium
B.Ed.	bachelor of education
Belg.	Belgium
Bi	bismuth
Bk	berkelium
Bol.	Bolivia
BP	before the present
B.Ph.	bachelor of philosophy
Br	bromine
Braz.	Brazil
Brig.	Brigadier
Brit.	British
B.S.	bachelor of science
B.Sc.	bachelor of science
Bulg.	Bulgaria
c.	about, approximately (Latin *circa*)
C	carbon; Celsius
Ca	calcium
Calif.	California
Can.	Canada
Capt.	Captain
Cb	columbium
C.B.	Companion of the Order of the Bath
C.B.E.	Companion of the Order of the British Empire
Cd	cadmium
Ce	cerium
CE	Christian era, Common Era
cf.	compare (Latin *confer*)
Cf	californium
cg	centigram(s)
ch.	chapter
C.H.	Member of the Order of Companions of Honour
Chron.	Chronicles (Bible)
Cia.	Company (Italian *Compagnia;* Portuguese *Companhia;* Spanish *Compañia*)
Cie.	Company (French *Compagnie*)
cl	centilitre(s)
Cl	chlorine
cm	centimetre(s)
Cm	curium
C.M.G.	Companion of the Order of St. Michael and St. George
CMSA	consolidated metropolitan statistical area
Co	cobalt
Co.	Company
Col.	Colonel; Colossians (Bible)
Colo.	Colorado
Colom.	Colombia
Comdr.	Commander
Comdt.	Commandant
Commo.	Commodore
Conn.	Connecticut
Cor.	Corinthians (Bible)
Corp.	Corporation
cos	cosine
cot	cotangent
Cr	chromium
Cs	cesium
csc	cosecant
cu	cubic
Cu	copper (Latin *cuprum*)
C.V.O.	Commander of the Royal Victorian Order
Czech.	Czechoslovakia
d.	died
Dan.	Daniel (Bible)
D.B.E.	Dame Commander of the Order of the British Empire
DC	direct current
D.C.	District of Columbia
D.C.M.G.	Dame Commander of the Order of St. Michael and St. George
D.C.V.O.	Dame Commander of the Royal Victorian Order
D.D.	doctor of divinity
Dec.	December
Del.	Delaware
Den.	Denmark
Deut.	Deuteronomy (Bible)
D.F.	Federal District (Spanish *Distrito Federal*)
D.Litt.	doctor of letters (Latin *doctor litterarum*)
Dom.Rep.	Dominican Republic
Dr.	Doctor
Dy	dysprosium
E	east
Eccles.	Ecclesiastes (Bible)
ed.	edited; edition; editor
Ed.B.	bachelor of education
eds.	editors
e.g.	for example (Latin *exempli gratia*)
E.Ger.	East Germany
Eng.	England; English
Eph.	Ephesians (Bible)
Er	erbium
Es	einsteinium
est.	estimate; estimated
Esth.	Esther (Bible)
et al.	and others (Latin *et alii,* or *aliae*)
et seq.	and following page(s) (Latin *et sequens, sequentes,* or *sequentia*)
etc.	and so forth (Latin *et cetera*)
Eth.	Ethiopia
Eu	europium
Ex.	Exodus (Bible)
Ezek.	Ezekiel (Bible)
F	Fahrenheit; fluorine
Fe	iron (Latin *ferrum*)
Feb.	February
ff.	and following pages
Fig.	Figure
Fin.	Finland
fl.	flourished (Latin *floruit*)
Fla.	Florida
Fm	fermium
FM	frequency modulation
Fr	francium
Fr.	France
ft	foot, feet
Ft.	Fort
g	gram(s)
Ga	gallium
Ga.	Georgia
gal	gallon(s)
Gal.	Galatians (Bible)
G.B.E.	Knight (or Dame) Grand Cross of the Order of the British Empire
G.C.B.	Knight (or Dame) Grand Cross of the Order of the Bath
G.C.M.G.	Knight (or Dame) Grand Cross of the Order of St. Michael and St. George
G.C.V.O.	Knight (or Dame) Grand Cross of the Royal Victorian Order
Gd	gadolinium
Ge	germanium
Gen.	General; Genesis (Bible)
Ger.	Germany
GmbH	Company with Limited Liability (German *Gesellschaft mit beschränkter Haftung*)
Guat.	Guatemala
h	hour
H	hydrogen
ha	hectare(s)
Ha	hahnium
Hab.	Habakkuk (Bible)
Hag.	Haggai (Bible)
He	helium
Heb.	Hebrews (Bible)
Hf	hafnium
Hg	mercury (Latin *hydrargyrum*)
HMS	His, or Her, Majesty's Ship, or Service
HMSO	His, or Her, Majesty's Stationery Office
Ho	holmium
Hos.	Hosea (Bible)
hr	hour(s)
Hung.	Hungary
I	iodine
ibid.	in the same place (Latin *ibidem*)
Ice.	Iceland
i.e.	that is (Latin *id est*)
Ill.	Illinois
in.	inch(es)
In	indium
Inc.	Incorporated
Ind.	Indiana
Indon.	Indonesia
Ir	iridium
Ire.	Ireland
Isa.	Isaiah (Bible)
Jam.	Jamaica
Jan.	January
Jer.	Jeremiah (Bible)
Josh.	Joshua (Bible)
Jr.	Junior
Judg.	Judges (Bible)
K	Kelvin; potassium (Latin *kalium*); Köchel catalog number
Kan.	Kansas
K.B.E.	Knight Commander of the Order of the British Empire
K.C.B.	Knight Commander of the Order of the Bath
K.C.M.G.	Knight Commander of the Order of St. Michael and St. George
K.C.V.O.	Knight Commander of the Royal Victorian Order
kg	kilogram(s)
KG	Limited Partnership (German *Kommandit Gesellschaft*)
K.G.	Knight of the Order of the Garter
KK	Limited-liability Company (Japanese *Kabushiki Kaisha*)
kl	kilolitre(s)
km	kilometre(s)
kph	kilometre(s) per hour
Kr	krypton
K.T.	Knight of the Order of the Thistle
Ky.	Kentucky
l	litre(s)
La	lanthanum
La.	Louisiana
Lam.	Lamentations (Bible)
lb	pound(s)
Lev.	Leviticus (Bible)
Li	lithium
Liech.	Liechtenstein
Lieut.	Lieutenant
LL.B.	bachelor of laws (Latin *legum baccalaureus*)
LL.D.	doctor of laws (Latin *legum doctor*)
log	logarithm
Lr	lawrencium
Ltd.	Limited
Lu	lutetium
Luxem.	Luxembourg
m	metre(s)
M.A.	master of arts
Maj.	Major
Mal.	Malachi (Bible)
Man.	Manitoba
Mass.	Massachusetts
Matt.	Matthew (Bible)
M.B.E.	Member of the Order of the British Empire
mbH	Limited, with Limited Liability (German *mit beschränkter Haftung*)
Md	mendelevium
Md.	Maryland
M.D.	doctor of medicine (Latin *medicinae doctor*)
Mex.	Mexico
mg	milligram(s)
Mg	magnesium
mi	mile(s)
Mic.	Micah (Bible)
Mich.	Michigan
Mij	Company (Dutch *Maatschappij*)
min	minute(s)
Minn.	Minnesota
Miss.	Mississippi
ml	millilitre(s)
Mlle	Mademoiselle
mm	millimetre(s)
Mme	Madame
Mn	manganese
Mo	molybdenum
Mo.	Missouri
Mong.	Mongolia
Mont.	Montana
Mor.	Morocco
MP	member of Parliament
mph	mile(s) per hour
Mr.	Mister
Mrs.	"Missus"
MS.	manuscript
M.S.	master of science
MSA	metropolitan statistical area
M.Sc.	master of science

Msgr.	Monsignor
MSS.	manuscripts
Mt.	Mount; Mountain(s)
mun.	municipality
MV	Motor Vessel
M.V.O.	Member of the Royal Victorian Order
N	nitrogen; north
Na	sodium (Latin *natrium*)
NA	National Association
Nah.	Nahum (Bible)
Nb	niobium
N.B.	New Brunswick
N.C.	North Carolina
n.d.	no date
Nd	neodymium
N.D.	North Dakota
Ne	neon
NE	northeast
Neb.	Nebraska
Neh.	Nehemiah (Bible)
Neth.	The Netherlands
Nev.	Nevada
Nfd.	Newfoundland
N.H.	New Hampshire
Ni	nickel
Nic.	Nicaragua
N.Ire.	Northern Ireland
N.J.	New Jersey
N.Kor.	North Korea
N.M.	New Mexico
no.	number
No	nobelium
Nor.	Norway
Nov.	November
Np	neptunium
NS	Nuclear Ship
N.S.	New Style (calendar); Nova Scotia
N.S.W.	New South Wales
N.Terr.	Northern Territory
Num.	Numbers (Bible)
NV	Limited-liability Company (Dutch *Naamloze Vennootschap*)
NW	northwest
N.W.Terr.	Northwest Territories
N.Y.	New York
N.Z.	New Zealand
O	oxygen
Obad.	Obadiah (Bible)
O.B.E.	Officer of the Order of the British Empire
Oct.	October
Okla.	Oklahoma
Ont.	Ontario
op.	opus
op. cit.	in the work cited (Latin *opere citato*, or *opus citato*)
Ore.	Oregon
Os	osmium
O.S.	Old Style (calendar)
oz	ounce(s)
p.	page
P	phosphorus
pA	Limited (Italian *per Azioni*)
Pa	protactinium
Pa.	Pennsylvania
Pak.	Pakistan
Pan.	Panama
Pb	lead (Latin *plumbum*)
Pd	palladium
P.E.I.	Prince Edward Island
Pet.	Peter (Bible)
pH	potential of hydrogen (acidity–alkalinity factor)
Ph.B.	bachelor of philosophy (Latin *philosophiae baccalaureus*)
Ph.D.	doctor of philosophy (Latin *philosophiae doctor*)
Phil.	Philippians (Bible); Philippines
Philem.	Philemon (Bible)
PLC	Public Limited Company
Pm	promethium
PM	afternoon (Latin *post meridiem*)
PMSA	primary metropolitan statistical area
Po	polonium
Pol.	Poland
pop.	population
Port.	Portugal
pp.	pages
Pr	praseodymium
P.R.	Puerto Rico
prelim.	preliminary
Pres.	President
Prov.	Proverbs (Bible)
Ps.	Psalms (Bible)
Pt	platinum
Pu	plutonium
qq.v.	which see (plural; Latin *quae vide*)
Que.	Quebec
Queen.	Queensland
q.v.	which see (singular; Latin *quod vide*)
R	Rankine
Ra	radium
Rb	rubidium
Re	rhenium
rev.	revised; revision
Rev.	Revelations (Bible); Reverend
Rf	rutherfordium
Rh	rhodium
R.I.	Rhode Island
Rn	radon
Rom.	Romania; Romans (Bible)
rpm	revolutions per minute
Rt. Rev.	Right Reverend
Ru	ruthenium
s	second
S	south; sulfur
S.	Saint (*san, santo, santa, sant'*)
S. of Sol.	Song of Solomon (Bible)
SA	Limited-liability Company (French *Société Anonyme;* Italian *Società Anònima;* Portuguese *Sociedade Anónima;* Spanish *Sociedad Anónima*)
S.Af.	South Africa
Sam.	Samuel (Bible)
Sask.	Saskatchewan
S.Aus.	South Australia
Sb	antimony (Latin *stibium*)
Sc	scandium
S.C.	South Carolina
Scot.	Scotland
SCSA	standard consolidated statistical area
S.D.	South Dakota
Se	selenium
SE	southeast
sec	secant; second(s)
Sept.	September
S.F.S.R.	Soviet Federated Socialist Republic
Si	silicon
sin	sine
S.Kor.	South Korea
Sm	samarium
SMSA	standard metropolitan statistical area
Sn	tin (Latin *stannum*)
SpA	Limited-liability Company (Italian *Società per Azioni*)
sq	square
Sr	strontium
Sr.	Senior
SS	Steamship
SS.	Saints; Saintliest, or Holiest (Italian *Santissimo, Santissima*)
S.S.R.	Soviet Socialist Republic
St.	Saint (*Sankt, Sint*)
Sta.	Saint (*Santa*)
Ste.	Saint (*Sainte*)
SW	southwest
Swed.	Sweden
Switz.	Switzerland
Ta	tantalum
tan	tangent
Tanz.	Tanzania
Tas.	Tasmania
Tb	terbium
Tc	technetium
Te	tellurium
Tenn.	Tennessee
Th	thorium
Thai.	Thailand
Thess.	Thessalonians (Bible)
Ti	titanium
Tim.	Timothy (Bible)
Tit.	Titus (Bible)
Tl	thallium
Tm	thulium
trans.	translated; translation; translator(s)
Tun.	Tunisia
Tur.	Turkey
U	uranium
U.A.E.	United Arab Emirates
U.A.R.	United Arab Republic
U.K.	United Kingdom
UN	United Nations
U.S.	United States
USGPO	United States Government Printing Office
USS	United States Ship
U.S.S.R.	Union of Soviet Socialist Republics
v.	versus (law)
V	vanadium
Va.	Virginia
Venez.	Venezuela
Vic.	Victoria
Vir.Is.	Virgin Islands
vol.	volume(s)
Vt.	Vermont
W	tungsten (wolfram); west
Wash.	Washington
W.Aus.	Western Australia
W.Ger.	West Germany
Wis.	Wisconsin
W.Va.	West Virginia
Wyo.	Wyoming
Xe	Xenon
Y	yttrium
Yb	ytterbium
yd	yard(s)
Yugos.	Yugoslavia
Zech.	Zechariah (Bible)
Zeph.	Zephaniah (Bible)
Zimb.	Zimbabwe
Zn	zinc
Zr	zirconium

Table of Measurement Conversions

To convert	Into	Multiply by
acres	hectares	0.40468564
Celsius (centigrade)	Fahrenheit	$(C° \times 9/5) + 32$
centimetres	inches	0.3937008
cubic feet	cubic metres	0.028316847
cubic metres	cubic feet	35.31467
Fahrenheit	Celsius (centigrade)	$5/9(F° - 32)$
feet	metres	0.3048
gallons (U.S. liquid)	litres	3.785412
grams	ounces (troy)	0.032150747
hectares	acres	2.471054
inches	centimetres	2.54
inches	millimetres	25.4
kilograms	pounds	2.2046226
kilometres	miles (nautical)	0.5399568
kilometres	miles (statute)	0.6213712
litres	gallons (U.S. liquid)	0.26417205
metres	feet	3.2808399
metres	yards	1.093613298
miles (nautical)	kilometres	1.852
miles (statute)	kilometres	1.609344
millilitres	ounces (U.S. fluid)	0.03381402
millimetres	inches	0.03937008
newtons	pounds (of force)	0.224809
ounces (troy)	grams	31.1034768
ounces (U.S. fluid)	millilitres	29.57353
pounds	kilograms	0.45359237
pounds (of force)	newtons	4.44822
square kilometres	square miles	0.38610216
square miles	square kilometres	2.58998811
yards	metres	0.9144